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The Effect of Sample Representativeness on Consumer Responses to Target Products

A Dissertation submitted in partial satisfaction of the requirements for the degree of

Doctor of Philosophy

in

Management

by

Yuanrui Li

June 2016

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ABSTRACT OF THE DISSERTATION

The Effect of Sample Representativeness on Consumer Responses to Target Products

by

Yuanrui Li

Doctor of Philosophy, Graduate Program in Management
University of California, Riverside, June 2016
Dr. Thomas Kramer, Chairperson

Marketers often give consumers samples of products before consumers make decisions. However, in the marketplace, samples can be offered in many different forms. For example, to promote a cake, marketers could provide a slice of the cake or a mini version of the cake. To advocate for a software package, marketers could provide either a trial version with full features but for a limited time only, or a trial version with limited features but for a longer time period. Are all samples created equal? While previous literature has mainly focused on the general effect of samples, in this dissertation I examine how different types of sampling experiences influence consumer responses to target products. Particularly, I focus on how representative samples are of their target products, as it relates to how fundamentally consumers recognize and understand products. Normatively, high representative samples (e.g., a mini cake) should be more effective than low representative samples (e.g., a slice of a cake) in promoting target products, as high representativeness eases perceived uncertainty about target products.
However, counter-intuitively, across a series of online and field experiments, I find that low representative samples actually lead to more favorable responses to target products as compared to high representative samples. The effect of sample representativeness on consumer responses to target products is driven by a differential level of satiation – high representative samples lead to a higher level of satiation. Moreover, I find that the effect of sample representativeness on consumer responses to target products is strengthened when need for cognition is low.
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INTRODUCTION

Marketers often give consumers samples of products before consumers make decisions (Biswas et al. 2014; Cheng and Liu 2012; Kempf and Smith 1998; Nowlis and Shiv 2005; Shiv and Nowlis 2004). Considerable research has shown that samples have a strong impact on consumers’ product and brand attitudes (Kempf and Smith 1998; Marks and Kamins 1988; Smith 1993). Pleasant sampling experiences can create an appetizing effect, enhancing consumers’ motivation for target products (Wadhwa, Shiv and Nowlis 2008).

However, in the marketplace, samples can be offered in many different forms. For example, to promote a cake, marketers could provide either a slice of the cake or a mini version of the cake. To advocate adoption of a software, marketers could provide either a trial version with full features but for a limited time only, or a trial version with limited features but for a longer time period. Are all samples created equal? Surprisingly, previous research on the relationship between samples and consumer responses to target products seldom distinguished between different types of samples. However, as I discuss below, the form of the samples may have important downstream consequences for consumers – especially those types of samples that, counterintuitively, most closely correspond to the target products they represent.

Therefore, in my dissertation I seek to fill this research gap by studying how different types of samples influence consumer responses to target products. Particularly, I focus on how representative samples are of target products, as it relates to how
consumers fundamentally recognize and understand products (Loken, Barslou and Loiner 2008; Meris and Rosch 1981). Adapted from Tversky and Kahneman (1983), sample representativeness is defined here as the degree of correspondence between a sample and its target product. For example, a mini cake that is proportionally smaller than the target cake may be perceived more representative as compared to a slice of the target cake. Intuitively, people might think that high representative samples should be more effective than low representative samples in promoting target products and stimulating purchase, as high representativeness eases perceived uncertainty about target products. If consumers enjoyed a high representative sample, their positive attitude towards this sample should easily translate to its target product. However, based on categorization and satiation theories, I propose that low representative samples may actually lead to more favorable responses to target products as compared to high representative samples (Hypothesis 1). Further, I propose that the effect of sample representativeness on consumer responses to target products is driven by a differential level of satiation associated with differences in sample representativeness (Hypothesis 2). Moreover, consistent with my argument that sample representativeness serves as a decision heuristic, I suggest that the effect of sample representativeness on consumer responses to target products is strengthened when need for cognition is low (Hypothesis 3).

These hypotheses will be tested across a series of studies. Specifically, Pre-test 1 is to validate the operationalization of high versus low representative samples, which will be adopted in Experiments 1 and 2. In Experiments 1 and 2, I will examine the proposed key effect (Hypothesis 1) using hypothetical sampling experiences. Pre-test 2 is to
validate a different way to indicate high versus low representative samples, which will be adopted in Experiments 3 and 4. Experiment 3 will test the moderating effect of need for cognition (Hypothesis 3) while Experiment 4 will examine the mediating role of satiation (Hypothesis 2). Experiments 3 and 4 will involve actual sampling experiences.
THEORETICAL BACKGROUND

Product Samples

Marketers often give consumers samples of products before consumers make decisions, such as a piece of chocolate or a free trial version of a software package (Biswas et al. 2014; Cheng and Liu 2012; Kempf and Smith 1998; Nowlis and Shiv 2005; Shiv and Nowlis 2004).

There are many reasons why marketers would like to provide product samples. First, marketers may use samples to provide product information, particularly when they introduce new products. Research has shown that consumers’ exploration during initial product trials can help them better understand how to use new products (Lakshmanan and Krishnan 2011). Second, marketers may provide product samples to test new ideas. Research has demonstrated that consumers’ attitudes in response to product trials predict purchases very well (Smith and Swinyard 1983). Based on consumers’ reactions to samples, marketers can make adjustments before launching final products. Third, marketers may use samples to lower barriers to product adoption. This is particularly important when consumers are making decisions that require deliberative considerations (e.g., purchasing a car). It has been shown that consumers become less ambiguity-averse after positive sampling experiences (Güney and Newel 2015). Moreover, providing free samples can be an effective way to induce perceived ownership. Research has shown that perceived ownership can occur without actual possession (Peck and Shu 2009; Peck, Barger and Webb 2013). Through merely interacting with product samples, consumers
may develop a sense of perceived ownership. Consequently, the perceived ownership can lead to an increased product valuation (Kahneman, Knetsch and Thaler 1990; Dommer, Loughran and Swaminathan 2013).

Considerable research has indicated that sampling experiences are an important determinant of consumers’ product and brand attitudes (Kempf and Smith 1998; Marks and Kamins 1988; Smith 1993). However, perhaps the most important thing to marketers is that their effort in providing samples would eventually promote the sales of target products. The rationale is that if consumers enjoyed product samples, their positive attitudes toward samples would translate to target products. Indeed, research confirms that pleasant sampling experiences can create an appetizing effect, enhancing consumers’ motivation for target products (Wadhwa, Shiv and Nowlis 2008).

However, in the marketplace, samples can be offered in many different forms. For example, to promote a cake, marketers could provide a slice of the cake or a mini version of the cake. To advocate for a software package, marketers could provide a trial version with full features but for a limited time only, or a trial version with limited features but for a longer time period. Are all samples created equal? While previous research has mainly focused on the general effect of samples, my dissertation is to examine how different types of samples influence consumers’ responses to target products. Particularly, I focus on types of samples that differ in their level of representativeness; that is, in how representative samples are of their target products. In the next section, I will explain why representativeness is the key to conceptually differentiate between different types of samples and how it relates to categorization.
Representativeness and Categorization

Categorization is a basic human function through which consumers recognize and understand products (Loken, Barsalou and Joiner 2008). Substantial research has demonstrated that categorization plays an important role in consumers’ decision making process. For example, consumers make inferences about an individual item based on the properties of its category (Hampton and Cannon 2004; Moreau, Markman and Lehmann 2001; Moshinsky and Bar-Hillel 2002). For example, knowing that Fitbit Charge HR is a wearable fitness device, consumers would imply that it could track how many steps they walk per day. Research has shown that consumers’ evaluation of brand extensions depends on how well these extensions fit the original brand categories (Aaker and Keller 1990; Bottomley and Holden 2001; Ma, Wang and Wang 2014; Zhang and Sood 2002). Moreover, consumers’ budgeting and spending are influenced by whether consumers categorize purchases into ordinary or exceptional purchases (Sussman and Alter 2012). Research has also shown that the mere presence of categorization can increase consumers’ perception of assortment variety and satisfaction of decision outcomes (Mogilner, Rudnick and Iyengar 2008). The level of categorization can systematically affect consumers’ information processing and subsequent decisions (Ülkümen, Chakravarti and Morwitz 2010).

Previous research suggests that representativeness is a major determinant in the learning and development of categorization (Meris and Rosch 1981). The concept of representativeness has been defined as follows:
“Representativeness is an assessment of the degree of correspondence between a sample and a population, an instance and a category, an act and an actor, or more generally between an outcome and a model (Tversky and Kahneman 1983, pp.295).”

Adapted from Tversky and Kahneman (1983), sample representativeness is defined here as the degree of correspondence between a sample and its target products. Despite subtle differences, representativeness has been used interchangeably with similarity and typicality (Fischhoff and Maya Bar-Hillel 1984; Kahneman and Tversky 1996; Hampton and Cannon 2004; Loken, Barsalou and Joiner 2008; Read and Grushka-Cockayne 2011). A basic principle of categorization is to maximize the similarities within one category and minimize the similarities between different categories (Merrvis 1981). The level of representativeness within the same category is graded - some members may be more representative than others (Loken, Barsalou and Joiner 2008). On the other hand, consumers decide category membership based on how representative each individual item is of a specific category (Murphy and Ross 2005).

While the construction of categories is influenced by degree of representativeness, the judgment of representativeness is subjective and can be influenced by contextual cues (Haslam et al. 1995). Research suggests that physical changes in size or form can affect perceived representativeness, which in turn influences consumer behaviors. For example, a distorted water bottle is perceived more like “garbage” than “recyclable,” and is therefore less likely to be recycled (Trudel and Argo 2013).
Within the context of sampling experiences, I propose that the level of sample representativeness can affect the way consumers categorize samples and target products. Specifically, I propose that high representative samples (e.g., a mini cake) are more likely to be perceived as in the same category as their target products (e.g., a regular size cake). In that case, consumers generate one broad category (e.g., cakes). In contrast, low representative samples (e.g., a slice of a cake) are more likely to be perceived as in a different category as their target products (e.g., a regular size cake). In that case, consumers generate two narrow categories (e.g., sample cakes versus target cakes). As I will elaborate in the next section, broad versus narrow categorization in turn affects consumers’ feelings of satiation.

To sum up, I suggest that the level of sample representativeness influences consumers’ categorization of samples and target products. In the next section, I will first summarize some of the most important research on satiation and then discuss how the categorization derived from sample representativeness relates to consumers’ feelings of satiation.

_Categorization and Feelings of Satiation_

Satiation is defined as decline in enjoyment resulting from repeated consumption (Chugani, Irwin and Redden 2015; Redden 2008; Redden and Haws 2013). A wealth of research has demonstrated that repetition is a key determinant of satiation. For example, repeated television commercials reduce message acceptance and cognitive responses (Belch 1982); prolonged inspection and verbalization of a word leads to loss of meaning
Art paintings become less attractive when people have seen them multiple times (Zajonc, Shaver, Tavris and Kreveld 1972). Consumers grow tired of their initially well-liked snacks when consuming too rapidly (Galak, Kruger and Loewenstein 2013).

It is worth noting that satiation is affected by not only physiological consumption, but also psychological mechanisms (Redden and Galak 2013). For example, consumers can experience increased feelings of fullness by merely recalling their previous food consumptions (Higgs 2002). Consumers may also feel satiated after repeatedly rating food pictures or choosing the most appetizing food shown in pictures (Larson, Redden and Elder 2014). Moreover, emerging research on vicarious goal satiation suggests that when witnessing others’ goal completion, people can feel as if they have accomplished their own goals (McCulloch, Fitzsimons, Chua and Albarracin 2011; Tobin, Greenaway, McCulloch and Crittall 2015).

There are many factors that can attenuate or strengthen the degree of satiation. For example, research has shown that dietary variety can reduce food satiation (Hardman et al. 2015). In a similar way, memory about past variety can accelerate recovery from satiation (Galak, Redden and Kruger 2009). Moreover, breaks between consumption episodes can slow satiation rate (Galak, Kruger and Loewenstein 2013). For example, commercial interruptions during long time television-viewing can reduce satiation and improve consumer enjoyment over time (Nelson, Meyvis and Galak 2009). Consistent with its subjective nature, satiation is also affected by perceived temporal distance such that satiation decreases when perceived temporal distance is long (Galak, Redden, Yang
Satiation is also reduced when products are available only at limited times (Sevilla and Redden 2014). Moreover, the degree of satiation is influenced by how consumers frame repetition. For example, research has shown that framing repetition in a negative way such as boredom strengthens satiation whereas framing repetition in a positive way such as loyalty attenuates satiation (Fishbach, Ratner and Zhang 2011).

In addition to consumption and contextual cues, satiation is also affected by individual characteristics. For example, consumers high in trait self-control experience a higher rate of satiation in response to unhealthy foods (Redden and Haws 2013). Consumers satiate less when products are consistent with their identity, for example, a painting that is related to consumers’ school (Chugani, Irwin and Redden 2015). Moreover, consumers satiate at a lower rate when they are able to differentiate between positive and negative emotions that arise during repeated consumption (Poor, Duhachek and Krishnan 2012).

Importantly, categorization also affects satiation. Research has shown that broad categorizations (e.g., jelly beans) lead to a higher level of satiation as compared to narrow categorizations (e.g., cherry flavored jelly beans, orange flavored jelly beans) (Redden 2008). This phenomenon happens because narrow (versus broad) categorizations increase the salience of distinctive features, making multiple consumptions seem less similar and consequently less satiating (Redden 2008). On the other side of the coin, this line of reasoning is also consistent with the relationship between satiation and perceived variety. That is, the more similar consumers perceive the different consumption episodes to be, the more likely they are to consider these consumption episodes to offer less variety.
(Hoch, Bradlow, and Wansink 1999). As a result, the decrease in perceived variety results in a higher level of satiation (Galak, Redden and Kruger 2009).

Recall that in the previous section, I argued that sample representativeness influences how consumers categorize samples and target products. More specifically, *high* representative samples are more likely to be perceived as in the same category as target products (i.e., *broad* categorization). In contrast, *low* representative samples are more likely to be perceived as in a different category as target products (i.e., *narrow* categorization). Connecting this argument with the relationship between categorization and satiation, I propose that sample representativeness (*high* versus *low*) influences categorization (*broad* versus *narrow*), which in turn affects the level of satiation (*low* versus *high*).

*Feelings of Satiation and Consumer Responses*

Feelings of satiation have a strong impact on consumer preferences and subsequent decisions. Research has shown that satiation decreases product desirability and perceived utility (Baucells and Sarin 2010). For example, when consumers are food satiated, they express a less positive attitude in response to food words (Staats, Minke, Martin, and Higa 1972). Moreover, satiation makes consumers less sensitive to monetary and nonmonetary rewards (Van den Bergh, Dewitte, and Warlop 2008) and attenuates the impact of customer satisfaction on repurchases (Voss, Godfrey, and Seiders 2010). The effect of satiation, when aggregated, can extend to competition and profits at firm level (Caro and Martínez-de-Albéniz 2012). Satiation also leads to increased variety seeking -
when consumers feel satiated, they look for things that are different (Wang, Sun, and Keh 2013; McAlister 1982; Hasegawa, Terui, and Allenby 2012). Moreover, satiation affects consumption. Research has shown that the expected satiation influences portion size selection and calorie intake (Brogden and Almiron-Roig 2010; Martin et al. 2015). Additionally, the expected satiation guides consumers’ choices not only for self but also for others (Choi, Kim, Choi, and Yi 2006).

Adapting the consequences of satiation to the context of samples and target products, I suggest that if high (versus low) representative samples lead to a higher level of satiation, consumers should show less favorable responses to target products after consuming high (versus low) representative samples. To summarize the aforementioned reasoning, I hypothesize that:

**H1**: Low representative samples lead to more favorable responses to target products as compared to high representative samples (i.e., the key effect).

**H2**: The effect of sample representativeness on consumer responses to target products is driven by differences in level of satiation (i.e., the mediating effect of satiation).

To sum up, I suggest that low representative samples should be more effective than high representative samples in eliciting favorable responses to target products. This effect happens because high representative samples lead to a higher level of satiation, negatively affecting consumer responses to target products. In the next section, I will
discuss why and how need for cognition should moderate the effect of sample representativeness on consumer responses to target products.

Need for Cognition

Need for cognition refers to the individual’s dispositional tendency to engage in and enjoy effortful thinking (Cacioppo and Petty 1982; Cacioppo, Petty, Feinstein and Jarvis 1996). The concept of need for cognition has been widely used in the consumer behavior literature to understand how consumers perceive things and make subsequent decisions.

People with high versus low need for cognition process information differently. To explain, research has shown that people with high need for cognition tend to process information in a more focused manner (Levin, Huneke and Jasper 2000). They are more likely to engage in elaborative and explanatory thinking (Barden and Petty 2008; Lassiter, Briggs and Slaw 1991; Stayman and Kardes 1992). Therefore, people with high need for cognition are able to generate more valid arguments to support their views (Shestowsky, Wegener and Fabrigar 1998). They are also relatively more suspicious and resistant to environmental changes (Chatterjee, Heath and Basuroy 2003; Haugtvedt and Petty 1992).

In contrast, people with low need for cognition tend to process information in a more spontaneous manner. They are more likely to engage in heuristic processing and form attitudes based on peripheral cues (Batra and Stayman 1990; Drolet, Luce and Simonson 2009; Haugtvedt, Petty and Cacioppo 1992). Therefore, people with low need
for cognition are more susceptible to priming effect and heuristic bias (D'Agostino and Fincher-Kiefer 1992; Smith and Levin 1996; Kuvaas and Kaufmann 2004).

As need for cognition systematically affects information processing, it further impacts consumers’ attitude formation and subsequent decisions. Research has shown that people with high need for cognition tend to make decisions based on cognitive thoughts whereas people with low need for cognition tend to make decisions based on subjective feelings (Mantel and Kardes 1999; van Giesen, Fischer, van Dijk and van Trijp 2015). As a result, consumers are more receptive to cognitive- versus affect-based messages, depending on their level of need for cognition (Haddock, Maio, Arnold and Huskinson 2009). In a similar way, need for cognition can affect consumers’ decisions to adopt new products (Meyers-Levy and Tybout 1997; Wood and Swait 2002). Moreover, need for cognition can also influence consumers’ reactions to decision outcomes. For example, when a good decision leads to an unfavorable outcome, consumers with high need for cognition are less likely than those with low need for cognition to switch away from that decision and are less likely to be affected by the negative emotional responses to the outcomes (Ratner and Herbst 2005).

Many consumer behavior researchers have examined the moderating role of need for cognition in situations where consumers process product information. For example, within the context of comparative advertisements, dissimilarity between the sponsor brand and the comparison brand results in greater elaboration by consumers (Priester, Godek, Nayakankuppum and Park 2004). However, this pattern is particularly strong for consumers with low need for cognition (Priester, Godek, Nayakankuppum and Park
2004). For another example, when consumers read information about technical products, ambiguous context language is more helpful for consumers with high need for cognition to form attitudes while explanatory context language is more helpful for consumers with low need for cognition to form attitudes (Bradley and Meeds 2004). Moreover, nowadays many technical products use alphanumeric brand names (e.g., X-100). Research has shown that consumers with low need for cognition tend to use “the higher, the better” heuristic to choose brands with higher numeric portions (Gunasti and Ross 2010). As a result, for example, X-200 is preferred over X-100 even when X-200 is objectively inferior to X-100 (Gunasti and Ross 2010). In contrast, consumers with high need for cognition tend to process alphanumeric brand names more systematically and their preferences are based on brand name-attribute correlations (Gunasti and Ross 2010).

The moderating role of need for cognition is also embedded in consumers’ reactions to marketing strategies. For example, Inman, Peter and Raghubir (1997) show that sales restrictions such as time or quantity limit can increase deal evaluations. However, this effect only occurs for consumers with low need for cognition (Inman, Peter and Raghubir 1997). For another example, Inman, McAlister and Hoyer (1990) find that consumers with low need for cognition react to the mere presence of promotion signals without considering relative price information. In contrast, consumers with high need for cognition react to promotion signals only when the prices are substantively reduced (McAlister and Hoyer 1990). Moreover, Goodman and Irmak (2013) find that consumers tend to overestimate feature usage frequency before purchasing multifunctional products, resulting in lower product satisfaction. Therefore, having consumers estimate feature
usage before choices can help them make better decisions. However, consumers with high need for cognition are not influenced by the usage estimation, as they like to elaborate on things anyway (Goodman and Irmak 2013). In addition, Zhu, Billeter and Inman (2012) show that salient marketing cues in advertising or packaging (e.g., pictures) can increase perceived product efficacy and lead to a lower usage amount per occasion. However, this effect is attenuated for consumers with high need for cognition (Zhu, Billeter and Inman 2012).

In many situations, consumers with low need for cognition are more susceptible to marketing strategies due to lack of elaboration. However, in some situations, consumers with high need for cognition can be susceptible to making biased purchasing decisions due to overthinking. For example, research has demonstrated the “marketing placebo effect”—consumers infer product qualities based on price tags (e.g., higher-priced goods are of higher quality) and these price-based expectancies in turn affect consumption experiences (Shiv, Carmon and Ariely 2005). Research has shown that consumers with high need for cognition are more responsive to this placebo effect, as price tags help fulfill their needs to make sense of the experiential world (Plassman and Weber 2015).

Following the previous research on the relationship between need for cognition and heuristic processing, I propose that if sample representativeness serves as a decision heuristic, need for cognition should moderate the relationship between sample representativeness and consumer responses to target products. As consumers with low need for cognition are more susceptible to heuristic bias (D’Agostino & Fincher-Kiefer 1992; Smith & Levin 1996; Kuvaas & Kaufmann 2004), they should be more likely to
rely on the representativeness heuristic while making decisions. Thus, the effect of sample representativeness on consumer responses to target products should be stronger for consumers with low need for cognition. To summarize, I hypothesize that:

**H3:** The effect of sample representativeness on consumer responses to target products is strengthened when need for cognition is low (i.e., the moderating effect of need for cognition).

To sum up, I suggest that need for cognition moderates the relationship between sample representativeness and consumer responses to target products. In the next section, I will present a series of experiments to test my hypotheses.
PRE-TEST 1: THE MANIPULATION OF
SAMPLE REPRESENTATIVENESS

Purpose
In order to examine the impact of sample representativeness on consumer responses to target products, the first step is to find out ways to operationalize low versus high representative samples. Therefore, the objective of Pre-test 1 is to test and verify the manipulation of sample representativeness that will be adopted in Experiments 1 and 2.

Method
To operationalize low versus high representative samples, I chose peanut butter cups to be my experiment stimuli. Suppose a regular size peanut cup was the target product, a high representative sample would be a mini peanut butter cup that was proportionally smaller than a regular size peanut butter cup. In contrast, a low representative sample would be a slice of a regular size peanut butter cup that was of the same amount as the mini peanut butter cup. The reasons for using peanut butter cups as opposed to some other products such as cupcakes or chocolate were 1) peanut butter cups are highly standardized products, allowing me to control for other factors such as product quality; and 2) both regular size and mini peanut butter cups are available in the marketplace, allowing me to extend from online experiments (i.e., Experiments 1 and 2) to field experiments (i.e., Experiments 3 and 4).
Pre-test 1 employs a single factor between-subjects design. Forty participants from Amazon Mechanical Turk (mTurk) were randomly assigned to either the high representative sample (i.e., mini peanut butter cup) or the low representative sample condition (i.e., slice peanut butter cup). Participants in the high representative sample condition saw a picture of a mini sample (i.e., a proportionally smaller peanut butter cup) and a regular size peanut butter cup (Figure 1.1). In contrast, participants in the low representative sample saw a picture of a slice sample (i.e., a slice taken from the target product) and a regular size peanut butter cup (Figure 1.2). The amount of peanut butter cup samples for the low and the high representative conditions were the same – about 1/4 of the regular size peanut butter cup.

![Figure 1.1 Pre-test 1 Stimuli: High Representative Sample Condition](image)
According to Tversky and Kahneman (1983, pp. 295-296), “Representativeness can be investigated empirically by asking people, for example, which of two sequences of heads and tails is more representative of a fair coin or which of two professions is more representative of a given personality.” Analogously, after showing the picture, I asked participants to rate how representative, identical and similar the samples appeared to the target peanut butter cups (from 1 = not at all to 7 = very much).

**Results**

*Perceived Representativeness.* The perceived representativeness was checked by means of the three-item summed scale (Cronbach’s alpha = .84). As expected, the results showed that the mini peanut butter cups were indeed considered more representative as compared to the slice peanut butter cups ($M_{\text{mini}} = 4.75$ vs. $M_{\text{slice}} = 3.65$; $F (1, 38) = 5.47, p < .05$) (Figure 1.3).
Discussion

The results of Pre-test 1 confirmed the operationalization of sample representativeness - the *mini* peanut butter cups were indeed considered more representative as compared to the *slice* peanut butter cups. Therefore, in Experiments 1 and 2, I will use the same manipulation method to examine the impact of sample representativeness on consumer responses to target products.
EXPERIMENT 1: THE EFFECT OF SAMPLE REPRESENTATIVENESS ON PURCHASE AMOUNT

Purpose

The objective of Experiment 1 is to examine the effect of sample representativeness on consumer responses to target products. I expect to find that low representative samples lead to more favorable responses to target products as compared to high representative samples (Hypothesis 1).

Method

Experiment 1 employs a single factor between-subjects design. Eighty participants from mTurk were randomly assigned to either the high representative sample (i.e., mini peanut butter cup), the low representative sample (i.e., slice peanut butter cup), or the control (i.e., no sample) conditions. Participants were asked to imagine that there was a local organic grocery store named Natural Greens. Recently, Natural Greens introduced their own freshly made peanut butter cups. In the two sample conditions, participants were told that in order to introduce the newly launched peanut butter cups, Natural Greens gave free samples to customers who shopped at the store. In the high representative sample condition, participants saw a picture of a mini sample and a regular size peanut butter cup (Figure 2.1). In the low representative sample condition, participants saw a picture of a slice sample and a regular size peanut butter cup (Figure 2.2). Participants were told that the sample was about 1/4 of the regular size peanut butter
cup. After the cover story, participants were asked to imagine that they took the sample, and examined its taste and texture. Recent research suggests that mental imagery can lead to the same physiological and behavioral responses as actually eating the food (Morewedge, Huh and Vosgerau 2010). In the control condition, participants only saw a picture of the target peanut butter cup (Figure 2.3).

![Figure 2.1 Experiment 1 Stimuli: High Representative Sample Condition](image1)

![Figure 2.2: Experiment 1 Stimuli: Low Representative Sample Condition](image2)
After the sampling experience, participants were asked to indicate how many peanut butter cups they would like to buy (choose from 0 to 20). They were also asked to indicate how much they liked peanut butter cups in general (from 1 = not at all to 5 = very much) and how often they ate peanut butter cups (from 1 = never to 5 = almost always). In the end, participants were asked to indicate whether they were allergic to peanuts, milk, soy, or any other ingredients contained in peanut butter cups.

Results

Purchase Amount. One participant allergic to peanut butter cups was excluded from the following analysis. As expected, results from ANOVA showed that low representative samples (i.e., slice peanut butter cups) led to more purchases ($M_{slice} = 8.32$) as compared to high representative samples (i.e., mini peanut butter cups) ($M_{mini} = 5.50$) and no sample ($M_{control} = 5.68$) (Figure 2.4). Planned contrast was used with eating frequency and general liking of peanut butter cups as covariates. Planned contrast indicated that purchase amount was significantly higher in the low representative sample.
condition than in the other two conditions pooled together (F (1, 74) = 5.77, p < .05) (analysis following Pham 1998; Rutjens, Pligt and Harreveld 2009). There was no significant difference between the high representative sample and the control conditions (F (1, 74) = .894, p > .10). Eating frequency and general liking of peanut butter cups were significant covariates (F (1, 74) = 3.54, p = .06; F (1, 74) = 4.43, p < .05, respectively).

![Figure 2.4 Experiment 1 Results: Purchase Amount](image)

One might argue that if high representative samples resulted in a higher level of satiation, shouldn’t high representative samples lead to an even lower purchase amount as compared to no sample? To explain the fact that there was no significant difference between the high representative and the control conditions, recall that samples can create a general appetizing effect (Wadhwa, Shiv and Nowlis 2008). Therefore, although high
representative samples resulted in a higher level of satiation, this satiation effect neutralized with the general appetizing effect. As a result, both the high representative sample and the control conditions led to similar outcomes.

Discussion

The results of Experiment 1 show that low representative samples lead to more purchases as compared to high representative samples, supporting Hypothesis 1.

One might argue that there could be some demand effects, as participants may feel obligated to make purchases after being instructed to experience the samples. However, if that is the case, the feelings of obligation should affect both sample conditions equally. In fact, I still find that low representative samples lead to more purchases as compared to high representative samples. To further bolster the proposed key effect, Experiment 2 will use relatively more subtle, less intrusive measures (e.g., willingness to pay) to gauge consumers’ attitudes towards target products.
EXPERIMENT 2: THE EFFECT OF SAMPLE REPRESENTATIVENESS ON WILLINGNESS TO PAY

Purpose

Experiment 2 has two objectives. First, I seek to replicate previous findings in Experiment 1 using different dependent variables (e.g., willingness to pay). Second, I want to test my theory – if high representative samples lead to a higher level of satiation, consumers should be more likely to avoid target products once they have consumed high (versus low) representative samples.

Method

Experiment 2 employs a single factor between-subjects design. One hundred-eleven participants from mTurk were randomly assigned to either the high representative (i.e., mini peanut butter cup), the low representative (i.e., slice peanut butter cup), or the control (i.e., no sample) conditions. Experiment 2 followed the same procedures as in Experiment 1, except for the new measures of consumers’ responses and the indicators of my theory (i.e., avoidance). In the two sample conditions, participants saw a picture of a sample (either a mini version or a slice version) and a regular size peanut butter cup. In the control condition, participants only saw a picture of the target peanut butter cup. See Figures 3.1-3.3 for experiment stimuli – these were the same as in Experiment 1.
Figure 3.1 Experiment 2 Stimuli: *High* Representative Sample Condition

Figure 3.2 Experiment 2 Stimuli: *Low* Representative Sample Condition

Figure 3.3 Experiment 2 Stimuli: *Control* Condition
Participants were asked to imagine experiencing the sample and then answer a few questions. To gauge consumers’ responses to the target peanut butter cups, participants were asked to indicate 1) how much they would be willing to pay for each target peanut butter cup (from $0 to $2.50); 2) how much they looked forward to the target peanut butter cups (from 0 = not at all to 100 = very much); and 3) how interested they were in the target peanut butter cups (from 0 = not at all interested to 100 = strongly interested).

To test my theory, I asked participants to indicate how much they wanted to avoid and how much they wanted to stay away from the target peanut butter cups (from 0 = not at all to 100 = very much). In the end, participants were asked to indicate how much they liked peanut butter cups in general and how often they ate peanut butter cups. Participants were also asked to indicate whether they were allergic to peanuts, milk, soy, or any other ingredients contained in peanut butter cups.

Results

Willingness to Pay. Consistent with Experiment 1 findings, low representative samples (i.e., slice peanut butter cups) led to higher willingness to pay for the target product (M_{slice} = $0.81) as compared to high representative samples (i.e., mini peanut butter cups) (M_{mini} = $0.58) and no sample (i.e., control condition) (M_{control} = $0.56) (Figure 3.4). Planned contrast was used with eating frequency and general liking of peanut butter cups as covariates. Results from the planned contrast showed that willingness to pay was significantly higher in the low representative sample condition.
than in the other two conditions pooled together (F (1, 106) = 4.79, p < .05). There was no significant difference between the high representative sample and the control conditions (F (1, 106) = .05, p > .10). The effects of eating frequency and general liking of peanut butter cups were not significant (F (1, 106) = .08, p > .10; F (1, 106) = .51, p > .10, respectively). However, same patterns were obtained without eating frequency and general liking as covariates.

**Willingness to Pay**

![Willingness to Pay Chart]

**Figure 3.4 Experiment 2 Results: Willingness to Pay**

*Looking Forward.* Similar patterns were revealed with looking forward as the dependent variable. Participants were looking forward more to the target peanut butter cups in the low representative sample condition (M$_{slice} = 68.61$) as compared to the high representative sample (M$_{mini} = 54.83$) and the control conditions (M$_{control} = 59.12$) (Figure Figure 3.5). Findings were marginally significant in that participants were looking
forward more to the target peanut butter cups in the *low* representative sample condition than in the other two conditions pooled together (F (1, 106) = 3.61, *p* = .06). There was no significant difference between the *high* representative sample and the *control* conditions (F (1, 106) = .39, *p* > .10).

**Figure 3.5 Experiment 2 Results: Looking Forward**

*Product Interest.* Consistent with willingness to pay and looking forward, *low* representative samples also led to higher product interest (M\text{slice} = 68.42) as compared to *high* representative samples (M\text{mini} = 58.32) and no sample (M\text{control} = 59.21) (Figure 3.6). Findings were marginally significant in that product interest was higher in the *low* representative sample condition than in the other two conditions pooled together (F (1, 106) = 3.61, *p* = .06).
There was no significant difference between the high representative sample and the control conditions ($F (1, 106) = .02, p > .10$).

Avoidance. Similar analyses were conducted to test my theory. Avoidance was calculated by taking the average of avoidance and staying away ($r = .942, p < .01$). As expected, high representative samples led to a higher level of avoidance ($M_{\text{high}} = 21.98$) as compared to low representative samples ($M_{\text{low}} = 11.65$) and no sample ($M_{\text{control}} = 10.59$) (Figure 3.7). Planned contrast was used with eating frequency and general liking of peanut butter cups as covariates. Results indicated that avoidance was significantly higher in the high representative sample condition than in the other two conditions pooled.
together (F (1, 106) = 4.12, \( p < .05 \)) and that there was no significant difference between the low representative sample and the control conditions (F (1, 106) = .04, \( p > .10 \)).

![Avoidance bar chart](chart.png)

**Figure 3.7 Experiment 2 Results: Avoidance**

**Discussion**

To summarize, Experiment 2 replicates the findings of Experiment 1 with different dependent variables, supporting Hypothesis 1 that low representative samples lead to more favorable consumer responses to target products as compared to high representative samples. More specifically, low (versus high) representative samples lead to higher scores in willingness to pay, looking forward, and product interest. Experiment 2 also provides support for my theory that participants are more likely to avoid target products after consuming high (versus low) representative samples.
Although I now have shown the proposed key effect twice, suggesting that it is robust, one might argue that these results may be confounded by the specific operationalization of sample representativeness. To illustrate, so far I have been using mini peanut butter cups as the high representative samples and slice peanut butter cups as the low representative samples. However, the mini and slice peanut butter cups are also different in other aspects such as completeness. Therefore, in the following experiments, I will flip the operationalization of sample representativeness – to make the mini samples less representative than the slice samples – and examine if low representative samples still lead to more favorable responses than high representative samples.
Purpose

In previous experiments (Pre-test 1, Experiments 1 and 2), I used mini peanut butter cups as high representative samples and slice peanut butter cups as low representative samples. However, I want to test if my findings are tied to the specific operationalization of sample representativeness. According to my theory, the issue here should not be about a mini versus a slice or a “whole” versus a “part” - it should be the level of representativeness that makes a difference. Therefore, if I flip the operationalization of sample representativeness – to make the mini peanut butter cups less representative than the slice peanut butter cups – I should expect to find that the slice peanut butter cups (i.e., high representative samples) lead to more favorable responses to target products as compared to the mini peanut butter cups (i.e., low representative samples).

In order to make the mini peanut butter cups less representative, I am going to use tall mini peanut butter cups, which are disproportionally smaller than regular size peanut butter cups. Pre-test 2 is to validate the reversed operationalization of sample representativeness.

To reconcile the different manipulations of sample representativeness, I expect to see that although slice peanut butter cups are less representative as compared to regular mini peanut butter cups (as in Pre-test 1, Experiments 1 and 2), slice peanut butter cups
are *more* representative as compared to *tall mini* peanut butter cups (as in Pre-test 2, Experiments 3 and 4).

**Method**

Pre-test 2 employs a single factor between-subjects design. Nighty-three participants from mTurk were randomly assigned to either the *regular mini* sample, the *slice* sample, or the *tall mini* sample conditions. Each participant was shown a picture of a sample (either regular mini, slice, or tall mini) and a regular size peanut butter cup, depending on the assigned condition. See experimental stimuli in Figures 4.1, 4.2, and 4.3. The amount of peanut butter cup samples were the same for all participants in all conditions – about 2/5 of the target peanut butter cup. After seeing the picture, participants were asked to indicate 1) how *representative* the sample appears of the target product; 2) how well the sample *corresponds* to the target product; and 3) how well the sample *exemplifies* the target product (from 1 = not at all to 7 = very much).

Figure 4.1 Pre-test 2 Stimuli: Regular Mini Sample Condition
Results

Perceived Representativeness. The perceived representativeness was checked by means of the three-item summed scale (Cronbach’s alpha = .76). Consistent with my expectation, although the slice samples were considered less representative as compared to the regular mini samples ($M_{\text{regular mini}} = 5.04$ vs. $M_{\text{slice}} = 4.22$; $F(1, 61) = 6.28, p < .05$), the slice samples were considered more representative as compared to the tall mini samples ($M_{\text{slice}} = 4.22$ vs. $M_{\text{tall mini}} = 3.80$; $F(1, 60) = 1.45, p = .23$) (See Figure 4.4).
Discussion

To summarize, Pre-test 2 confirms my expectation that mini peanut butter cup samples can be perceived as less representative than slice peanut butter cup samples when they are disproportionally smaller than the target peanut butter cups. Although the difference in perceived representativeness between the slice samples and the tall mini samples is not significant at the 0.05 level ($p = .23$), it may be more pronounced when participants receive actual product samples as compared to pictures. Therefore, in Experiments 3 and 4, I will use actual slice peanut butter cups as high representative samples and tall mini peanut butter cups as low representative samples.
EXPERIMENT 3: THE MODERATING EFFECT OF 
NEED FOR COGNITION

Purpose

Experiment 3 has three objectives. First, in Experiments 1 and 2, I demonstrated the proposed key effect (Hypothesis 1) using hypothetical sampling experiences. However, I have not yet shown whether this effect also holds with actual sampling experiences. Therefore, in this experiment, I intend to replicate previous findings using actual food samples. The second objective is to examine the moderating role of need for cognition. More importantly, if I find that the effect of sample representativeness on consumer responses to target products is indeed stronger when need for cognition is low (Hypothesis 3), such finding would add support to my argument that sample representativeness serves as a decision heuristic. That is, when need for cognition is low, people are more likely to engage in heuristic processing and are more susceptible to heuristic bias. As a result, it is more likely to happen that high representative samples make consumers feel satiated. Third, as mentioned in Pre-test 2, I want to examine if my findings are tied to the specific operationalization of sample representativeness. Therefore, I am going to use the reversed operationalization of sample representativeness - slice peanut butter cup samples as high representative samples and tall mini peanut butter cup samples as low representative samples.
Method

Experiment 3 includes a manipulated factor, sample representativeness, and a measured factor, need for cognition. Ninety-six undergraduate students from the University of California, Riverside participated in this experiment to receive course credit. Participants were randomly assigned to either the high representative sample (i.e., slice peanut butter cups) or the low representative sample (i.e., tall mini peanut butter cups) condition.

Participants were given the same cover story that was used in previous experiments: a local organic grocery store named Natural Greens recently introduced their own freshly made peanut butter cups and provided free samples for customers who shopped at the store. After the cover story, participants were asked to raise their hands to receive a sample of Natural Greens’ peanut butter cup. To control for other factors such as product quality, participants were actually provided with the Reese’s peanut butter cups. To avoid the effect of brand familiarity, the Reese’s peanut butter cups were unpacked and served with disposable plates. To further reduce the chance of brand recognition, I chose dark chocolate flavored peanut butter cups rather than the milk chocolate flavored peanut butter cups, as the former were relatively less popular in the campus area.

Participants in the high representative sample condition received a slice of a regular size peanut butter cup (Figure 5.1). In contrast, participants in the low representative sample condition received a tall mini peanut butter cup sample (Figure
5.2). Participants received the same amount of peanut butter cup (8.5 g) in all samples across all conditions.

![Image of high representative sample condition](image)

Figure 5.1 Experiment 3 Stimuli: *High* Representative Sample Condition

![Image of low representative sample condition](image)

Figure 5.2 Experiment 3 Stimuli: *Low* Representative Sample Condition

Two participants allergic to peanut butter cups were asked to complete a filter task. The remaining 94 participants were asked to taste the received peanut butter cup samples. After the sample tasting task, participants were asked to indicate how much they would be willing to pay for each target peanut butter cup (from $0 to $2.50). To test the alternative explanation that perhaps participants held different attitudes toward the two
types of samples (i.e., slice versus tall mini), I asked “How much did you like the sample Natural Greens’ peanut butter cup that you just tried? (from 1 = not at all to 5 = very much).” I expected no significant difference in sample attitudes across conditions.

To measure need for cognition, I asked participants to complete the 18-item Need for Cognition Scale (Cronbach’s alpha = .87, Cacioppo, Petty and Kao 1984, see Appendix A). These items were rated on a 7-point scale, ranging from 1 = strongly disagree to 7 = strongly agree. Sample items included “I like to have the responsibility of handling a situation that requires a lot of thinking” and “Thinking is not my idea of fun (reverse coded).” Participants were also asked how often they ate peanut butter cups (from 1 = never to 5 = almost always) and how much they liked peanut butter cups in general (from 1 = not at all to 5 = very much). To confirm the manipulation of sample representativeness, participants were asked “How representative does the sample appear to the regular size Natural Greens’ peanut butter cup? (from 1 = not representative to 7 = clearly representative).”

Results

Among the 94 students who participated in the sample tasting task, two students who did not follow the experiment instructions (e.g., did not raise their hands to ask for peanut butter cup samples) were excluded from the following analysis.

Manipulation Check. The results confirmed the manipulation of sample representativeness. As expected, the tall mini peanut butter cup samples were indeed
rated less representative as compared to the slice peanut butter cup samples ($M_{\text{tall mini}} = 4.82$ vs. $M_{\text{slice}} = 5.58$; $F (1, 90) = 6.91, p < .05$) (Figure 5.3).

To examine the moderating role of need for cognition, I conducted a bias-corrected (BC) bootstrapping analysis with 10,000 resamples (Hayes 2013, PROCESS Model 1). I used the design factor of sample representativeness as the independent variable, need for cognition as the moderator, and willingness to pay as the dependent variable. The product of predictors was mean-centered. The results revealed significant interaction effect ($b = .156; p < .05$).

A spotlight analysis was then conducted: the values at minus or plus one standard deviation of independent variable (i.e., sample representativeness) and moderator (i.e., need for cognition) are shown in Figure 5.4. Results confirmed Hypothesis 3 that the key
effect was strengthened when need for cognition was low. More specifically, the effect of sample representativeness on willingness to pay was significant when need for cognition was at one standard division below the mean ($M_{\text{tall mini}} = $0.74 vs. $M_{\text{slice}} = $0.52; 95% confidence interval of -.4004 to -.0398). The effect of representativeness on willingness to pay was not significant when need for cognition was at one standard division above the mean ($M_{\text{tall mini}} = $0.47 vs. $M_{\text{slice}} = $0.52; 95% confidence interval of -.1303 to .2306). The same results hold with or without eating frequency and general liking of peanut butter cups as covariates.

![Figure 5.4 Experiment 3 Results: The Moderating Effect of Need for Cognition](image)

*Figure 5.4 Experiment 3 Results: The Moderating Effect of Need for Cognition*

*Alternative Explanation.* One might argue that since participants were given different types of samples (i.e., either slice or tall mini), the results may be due to the possibility that participants liked the samples differently. In order to test this alternative
explanation, I compared participants’ attitudes toward the samples across conditions. The results showed that there was no significant difference in sample attitudes between the *tall mini* peanut butter cup samples and the *slice* peanut butter cup samples ($M_{\text{tall mini}} = 4.57$ vs. $M_{\text{slice}} = 4.65$; $F(1, 90) = .04, p > .10$), excluding the alternative explanation (Figure 5.5).

![Sample Attitude](image)

**Figure 5.5 Experiment 3 Results: Sample Attitude**

**Discussion**

To summarize, Experiment 3 extends hypothetical sampling experiences to actual sampling experiences. The results are consistent: compared to high representative samples, low representative samples lead to more favorable responses to target products. By reversing the operationalization of sample representativeness, I show that my findings are not contingent on whether the sample is a *mini* versus a *slice* or a “whole” versus a
“part.” It is really the level of sample *representativeness* that matters. Moreover, I show that this effect happens not because participants like these two types of samples differently.

Experiment 3 also supports my theory by demonstrating the moderating role of need for cognition (Hypothesis 3). As expected, I find that the effect of sample representativeness is strengthened when need for cognition is low. In Experiment 4, I want to directly test the proposed satiation mechanism.
EXPERIMENT 4: THE MEDIATING ROLE OF SATIATION

Purpose

Experiment 4 is to examine the proposed satiation process such that the effect of sample representativeness on consumer responses to target product is driven by a differential level of satiation associated with differences in sample representativeness (Hypothesis 2). Following previous literature, I will directly measure satiation using the reverse of the subsequent consumption amount (Wadhwa, Shiv and Nowlis 2008). The rationale is that when consumers feel satiated, they will have a lower desire for further consumption (Galak, Redden and Kruger 2009; Redden and Haws 2013). That is, the more satiated they feel, the less amount they would like to consume subsequently (Wadhwa, Shiv and Nowlis 2008). Therefore, from the amount of the subsequent peanut butter cup consumption, I could detect the level of satiation resulting from sampling experiences.

Method

Experiment 4 employs a single factor between-subjects design. One hundred sixteen undergraduate students from the University of California, Riverside participated in this experiment to receive course credit. Participants were randomly assigned to either the low representative sample (i.e., tall mini peanut butter cup) or the high representative sample condition (i.e., slice peanut butter cup).
One participant allergic to peanut butter cups was directed to a filter task. The remaining 115 participants continued with the sampling experience task. The same cover story was used as in previous experiments. After the cover story, each participant received a bag of five peanut butter cup samples (either five *tall mini* samples or five *slice* samples). See Figures 6.1 and 6.2 for experimental stimuli. The total weight of peanut butter cup samples was kept the same (48 g ± 1g) for all participants in both conditions. Participants were told that they could taste as many samples as they liked. To ensure that participants had sufficient time to experience the samples, they were asked to watch a two-minute *Kung Fu Panda* movie trailer while tasting the samples.

Figure 6.1: Experiment 4 stimuli – *High* Representative Sample Condition
When the movie trailer ended, participants were asked to stop eating the samples, close the bag, and leave the bag on their desk. Participants were then asked to indicate how many peanut butter cups they would like to buy (choose from 0 to 20). To confirm the manipulation of sample representativeness, participants were asked “How representative does the sample appear to the regular size Natural Greens’ peanut butter cup? (from 1 = not representative to 7 = clearly representative).” After participants completed the experiment session, the bags were collected and the remaining weights were measured using a kitchen scale. To calculate participants’ actual consumption, I subtracted the remaining weights from the initial weights.

**Results**

Among the 115 students who participated in the sample tasting task, eight were excluded from the analysis, including 1) three participants who failed to follow the
experiment instructions (e.g., wrote bag numbers that did not exist), 2) one missing bag, and 3) four participants whose purchase amount was three standard deviations above the mean.

*Manipulation Check.* The results confirmed the manipulation of sample representativeness. As expected, *tall mini* peanut butter cup samples were indeed considered less representative as compared to *slice* peanut butter cups ($M_{\text{tall mini}} = 4.00$ vs. $M_{\text{slice}} = 4.98$; $F(1, 105) = 10.65, p < .01$) (Figure 6.3).

![Figure 6.3 Experiment 4 Results: Perceived Representativeness](image)
Main Effect. Consistent with previous findings, low representative samples (i.e., tall mini peanut butter cup samples) led to significantly higher purchase amount than high representative samples (i.e., slice peanut butter cup samples) ($M_{tall\ mini} = 4.43$ vs. $M_{slice} = 3.29$; $F (1, 105) = 3.83$, $p = .053$) (Figure 6.4).

Satiation. Similar analysis was conducted with satiation as the dependent variable. The level of satiation was measured by the reverse of participants’ actual consumption. In other words, less consumption indicated more satiation. As expected, high representative samples (i.e., slice peanut butter cups) led to a higher level of satiation (i.e., less consumption) as compared to low representative samples (i.e., tall mini peanut butter cups) ($M_{tall\ mini} = 24.23g$ vs. $M_{slice} = 19.67g$; $F (1, 105) = 3.12$, $p = .080$) (Figure 6.5).
Mediation Analysis. To examine the mediating effect of satiation, I conducted a bias-corrected (BC) bootstrapping analysis with 10,000 resamples (Hayes 2013, PROCESS Model 4). I used the design factor of sample representativeness as the independent variable, consumption weight (i.e., reverse of satiation) as the mediator, and purchase amount at the dependent variable. The results showed that the indirect effect was statistically significant (95% confidence interval of -.8114 to -.0074) and the direct effect was non-significant (95% confidence interval of -1.9831 to .2728), indicating full mediation. Therefore, Hypothesis 2 was supported that the effect of sample representativeness on consumer responses to target products is driven by differences in level of satiation.
Discussion

To summarize, first, the proposed key effect is once again replicated such that low representative samples lead to more favorable responses to target products as compared to high representative samples.

Second, the proposed satiation process is supported such that the effect of sample representativeness on consumer responses to target products is driven by a differential level of satiation – high representative samples lead to a higher level of satiation as compared to low representative samples (Hypothesis 2).

Third, Experiment 4 extends my findings from the mere purchasing intention to the actual consumption. In previous experiments, I measured only participants’ purchasing intentions such as how much they would like to pay or how many they would like to buy. Here in Experiment 4, I also measured participants’ actual consumption. The results indicate that after consuming low (versus high) representative samples, consumers not only would like to buy more, but also actually eat more.
GENERAL DISCUSSION

To summarize, in this dissertation I examine the effect of sample representativeness on consumer responses to target products. Intuitively, one might think that high representative samples should be more effective than low representative samples in promoting target products and stimulating purchase, as high representativeness eases perceived uncertainty about target products. However, based on categorization and satiation theories, I argue for the opposite effect. Through a series of experiments, I find that low representative samples indeed lead to more favorable responses to target products (e.g., higher willingness to pay, more purchase amount) as compared to high representative samples. This phenomenon occurs because high representative samples result in a higher level of satiation. Moreover, the effect of sample representativeness on consumer responses to target products is strengthened for consumers with low need for cognition.

Theoretical Contributions

This dissertation makes a number of contributions. First of all, while previous research has been focused on the general effect of samples, this dissertation examines how different types of samples can influence consumer responses differently. While samples may create a general appetizing effect (Wadhwa, Shiv and Nowlis 2008), I suggest that some samples may be more effective than others in promoting target products and stimulating purchase. In fact, across a series of studies, I find that low
representative samples can lead to more favorable responses to target products than *high* representative samples. Moreover, the effect of sample representativeness on consumer responses to target products is strengthened for consumers with low need for cognition.

Second, while samples may vary in many different aspects, my dissertation suggests that perceived representativeness is the key to conceptually distinguish between different types of samples. This is because the perceived representativeness relates to how fundamentally consumers recognize and understand products. Depending on the level of perceived representativeness, consumers form beliefs on whether these samples and target products belong to the same category (i.e., broad categorization) or different categories (i.e., narrow categorization). Such beliefs will then affect consumer responses to target products.

Third, by studying samples through the perspective of *categorization*, my dissertation extends categorization framework to a previously unexplored domain (i.e., the domain of samples). It suggests that categorization is a universal and powerful approach to understanding consumer behaviors.

Moreover, my dissertation also contributes to the literature on satiation by suggesting that sample representativeness can also lead to satiation. Previous research suggests that satiation comes from repeated consumption such as viewing the same painting multiple times (Chugani, Irwin and Redden 2015). More recent research shows that satiation derives from not only physiological but also psychological consumptions (Redden and Galak 2013). For example, consumers can feel satiated by merely recalling previous consumption, repeatedly evaluating food pictures, or choosing among similar
food in pictures (Higgs 2002; Larson, Redden and Elder 2014). My dissertation adds to this growing research stream, suggesting that sample representativeness can also induce feelings of satiation.

In addition, it is worth noting that my findings are consistent with previous research on unit bias as well as exemplars and prototypes. To illustrate, research on unit bias suggests that people perceive a unit of some entity as the optimal amount and tend to stop after consuming one unit (Geier, Rozin and Doros 2006). As high representative samples are more likely to be perceived as a unit than low representative samples, consumers are more likely to stop after consuming high (versus low) representative samples. My findings are also consistent with previous research on exemplars and prototypes. I propose that low representative samples (e.g., a slice of a cake) are more like exemplars whereas high representative samples (e.g., a mini version of a cake) are more like prototypes. Research has shown that prototypes are more often used than exemplars in top-down processing, a situation when consumers have an explicit goal (e.g., purchase a cake) (Mao and Krishnan 2006; Park and Smith 1989). Therefore, when consumers are trying product samples in order to decide whether to make a purchase, high representative samples (prototypes) are more likely than low representative samples (exemplars) to make consumers feel as if they have already attained their goal and thus no purchase is needed. My dissertation brings together these two previously unrelated research streams. In addition, the consistency between my theory and these two supplemental research streams adds support for my findings.
Practical Implications

My dissertation also has several practical implications. From a marketer’s perspective, my research suggests that samples are not all created equal. Contrary to the intuition that high representative samples may be more effective, my studies show that low representative samples can actually lead to more favorable responses to target products as compared to high representative samples. This effect happens because high representative samples lead to a higher level of satiation. Therefore, marketers should pay close attention to the specific types of samples they offer to successfully promote target products. They should be aware that high representative samples may take away consumers’ motivation for target products, particularly in the food domain where satiation plays a significant role.

From a consumer’s perspective, my dissertation suggests that consumers may strategically use samples to improve self-control. To illustrate, my research shows that high representative samples can make consumers feel satiated and thus reluctant to purchase target products. Therefore, consumers may substitute the consumption of target products with high representative samples to avoid overeating and overspending. On the other side of the coin, consumers may use low representative samples to increase the consumption of products that are beneficial for consumers, for example, healthy foods.

Limitations and Future Research

There are some limitations in this dissertation that I plan to address in future research. First, the experiments in this dissertation are focused primarily on the food
domain. However, samples are also available in many other domains. For example, movie trailers are samples of movies, software trials are samples of software packages, and so forth. The effect of sample representativeness on consumer responses to target products may vary across product categories, given the role of satiation. Therefore, in future research, I plan to extend my research to a broader marketing context and test if the proposed key effect is moderated by product category.

Second, in this dissertation I have used two ways to manipulate low versus high sample representativeness. One is to use slice peanut butter cups as the low representative samples and mini peanut butter cups as the high representative samples (Pre-test 1, Experiments 1 and 2). The other is to use tall mini peanut butter cups as low representative samples and slice peanut butter cups as the high representative samples (Pre-test 2, Experiments 3 and 4). However, there is another way to manipulate sample representativeness – to keep the samples unchanged and only shift participants’ focus to be on either the similarity (high representativeness) or dissimilarity (low representativeness) between the sample and its target product. In future research, I plan to test my hypotheses using the third manipulation method and I expect to find consistent results – even for the same samples, participants would respond to these samples differently, depending on perceived representativeness.

Third, my research has been focused on sample shape as one dimension of representativeness. In future research, I plan to explore multiple dimensions of representativeness. For example, sample content can be another dimension of
representativeness. In an extreme case, if a movie trailer contains all the important content of a movie, it might reduce consumers’ willingness to watch the full movie.

Fourth, while my dissertation shows that high representative samples can make consumers feel satiated, it is unknown how broad the impact of satiation would be. For example, if consumers feel satiated after consuming a high representative peanut butter cup sample such that they reject target peanut butter cups, do they also reject other products not related to the sample, such as potato chips? In future research, I plan to examine if the impact of sample representativeness can extend to unrelated products.

Moreover, my dissertation shows that low representative samples lead to more favorable responses to target products as compared to high representative samples. Across all studies, the best outcome that high representative samples can produce is just as good as (but not better than) low representative samples – when need for cognition is high. However, I believe that there may be situations in which high representative samples lead to more favorable responses than low representative samples. Given that the effect of sample representativeness on consumer responses to target products carries out through the mechanism of satiation, the patterns may change when satiation does not play a role or when repetition is appreciated. For example, when consumers make car purchasing decisions, they may prefer to have identical, stable, and replicable experiences. In that situation, high representative samples may lead to more favorable responses than low representative samples. Therefore, in future research, I plan to explore situations when high representative samples are more effective than low representative samples.
APPENDIX A. THE NEED FOR COGNITION SCALE
(Cacioppo, Petty, and Kao 1984)

Please indicate the degree to which you agree or disagree with each of the following items. There are no right or wrong answers ($1 = \text{strongly disagree}$ to $7 = \text{strongly agree}$).

- I would prefer complex to simple problems.
- I like to have the responsibility of handling a situation that requires a lot of thinking.
- Thinking is not my idea of fun. (R)
- I would rather do something that requires little thought than something that is sure to challenge my thinking abilities. (R)
- I try to anticipate and avoid situations where there is likely chance I will have to think in depth about something. (R)
- I find satisfaction in deliberating hard for long hours.
- I only think as hard as I have to. (R)
- I prefer to think about small, daily projects to long-term ones. (R)
- I like tasks that require little thought once I’ve learned them. (R)
- The idea of relying on thought to make my way to the top appeals to me.
- I really enjoy a task that involves coming up with new solutions to problems.
- Learning new ways to think doesn’t excite me very much. (R)
- I prefer my life to be filled with puzzles that I must solve.
- The notion of thinking abstractly is appealing to me.
• I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.

• I feel relief rather than satisfaction after completing a task that required a lot of mental effort. (R)

• It’s enough for me that something gets the job done; I don’t care how or why it works. (R)

• I usually end up deliberating about issues even when they do not affect me personally.
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