

When Comparison Becomes Contrast: Choice in an Oppositional Framework

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ABSTRACT

In this dissertation, I propose that there are multiple factors, such as the education process and the consumption environment, which work to simultaneously create an opposition framework. People are constantly exposed to rival products, which are positioned to be opposites even when they are often extremely similar in chemical content and physical appearance. Thus, the implications of the recency-frequency model of activation (Higgins, Bargh and Lombardi 1985) would be that these proximal factors could, in some sense, prime dichotomous thinking. Dichotomous or oppositional thinking, as it is defined in this dissertation, pertains to the flattening of dimensions present in a choice set such that the items can be graphically depicted at two ends of one dimension (see Figure 2 and Figure 3). I will first explore the impact of a dichotomous mindset on making a decision and then expand to the realm of opposition in choice set structures.

Dedication

This dissertation is dedicated to my daughters, Axenya Kachen and Sheen Kachen, who have shown me true love and support throughout my educational process, and to my husband, Pushkin Kachroo, who has always been an example of a truly outstanding professor and human being.

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CHAPTER 1. INTRODUCTION

The Principle of Dichotomy: A fundamental tool used in prediction is the derivation of a classification system. In Western civilization, we can trace this back to the works of Aristotle and the concept of dichotomy. A dictionary describes dichotomy as: "1. (logic) division into two classes, one positive, the other negative. 2.(botony) a mode of branching by repeated bifurcation" —(Lofting 1996)

In relation to choice processing, this dissertation investigates whether opposition (as opposed to dissimilarity) is a functional mechanism individuals are exposed to in order to facilitate simpler learning and decision making. Beginning with primary education, there are many problem solving techniques that utilize framing of information in opposites, such as true/false, include/exclude or pros/cons.

Dichotomy is defined as "...a division or the process of dividing into two especially mutually exclusive or contradictory groups," (Woolf 1981, p. 313) or "...division into two usually contradictory parts or opinions: *"the dichotomy of the one and the many"* (Louis Auchincloss)" ("dichotomy", American Heritage Dictionary, Fourth Edition).

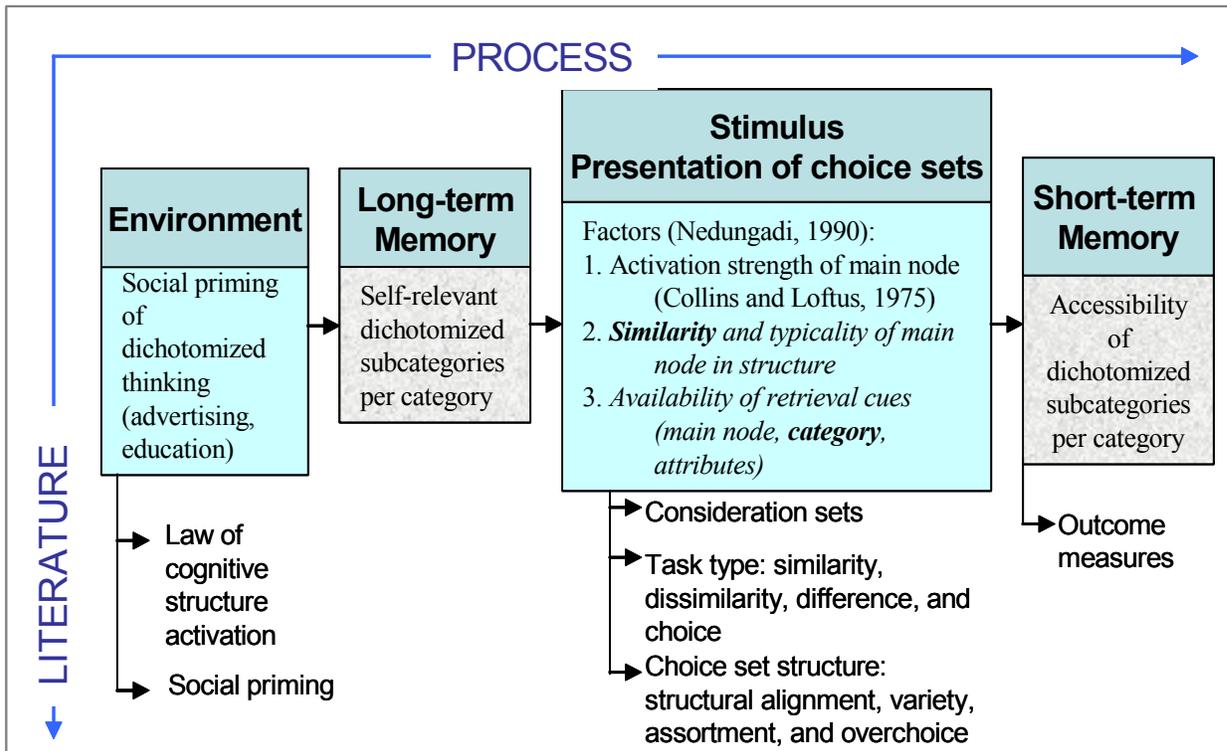
Opposition is defined as "...the relation between two propositions in virtue of which the truth or falsity of one of them determines the truth or falsity of the other," or "the act of opposing, or the state of being opposed by way of comparison or contrast," ("opposition", American Heritage Dictionary, Fourth Edition). These definitions are what pave the way for the terms *dichotomous and oppositional thinking, choice sets, and frameworks* which are defined and

analyzed here. The two terms are used interchangeably for good reason. Essentially, though the key idea here is that information is more simplified by digesting it oppositionally, it is important that the opposition is framed as dichotomous, i.e. there are two sets. Therefore, the oppositional framework here is also characterized and defined by dichotomy.

As vast amounts of literature have shown, a consumer's memory is extremely relevant to both the structure and process of his or her decision making (Alba, Hutchinson and Lynch 1991; Bettman, Johnson, and Payne 1991; Kardes 1998). This dissertation thus proposes a memory process framework (Figure 4), to explain opposition in a decision making context. Figure 1 depicts a memory retrieval process which was created based on the constructive view of choice (Bettman and Zins 1979) and the concept and definition of consideration set formation (Paulssen and Bagozzi 2005).

Figure 1 illustrates a conceptual flow for how dichotomization could hypothetically become a retrieval framework. Much like the formation of a consideration set (some existing research will be elaborated in the literature review section which follows), this dissertation argues that dichotomized thinking can be activated due to external stimuli. The environment, thus, serves as the background process, and will consist of the fundamental trigger point for dichotomized thinking. I contend that dichotomized thinking can be primed and set out to empirically investigate that conjecture in the first study. The next study moves to the "Stimulus Presentation of Choice Sets" box and instead modifies the choice set structure (defining the concept of *dichotomous choice sets*) itself to trigger dichotomized thinking. In the final study, subjects are presented with goals which serve as the trigger point while they make choices from dichotomous choice sets.

Figure 1: DICHOTOMOUS PROCESSING



In order to define the oppositional framework, I must first discuss the background literature as it relates to environmental factors (social priming and the law of cognitive structure activation), stimulus-based factors (consideration sets, task type and choice set structure), and outcome factors (choice process satisfaction, decision difficulty, perceived complexity, number of reasons given, and perceived variety).

CHAPTER 2. LITERATURE REVIEW

Environmental Factors

Priming of dichotomous thinking and the Law of cognitive structure activation

The delineation between conscious and unconscious impacts of environmental and social factors on memory encoding, activation, accessibility, salience, and such, is important for many reasons. In an everyday consumption decision, such as purchasing a snack from a vending machine, the consumer enters with a goal. This goal will not only impact the physical process he will undergo, but also the mental activity prior to, during, and after his encounter. The cognitions he has are also the product of prior experiences, habits, relevant memories, and many other social and psychological factors. Thus, even if not intentional, activations within memory can take place which impact the decisions people make and the manner in which they make them.

Higgins and Chaires (1980) showed that recent and frequent activation of a construct (defined as either a generic or proper category) will increase the accessibility of that construct. Their research and empirical findings indicated that priming via sets of information presented with two different interrelational constructs (“and” versus “or”) caused subjects to subsequently view a stimulus either as one object, a box of tacks, or as two objects, a box and a set of tacks. This has two relevant implications for the current research.

It is worthwhile to note that in an experimental paradigm, people can be primed not only at a semantic level (actual words given in a memory-based task), but also at the level of

“mind-sets.” Mind-sets are cognitive frames which cause people to organize relationships between information such that they are consistent with the priming they have received. Higgins, Bargh, and Lombardi (1985) extended the findings to develop the recency-frequency model of activation, further specifying the conditions under which priming can impact construct accessibility. Consistent with these findings, Galinsky and Moskowitz (2000) investigated how counterfactuals can be used to activate a mind-set, in their case, the simulation heuristic. In subsequent work, Kray, Galinsky and Wong (2006) identified a counterfactual mind-set, arguing that individuals engage in this mind-set when deliberating on issues in a counterfactual manner and that it gives rise to relational processing.

In this dissertation, I propose a social constructionist view of how people categorize and organize information. Essentially, persons may seek to simplify information which is presented (especially when it is overwhelming) and this simplification motive gives rise to *oppositional or dichotomous thinking*. We organize the information (or like it more when it already is) in opposing sets in order to make it easier to process, under certain circumstances. The opposition may depend on our particular likes and dislikes. This dissertation proposes that individuals may be primed to think oppositionally. More specifically, oppositional thinking (what I am also terming dichotomous thinking) would consist of defining what something *is* by knowing what it is *not*. For example, when I asked people to define the word “crude” (in a pretest), the words I most often heard were “unsophisticated”, “unruly”, “unpolished” and “uncivilized.” Study 1 will prime subjects using a memory task in order to activate a *dichotomy mind-set*.

The second relevant implication of the Higgins and Chaires (1980) study extends beyond laboratory experimentation. In the present research, I ask if memory-based tasks can

prime mind-sets, might the social environment itself serve as a priming mechanism? The law of cognitive structure activation (Sedikides and Skowronski 1991) proposes that the method of encoding of an ambiguous stimulus will be based on the most active structure in memory as well as the one which is most semantically similar to the stimulus itself. The key ingredient of this theory for our purposes is the concept of *activation*. Could it be that we are constantly primed to think in opposites or dichotomies? If so, the law of cognitive structure activation may explain how persons structure a choice set into two opposing sets. Does our learning process require us to compare and *contrast* constantly?

Stimulus-based Factors

Consideration sets

Carpenter and Nakamoto (1989) suggest that buyer preference formation is greatly impacted by the pioneering brand in a category. They also illustrate that subsequent entrants into the same buyer space will have a greater likelihood of failure when they try to position themselves too close to the pioneer. Instead, the more distinctive later entrants are relative to the pioneer, the greater chances they will have of gathering their own market share. Differentiation, even if meaningless, is an important strategy adopted by product marketers in order to achieve competitive advantage (Carpenter, Glazer, and Nakamoto, 1994). The important point in the pioneering brand research is that later entrants must still fit into the “brand-space” (category) of the original product in order to compete with the pioneer. This literature ties to the current research by supporting the idea that perhaps even when

consumers consider categories, they readily classify products at opposite ends of a single dimension.

Consideration sets have been defined as “...the set of brands brought to mind on a particular choice occasion” (Nedungadi, 1990, p.264). Nedungadi (1990) showed that the retrieval of reference brands for a category influences the construction of a consideration set and thus influences the final choice. The most relevant empirical finding for the current study is that an advertisement for one brand could actually cause a different brand to be retrieved from memory, and thus included in a consumer’s consideration set. In an interesting extension of this research, Nedungadi, Chattopadhyay and Muthukrishnan (2001) provided category and subcategory information to subjects, allowed them to view it for two minutes, and then measured their cued versus uncued brand recall. Providing category structure during both the learning and retrieval cognitive phases increased evaluation-choice consistency. This research underscores the importance of increasing the salience of product category information, especially for underdog brands. Figure 1 extends the memory retrieval process structure which is derived from the consideration set research of Nedungadi and colleagues (1990; 2001) to encompass task types other than recall of brands, such as choice.

Previous literature defines a consideration set in terms of brand memory producing a focal consideration set for a specific category (Alba, Hutchinson and Lynch 1991). The category is presented first, followed by increased activation of a set of brands, and finally higher likelihood that one of those brands will be chosen (Kardes 1998). This suggests that the choice a consumer makes is not purely based on the products physically presented, but on the categories brought to mind by those products (or conversely, the brands brought to mind by activation of the categories). Research by Fazio, Herr and Powell (1992) investigated how

when subjects were presented with unfamiliar brands, they had greater “readiness to categorize” tendencies, and thus developed stronger category-brand associations following receipt of the information. As an extension of Nedungadi (1990) and Nedungadi et al. (2001), this study shows that not only do categories bring about activation of consideration set brands, but the reverse is also true, that unfamiliar brands create unknown-category anxiety.

In the context of this dissertation, there are several ways in which the consideration set literature is relevant. First, as noted, the memory retrieval process for a consideration set is hypothesized as a conceptual framework within which to define opposition in choice sets. Secondly, when subjects are presented with a choice set, whether or not there are oppositional forces within it, the categories brought to mind by the choices presented will not only be relevant, but will drive the process by which choice is made. This dissertation argues that presentation of a dichotomous framework, i.e. opposition along a single and relevant dimension, will often allow consumers to perceive the product differentiation which is so important (Carpenter, Glazer, and Nakamoto, 1994), while still achieving categorization of the choices, the lack of which could create anxiety (Fazio, Herr and Powell 1992).

Decision making

The experimental paradigm used for decision making often presents a set of choices in a tabular format, with multiple attributes listed per choice. Computer-aided software or the equivalent (e.g. Mouselab in Payne, Bettman, and Johnson 1993; Sawtooth ACA in Toubia, Simester, Hauser and Dahan 2003; information boards in Payne 1976; *Consumer Reports* format in Johnson 1984 and Lynch, Marmorstein, and Weigold 1988) is often used to present

multiple products and corresponding features and thus generate a choice scenario for the subject. Within the advent of e-commerce, this type of choice, where pictures and multiple features/attributes are presented simultaneously across multiple products, is not uncommon. Equally common are the day-to-day decisions consumers make when visually presented with physical products, both when they are in the “shopping” mindset (e.g. at a store), and when they are not (e.g. in the middle of a class).

Products’ attributes or dimensions consist of specific values (either continuous or discrete measures) which allow products to be differentiated (Payne, Bettman & Johnson 1993). For example, Bettman and Park (1980), presented subjects with a tabular format of information for fifteen microwaves in terms of brand, price, distribution, number of cooking levels, temperature scale timer (y/n), browner (y/n), leakage, safety start (y/n), and capacity. In the present dissertation, subjects will be presented with a tabular format of choice sets of snacks. The method of viewing information can have an obvious impact on the method used to categorize that information (framing effects).

Kardes (1998) mentions several important points regarding the presentation of information to subjects, namely that: 1) pictorial presentation is more impactful on judgment (Childers and Houston 1987); 2) manner of memorization of product information (for example brand-based versus attribute-based format) influences subsequent comparison processes accordingly (Biehal and Chakravarti 1982, 1983); and 3) during stimulus-based choice with a large number of products, consumers engage in a two-step process (Kardes 1998, p.418) The two-step decision making process is mainly relevant to this research in that we consider the dichotomy framework to be a step towards the final decision process, i.e. subcategorization prior to final choice.

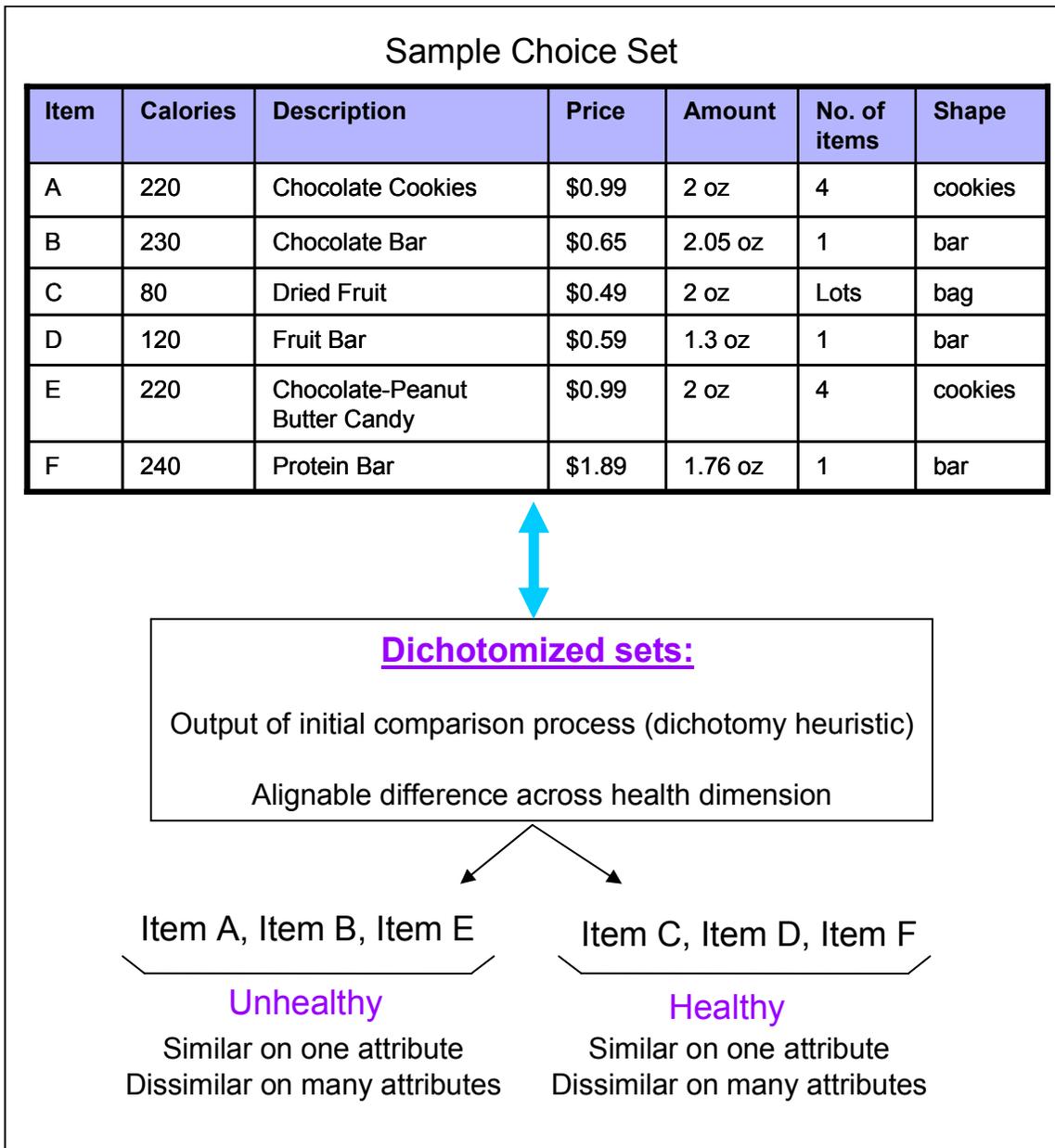
A combination of the choice research (in which many attributes were presented) with the consideration set research (in which brand salience was highlighted) provides the conceptual framing for the dichotomy framework presented here. During a choice scenario in which the set of products are already categorized as part of the choice process (standing in the aisle at a drugstore looking at the shampoo choices), the consideration set for brand should already be activated (Nedungadi 1990). The question we have is why should that consideration set necessarily be a function of the *brand* of the set of products which come to mind when viewing a choice scenario? Couldn't this set be a function of any of the other attributes, possibly ones which are more accessible due to the set of choices given?

Task Type: Similarity, dissimilarity, difference, choice, and comparative valuation

When consumers are asked to perform similarity tasks versus choice tasks, though related, tasks do not necessarily follow the same process. However, the processing involved in making similarity comparisons and *simplifying* decision making have been identified as overlapping in many ways (Medin, Goldstone, and Markman 1995). Similarity has been studied in relation to features within categories (Tversky 1977) as well as in relation to decision making (Medin, Goldstone, and Markman 1995). Tversky (1977) noted a difference in the representations of similarity and dissimilarity, namely that similarity can be represented by points in coordinate space whereas dissimilarity can be represented by metric distance. He also noted that when given a similarity task, people pay more attention to common features whereas with a difference task, they pay more attention to distinctive features (p. 339). But what happens when consumers are simply asked to choose a product? To what extent does

not only the structure but also the content of the choice itself (e.g. the assortment) reduce difficulty and increase satisfaction with the set? Although choosing a product was the primary task, the present research utilized in the first two studies, framing the choice with a specific goal occurs in Study 3, in order to examine the role of task type. One of the most important questions this research addresses is how opposition in a choice set is perceived by consumers; is it unusual, simplifying, frustrating, satisfying, or even noticeable? Further, to what extent does asking a consumer to make a *choice* force him to make an overt *comparison* between the items? If, in fact, the consumer must make a comparison in order to make a choice, how important will the similarity, dissimilarity, or difference between the items be with respect to the consumers' task goal? I discuss the output of comparison processing in the next section in relation to choice set structure. Figure 2 shows the distinction between dissimilarity, difference and dichotomy, especially as it pertains to how a choice set can be perceived as a set of dichotomous information.

Figure 2: DISSIMILARITY, DIFFERENCE, and DICHOTOMY



Elimination by aspects (Tversky 1972) as a noncompensatory choice heuristic is worthy of mention at this point, as well as spatial and tree models (Pruzansky, Tversky and Carroll 1982; Ghose 1998). Elimination by aspects is a decision strategy whereby the choice

set is assumed to be hierarchical in structure and sets are organized so as to eliminate them until a final decision is reached. Several researchers have investigated the concept of categorizing as it relates to choice sets and have shown that altering a goal (Ratneshwar, Pechmann, and Shocker 1996; Ratneshwar et al. 2001; Gourville and Soman 2005) or providing an agenda (Hauser 1986; Payne, Bettman and Johnson 1993) can drive a consumer's perception of a choice set to a completely unobvious direction.

Thus, elimination by aspects along with many other choice heuristics plays an important role in simplifying decision making for consumers but does not directly relate to the concept of opposition in choice sets. In general, the key difference between elimination by aspects and oppositional processing is that the former is layered on attribute-based aspects of a set whereas the latter is layered on dimensional ones.

Spatial and tree models are normally used to model consumer representations of data, with the finding that dimensional or continuous data maps most readily to spatial models, whereas features or discrete data usually follow a more hierarchical or tree structure (Ghose 1998). Focus on the similarity or dissimilarity of objects through choice experimentation has yielded interesting results. Dhar, Nowlis, and Sherman (1999) studied the effect of either a similarity or dissimilarity comparison process on the subsequent preference construction for choices constructed in twos. They found that in the process of assessing similarity or dissimilarity of items, focus is shifted to only certain features and differential weighting is given to them (in an attempt to simplify the choice process). Another important finding of this study was that the focal object (in the task given) served as the frame of reference for the dissimilarity rating and was preferred over the other object. This suggests the importance of asymmetry in dissimilarity measures, based on the order of the stimuli in the choice task.

Lichtenberg (1962, p. 98) mentions that “implicit in the comparative mode of valuation is the superiority of the person as a person (or commodity) when he possesses the value content.” In his experimental paradigm, subjects were presented with twenty value contexts, half of which imply comparative valuation (items such as fame, wealth, strength). They were asked to write in something they liked more or less than the item presented and underline the preferred item. The study hypothesized that: 1) “the more a person values comparatively, the more he thinks oppositionally”; and 2) “the more a person values comparatively, the more he will contrast values with disvalues” (Lichtenberg, 1962, p.99). The findings showed that two psychological processes occurred in subjects: (1) subjects made valuations with respect to the original content and (2) subjects supplied an alternative to be used in relation to the original content. Most relevant to our research is this particular passage regarding the results: “If one supposes that the second process occurs first, then it may be true that the use of opposites implies the content that will be preferred. But this occurs only because the alternative item is on a quantitative scale with the original content, and it becomes obvious that the person using opposites has condensed the two demands into one.....Yet the task only permits, but does not force, such a procedure” (Lichtenberg, 1962, p. 103). The relevance of this theory to our framework mainly centers in Lichtenberg’s discussion of how comparative valuation and opposition are often so closely tied that it is impossible to separate them.

Choice set structure: Structural alignment, Variety, Assortment, and Overchoice

In similarity tasks, the output of the comparison process has been shown to produce two kinds of differences, alignable, i.e. two choices having values along a common dimension, or nonalignable, i.e. one choice having a value along a unique dimension (Markman and Gentner 1993). Gourville and Soman (2005) extend the alignment concept given by Markman and Gentner (1993) to the realm of assortments, by describing alignable assortments as ones which vary along a single, compensatory product dimension and nonalignable assortments as ones in which products vary along multiple, noncompensatory dimensions.

Chernev (March 2005) delineates the goal of the process used to attain the terms alignability and complementarity, noting that alignability is the outcome of a similarity process whereas complementarity is the outcome of a choice process. In this research, complementary features are defined by the additivity of their utilities whereas noncomplementary features have nonadditive utilities. Recently, perceived variety in an assortment has been linked with higher stated satisfaction and more organization (Hoch et al. 1999). Extending this idea, Morales, Kahn, McAlister & Broniarczyk (2005) found that when a consumer's internal category structure matches that of the retailer, the result is higher perceived variety and more satisfaction with the items which are chosen.

Thus, along the lines of the structural alignment process, if one examines the impact of how choices can be viewed as alignable or nonalignable based on a goal, would a consumer decision be easier to make if the choice set is constructed as oppositional along a single dimension? This would mean that the set of features would be considered nonalignable with

respect to several dimensions, yet alignable in an oppositional way along a single, relevant dimension.

Decision making research in which consumers are presented with a set of choices has explored information overload as a possible consequence of the presentation of too many choices or product attributes. (Jacoby and Malhotra 1984; Keller and Staelin 1987) Overchoice as a phenomenon has been studied in terms of the effort-accuracy framework, with the underlying argument centering on its adverse affect on choice quality (Payne, Bettman and Johnson 1993). Iyengar and Lepper (2000) found that larger choice sets created greater levels of frustration and regret and post-choice lowering of satisfaction in comparison to smaller choice sets. The overchoice effect, as presented by Gourville and Soman (2005) is more likely to occur in sets of items in which conflict within the items is greater, i.e. nonalignable assortments, and can result in lowered brand choice. More recently, Mick, Broniarczyk and Haidt (2004) discussed the deleterious consumer outcome effects of hyperchoice such as increased stress, negative emotions, and decreased satisfaction. As a possible remedy to this phenomenon, Chernev (2003) found that when providing consumers with a large choice set, the presence of an ideal point allowed them to simplify the choice process and lead them to a stronger preference for their selected alternative.

In contrast to the overchoice effect, the research of Oppewal and Koelemeijer (2005) used twelve items as their largest assortment, but found that more choice was always regarded as better, regardless of the similarity of the items and whether the choice set already contained a preferred alternative. Although this finding conflicts with most previous studies regarding the overchoice phenomenon, the degree of similarity between the items was not directly discussed for the choice sets.

Clearly, whether labeled information overload, overchoice, or hyperchoice, the negative consequences of this phenomenon have been reported extensively in the consumer behavior literature. This dissertation seeks to show that by presenting choices in an oppositional framework, the negative reactions experienced by consumers due to overchoice (i.e. the overchoice effect) may be reduced.

Outcome Factors

Choice process satisfaction, decision difficulty, perceived complexity, number of reasons (choice justification), etc.

Fitzsimons, Greenleaf, and Lehmann (1997) delineate between consumption satisfaction and decision satisfaction, noting that the latter is a more specific case of the former. Carrying this notion into the empirical realm, Zhang and Fitzsimons (1999) explain that the key difference in this particular outcome variable is the word “process.” Whereas most satisfaction research focuses on a consumers’ post-choice satisfaction with the choice itself (Houston, Sherman, and Baker 1991), choice process satisfaction as a variable was created in order to separate the *process* of making a choice with the choice itself.

In this dissertation, I want to consider, for example, the internet as a purchasing environment. Clearly, consumers spend significant amounts of time perusing websites, and potentially choice sets, without actually making purchases. In support of this notion, Moe (2003) used clickstream data to identify four key goals consumers have when visiting a website; these can broadly be classified as learning, browsing, buying, or searching. Moe’s findings are relevant from the standpoint that three out of four of the goals she identifies do

not include an actual purchase, thus there are many occasions under which a consumer could be perusing a choice set on the internet and not actually completing a purchase. The implications of this finding are that subjective choice *process* (or choice set) satisfaction is important, given that consumers may not take the next step to make a purchase if they are not satisfied with the choice process itself.

CHAPTER 3. CONCEPTUAL FRAMEWORK

The dichotomy paradigm presented in this research will be studied using the memory-retrieval based framework presented in Figure 1. The framework centers on choice processing, not directly on comparison processing, and on the subjective outcomes which consumers experience or report after completing a choice task.

Figure 3 shows a dichotomization of a sample choice set by graphing it on two of the possible dimensions (attributes) - calories and total fat. The healthy/unhealthy dichotomy then shows how these two dimensions can be collapsed into one dimension in order to separate the six products into two opposing sets. The question, then, is when would a consumer choose to view a choice set on the healthy/unhealthy dimension, and why? Further, would a consumer find that the dichotomization reduces decision difficulty or increases it?

Figure 3: FLATTENING OF DIMENSIONS¹

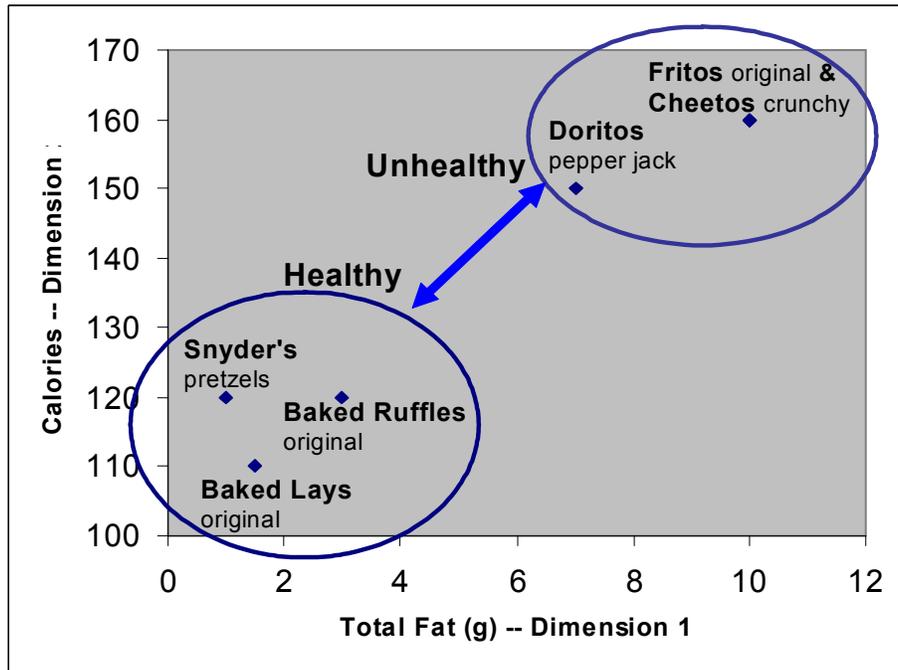
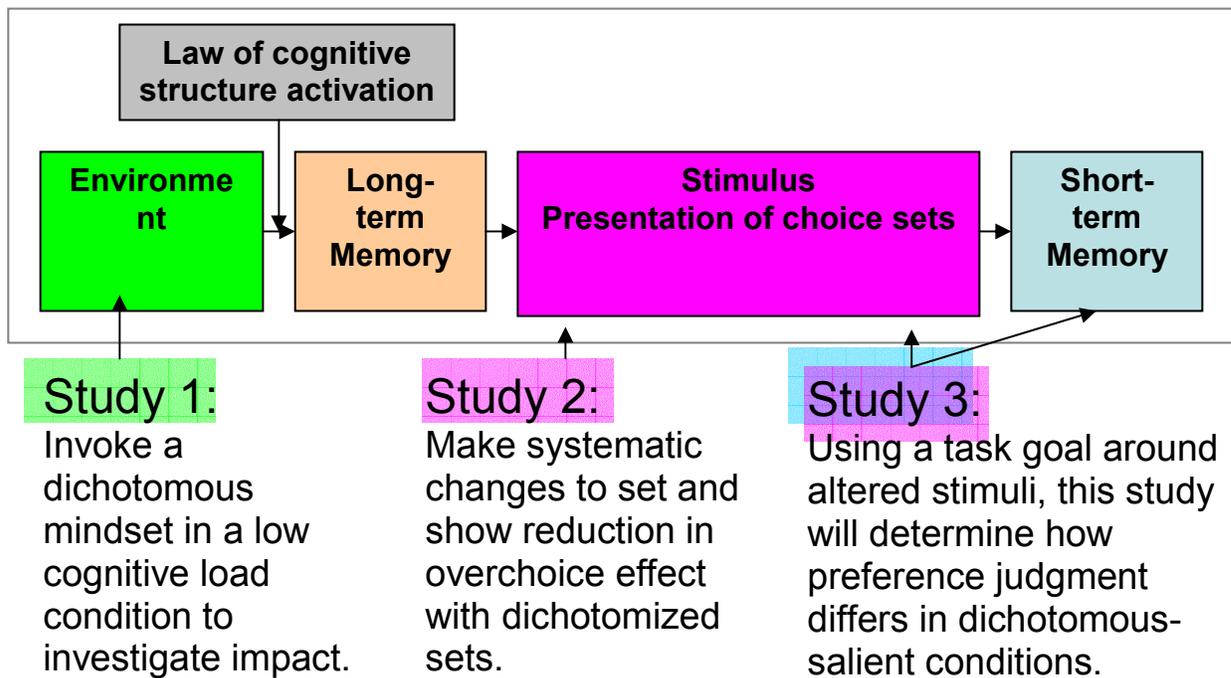


Figure 4 depicts how three studies will investigate first the impact of the environment in terms of a dichotomy mindset prime (Study 1), then the stimulus presentation in terms of the choice set variety and assortment (Studies 2 and 3) and finally the impact of a different task or goal (Study 3).

¹ Nutrition information was ascertained from each product label.

Figure 4: RESEARCH PLAN



Building on the memory retrieval model in Figure 1, Figure 4 outlines the flow of this dissertation in terms of empirical investigation. The first study will cognitively prime dichotomous thinking and examine how participants react when given the opportunity to choose several items. The purpose of this study is to establish the concept of a dichotomous mindset and show that when subjects are not under cognitive load, they will not experience the overchoice effect in terms of choice process satisfaction, i.e. the dichotomous mind-set is functional. The second study will introduce dichotomization into the design of a choice set, using multiple correspondence analysis. Following this, the study will delve into a choice experiment wherein subjects will be asked to make a choice and then report their decision difficulty along with other outcome variables. Finally, Study 3 uses dichotomization in the choice set again, this time limiting the choice set size to large while prompting individuals to

make choices based on various goals. The objective of this final study is to determine the motivational drivers for the dichotomy mechanism in combination with the assortment and variety context.

Many researchers have shown that the two primary causes of the overchoice effect are cognitive load and anticipation of regret (Gourville and Soman 2005). Cognitive load has been shown to be induced by increasing the set size (Chernev 2003; Iyengar and Lepper 2000) whereas anticipation of regret can be reduced by offering warranties or returns on products. In Study 1, we will further validate this by not inducing cognitive load and not forcing anticipation of regret. Anticipation of regret will be reduced by allowing participants to choose multiple products from the sets. Cognitive load will be tested as a separate factor, by having set sizes of either six (underload) or twelve (overload). In this first experiment, since overload will not be induced, the dichotomy-prime should not have a main effect on the frustration levels between the set sizes. However, for the smaller sets, opposite priming should allow for lower frustration.

In Study 1, a between-subjects semantic prime will be conducted using a cognitive test from Educational Testing Services (Ekstrom et al. 1976). Table 1 below shows the specific words used in the prime, but in essence, there are two conditions. The first will be the “same” prime, wherein subjects have to provide as many synonyms as they can for each word they are presented. In the second condition, which is termed the “opposite” prime, subjects write down as many antonyms as they can for the words they are presented. The opposite prime is expected to trigger a dichotomous mind-set. Specifically, Study 1 will investigate how a dichotomous mindset impacts frustration and choice process satisfaction when subjects are not put under cognitive load. I hypothesize that:

H1: There will be a main effect of the dichotomy-prime mind-set such that in the dichotomous mind-set, subjects will experience significantly lower frustration than in the same-nondichotomous mind-set. Additionally, for the smaller sets, opposite priming should allow for significantly lower frustration.

H2: When subjects are not under a cognitive load condition and are not forced to choose only one product (i.e. they should experience neither of the two main causes of the overchoice effect which are cognitive load and regret), there should be no significant negative impact of the large size of the choice set on choice process *satisfaction*. More specifically, when in the same-nondichotomous mind-set, subjects should find that small choice sets create lower choice process satisfaction than large ones.

H3: Opposite priming should remove any difference in choice process satisfaction due to choice set size.

CHAPTER 4. EXPERIMENTS

Study 1

Method

The study employed a 2x2 full factorial design. Dichotomy-prime (same vs. opposites) and size (small vs. large) were manipulated as between-subject factors.

Independent variables

Dichotomy-prime manipulation. This manipulation posits that dichotomous thinking can be primed by manipulating the type of semantic cognitive task a person completes. Therefore, each participant was asked to complete a Controlled Associations Test (FA-1 for the same prime or FA-2 for the opposites prime). These cognitive tests are normally used to measure the associational fluency of a person, i.e. “The ability to produce rapidly words which share a given area of meaning or some other common semantic property” (Ekstrom, French and Harmon 1976, p. 41). For the purposes of this manipulation, subjects completed these tests, but the results were not directly used as a measure. Each test consisted of two parts and participants were provided with five minutes per part. Table 1 lists the words that were used in each of the tests.

Table 1: DICHOTOMY-PRIME MANIPULATION

TYPE OF PRIME	PART 1 WORDS	PART 2 WORDS
Same (FA-1)	clear, dark, strong, wild	company, sharp, tell, turn
Opposites (FA-2)	calm, wrong, fair, awkward	loyal, fearful, gentle, ugly

Size manipulation. The size of the presented choice set was varied to two levels, either six choices (small) or twelve choices (large). The choice sets were constructed such that the six choices in the small choice set were also present (in addition to another six) in the second choice set. The actual choice sets are presented in Appendix 1.

Dependent variables

Choice process/set satisfaction. Also referred to as a subject's "satisfaction with the decision process" (Fitzsimons, Greenleaf, and Lehmann 1997), this construct is measured using a ten-point (where 1 = strongly agree and 10 = strongly disagree except item 3, where 1 = extremely satisfied and 10 = extremely dissatisfied) six-item scale. The items were: (1) I would find the process of deciding which product to buy frustrating; (2) Several good options are available for me to choose among; (3) If I had to choose, how satisfied or dissatisfied would I be with my experience of deciding which product option to choose?; (4) I think the choice selection is good; (5) I would be happy to choose from the same set of product options on my next purchase occasion; and (6) I found the process of deciding which product to buy interesting (Zhang and Fitzsimons 1999).

Individual differences variable

Gender. Gender was collected in order to rule out any possible masking effects it could have on any of the dependent variables.

Sample and Procedure. A total of 133 marketing undergraduates, enrolled in an introductory level marketing course participated in this study. College students were chosen as the target population due to the purpose of the study and the salience caused by the topic of purchasing vending machine snacks. The first task asked subjects to complete the cognitive test (as the dichotomy-prime). After the materials were gathered from this prime, the subjects were asked to open up an online document which showed them the choice sets presented in Appendix 1 along with their accompanying task. The task asked subjects to “...Imagine that you are standing in front of a vending machine and have the following 6 (12) options for snacks. Which ones would you choose if you could pick up to 4 (7) items?” The choice set was presented as part of a survey such that the subjects could click checkboxes pertaining to the names of the products (A-L) they would choose. In this first study, subjects were allowed to choose multiple items from each choice set, so as to manage their cognitive load. Subjects were allowed to choose up to more than half of the choices presented (i.e. 4 out of 7 or 6 out of 12) but were not forced to do so in any way. The number of choices they made was used as an outcome variable to uncover any possible tendency to choose more under any of the conditions. Finally, the subjects completed a survey which consisted of demographic information and the choice process satisfaction scale.

Results

ANOVA Analysis

Gender. A one-way ANOVA was performed on the frustration and satisfaction dependent variables with gender as a factor. The results (shown in Table 2) confirm that there are no significant differences between these variables for the gender factor.

Table 2: GENDER FACTOR CHECK FOR STUDY 1

		Sum of Squares	df	Mean Square	F	Sig.
satisfaction	Between Groups	1.361	1	1.361	.443	.507
	Within Groups	381.062	124	3.073		
	Total	382.423	125			
frustration	Between Groups	5.400	1	5.400	1.049	.308
	Within Groups	638.545	124	5.150		
	Total	643.944	125			

Choice process satisfaction. An exploratory factor analysis was conducted on the six items of the choice process satisfaction scale. Principal component analysis resulted in factor loadings for the six items of 0.31, 0.87, 0.80, 0.89, 0.82, and 0.61, respectively. The results indicated that the items all represent a single factor, however because of the 133 sample size, the first factor (loading of .31) could not be considered significant as part of the choice process satisfaction scale (Hair, Anderson, Tatham, and Black 1998, p. 133). Thus, this factor, representing *frustration with the choice process*, was analyzed as a separate factor. The second study will be used to further verify the structure of the choice process satisfaction scale.

Preliminary Discussion: Single-item Measure of Frustration with the Choice Process

There has been substantial debate about whether single-item measures should be used to measure complex psychological constructs (Wanous, Reichers, and Hudy 1997), but very recent research shows that, where appropriate, single-item measures are sufficient (Bergkvist and Rossiter 2007). To that end, many marketing researchers have used single-item measures of self-reports, for example, for self-reported driving alertness following a public service announcement (Potter, LaTour, Braun-LaTour, and Reichert 2006), for perceptions of disease risk based on food consumption (Kozup, Creyer and Burton 2003), and for measurement of satisfaction with a firm (Bendapudi and Leone 2003).

Specifically, “frustration with a choice process” has repeatedly been measured in the literature with a single-item measure (see Table 3). For this reason, it is logical to use a single-item measure for frustration with the choice process in the present dissertation.

Table 3: PREVIOUS RESEARCH WHICH USES SINGLE-ITEM FRUSTRATION MEASURE

<i>Type of measure</i>	<i>Item(s)</i>	<i>Scale</i>	<i>Reference</i>
Single item	“How frustrated did you feel when making the choice?”	7 point Likert scale, 1 = “not at all” to 7 = “extremely”	Iyengar and Lepper (2000)
Single item	“How frustrated were you with this evaluation task?”	7 point Likert scale, 1 = “not frustrated at all” to 7 = “very frustrated”	Peck and Childers (2003)
Indirect	Choice shares, i.e. the percentage of subjects in each cell who chose one of the recommended hotels → heuristic processing → due to frustration	9 point Likert scale	Huffman and Kahn (1998)
Indirect	"I find it difficult to shop for a gift for a friend"	Single item from 13-item maximizing versus satisficing scale	Desmeules (2002)

Hypothesis 1 was tested by analyzing the respondent's frustration with the choice set, or item 1 of the choice process satisfaction scale. Subjective frustration was thus computed by conducting a separate 2x2 (Dichotomy-prime x Size) between-subjects factorial ANOVA with gender as a covariate. There was a significant main effect for the dichotomy-prime factor such that the same-nondichotomous mindset produced significantly higher frustration ($M = 4.77$) than the opposite-dichotomous one ($M = 4.07$), $F(1, 121) = 4.09, p=.04$. Simple main effects analysis of the dichotomy-prime factor for various sized choice sets showed that for small choice sets, choice process frustration was significantly lower when in the dichotomous (or opposite) mindset ($M=3.60$) versus the nondichotomous (or same) mindset ($M=4.86$), $F(1, 121)= 4.67, p=.03$. Figure 5 shows the frustration levels for the two factors and Figure 6 depicts the graphic representation of their interaction.

Figure 5: CHOICE PROCESS FRUSTRATION (STUDY 1)

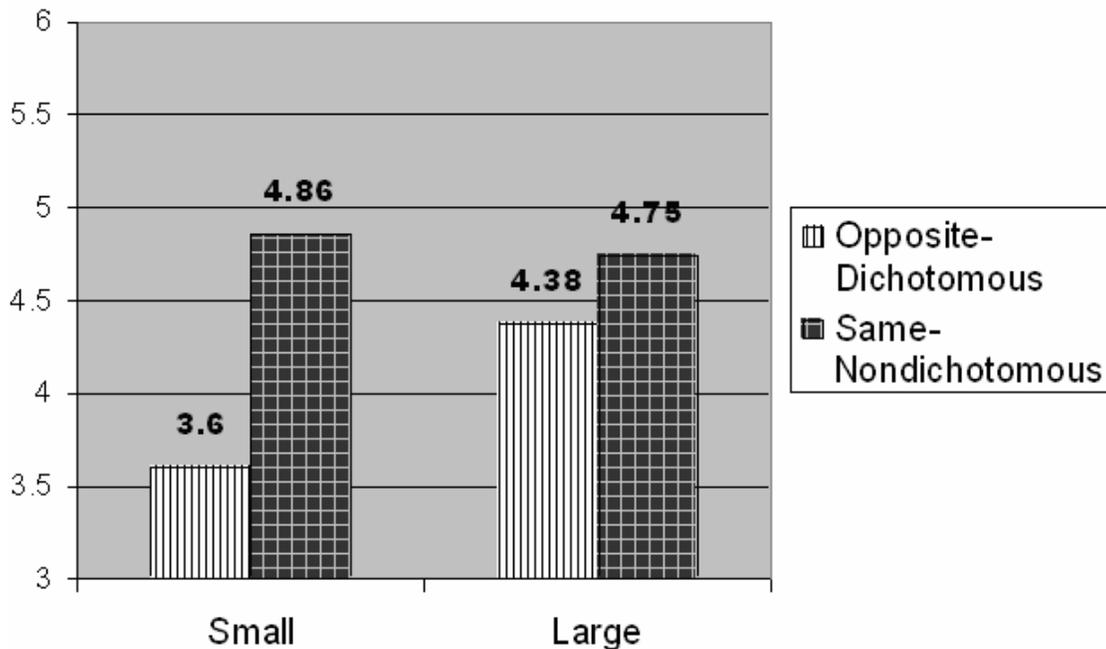
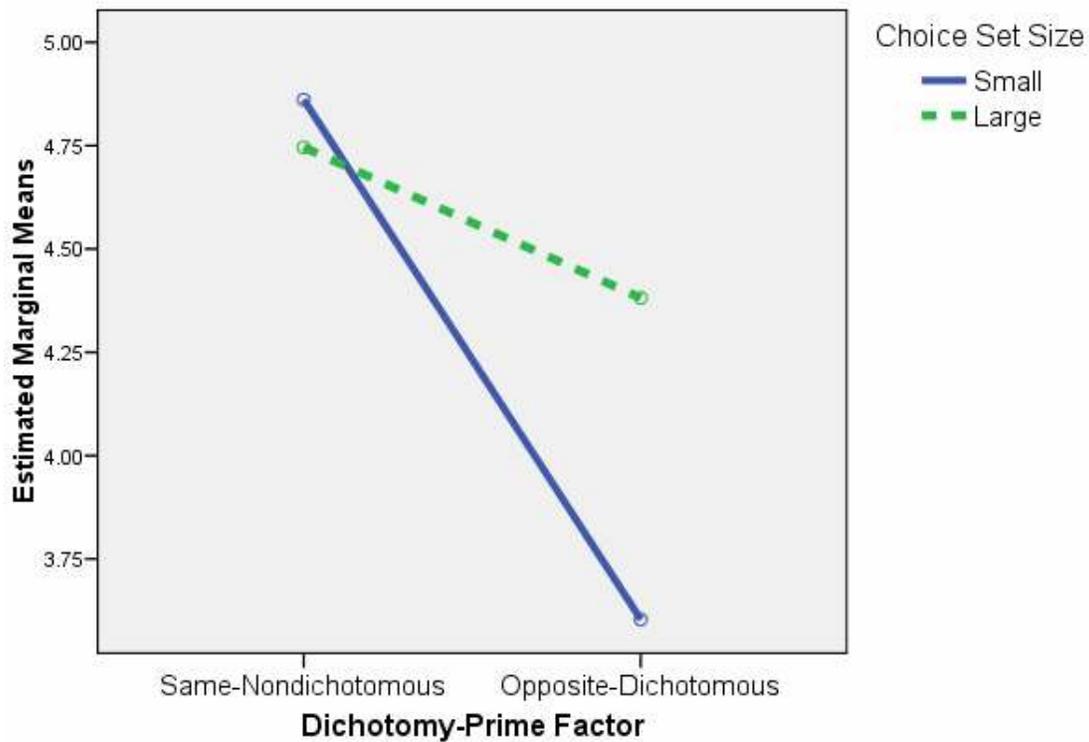


Figure 6: CHOICE PROCESS FRUSTRATION INTERACTION DIAGRAM (STUDY 1)



To test Hypotheses 2 and 3, A 2x2 (Dichotomy-prime x Size) between-subjects factorial ANOVA was performed on the remaining five items (items 2-6) of the choice process satisfaction scale and was shown to be reliable ($\alpha = .87$). There were no significant main effects of dichotomy-prime. The opposite prime ($M=5.96$) did not have significantly different choice satisfaction than the same prime ($M=5.97$), $F(1, 121) = 0.01, p > .05$. There was, however, a significant main effect for size, $F(1, 121) = 4.95, p = .03$. In contrast to the overchoice effect, per the second hypothesis, smaller choice sets ($M=5.61$) generated lower choice set satisfaction than larger ones ($M=6.32$). As can be seen in Figure 7, there was also a significant interaction between prime and size, $F(1, 121) = 5.79, p = .02$.

A simple main effects analysis of the size factor showed that in the same-prime (nondichotomous) condition, small choice sets created significantly lower choice set satisfaction ($M=5.26$) than large choice sets ($M=6.68$), $F(1, 121)= 10.73, p= 0$.

Figure 7: CHOICE PROCESS SATISFACTION (STUDY 1)

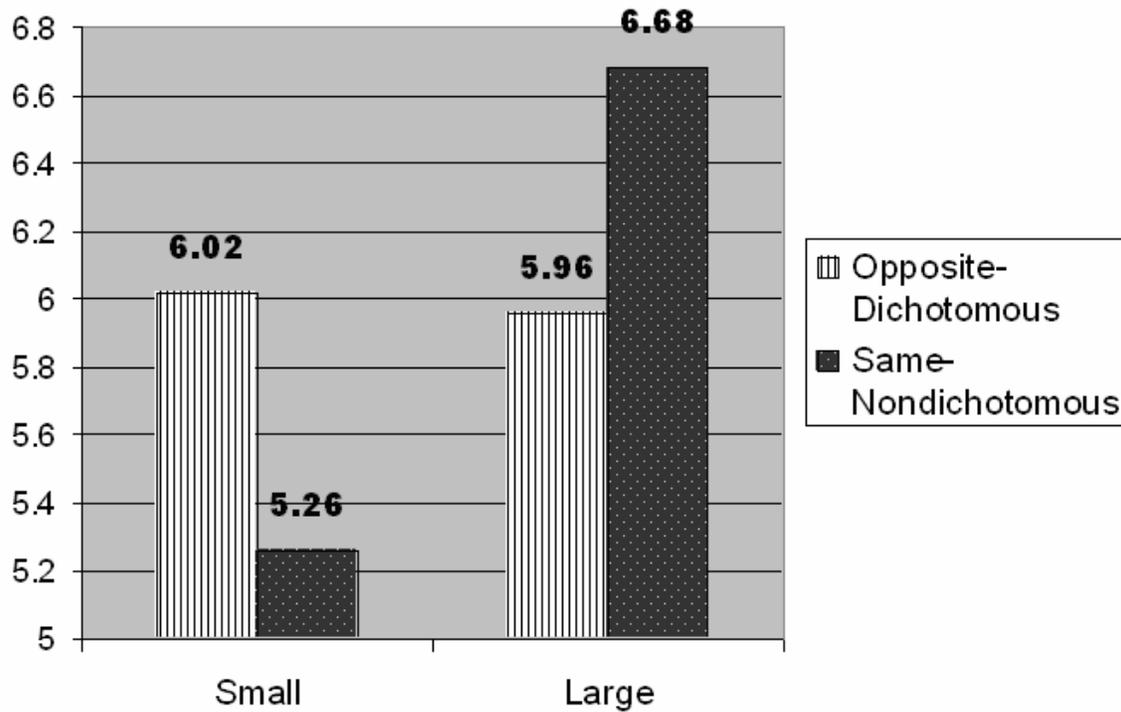
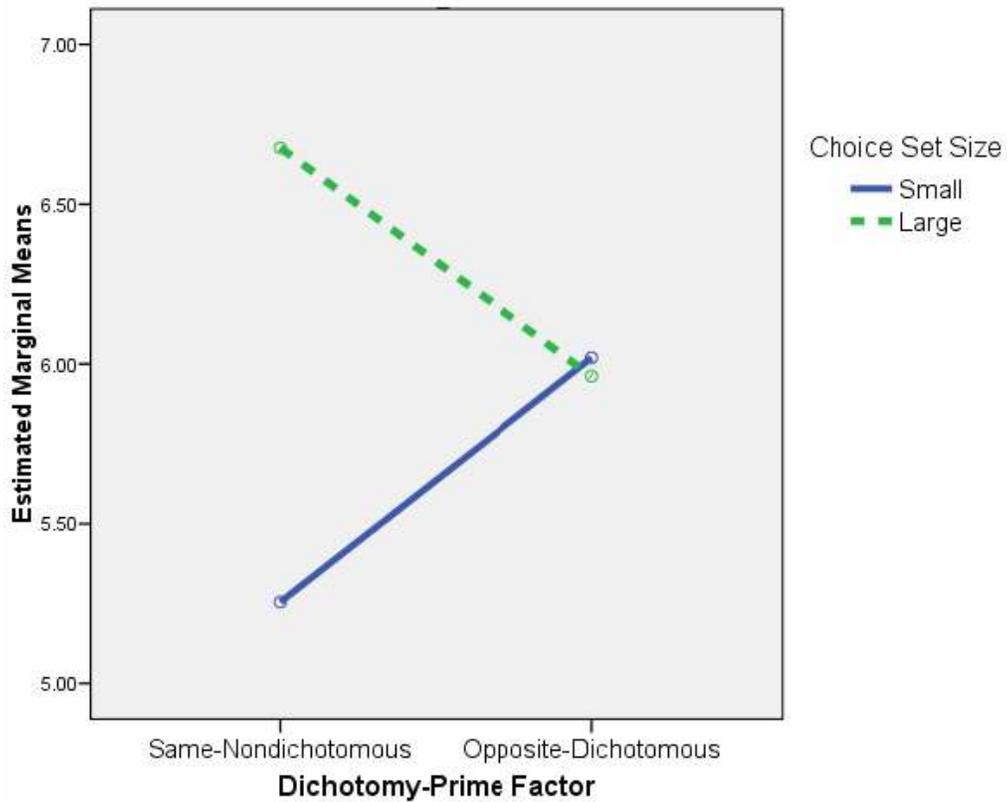


Figure 8: CHOICE PROCESS SATISFACTION INTERACTION DIAGRAM (STUDY 1)



Decision taken. A second set of analysis was conducted in order to further explicate the actual choices made and how they relate to choice set satisfaction or the two manipulated variables. A variable called *totalchosen* was created as follows:

$$totalchosen = \frac{Number\ chosen}{Set\ size\ (SMALL = 6\ or\ LARGE = 12)}$$

A second variable for the maximum number participants could choose was created, called *maxcouldchoose* as follows:

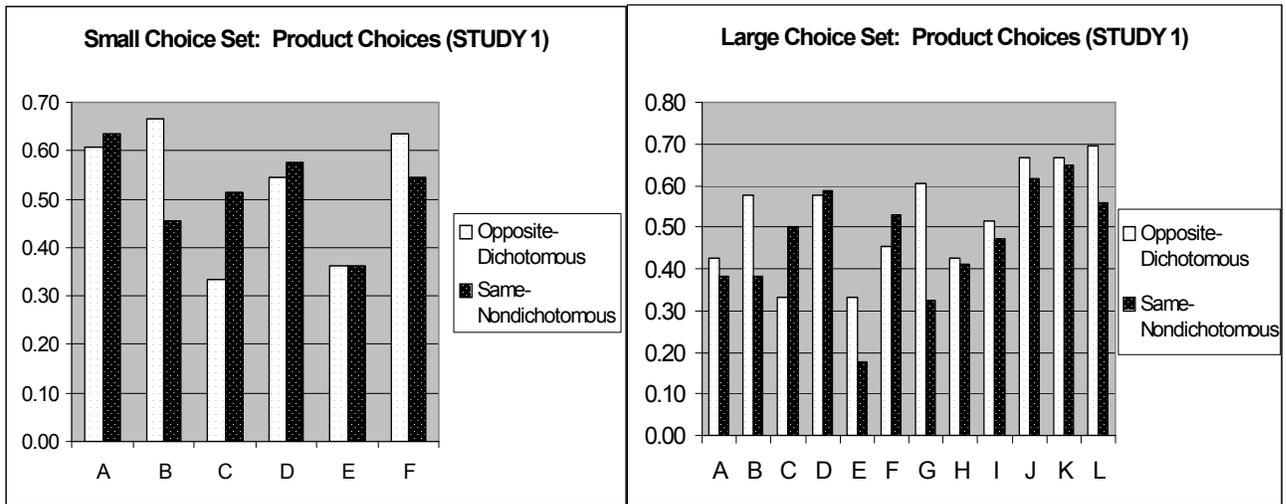
$$\text{max couldchoose} = \frac{\text{Maximum possible (SMALL = 4 or LARGE = 7)}}{\text{Set size (SMALL = 6 or LARGE = 12)}}$$

Finally, to calculate the *relativechosen*, the *totalchosen* had to be divided by the *maxcouldchoose*, creating a variable called *relativechosen*. *Relativechosen* allows estimation of the relative number of choices per individual across the set size manipulation, thereby enabling comparison across small vs. large choice sets. It is thus defined as:

$$\text{relativechosen} = \frac{\text{totalchosen}}{\text{max couldchoose}}$$

A one-way ANOVA was conducted to determine the impact of size on the *relativechosen* variable. The test showed that small choice sets ($M=.78, SD=.32$) did not have significantly different numbers of items chosen than did large choice sets ($M=.85, SD=.30$), $F(1,132) = 1.99, p > .05$. The following tables show the distribution of the items in the choice sets. ANOVA tests were conducted and showed very few significant differences in terms of either of the manipulations regarding which items were chosen. Specifically, for small choice sets, ChoiceA was chosen significantly more often ($M=.62, SD=.49$) than it was in large choice sets ($M=.40, SD=.49$). None of the other choices had this difference and since choices G-L were not present in the small choice sets, ANOVA could not be conducted to measure differences. Figure 9 illustrates the distribution of choices made.

Figure 9: ACTUAL NUMBER OF PRODUCTS CHOSEN (STUDY 1)



The main finding in terms of the choice set selections is that neither of the two manipulations created significant between-group differences.

Preliminary Discussion: Interpretation of Study 1 Results

Study 1 results warrant further discussion and understanding. Table 4 will be used to explain each of the major findings of this study and explain them.

Table 4: STUDY 1 RESULTS AT A GLANCE

<i>CONDITION</i>		<i>FRUSTRATION</i>	<i>CHOICE PROCESS SATISFACTION</i>	<i>TOTAL NO. CHOSEN</i>
Small	Opposite/Dich	3.60 ^a	6.02	3.15 ^d
Small	Same/Nondich	4.86 ^a	5.26 ^b	3.09 ^d
Large	Opposite/Dich	4.38	5.96	6.27 ^c
Large	Same/Nondich	4.75	6.68 ^b	5.59 ^c

^a $F(1,121) = 4.67, p=.03$

^b $F(1,121) = 10.73, p=0$

^c $t(64) = -.19, p>.05$

^d $t(64) = -1.37, p>.05$

In the superscript *a* effect, one can see that the dichotomous mind-set produced significantly lower frustration when sets were small. From the ease of choice perspective, the fact that the sets were small and subjects could choose over half of them, in and of itself, should produce lower difficulty of decision. But the difference between opposite and same mindset priming in this case is significant, and this difference can be explained in light of the fact that with small sets, there is not enough information to discern differences between the products. This could then give rise to more frustration without the opposition prime or less frustration with it. In short, with a small set, differences between objects would be much harder to justify, thus giving rise to a more frustrating choice experience when the mind-set is not framed oppositionally.

Superscript *b* can be explained by noting that choice process satisfaction generally seems to have mapped to a participant's idea of his object of choice, not necessarily his choice

process. Regret was not induced in this study since they were not asked to limit their selection to only one product, thus the participants did not experience the overchoice effect. For this reason, they found large same-nondichotomous sets to be more satisfying than small ones, i.e. they perceived more variety in them, giving rise to higher satisfaction (and more choices themselves was not a negative since subjects were not overloaded).

Correlation Analysis

The relationship between frustration and satisfaction is of further interest, especially in light of future studies and extant research (see Preliminary Discussion: Frustration versus Satisfaction). As Table 5 shows, frustration and satisfaction are significantly negatively correlated, as we expect ($r = -.21, p < .05$).

Table 5: OVERALL CORRELATION COEFFICIENTS (STUDY 1)

		satisfaction	frustration
satisfaction	Pearson Correlation	1	-.212*
	Sig. (2-tailed)		.015
	Sum of Squares and Cross-products	402.292	-112.712
	Covariance	3.071	-.860
	N	132	132
frustration	Pearson Correlation	-.212*	1
	Sig. (2-tailed)	.015	
	Sum of Squares and Cross-products	-112.712	702.242
	Covariance	-.860	5.361
	N	132	132

*. Correlation is significant at the 0.05 level (2-tailed).

Table 6: CORRELATION COEFFICIENTS FOR FRUSTRATION AND SATISFACTION (STUDY 1)

SIZE FACTOR	SMALL SETS			LARGE SETS		
		Satisfaction	Frustration		Satisfaction	Frustration
	Satisfaction	1.00	-.26*	Satisfaction	1.00	-.20
	Frustration	-.26*	1.00	Frustration	-.20	1.00
*Significant at the .05 level						
<i>Small Sets (More details)</i>			satisfaction	frustration		
	satisfaction	Pearson Correlation	1	-.265*		
		Sig. (2-tailed)		.033		
		Sum of Squares and Cross-products	194.721	-69.686		
		Covariance	3.043	-1.089		
		N	65	65		
	frustration	Pearson Correlation	-.265*	1		
		Sig. (2-tailed)	.033			
		Sum of Squares and Cross-products	-69.686	356.062		
		Covariance	-1.089	5.563		
	N	65	65			
* Correlation is significant at the 0.05 level (2-tailed).						
DICHOTOMY -PRIME FACTOR	OPPOSITIONAL/DICH MINDSET			SAME/NONDICH MINDSET		
		Satisfaction	Frustration		Satisfaction	Frustration
	Satisfaction	1.00	-.28*	Satisfaction	1.00	-.16
	Frustration	-.28*	1.00	Frustration	-.16	1.00
*Significant at the .05 level						
<i>Opposite- Dichotomous Mind-set (More information)</i>			satisfaction	frustration		
	satisfaction	Pearson Correlation	1	-.278*		
		Sig. (2-tailed)		.024		
		Sum of Squares and Cross-products	206.032	-70.414		
		Covariance	3.170	-1.083		
		N	66	66		
	frustration	Pearson Correlation	-.278*	1		
		Sig. (2-tailed)	.024			
		Sum of Squares and Cross-products	-70.414	310.621		
		Covariance	-1.083	4.779		
	N	66	66			
* Correlation is significant at the 0.05 level (2-tailed).						

As can be seen in Table 6 above, frustration and satisfaction had a significant correlation in the case of both small sets ($r = -.27, p < .05$). and the dichotomous-mindset conditions ($r = -.28, p < .05$).

Discussion

In this first experiment, the goals were multifold. First, no time pressure or difficult tradeoffs were set up in the choice task. Instead, subjects were given ample time and allowed to choose multiple items. Findings indicated that subjective frustration was lowered when subjects held the opposite or dichotomous mindset. In terms of choice process satisfaction, the lack of cognitive load condition showed that the opposite-dichotomous mindset removed the impact of choice set size on satisfaction. Interesting, in this no-load condition, subjects seemed to be more appreciative of the variety in the choice set when they were in the same-nondichotomous mindset. The *relativechosen* variable was measured to make sure that subjects did not have lower choice process satisfaction because they were too overwhelmed to select a suitable number of products. The results of the *relativechosen* analysis confirmed, in fact, that subjects did not choose significantly different numbers of items between the four conditions, confirming that their satisfaction was not necessarily based on how many they chose, or what they chose, but the actual process they experienced after being primed with the opposite/same cognitive mindset.

The findings of the first study indicate that oppositional thinking is a real phenomenon and can influence the subjective experiences of the choice process. One of the most fundamental contributions of this study was to induce a dichotomous mind-set on

individuals; following the mind-set priming techniques which have been implemented by many researchers and continue to be used (see Priming of dichotomous thinking and the Law of cognitive structure activation

The impact of the dichotomous mind-set, though, may be less obvious when subjects are not in an overload condition, as in Study 1. Thus, the second study will put subjects in more of an overload condition, by asking them to make a single choice. To extend this work along the lines of Figure 4, I will now change the stimuli themselves to actually decompose how subjects will react.

Study 2

Study 2 Conceptual Framework

Preliminary Discussion: Defining opposition in a choice context

Study 2 shifts opposition to the stimulus, or in this case, the choice set, and thus I will now clarify the stimulus-based definition of opposition. In a given choice set, if the choices vary along multiple dimensions but can be mapped unidimensionally at opposite ends of one relevant dimension, I define the set as dichotomous. Dichotomous choice sets are characterized both in terms of content (actual variety of the assortment) and structure (organization and entropy of the assortment). Markman and Medin (1995) discuss how two biases are the result of similarity judgments when options in a choice set are not fully comparable: (1) a focus on alignable rather than nonalignable differences; and (2) an attempt to establish alignability across all aspects of the set.

Structurally, a dichotomous choice set is a set in which the items can be mapped on one dimension, at two ends, but the attributes themselves do not necessarily make this dimension obvious. As an example, Figure 2 shows various ways in which a set of soda cans can be classified on opposite ends of various dimensions, such as diet – nondiet, healthy – unhealthy, or even brand-oppositional. In terms of content, a dichotomous choice set has less variety since the items differ along a single dimension. Kahn and Wansink (2004) define actual variety as having two distinct components: (1) the number of distinct options or

conceptually distinct subcategories; and (2) the number of category replicates. They further define assortment structure in terms of organization of an assortment and the relative symmetry in the frequencies of the items of the assortment. I will define the manipulation of interest along these lines (see Table 7).

Preliminary Discussion: Separating Browsing from Choosing

As noted (see *Outcome Factors*), Moe (2003) detects four consumer goals through analysis of consumer clickstream data. In Study 1, the choice process was not separated from the initial view of the assortment. Iyengar and Lepper (2000) demonstrated in several studies that the overchoice phenomena is robust and complex to the extent that consumers tend to experience the outcomes not necessarily as a factor of their *browsing* of the choices, but more related to their actual *purchase*. Specifically, in their first study, they found that subjects initially liked the larger assortment of items, but when asked to actually make a choice, became dissatisfied. Thus, in Moe's terms, consumer goals have a large impact on the overchoice effect. Perhaps by browsing a huge selection of items, a consumer will not get overly frustrated or dissatisfied, but when forced to actually make a choice, he/she will. Hence, Study 2 separates the browsing of a set (pre-choice measures) from the process of making a choice and the subsequent reactions (post-choice measures).

Study 2 tests several hypotheses regarding how a dichotomous choice set stimulus may influence subjective frustration and choice process satisfaction (pre and post-choice), decision difficulty, perceived complexity, and the number of reasons given.

I hypothesize that:

H4: For large choice sets, both pre and post-choice frustration will be lower when sets are dichotomous (regardless of set size) than when they are

nondichotomous, whereas choice-process satisfaction will not be significantly different.

H5: For high-involvement individuals, dichotomous choice sets will produce significantly lower pre-choice frustration than nondichotomous ones.

H6: Pre-choice process satisfaction will not be significantly different for either the choice set size or the dichotomy-set factor.

H7: For dichotomous choice sets, small ones will produce significantly higher post-choice frustration than large ones.

H8: For low-involvement individuals, small sets will generate significantly higher post-choice frustration than large ones. For nondichotomous sets, small ones will have significantly higher post-choice frustration than large ones (as was seen in Study 1, in the superscript *b* effect).

H9: For high-involvement individuals, large nondichotomous sets will be significantly more frustrating than large dichotomous ones.

H10: For large choice sets, decision difficulty will be significantly lower when sets are dichotomous than when they are nondichotomous.

H11: Perceived complexity will be significantly lower for small nondichotomous sets than for large nondichotomous ones. However, for dichotomous sets, the choice set size factor will not show significant differences for large versus small sets.

H12: For high-involvement individuals, large choice sets will be perceived as significantly more complex than small ones. More specifically, large

nondichotomous sets will be viewed as more complex than small nondichotomous ones.

H13: There will be an interaction effect between set size and dichotomous versus nondichotomous sets for the number of reasons given. Specifically, nondichotomous choice sets will have fewer reasons given when they are large versus when they are small.

Method

The study employed a 2x2 full factorial design. Dichotomy-set (dichotomous vs. nondichotomous) and choice set size (large vs. small) were manipulated as between-subject factors.

Independent variables

Dichotomy-set manipulation. In this study, the choice sets presented to subjects were systematically manipulated using the proposed dichotomy-nondichotomous conditions. The subjects were presented assortments which differed such that they offered more/less variety, were organized/disorganized, and differed on one vs. two dimensions.

In this research, this combination is henceforth defined as dichotomous versus nondichotomous. Essentially, dichotomous choice sets offer less variety in terms of the number of distinct options.

Table 7: STIMULI RELATED TO VARIETY AND ASSORTMENT (STUDY 2)

	<i>Actual variety</i>		<i>Assortment-set</i>	
	<i>Choice set Size</i>		<i>Dichotomy-set</i>	
	No. of category replicates (items in set)	Distinct options (#)	Organized or Disorganized	Dimensions designed
Large-nondichotomous	12	Amount (6), No. of items (4), Shape (6)	Disorganized	2
Large-dichotomous	12	Amount (1), No. of items (3), Shape (2)	Organized	1
Small-nondichotomous	6	Amount (4), No. of items (3), Shape (5), Calories (4)	Disorganized	2
Small-dichotomous	6	Amount (1), No. of items (2), Shape (2), Calories (4)	Organized	1

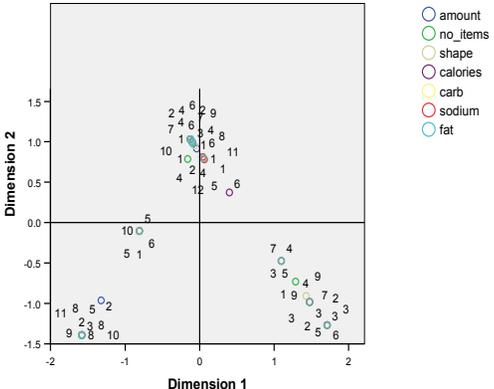
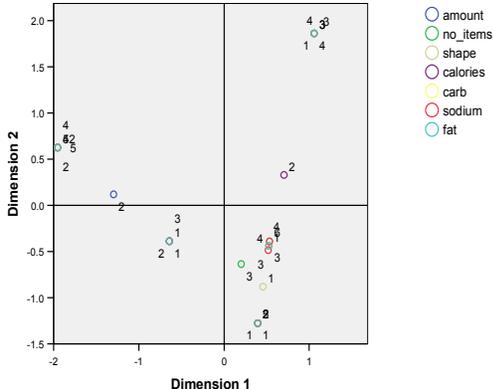
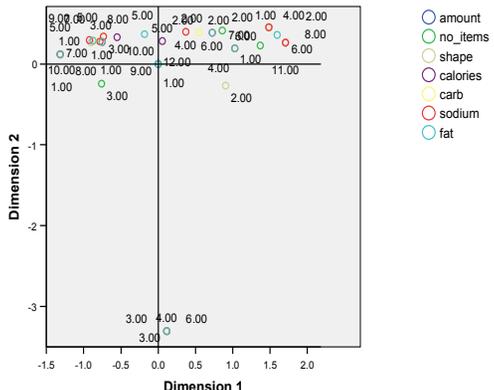
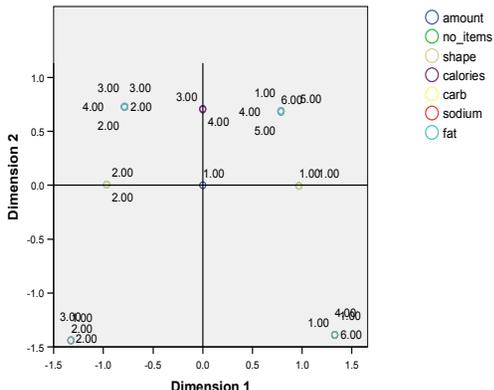
Stimulus design. Consideration set theory forms the theoretical basis for the hypothesized oppositional framework of this dissertation, as shown in Figure 4. In Study 1, dichotomous thinking was primed, whereas in Study 2, the stimulus itself is manipulated in order to examine outcome variables such as decision difficulty.

Table 7 lists the characteristics of the manipulated stimuli. Multiple correspondence analysis (MCA) is an exploratory technique which can be used to perceptually map nominal variables in dimensional space. Although MCA has been applied in the marketing research context for the mapping of choice data from multiple experiments (Hoffman and Franke 1986; Kaciak and Louviere 1990; Dillon, Mulani and Frederick 1989), the current application of this technique centers more on the stimuli themselves rather than their outcome data. The

number of dimensions presented in the choice sets was calculated using MCA (see the right-hand column of Table 8).

Note that the stimuli were first designed using the variety and assortment framework given in Table 7. Following this, the MCA analysis was used to verify that the number of physical dimensions matched the definitional constructs which this dissertation defines as “dichotomous or oppositional.” Table 7 is more of a format and content-based verification of the information in the choice set, whereas Table 8 is a quantifiable method which was used as confirmation.

Table 8: STIMULI MCA MAPPINGS (STUDY 2)

	<i>Large</i>		<i>Small</i>	
Non dichotomous	<p>Quantifications</p> 	<p>Eigenvalues: Dim 1: .977 Dim 2: .956</p>	<p>Quantifications</p> 	<p>Eigenvalues: Dim 1: .952 Dim 2: .883</p>
Dichotomous	<p>Quantifications</p> 	<p>Eigenvalues: Dim 1: .752 Dim 2: .593</p>	<p>Quantifications</p> 	<p>Eigenvalues: Dim 1: .780 Dim 2: .571</p>

Choice set size manipulation. The number of category replicates (items) in the presented choice set was varied such that the sets were either larger (greater number of choices was twelve) or smaller (fewer number of choices was six). The actual choice sets are presented in Appendix 1.

Dependent variables (other than those present in Study 1)

Decision difficulty. Decision difficulty was measured using a seven-point two-item scale, which has been previously used to measure the subjective difficulty experienced when facing a choice task (Zhang and Mittal 2005). Participants were asked if the decision they made was: (1) 1 = not at all difficult, 7 = very difficult; and (2) 1 = not at all easy, 7 = very easy (reverse scaled).

Choice set complexity. Subjects were asked to assess the choice set presented using a seven-point seven-item scale which has been previously used in a website context (Geissler, Zinkhan, and Watson 2001). Items ranged as follows: (1) 1 = not complex, 7 = complex; (2) 1 = not dense, 7 = dense; (3) 1 = not crowded, 7 = crowded; (4) 1 = no variety, 7 = lots of variety; (5) 1 = inefficient, 7 = efficient; (6) 1 = not overwhelming, 7 = overwhelming; and (7) 1 = simple, 7 = complicated.

Individual differences variables

Gender. Gender was collected in order to rule out any possible masking effects it could have on any of the dependent variables.

Involvement (Product-related relevance). A three-item seven-point scale was used to measure the involvement (product-related relevance) of snack foods per subject. Subjects were asked, “For the following 3 questions, please describe how important snack foods are to you.” Items given were: (1) 1 = nonessential; 7 = essential; (2) 1 = not beneficial; 7 = beneficial; (3) 1 = not needed; 7 = needed (Jain and Srinivasan 1990).

Need for cognition. An eighteen-item five-point scale was used to measure individual need for cognition. Items are presented in Appendix 2 (Cacioppo, Petty and Kao 1984).

Style of Processing. A twenty-two-item four-point scale was used to measure individual style of processing, verbal versus visual. The scale measures an individual’s likelihood of using visual versus verbal modes of processing information. Items are presented in Appendix 2 (Childers, Houston and Heckler 1985).

Sample and Procedure. A total of 72 marketing undergraduates, enrolled in an introductory level marketing course participated in this study. Participants were first asked to complete two individual differences scales, the style of processing scale and the need for cognition scale (see Appendix 2). Following this, they were presented with a second survey in which they were asked to “Imagine that you are standing in front of a vending machine and have the following x choices” (where x was either 12 or 6), below this, the choice set was presented in the same format as given in Appendix 1 (one of the four shown). Beneath the choice set, the subject saw this: “Thinking of the choice set above, please answer the

following questions.” The six-item choice set satisfaction scale (given in Study 1) was presented. Next, the subjects were asked to “...select the response that best fits your assessment of the choice set presented above...” followed by the seven-item choice set complexity scale. They were asked for the involvement (product-related relevance) for the domain of snack foods, and finally, demographic information. After completing and submitting this survey, the subjects were presented with a third survey in which the task of completing the survey was augmented so that they actually had to make a choice: “Imagine that you are standing in front of a vending machine and have the following x options for snacks. Now please choose one of the snacks.” The choice set presented was the same as the one they had previously commented on regarding choice set satisfaction and choice set complexity. After making a choice, the subjects were asked to one again complete the choice set satisfaction scale. After this, they were asked to complete the decision difficulty scale. They were then asked: “If you had to take the choices presented above and put them into sets of products, how many sets would you put them into?” followed by: “Briefly describe how you would break these products into sets.” They were then asked to rate their opinion of the choice task they completed in terms of the seven-item decision satisfaction scale, along with their confidence in their completion of the task using the three-item confidence in the task scale. Finally, the subjects were given the opportunity to list between zero and six reasons for their choice using the following question: “Please briefly list as many reasons as you would like (up to 6) for why you chose the product you chose above (leave blank if you have none).”

Results

ANOVA and Individual Differences Analysis

Manipulation check. The question regarding the number of sets subjects would break the stimuli into was used to verify the dichotomy-set manipulation. The check confirmed that in the dichotomy-set dichotomous condition, subjects perceived significantly fewer number of sets ($M = 2.58$) than in the nondichotomous condition ($M = 3.42$, $F(1, 70) = 8.79$, $p < .01$). Choice set size (large vs. small) was not found to have any such significant effect on the perceived number of sets ($M = 3.03$ vs. $M = 2.97$, $F(1, 68) = .035$, $p > .05$).

Gender. A one-way ANOVA was performed on all of the key dependent variables with gender as a factor. The results (shown in Table 9) confirm that there are no significant differences between groups for the gender factor.

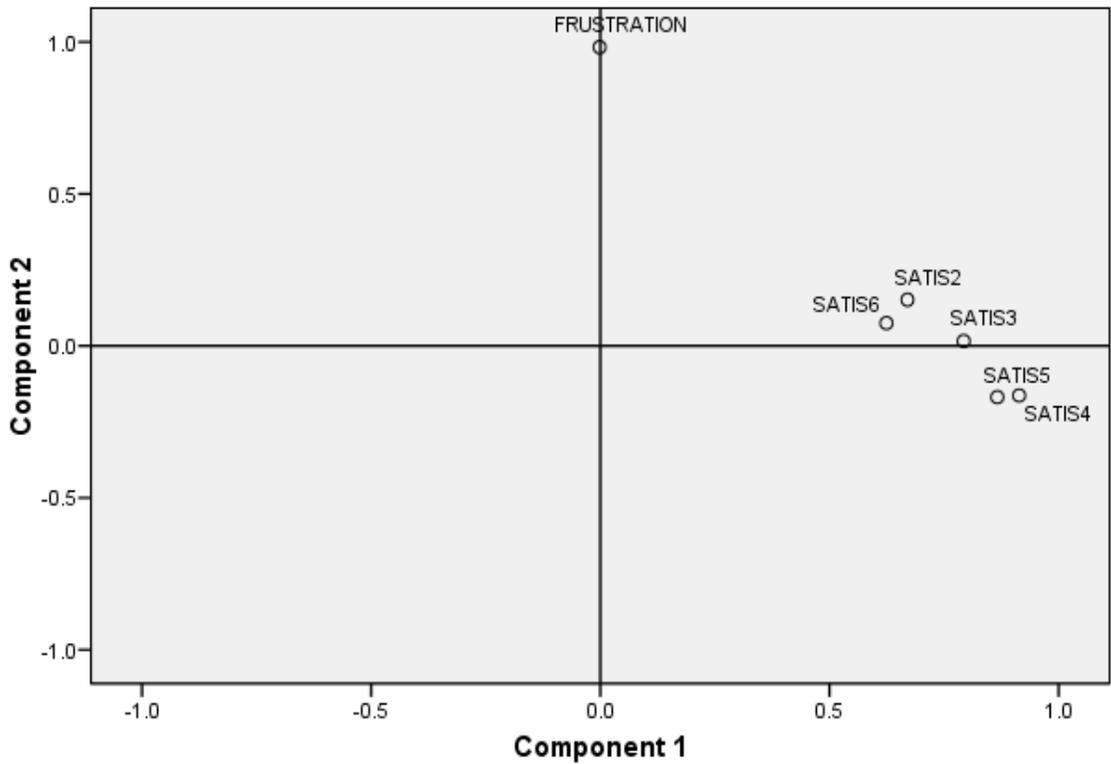
Table 9: GENDER FACTOR CHECK FOR STUDY 2

		Sum of Squares	df	Mean Square	F	Sig.
PRE-SATISFACTION	Between Groups	.467	1	.467	.117	.733
	Within Groups	279.048	70	3.986		
	Total	279.515	71			
PRE-FRUSTRATION	Between Groups	2.722	1	2.722	.357	.552
	Within Groups	533.278	70	7.618		
	Total	536.000	71			
POST-SATISFACTION	Between Groups	.534	1	.534	.149	.700
	Within Groups	249.986	70	3.571		
	Total	250.519	71			
POST-FRUSTRATION	Between Groups	3.125	1	3.125	.549	.461
	Within Groups	398.750	70	5.696		
	Total	401.875	71			
COMPLEXITY	Between Groups	.255	1	.255	.226	.636
	Within Groups	79.142	70	1.131		
	Total	79.397	71			
NO. OF REASONS	Between Groups	2.347	1	2.347	1.671	.200
	Within Groups	98.306	70	1.404		
	Total	100.653	71			
DEC. DIFFICULTY	Between Groups	1.253	1	1.253	.605	.439
	Within Groups	144.993	70	2.071		
	Total	146.247	71			

Choice process satisfaction. Given the results of this construct from Study 1, an exploratory factor analysis was again conducted on the six items of the choice process satisfaction scale. Due to the nature of the experimental design in this study, there were two separate occasions (pre and post choice) when the choice process satisfaction (CPS) scale was administered. For the pre-choice CPS scale, the principal component analysis resulted in two separate components for the CPS construct, one explaining 51.02% of the variance and the second explaining 17.34% of the variance. Consistent with the findings in the first study, the first item of the scale, or frustration with the choice set, was analyzed to be a separate factor.

Figure 10: FACTOR ANALYSIS OF PRE-CHOICE CHOICE PROCESS SATISFACTION (STUDY 2)

Component Plot in Rotated Space



Component Score Coefficient Matrix

	Component	
	1	2
FRUSTRATION	.041	.941
SAT2	.227	.174
SAT3	.262	.049
SAT4	.294	-.117
SAT5	.278	-.125
SAT6	.209	.098

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Component Score Covariance Matrix

Component	1	2
1	1.000	.000
2	.000	1.000

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

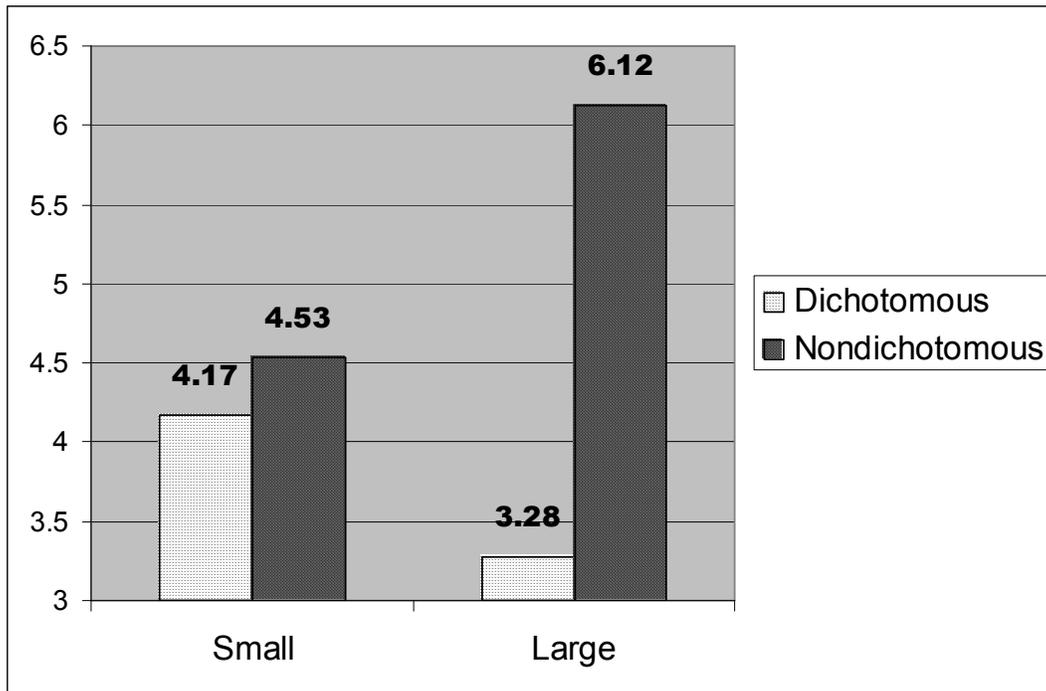
For post-choice CPS, factor analysis yielded results similar to the first study. Since there was no pre-choice CPS measure taken in the first study, post-choice CPS should look similar to the CPS measure in the first study. Thus, post-choice CPS showed one component (accounting for 55.75% of the variance) and principal component analysis factor loadings of .34, .84, .61, .94, .91, and .66, respectively. Again, since there were 72 subjects, the factor loading of .34 for the first component indicates that it should be separated for analysis of the post-choice choice process satisfaction construct (Hair, et al. 1998, p. 133).

Pre-choice CPS. Thus, the CPS construct was again analyzed as two components, frustration with the choice set (first item of the scale), and choice process satisfaction ($\alpha=.83$). To verify the exploratory analysis results, the Cronbach's alpha for all six components was indeed found to be lower than this, or .73.

Pre-choice Frustration with Choice set. A 2x2 (Dichotomy-set x Choice set size) between-subjects factorial ANOVA was conducted. There was a significant interaction between choice set size and dichotomy-set, $F(1, 68) = 4.06, p < .05$. Per Hypothesis 4, there was also a significant main effect for dichotomy-set, $F(1, 68) = 6.76, p < .02$.

A simple main effects analysis of the dichotomy-set factor showed that for large choice sets, nondichotomous sets were perceived as much more frustrating ($M = 6.12$) than dichotomous ones ($M = 3.28$), $F(1, 68) = 10.36, p < .01$. For nondichotomous sets, a simple main effects analysis revealed that small ones were perceived as marginally less frustrating ($M = 4.53$) than large ones ($M = 6.12$), $F(1, 68) = 3.34, p = .07$.

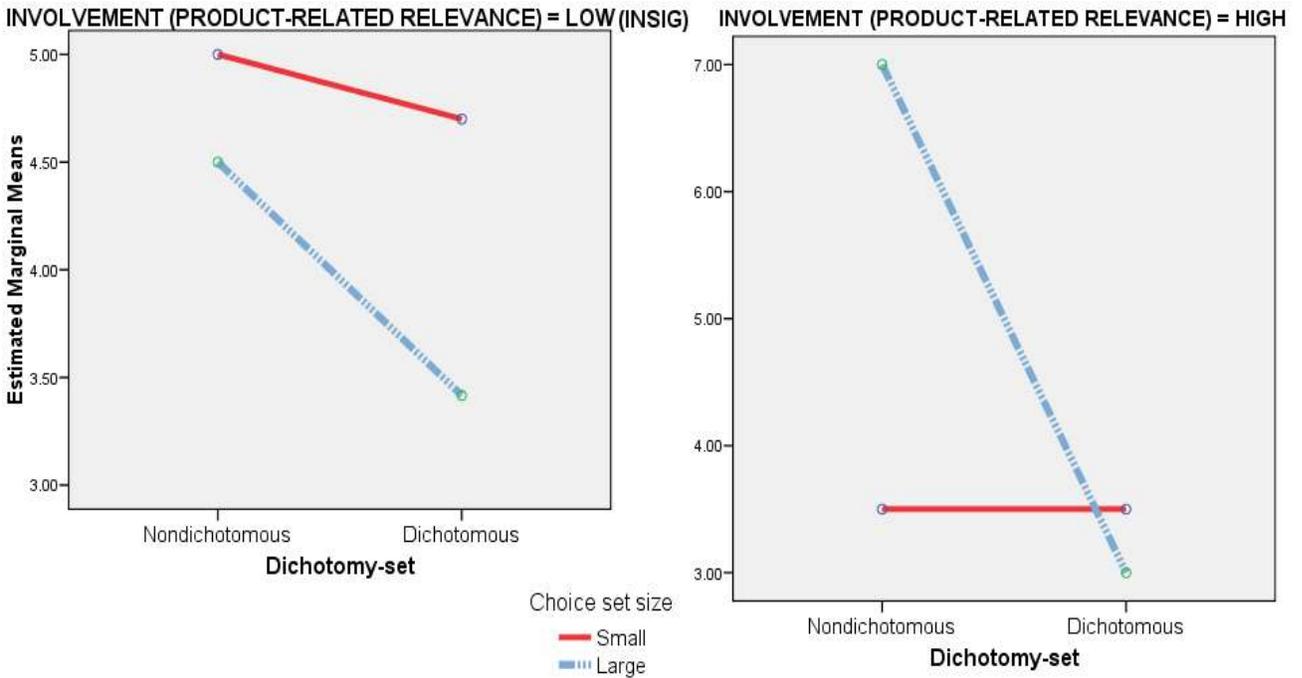
Figure 11: PRE-CHOICE FRUSTRATION (STUDY 2)



Involvement (product-related relevance) as an individual differences variable for Pre-choice frustration. A 2 x 2 between-subjects ANOVA (dichotomy-set vs. choice-set size) was run on pre-choice frustration for the low and high groups of involvement (product-related relevance). For the low-involvement group, there were neither significant main effects nor a significant interaction. For the high-involvement group, there was a significant interaction between dichotomy-set and choice-set size $F(1, 27) = 5.89, p = .02$. As evidence of Hypothesis 5, for high-involvement individuals, there was also a significant main effect of dichotomy-set (nondichotomous $M = 5.76$ versus dichotomous $M = 3.28$), $F(1, 27) = 5.89, p = .02$. Simple main effects analysis showed two effects. For large choice-sets, nondichotomous ones ($M = 7.0$) were perceived as significantly more frustrating than dichotomous ones ($M = 3.0$), $F(1, 27) = 12.56, p = 0$. Further, for nondichotomous

choice sets, large ones ($M = 7.0$) were perceived as significantly more frustrating than small ones ($M = 3.5$), $F(1, 27) = 9.62, p = 0$.

Figure 12: PRE-CHOICE FRUSTRATION BY INVOLVEMENT (PRODUCT-RELATED RELEVANCE)



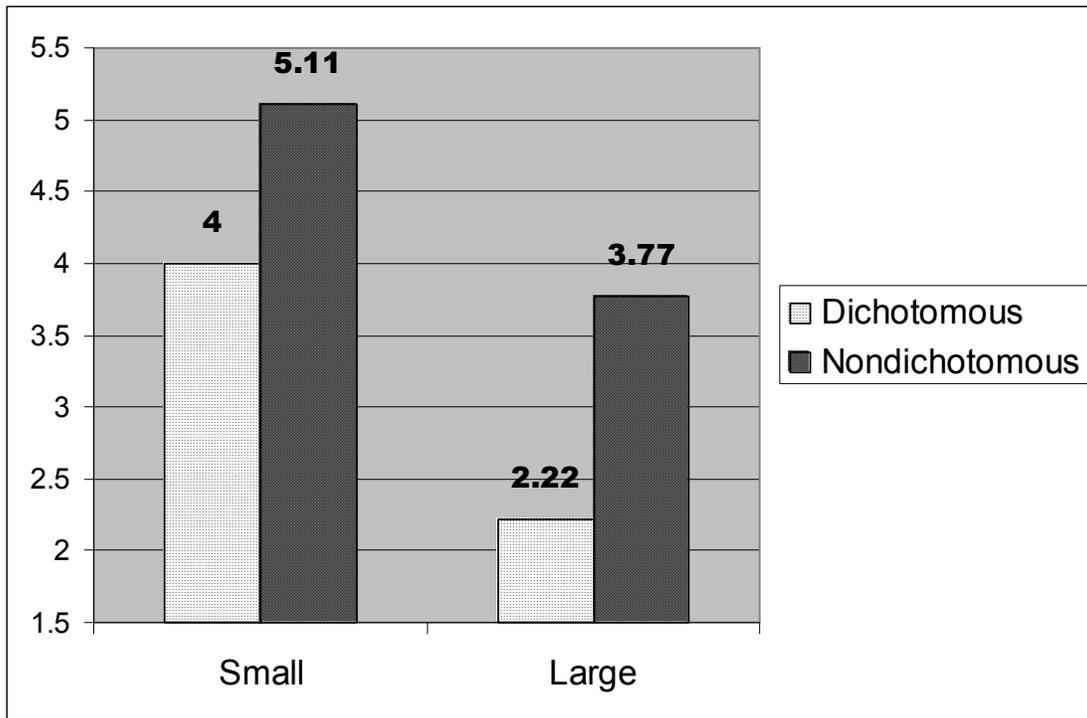
Pre-choice Choice Process Satisfaction. A 2x2 (Dichotomy-set x Choice set size) between-subjects factorial ANOVA was conducted. There were no significant differences between groups, as given in Hypothesis 6.

Post-choice CPS. The CPS construct was again analyzed as two components, frustration with the choice set (first item of the scale), and choice process satisfaction ($\alpha=.86$). To verify the exploratory analysis results, the Cronbach's alpha for all six components was indeed found to be lower than this, or .82.

Post-choice Frustration with Choice set. A 2x2 (Dichotomy-set x Choice set size) between-subjects factorial ANOVA was conducted. As predicted in Hypothesis 4, there were significant main effects for both dichotomy-set (nondichotomous $M = 4.47$ versus dichotomous $M = 3.11$) and choice-set size (small $M = 4.57$ versus large $M = 2.97$), $F(1, 68)=6.61, p<.02$ and $F(1, 68)=9.17, p<.01$, respectively.

As a test of Hypothesis 7, simple main effects analysis revealed that for dichotomous choice sets, small ones were perceived as significantly more frustrating after choice ($M = 4.00$) than large ones ($M = 2.22$), $F(1, 68)=5.97, p = .02$. Additionally, for large choice sets, nondichotomous ones were perceived as significantly more frustrating after choice ($M = 3.77$) than dichotomous ones ($M = 2.22$), $F(1, 68)=4.37, p = .04$.

Figure 13: POST-CHOICE FRUSTRATION (STUDY 2)

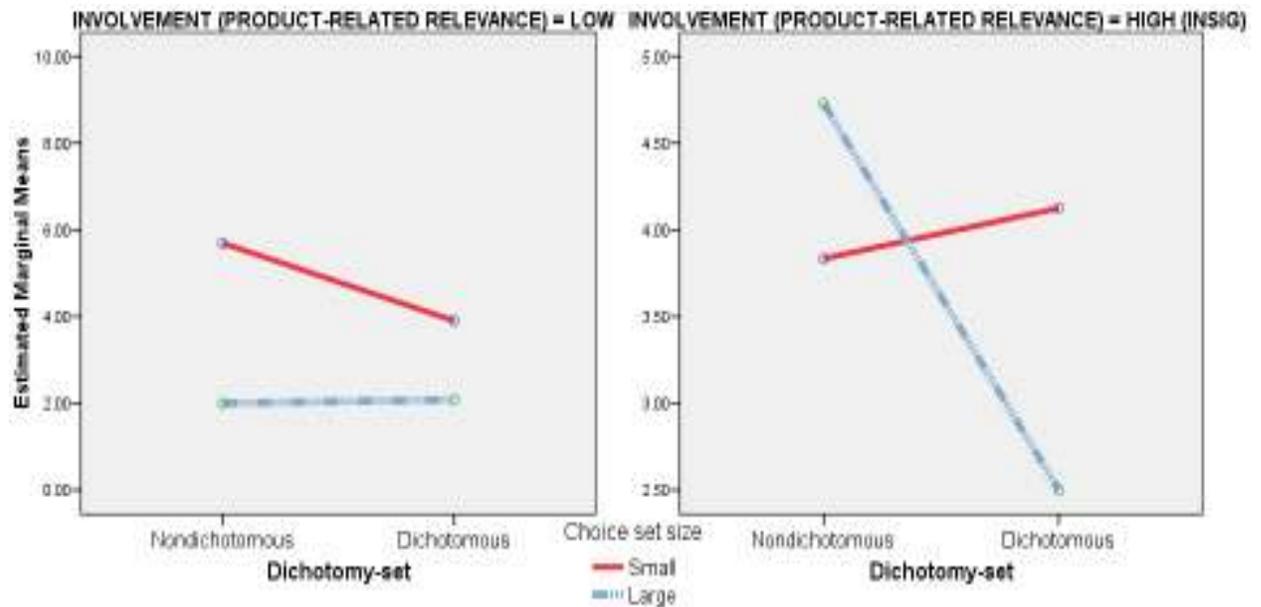


Involvement (product-related relevance) as an individual differences variable for Post-choice frustration. A 2 x 2 between-subjects ANOVA (dichotomy-set vs. choice-set size) was run on post-choice frustration for the low and high groups of involvement (product-related relevance). As verification of Hypothesis 8, for the low-involvement group, there was a significant main effect for choice-set size such that small sets were significantly more frustrating than large ones, post-choice (small $M = 4.91$ versus large $M = 2.06$), $F(1, 37) = 14.1, p = 0$. Simple main effects revealed that for nondichotomous sets, small ones were perceived as significantly more frustrating ($M = 5.69$) than large ones ($M = 2.00$), $F(1, 37) = 11.10, p = 0$.

As proof of Hypothesis 9, for the high-involvement group, there were no significant main effects or interaction effects, but there was a significant simple main effect for the large

choice-set size factor. Large nondichotomous sets were perceived as significantly more frustrating ($M = 4.73$) than were large dichotomous sets ($M = 2.50$), $F(1, 27) = 5.57, p = .03$.

Figure 14: POST-CHOICE FRUSTRATION BY INVOLVEMENT (PRODUCT-RELATED RELEVANCE)



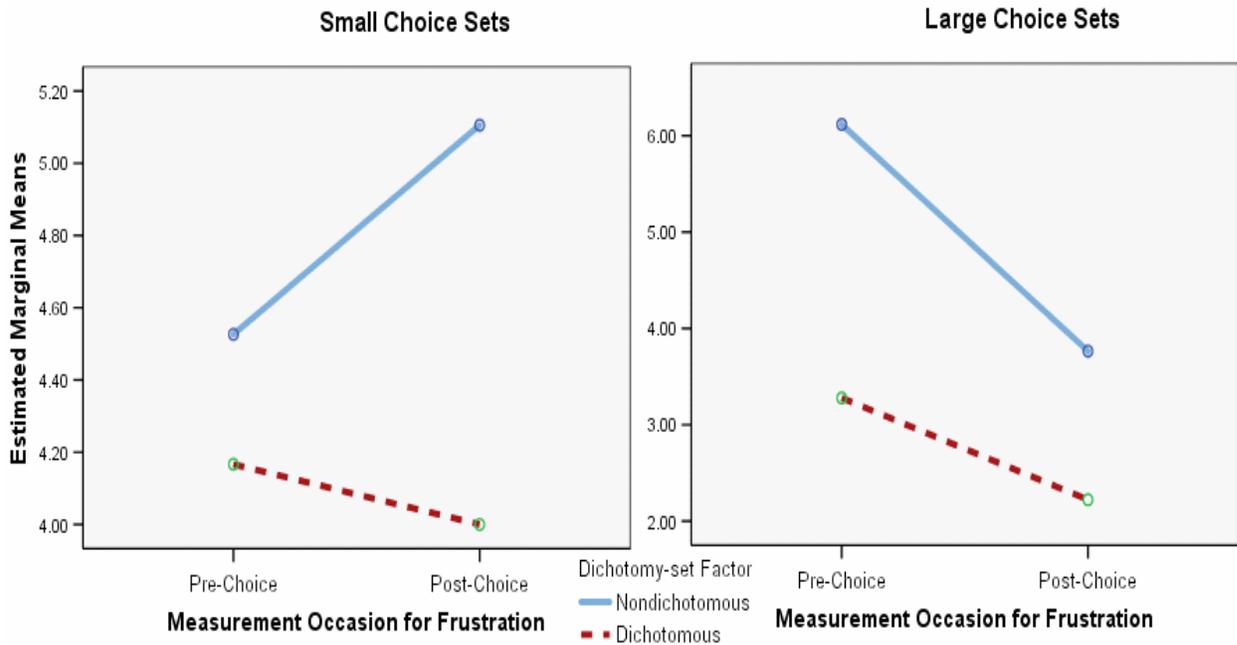
Post-choice Choice Process Satisfaction. A 2x2 (Dichotomy-set x Choice set size) between-subjects factorial ANOVA was conducted. There were no significant differences between groups.

Choice process frustration pre versus post-choice. A 2 (Dichotomy-set) x 2 (Choice set size) x 2 (pre and post choice frustration) mixed-model ANOVA revealed that there was a main effect for dichotomous sets, $F(1, 68) = 9.88, p < .05$, Eta-squared = .127. Tests of within-subject contrasts revealed that there was a significant interaction effect between choice-set size and frustration, $F(1, 68)=8.64, p<.05$, Eta-squared = .113. There was

also a significant within-subject main effect for frustration, $F(1, 68) = 5.32, p < .05$, Eta-squared = .073.

Paired samples t-tests were then conducted and revealed that for nondichotomous large choice sets, pre-choice frustration was significantly higher ($M = 6.12$) than post-choice frustration ($M = 3.77$), $t(16) = 3.33, p < .05$. For dichotomous large choice sets, pre-choice frustration ($M = 3.28$) was marginally significantly higher than post-choice frustration ($M = 2.22$), $t(17) = 1.90, p = .07$. Notably, the initial frustration was much higher for nondichotomous choice sets than for dichotomous ones when they are large (see simple main effects analysis given above).

Figure 15: PRE VS. POST CHOICE PROCESS FRUSTRATION (STUDY 2)



Choice process satisfaction, pre versus post-choice. A 2 (Dichotomy-set) x 2

(Choice set size) x 2 (pre and post choice satisfaction) mixed-model ANOVA revealed no significant differences in choice process satisfaction before and after the choice process.

Preliminary Discussion: Interpretation of Study 2 Frustration and CPS

A tabular format will be used to interpret the frustration and satisfaction results of the second study. Table 10 allows viewing of the significant findings for this study as they pertain to frustration and satisfaction.

Table 10: STUDY 2 FRUSTRATION RESULTS AT A GLANCE

<i>CONDITION</i>		<i>FRUSTRATION (PRE)</i>	<i>FRUSTRATION (POST)</i>
Small	Opposite/Dich	4.17	4.00 ^f
Small	Same/Nondich	4.53	5.11
Large	Opposite/Dich	3.28 ^e	2.22 ^{fg}
Large	Same/Nondich	6.12 ^e	3.77 ^g

^e $F(1, 68) = 10.36, p < .01$

^f $F(1, 68) = 5.97, p = .02$

^g $F(1, 68) = 4.37, p = .04$

Study 2 attempts to create “overchoice effect” circumstances firstly by inducing regret (only allowing participants to select one product) and second by using set size as a factor (where large nondichotomous sets would be the overchoice condition). The results in the study are consistent with expectations on multiple fronts.

Superscript *e* (Hypothesis 4, first part) shows that even without making a choice, the simple presentation of a dichotomous (non-overload condition) versus nondichotomous (overload condition) set creates significantly less frustration for the participants. In the opposite/dichotomous condition, pre-choice frustration is lower, demonstrating that even when participants are browsing the choice sets, they find large dichotomous sets less frustrating than large nondichotomous ones (which created the overchoice effect for the subjects).

Superscript *f* (Hypothesis 7) shows that large dichotomous sets produced the least frustration, significantly less than small dichotomous sets, in fact. Dichotomous large sets provide plenty of variety and choice which is manageable and preferred, yet they are palatable due to their presentation. The fact that participants actually got to make a choice is what may have given rise to the even lower post-choice frustration for large dichotomous sets. Alternatively, perhaps in the face of frustration, they engaged in sufficient cognitive work to make the choice set more palatable and the choice more acceptable. These questions can be answered in future work on specific cognitive mechanisms for oppositional thinking and choice. Small dichotomous sets have higher frustration than large dichotomous sets because they may not be perceived to have enough variety (fewer items in a dichotomous format).

Superscript *g* (Hypothesis 4, second part) shows that by dichotomizing, the size itself became a non-issue for participants, and in fact, there was an advantage to the dichotomous format for large sets – not only did it create less frustration than the nondichotomous format, it created the lowest frustration overall.

Preliminary Discussion: Browsing versus choosing

When *browsing* the set of choices, subjects found large dichotomous sets to be the least frustrating ($M = 3.28$). Next were small dichotomous sets. Nondichotomous large ones produced the highest frustration ($M = 6.12$). Afterwards, when the participants were asked to *select* a product, large dichotomous sets still produced the least frustration (even lower than before, $M = 2.22$), followed by large nondichotomous ones, and then the small dichotomous ones. Small nondichotomous ones lead to the highest post-choice frustration ($M = 5.11$). A closer look at the individual differences involvement measure helps clarify the meaning of these findings.

Table 11: FRUSTRATION LEVELS FOR LOW VERSUS HIGH INVOLVEMENT INDIVIDUALS

<i>CONDITION</i>			<i>LOW INVOLVEMENT</i>	<i>HIGH INVOLVEMENT</i>
PRE	Large	Dichotomous	3.42	3.00
POST	Large	Dichotomous	2.08	2.50
PRE	Large	Nondichotomous	4.50	7.00
POST	Large	Nondichotomous	2.00	4.73
PRE	Small	Dichotomous	4.70	3.50
POST	Small	Dichotomous	3.90	4.12
PRE	Small	Nondichotomous	5.00	3.50
POST	Small	Nondichotomous	5.69	3.83

As Table 11 illustrates, high involvement individuals became much more frustrated with large nondichotomous sets than low involvement individuals, both before and after making a choice. Conversely, low involvement individuals became more frustrated with small

nondichotomous sets than high involvement individuals, both before and after making a choice.

For dichotomous sets, frustration was higher for low involvement individuals, although not by much. Also, frustration lessened after making a choice in the case of dichotomous sets, except for high involvement individuals with small dichotomous sets. Further, low involvement individuals had higher frustration levels for large and small dichotomous sets, pre-choice, than did high involvement individuals. Conversely, low involvement individuals had lower frustration levels for large and small dichotomous sets, post-choice, than did high involvement individuals.

Preliminary Discussion: Frustration versus Satisfaction

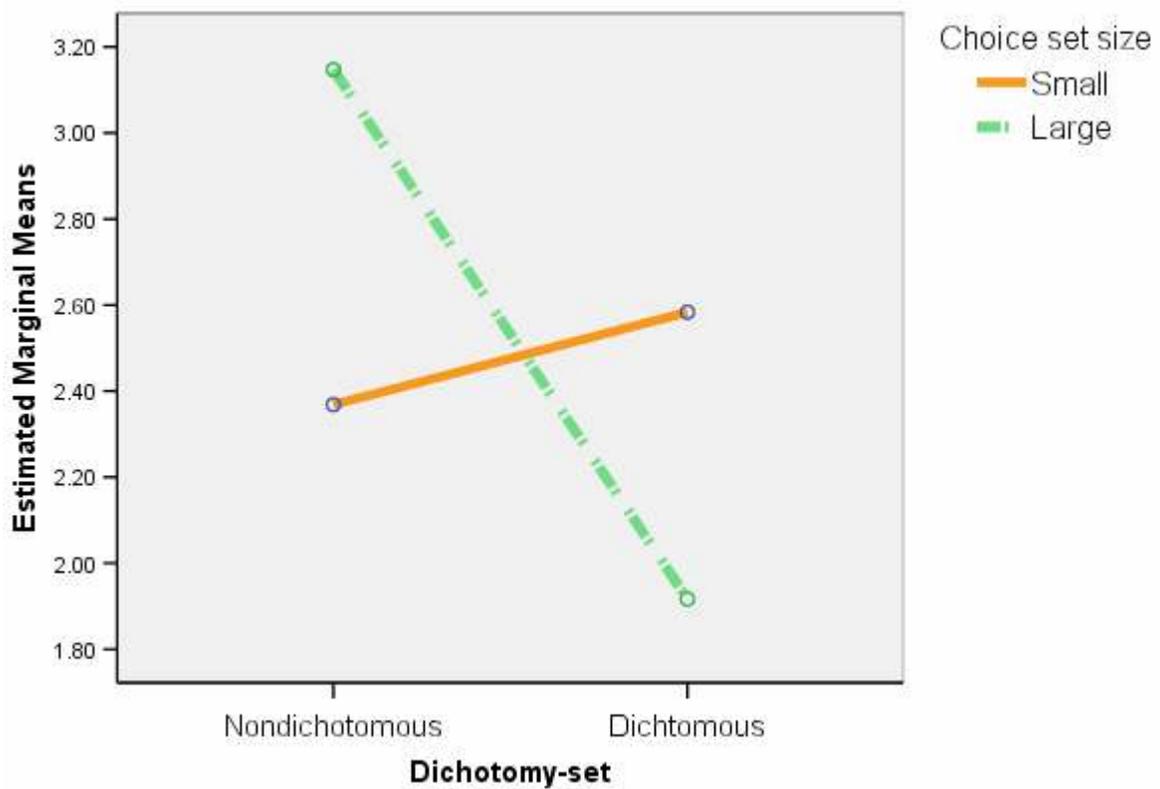
Studies 1 and 2 consistently illustrate that frustration mapped on a separate dimension than choice satisfaction. Study 1 shows that whereas frustration remained relatively constant for small versus large sets and dichotomous versus nondichotomous mindsets, satisfaction was not. In Study 2, a different design and procedure was set up in order to tease apart several concepts. First, subjects reported their subjective frustration and choice process satisfaction before realizing that they were soon going to make an actual choice. Botti and Iyengar (2004) delineated between choosers and non-choosers and essentially showed that the simple act of choosing is not a sufficient condition for outcome satisfaction. At a glance, this is something often taken for granted – that when an individual is presented with an array of goods and provided with one gratis, he/she will experience some level of satisfaction *above* that of someone who is merely presented with the same array of choices and not allowed to pick one. Yet Botti and Iyengar (2004) showed that it is not the simple act of choosing which produces increased satisfaction; individual goals and desires interact with the situation to determine final satisfaction. In Study 2, by providing measures of “pre”- frustration and “pre”-choice process satisfaction, this issue is brought to bear once again. Is it, in fact, that individuals experience the stress of making a decision simply by being *presented* with a set of choices (i.e. some sort of “implicit choice”)? Further, why do frustration and satisfaction perceptually map as orthogonal constructs?

Iyengar and Lepper (2000) found similar angularities in subjective response to their extensive choice participants. In their sample, extensive choice participants reported enjoying the choice process more while still finding it to be more frustrating and difficult. Iyengar and

Lepper (2000) conclude that the overchoice condition may have been more enjoyable but it was still overwhelming. The results given in Study 2 of this dissertation are consistent with Iyengar and Lepper (2000), in that even though there are significant differences in frustration both within and between conditions (see Figure 11, Figure 13, and Figure 15), choice process satisfaction remains consistent. This underscores that these two constructs are not as intertwined as we may otherwise think. Whereas frustration seems to be tied more to the *process*, satisfaction (even though it is measured as *choice process* satisfaction) appears to be linked more to the *outcome*.

Decision difficulty. A 2x2 (Choice set size x Dichotomy-set) between-subjects factorial ANOVA was performed on decision difficulty ($\alpha = .89$). There were no significant main effects of either choice set size or dichotomy-set. There was a significant interaction between choice set size and dichotomy-set, $F(1, 68) = 4.82, p < .05$.

Figure 16: DECISION DIFFICULTY (STUDY 2)



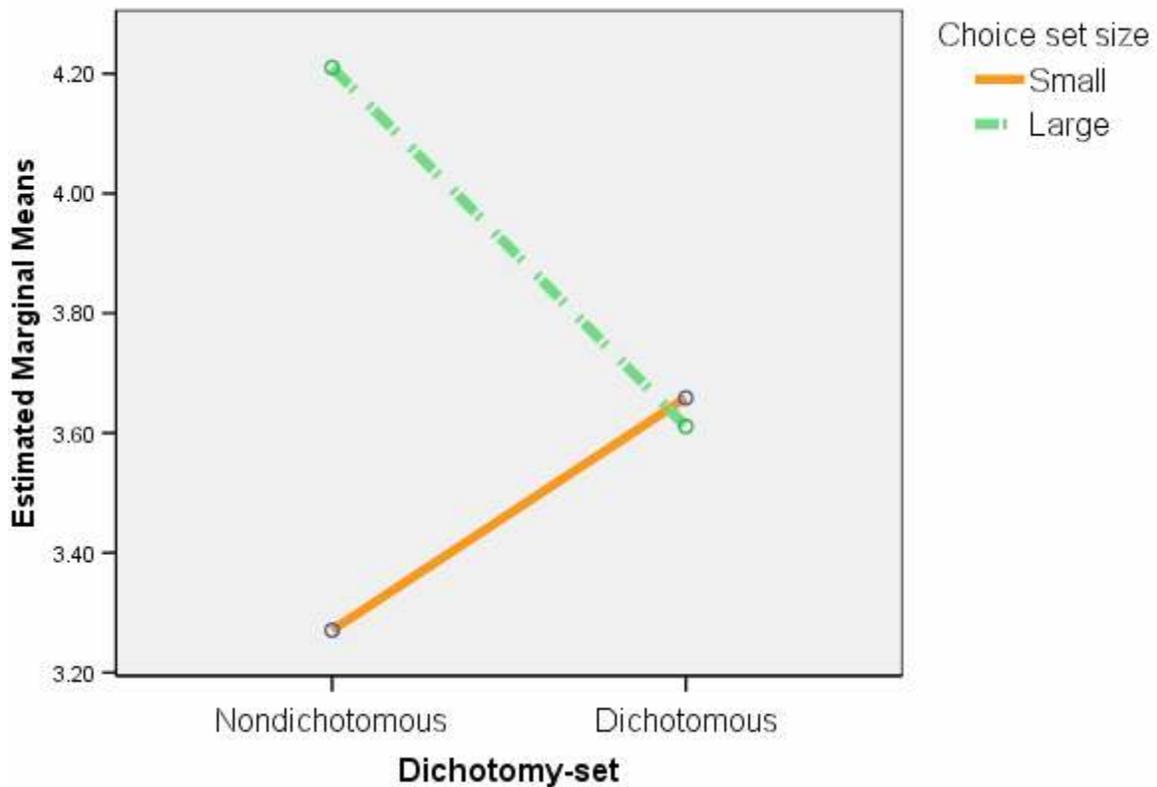
As a test of Hypothesis 10, a simple main effects analysis of the dichotomy-set factor showed that large choice sets created significantly lower decision difficulty in the dichotomy condition ($M = 1.92$) than in the nondichotomous condition ($M = 3.15$), $F(1, 68) = 6.79, p <$

.05. Conversely, small choice sets did not show significant differences in decision difficulty when they were dichotomous ($M = 2.58$) versus when they were nondichotomous ($M = 2.37$), $F(1, 68) = .22, p > .05$.

Choice set complexity. A 2x2 (Choice set size x Dichotomy-set) between-subjects factorial ANOVA was performed on choice set complexity ($\alpha = .74$). There were no significant main effects of either choice set size or dichotomy-set, but choice set size was marginally close to having a significant main effect, $F(1, 68) = 3.41, p = .07$. There was a significant interaction between choice set size and dichotomy-set, $F(1, 68) = 4.17, p < .05$.

A simple main effects analysis of the choice set size factor indicated that for nondichotomous choice sets, small ones were perceived to have significantly lower choice set complexity ($M = 3.27$) than large ones ($M = 4.21$), $F(1, 68) = 7.55, p < .01$, as expected per Hypothesis 11. For dichotomous choice sets, differences in perceived complexity between small ones ($M = 3.66$) and large ones ($M = 3.61$) were not significant, $F(1, 68) = .02, p > .05$. This underscores the overchoice effect in Study 2, by showing that the size factor difference for perceived complexity which is apparent in nondichotomous sets (small versus large) is not there for dichotomous sets.

Figure 17: CHOICE SET COMPLEXITY (STUDY 2)



Involvement (product-related relevance) as an individual differences variable for Complexity. A 2 x 2 between-subjects ANOVA (dichotomy-set vs. choice-set size) was run on complexity for the low and high groups of involvement (product-related relevance). As proof of Hypothesis 12, for the high-involvement group, there was a significant main effect for choice-set size such that large sets were perceived as significantly more complex than small sets (small $M = 3.39$ versus large $M = 4.28$), $F(1, 27) = 8.08, p = .01$. Simple main effects analysis indicated that for nondichotomous sets, large ones ($M = 4.48$) were perceived as significantly more complex than small ones ($M = 3.29$), $F(1, 27) = 9.20, p = 0$.

Figure 18: COMPLEXITY BY INVOLVEMENT (PRODUCT-RELATED RELEVANCE)

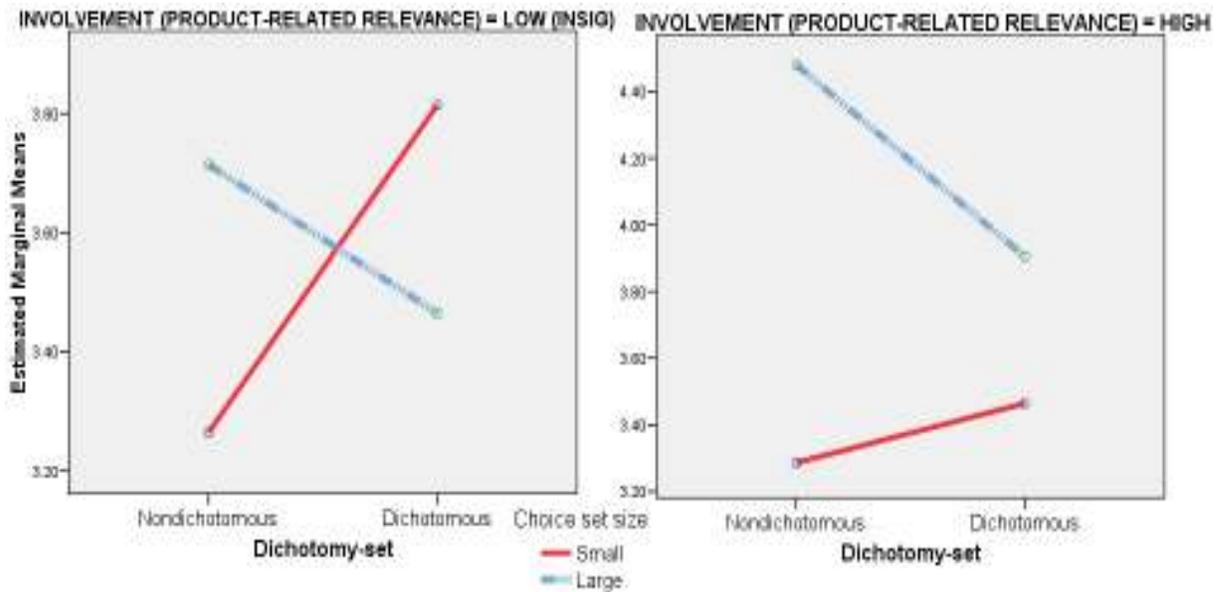


Table 12: PERCEIVED COMPLEXITY LEVELS FOR LOW VERSUS HIGH INVOLVEMENT INDIVIDUALS

<i>CONDITION</i>		<i>LOW INVOLVEMENT</i>	<i>HIGH INVOLVEMENT</i>
Large	Dichotomous	3.46	3.91
Large	Nondichotomous	3.71	4.48
Small	Dichotomous	3.81	3.46
Small	Nondichotomous	3.26	3.29

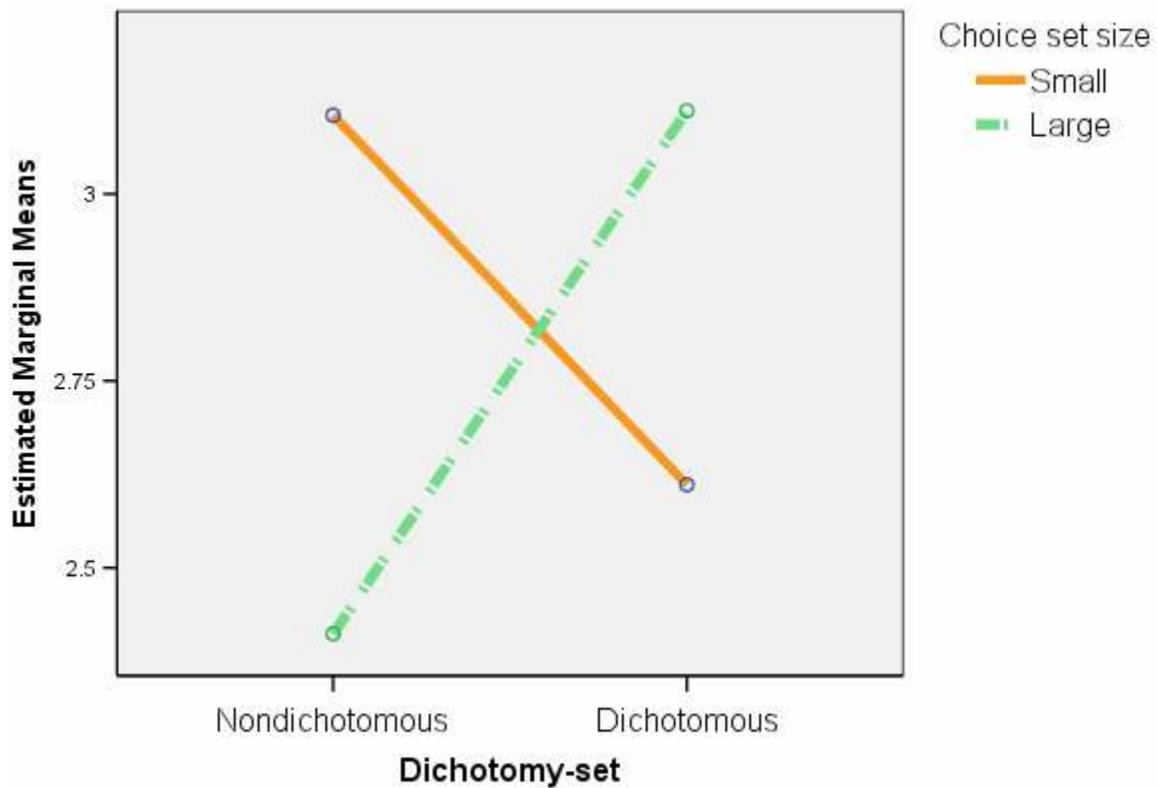
As Table 12 shows, perceived complexity tended to be higher in high involvement individuals when sets were large, and even more so with nondichotomous ones.

Number of reasons. Number of reasons was calculated by counting the number of filled reason boxes (regardless of content) for each subject. A 2x2 (Choice set size x Dichotomy-set) between-subjects factorial ANOVA was performed on number of reasons.

There were no significant main effects of either choice set size or dichotomy-set. Per Hypothesis 13, there was a significant interaction between choice set size and dichotomy-set, $F(1, 68) = 4.63, p < .05$.

A simple main effects analysis of the choice set size factor was performed and indicated that for nondichotomous choice sets, smaller ones had marginally significantly more reasons given ($M = 3.11$) than were given for larger ones ($M = 2.41$), $F(1, 68) = 3.12, p = .08$. For dichotomous choice sets, size did not have any significant main effect.

Figure 19: NUMBER OF REASONS (STUDY 2)



Correlation Analysis

It is also important to verify the relationships between the variables and make sure they follow the directional paths which are expected. The overall correlation coefficients (without taking any factors into account) are first presented in Table 13. Of initial interest is the relationship between frustration and satisfaction before (pre) and after (post) making a choice for the two factors in the study.

Table 14 below shows these coefficients. As expected, pre and post satisfaction are positively correlated ($r = .63, p < .01$) as are pre and post frustration ($r = .36, p < .01$). Pre-frustration and decision difficulty are also strongly positively correlated with perceived complexity ($r = .41, p < .01$ and $r = .48, p < .01$, respectively).

Table 13: OVERALL CORRELATION COEFFICIENTS (STUDY 2)

	PRE-SATISFACTION	PRE-FRUSTRATION	POST-SATISFACTION	POST-FRUSTRATION	COMPLEXITY	NO. OF REASONS	DEC. DIFFICULTY
PRE-SATISFACTION	1	.034	.632**	-.080	.001	.043	.113
PRE-FRUSTRATION	.034	1	.013	.363**	.408**	-.248*	.403**
POST-SATISFACTION	.632**	.013	1	-.236*	.011	.205	.029
POST-FRUSTRATION	-.080	.363**	-.236*	1	.221	-.222	.365**
COMPLEXITY	.001	.408**	.011	.221	1	-.225	.479**
NO. OF REASONS	.043	-.248*	.205	-.222	-.225	1	-.236*
DEC. DIFFICULTY	.113	.403**	.029	.365**	.479**	-.236*	1

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 14: CORRELATION COEFFICIENTS FOR FRUSTRATION AND SATISFACTION BEFORE AND AFTER CHOICE (STUDY 2)

<i>DICHOTOMY-SET FACTOR</i>						
PRE-CHOICE	DICHOTOMOUS SETS			NONDICHOTOMOUS SETS		
		Satisfaction	Frustration		Satisfaction	Frustration
	Satisfaction	1.00	.34*	Satisfaction	1.00	-.35*
	Frustration	.34*	1.00	Frustration	-.35*	1.00
*Significant at the .05 level			*Significant at the .05 level			
POST-CHOICE	DICHOTOMOUS SETS			NONDICHOTOMOUS SETS		
		Satisfaction	Frustration		Satisfaction	Frustration
	Satisfaction	1.00	-.19	Satisfaction	1.00	-.38*
	Frustration	-.19	1.00	Frustration	-.38*	1.00
*Significant at the .05 level			*Significant at the .05 level			
<i>SIZE FACTOR</i>						
PRE-CHOICE	SMALL SETS			LARGE SETS		
		Satisfaction	Frustration		Satisfaction	Frustration
	Satisfaction	1.00	-.08	Satisfaction	1.00	.11
	Frustration	-.08	1.00	Frustration	.22	1.00
POST-CHOICE	SMALL SETS			LARGE SETS		
		Satisfaction	Frustration		Satisfaction	Frustration
	Satisfaction	1.00	-.40*	Satisfaction	1.00	.05
	Frustration	-.40*	1.00	Frustration	.05	1.00
*Significant at the .05 level						

Table 15: FREQUENCY DISTRIBUTIONS FOR PRE-FRUSTRATION AND PRE-SATISFACTION FOR THE DICHOTOMY-SET FACTOR (STUDY 2)

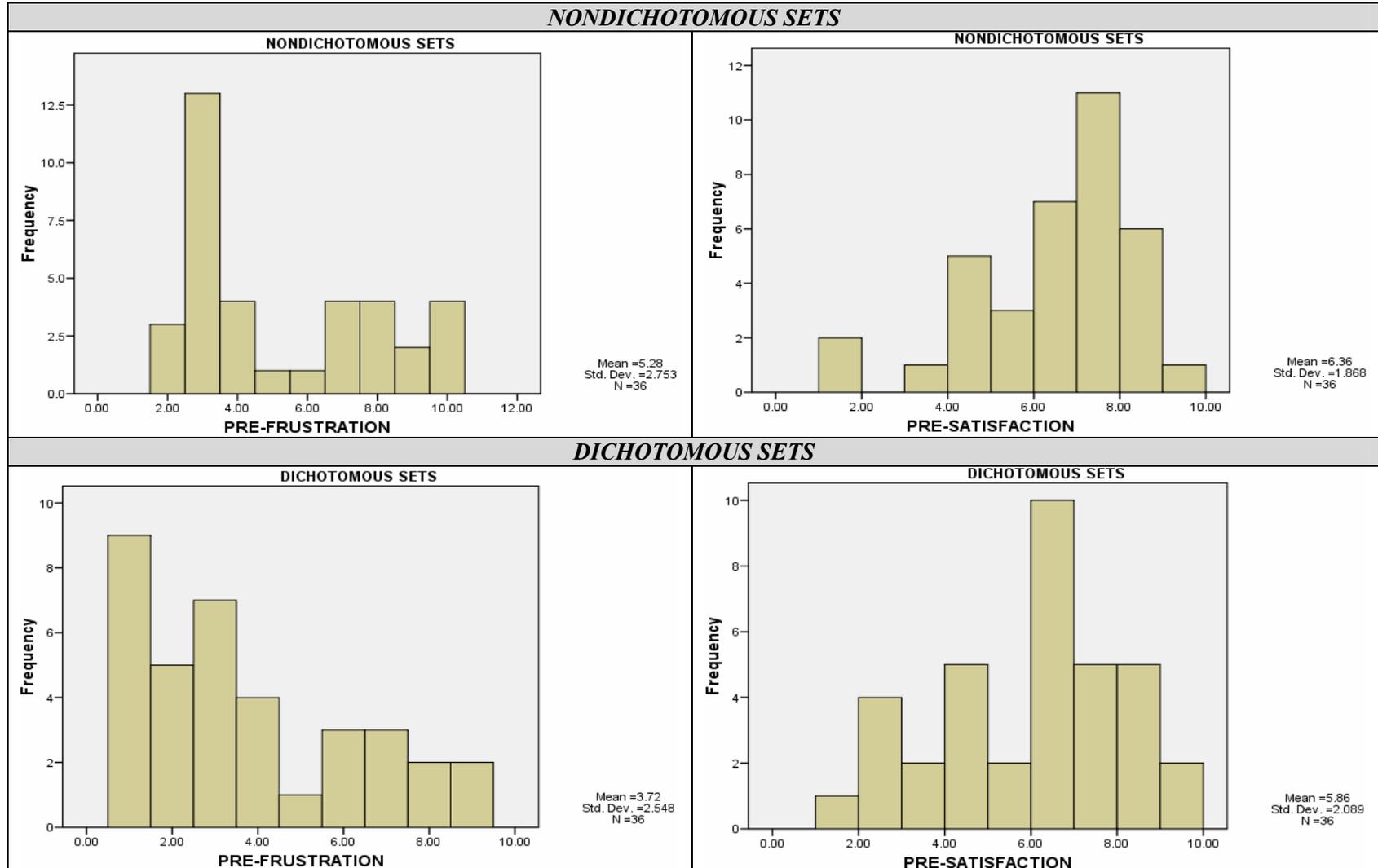


Table 16: CORRELATION COEFFICIENTS (STUDY 2)

DICHOTOMY-SET FACTOR							
NONDICHOTOMOUS SETS							
	PRE-SATISFACTION	PRE-FRUSTRATION	POST-SATISFACTION	POST-FRUSTRATION	COMPLEXITY	NO. OF REASONS	DEC. DIFFICULTY
PRE-SATISFACTION	1	-.353*	.462**	-.216	-.287	-.340*	-.023
PRE-FRUSTRATION	-.353*	1	-.241	.292	.544**	-.171	.246
POST-SATISFACTION	.462**	-.241	1	-.378*	-.252	.161	.018
POST-FRUSTRATION	-.216	.292	-.378*	1	.317	-.191	.060
COMPLEXITY	-.287	.544**	-.252	.317	1	-.236	.561**
NO. OF REASONS	-.340*	-.171	.161	-.191	-.236	1	-.276
DEC. DIFFICULTY	-.023	.246	.018	.060	.561**	-.276	1
DICHOTOMOUS SETS							
	PRE-SATISFACTION	PRE-FRUSTRATION	POST-SATISFACTION	POST-FRUSTRATION	COMPLEXITY	NO. OF REASONS	DEC. DIFFICULTY
PRE-SATISFACTION	1	.336*	.769**	-.024	.320	.287	.197
PRE-FRUSTRATION	.336*	1	.198	.327	.238	-.316	.513**
POST-SATISFACTION	.769**	.198	1	-.187	.330*	.251	-.006
POST-FRUSTRATION	-.024	.327	-.187	1	.062	-.267	.680**
COMPLEXITY	.320	.238	.330*	.062	1	-.233	.387*
NO. OF REASONS	.287	-.316	.251	-.267	-.233	1	-.211
DEC. DIFFICULTY	.197	.513**	-.006	.680**	.387*	-.211	1
SIZE FACTOR							
SMALL SETS							
	PRE-SATISFACTION	PRE-FRUSTRATION	POST-SATISFACTION	POST-FRUSTRATION	COMPLEXITY	NO. OF REASONS	DEC. DIFFICULTY
PRE-SATISFACTION	1	-.075	.722**	-.149	-.105	-.013	.007
PRE-FRUSTRATION	-.075	1	.027	.377*	.310	-.198	.262
POST-SATISFACTION	.722**	.027	1	-.399*	-.126	.243	-.160
POST-FRUSTRATION	-.149	.377*	-.399*	1	.334*	-.258	.466**
COMPLEXITY	-.105	.310	-.126	.334*	1	-.263	.285
NO. OF REASONS	-.013	-.198	.243	-.258	-.263	1	-.145
DEC. DIFFICULTY	.007	.262	-.160	.466**	.285	-.145	1
LARGE SETS							
	PRE-SATISFACTION	PRE-FRUSTRATION	POST-SATISFACTION	POST-FRUSTRATION	COMPLEXITY	NO. OF REASONS	DEC. DIFFICULTY
PRE-SATISFACTION	1	.112	.546**	.037	.068	.094	.191
PRE-FRUSTRATION	.112	1	-.008	.472**	.474**	-.285	.503**
POST-SATISFACTION	.546**	-.008	1	.056	.125	.173	.216
POST-FRUSTRATION	.037	.472**	.056	1	.322	-.254	.338*
COMPLEXITY	.068	.474**	.125	.322	1	-.190	.627**
NO. OF REASONS	.094	-.285	.173	-.254	-.190	1	-.305
DEC. DIFFICULTY	.191	.503**	.216	.338*	.627**	-.305	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Preliminary Discussion: Exploring the Cognitive Mechanism

Table 17 allows further understanding of the cognitive mechanism which facilitated reduction of decision difficulty in the overchoice condition. An independent samples t-test was performed on decision difficulty for dichotomous sets where the number of sets was 2 versus 3 (cell 1 versus cell 2), and showed that the difference between the means ($M = 1.65$ vs. $M = 2.29$) was marginally statistically significant, $t(15) = 1.95$, $p = .07$. Though the manipulation showed that statistically significant numbers of the subjects perceived the dichotomous stimulus as such, there is also interest in viewing the subjects who worked outside of that condition, for example, cell 2. In this cell, although the subjects were shown the dichotomous choice set, they perceived three sets of data. In the overchoice condition (large sets), the trend in the data shows that it is possible that the effort expended to create more than 2 sets out of the data (cells 2, 3, and 4 versus cell 1) could have resulted in greater decision difficulty. This effect is not found for small choice sets in which overchoice is not a problem, i.e. cell 7 has higher decision difficulty than cells 8 and 9, although these differences are not statistically significant nor are the number of subjects in them sufficient.

Table 17: SUB-CELL MEANS (STUDY 2)

<i>Cell</i>	<i>Size</i>	<i>Dichotomy-set</i>	<i># Sets</i>	<i># Reasons</i>	<i>N²</i>	<i>Diff CPS</i>	<i>Decision Difficulty</i>	<i>Perceived complexity</i>
1	Large	Dichotomous	2	3.1	10	-0.15	1.65	3.7
2	Large	Dichotomous	3	3.29	7	-0.17	2.29	3.31
3	Large	Nondichotomous	3	2.5	8	-0.63	2.75	4.43
4	Large	Nondichotomous	4	2.67	6	-0.28	2.83	3.53
5	Small	Dichotomous	2	2.67	15	0.11	2.37	3.54
6	Small	Dichotomous	>3	2	2	0.33	3.5	4.0
7	Small	Nondichotomous	2	2.3	3	0.78	3.17	4.1
8	Small	Nondichotomous	3	3.3	9	0.24	2.33	3.16
9	Small	Nondichotomous	4	3.3	6	-0.62	1.75	2.81

² Only cells in which $N > 1$ are reported in this table.

The most interesting result shown in Figure 19 is that in the large dichotomous condition, subjects listed more reasons than in the large nondichotomous condition. This provides justification to further augment our understanding of the “cold” mechanisms operating in the dichotomy condition with the “hot” ones – i.e. what is the motivation operating behind this cognitive mechanism?

Discussion

Study 2 began with the analysis of frustration and satisfaction with choice decisions. The experimental procedure allowed for a more detailed understanding of the oppositional framework in choice, by separating out the browsing of the set from the subsequent choice of a product. As suspected, dichotomizing the sets reduced the subjective frustration experienced by participants both before and after they made a choice. Interestingly, this effect was accentuated when taking into account the involvement individual difference variable. High involvement individuals got most frustrated with large nondichotomous sets, whereas low involvement individuals got most frustrated with small nondichotomous ones. Analysis of the satisfaction component of choice process satisfaction showed that this construct remained relatively constant regardless of the choice set presented or the implied goal (browsing versus choosing). As discussed in the previous “frustration versus satisfaction” section, this is consistent with previously conducted research on the overchoice effect.

Analysis of decision difficulty indicated that the dichotomy-set manipulation reduced decision difficulty more for larger choice sets than it did for smaller ones. Perceived choice

set complexity was lower for large choice sets but slightly larger for small choice sets in the dichotomy-set dichotomous condition. Further, both low and high involvement individuals found that larger sets were more complex. High involvement individuals reported significantly less complexity in large dichotomous sets and highest complexity in large nondichotomous sets.

The number of reasons given for a decision was interestingly higher for dichotomous sets when they were large versus when they were small. If subjects do not voluntarily provide reasons for their decision, it is plausible that they are not happy with their outcome, which would be shown in the case of nondichotomous large sets (significantly lower number of reasons than dichotomous large sets).

Fluency: Is it a possible explanation?

Fluency has been defined as a feedback mechanism signal which occurs when the affective system triggers a reaction to a stimulus which is non-specific to the stimulus content (Winkielman et al. 2003). *Processing fluency* is defined as the ease or difficulty of processing new external information (Schwarz 2004) and this term subsumes perceptual and conceptual fluency. Perceptual fluency relates to the ease of performing lower level cognitive operations whereas conceptual fluency relates to the ease of performing higher level operations such as categorization (Winkielman et al. 2003). Novemsky et al. (2004) extend the concept of processing fluency by defining the term *preference fluency* which they refer to as the subjective feeling that forming a preference is easy or difficult. They then manipulate preference fluency by changing the font of the choice scenario and find that when subjects are aware of the

manipulation, the decrease in preference fluency is no longer misattributed to decision difficulty and the subjects do not defer their decision as much (Study 2). In their third study, they asked participants to rate how easy it would be for them to list 2 versus 10 reasons for their choice prior to making their choice, wherein the former would be the high fluency condition (easier) and the latter would be the low fluency condition (more difficult). They found that in the low fluency condition (10 reasons), subjects were more likely to defer their choice. In Study 2 of the present dissertation, I asked subjects to list up to six reasons for their choice, leaving this decision completely to the participant. If a fluency explanation is argued, one would expect that when subjects experienced greater decision difficulty, they may list fewer reasons, conversely when they experience lower decision difficulty, they may list more reasons. This is, in fact, the case shown in Study 2 (see Figure 19 and Table 17). Thus, preference fluency is a plausible explanation for the higher number of reasons in the dichotomous large condition.

Studies 1 and 2 combine to show that when a choice set is dichotomous, participants experience less of the standard negative effects of information overload. One possible explanation of this reduction in the overchoice effect could be that subjects are motivated to simplify their decision making process and reduce their cognitive load, a la dichotomization. This motivation would be consistent with the effort-accuracy framework (Payne 1976). Another plausible explanation for the results deals with processing fluency. According to the hedonic-marking thesis, fluency triggers affective responses at the psychophysiological level, such as smiling or frowning (Winkielman and Cacioppo 2001), which in turn leads to positive evaluations.

Higher processing fluency can result from a person's state of knowledge, for example, if a stimulus is perceived as more familiar. This particular form of processing fluency can result in illusions of perception or illusions of memory, whereby people have a tendency to believe that stimuli were presented for longer durations of time or falsely recognize them (Schwarz and Clore, in press). Processability has also been studied in the context of advertisements with the finding that increased information processability (or the ease with which consumers can interpret information) leads to more positive affective response (Thompson and Hamilton 2006).

Study 3

Study 3 Conceptual Framework

Van Osselaer, Ramanathan, Campbell, Cohen, Dale, Herr, Janiszewski, Kruglanski, Lee, Read, Russo, and Tavassoli (2005) identify three types of goals in their view of cognitively-influenced, goal-based choice. These types are consumption, criterion, and process goals. Their goal taxonomy can be readily used to help identify the underlying reason for the results of studies 1 and 2. In other words, we seek to further explain why the dichotomous choice framework in Study 2 gave rise to lower frustration, constant levels of satisfaction, lowered decision difficulty, and less perceived complexity. Along with the motivated reasoning angle, we also seek to further our understanding of how individual states with regards to our choice domain (snack foods) could influence the *dichotomy framework*.

Griffin et al. (2005) augmented the constructed choice model by adding in individual memories (prior choice, individual differences) and motivational states (activated by goals). Their more inclusive choice model is well-suited for the empirical set up of Study 3 of the present dissertation, allowing for both cognitive factors (choice set itself) and motivational factors (goals given during the choice process).

Figure 20 shows how this model combines the goal insights of Van Osselaer, Ramanathan, Campbell, Cohen, Dale, Herr, Janiszewski, Kruglanski, Lee, Read, Russo, and Tavassoli (2005), and forms the basis for Study 3 of this dissertation. The shaded boxes show how the procedure for the last study itself is setup. The outcome factors still focus on subjective measures of either the choice process or the choice outcome. Individual differences measures are used to identify the relevance, involvement, and knowledge level of

the respondents with respect to the subject domain of snack foods. Further individual differences measures are taken which correspond to personality-type such as need for cognition, variety-seeking tendency, and time pressure. Finally, goals are manipulated in this final study such that they correspond to the taxonomy identified in Van Osselaer et al. (2005).

I hypothesize that:

- H14:** Dichotomous sets will create significantly lower frustration than nondichotomous ones.
- H15:** Frustration will be lowest for consumption goals, and for those types of goals, it will be lowest when they are dichotomous.
- H16:** For criterion goals, nondichotomous sets will generate significantly higher (the highest of all types of goals) frustration than dichotomous ones.
- H17:** The individual differences of familiarity, involvement, product class knowledge, need for cognition, time pressure, and variety-seeking tendency will interact with the frustration-dichotomy effect relationship such that individuals will experience the lowest frustration when they have low familiarity, low involvement, low knowledge, low need for cognition, high time pressure, and high variety-seeking tendency.
- H18:** Choice process satisfaction will be significantly lower for process goals when the sets are dichotomous whereas frustration for process goals in the dichotomous condition will not be lower.

H19: In particular, choice process satisfaction will be lowest for the high familiarity group who are given the process goal with the dichotomous choice set.

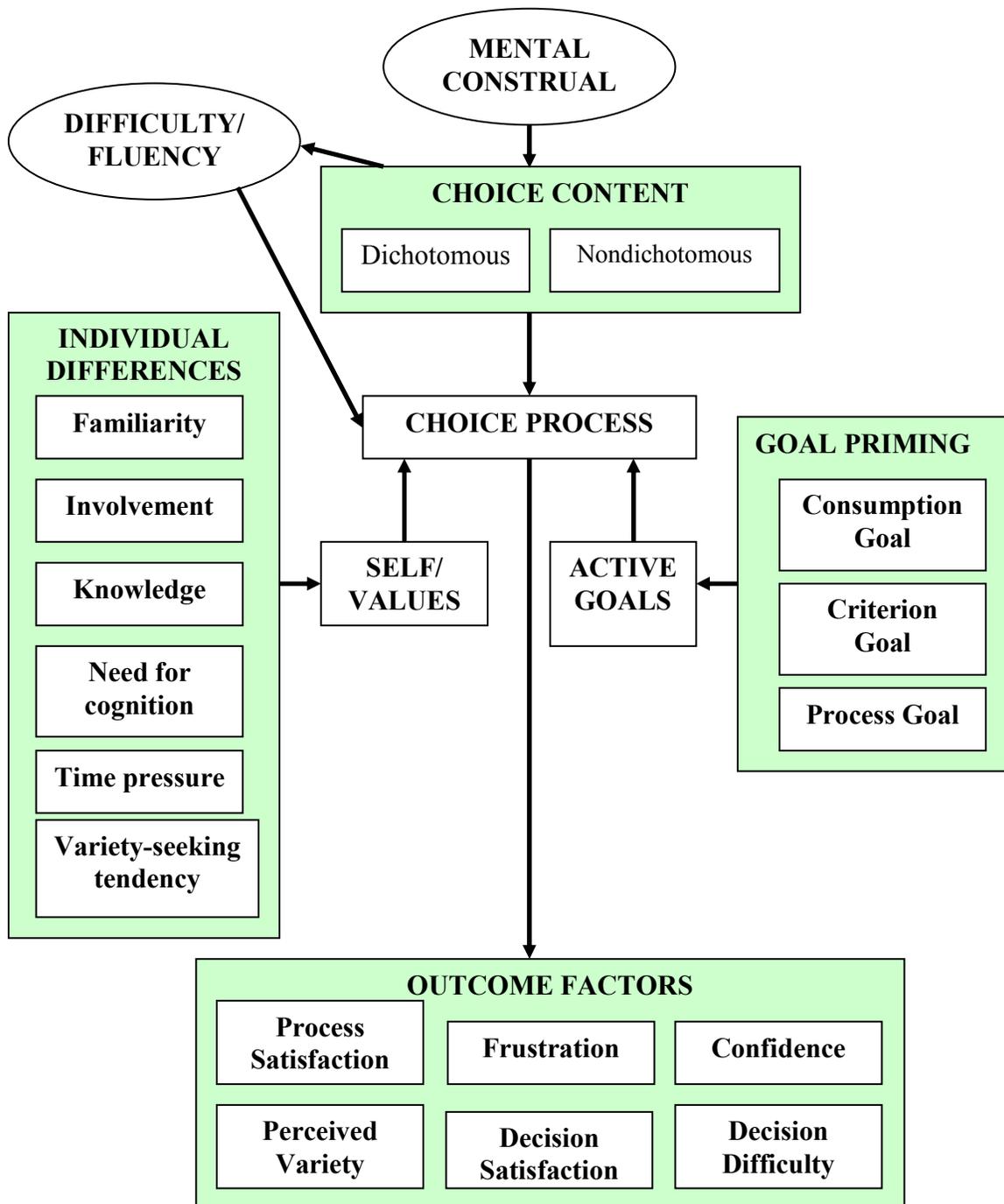
H20: Low versus high familiarity individuals will report differences in decision satisfaction such that low familiarity individuals will be more satisfied with dichotomous sets (specifically consumption goals) whereas high familiarity individuals will be less satisfied with dichotomous sets (all types of goals).

H21: Subjects will perceive less variety in the dichotomous choice set than in the nondichotomous one.

H22: For the consumption and criterion goals, subjects will have more confidence in their decisions for dichotomous sets than for nondichotomous ones.

Figure 20: STUDY 3 CONCEPTUAL FRAMEWORK

Adapted from Griffin, Liu, and Khan (2005, p. 323; contents included within the guidelines of fair use)



Method

The study employed a 2 x 3 full factorial design. Dichotomy-set (dichotomy vs. nondichotomous) and goal-type (consumption vs. criterion vs. process) were manipulated as between-subject factors.

Independent variables

Dichotomy-set manipulation. Dichotomy was manipulated exactly as it was in Study 2.

Goal-type manipulation. Subjects were presented with one of three goal types. The verbiage was manipulated as given below in Table 18.

Table 18: GOAL-TYPE FACTOR TASKS

<i>Goal-type factor</i>	<i>Task given to subject</i>
Consumption goal	Imagine that you are standing in front of a vending machine with the following 12 options for snacks. Please choose the tastiest and most desirable product from the choice set.
Criterion goal	Imagine that you are standing in front of a vending machine with the following 12 options for snacks. Please choose one product, bearing in mind that an expert will evaluate the overall quality of your choice afterwards.
Process goal	Imagine that you are standing in front of a vending machine with the following 12 options for snacks. Please choose one product as quickly as you can.

Dependent variables (other than those present in Studies 1 and 2)

Decision Satisfaction. Satisfaction with the choice task was measured using a seven-item seven-point scale (Spreng, MacKenzie and Olshavsky 1996). Participants were asked, “For the following 7 items, please rate your opinion of the choice task you just completed, in making your choice, were you:?” followed by the following seven items: (1) 1=dissatisfied, 7 = satisfied; (2) 1 = displeased, 7 = pleased; (3) 1 = unfavorable, 7 = favorable; (4) 1 = unpleasant, 7 = pleasant; (5) 1 = I didn’t like it at all, 7 = I liked it very much; (6) 1 = frustrated, 7 = contented; and (7) 1 = terrible, 7 = delighted.

Perceived Variety. Perceived variety was measured using a ten-point four-item scale, which has been previously used to measure the perceived variety in a set of choices. The questions were as follows: (1) This assortment of snacks gave me a lot of variety for me to enjoy, 1 = strongly agree and 10 = strongly disagree; (2) This assortment of snacks gives me at least one type I like; 1 = strongly agree and 10 = strongly disagree; (3) This assortment of snacks offers more ways to enjoy it; 1 = strongly agree and 10 = strongly disagree; and (4) How much variety do you think there is in this assortment? 1 = lots of variety and 10 = no variety. (Morales et al. 2005).

Confidence. Subjective confidence, i.e. the degree to which a subject feels confident about the actions taken, was measured using a three-item seven-point scale. They were asked, “For the following 3 questions, please rate the confidence you have in your completion of the choice task you just completed:” followed by three measures. The items were: (1) 1 =

uncertain; 7 = certain; (2) 1 = not sure; 7 = sure; and (3) 1 = not confident; 7 = confident (Urbany, Bearden, Kaicker and Smith-de Borrero 1997).

Individual differences variables.

Median splits were performed on each of these variables such that high and low groups were formed for analysis. None from previous studies are discussed here if used again.

Involvement (Product-Related Risk Importance). This construct is measured using a seven-point three-item scale with the underlying question being, “Please describe how difficult it is for you to buy vending machine snack foods.” The lowest end of the scale had these items (opposite for value of 7): (1) It is not annoying to make an unsuitable purchase; (2) A poor choice would not be upsetting; (3) Little to lose by choosing poorly (Jain and Srinivasan 1990).

Time Pressure. This construct is measured using a seven-point three-item scale, where 1 = strongly disagree and 10 = strongly agree. Items were: (1) “I am too busy to relax”; (2) “I am often juggling my time between too many things”; and (3) “‘So much to do, so little time;’ this saying applies very well to me” (Mittal 1994). Higher values on the scale equate to higher perceived time pressure.

Familiarity of Purchase Situation. The degree to which a person is familiar with buying vending machine foods was measured using this three-item nine-point scale, where 1 = not at all familiar and 9 = very familiar. The items were: (1) “How familiar do you think people in general are with purchasing vending machine snack foods?”; (2) How familiar are you with purchasing vending machine snack foods?; and (3) How frequently have you seen or

heard of vending machine snack foods being purchased?” (Shapiro, MacInnis, and Heckler 1997).

Knowledge (Product Class). This construct is measured using a seven-point three-item scale, where 1 = strongly disagree and 7 = strongly agree. Items were (1) “I have a lot of experience with vending machine snack foods”; (2) “As compared to the average person, I would say that I am highly knowledgeable about vending machine snack foods”; and (3) “I would describe myself as being very familiar with vending machine snack foods” (Beatty and Talpade 1994).

Variety-Seeking Tendency. The degree to which a person expresses a desire to try new and different things is measured by this three-item seven-point scale, in which 1 = strongly disagree and 7 = strongly agree. Items were: (1) “I like to try different things.”; (2) “I like a great deal of variety.”; and (3) “I like new and different styles.” (Donthu and Gilliland 1996).

Sample and Procedure. A total of 166 marketing undergraduates, enrolled in an introductory level marketing course participated in this study. The study was broken into two parts. Part 1 was completed 2 weeks prior to part 2. In part 1, the subjects were asked to complete several individual differences scales and provide their demographic information. The individual differences scales were as follows: style of processing, need for cognition, involvement (product-related risk importance), time pressure, variety-seeking tendency, knowledge (product class), and familiarity of purchase situation. Part 2 was administered very much like the main part of Study 2. As the survey was done as a between-subject study and goal-type was manipulated, each subject had one of three of the goals and one of two of the

dichotomy-set conditions. After making a choice, the subjects were asked to complete the following scales: choice process satisfaction, decision difficulty, perceived variety, decision satisfaction, and confidence. Similar to Study 2, they reported the number of sets they perceived and listed between zero and six reasons for their final choice.

Results

ANOVA and Individual Differences Analysis

Manipulation check. Similar to the previous studies, the question regarding the number of sets subjects would break the stimuli into was used to verify the dichotomy-set manipulation. The check consisted of a 2 x 3 between-subjects ANOVA for the sets factor (question about how many sets they perceived at the end of the study) and showed no significant interaction effect between dichotomy-set and goal-type (consumption vs. criterion vs. process) nor any significant main effect for goal-type. The analysis did show a significant main effect for the dichotomy-set factor such that in the dichotomy-set dichotomous condition, subjects perceived significantly fewer number of sets ($M = 2.46$) than in the nondichotomous condition ($M = 3.41$), $F(1, 160) = 50.38, p < .01$. Goal-type (consumption vs. criterion vs. process) was not found to have any such significant effect on the perceived number of sets ($M = 2.96$ vs. $M = 2.86$ vs. $M = 2.79$), $F(1, 159) = .42, p > .05$.

Gender. A one-way ANOVA was performed on all of the key dependent variables for Study 3 with gender as a factor. The results (see Table 19 below) confirm that there are no significant differences between groups for the gender factor.

Table 19: GENDER FACTOR CHECK FOR STUDY 3

		Sum of Squares	df	Mean Square	F	Sig.
FRUSTRATION	Between Groups	.822	1	.822	.147	.702
	Within Groups	916.262	164	5.587		
	Total	917.084	165			
SATISFACTION	Between Groups	7.916	1	7.916	2.675	.104
	Within Groups	485.350	164	2.959		
	Total	493.266	165			
NUMREASONS	Between Groups	1.477	1	1.477	.817	.367
	Within Groups	296.427	164	1.807		
	Total	297.904	165			
VARIETY	Between Groups	.865	1	.865	.252	.616
	Within Groups	558.688	163	3.428		
	Total	559.553	164			
DEC. DIFFICULTY	Between Groups	.251	1	.251	.072	.789
	Within Groups	573.063	164	3.494		
	Total	573.315	165			
DEC. SATISFACTION	Between Groups	.432	1	.432	.570	.451
	Within Groups	124.226	164	.757		
	Total	124.658	165			
CONFIDENCE	Between Groups	.251	1	.251	.149	.700
	Within Groups	276.758	164	1.688		
	Total	277.009	165			

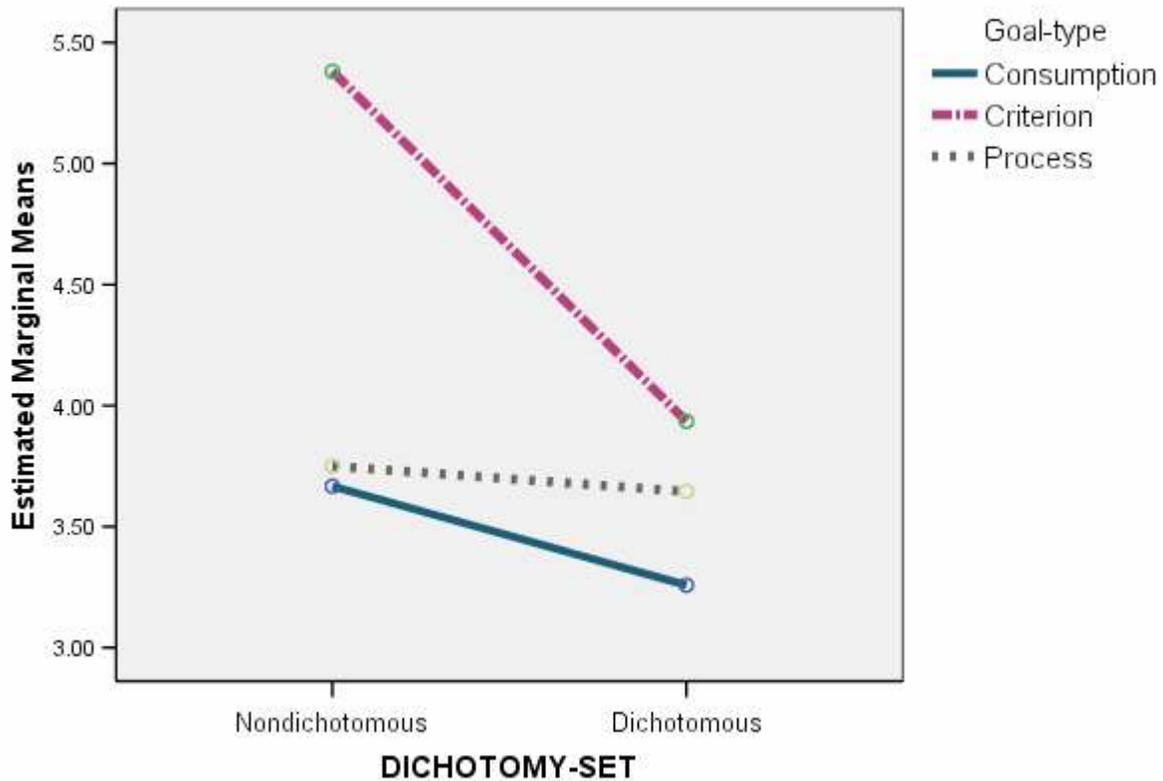
Choice process satisfaction. Given the results of this construct from studies 1 and 2, an exploratory factor analysis was again conducted on the six items of the choice process satisfaction scale. Consistent with the findings in all previous studies, the first item of the scale, or frustration, was found to be a second component. The first component consisted of the last five factors of the choice process satisfaction scale and explained 47.19% of the variance whereas the frustration factor accounted for 18.68% of the variance.

Choice process frustration. A 2 x 3 between-subjects ANOVA (dichotomy-set vs. goal-type) was conducted on frustration. Goal-type (consumption $M = 3.44$ vs. criterion $M = 4.52$ vs. process $M = 3.69$) was found to have a significant main effect, $F(1, 160) = 3.89, p <$

.05. As given in Hypothesis 15, frustration was lowest for consumption goals ($M = 3.44$) and even lower when subjects were presented with dichotomous sets.

Per Hypothesis 14, dichotomy-set had a marginally significant main effect such that dichotomous sets ($M = 3.61$) were perceived to be less frustrating than nondichotomous sets ($M = 4.19$), $F(1, 160) = 3.24$, $p = .07$. Simple main effects analysis revealed that nondichotomous criterion goals ($M = 5.38$) were perceived as significantly more frustrating than dichotomous criterion goals ($M = 3.94$), $F(1, 160) = 4.90$, $p < .03$, as predicted in Hypothesis 16. Simple main effects of goal-type within each dichotomy-set combination illustrated that for nondichotomous sets, criterion goals had the highest frustration level ($M = 5.38$), whereas consumption ($M = 3.67$) and process ($M = 3.75$) goals were almost the same, $F(1, 160) = 3.91$, $p < .03$.

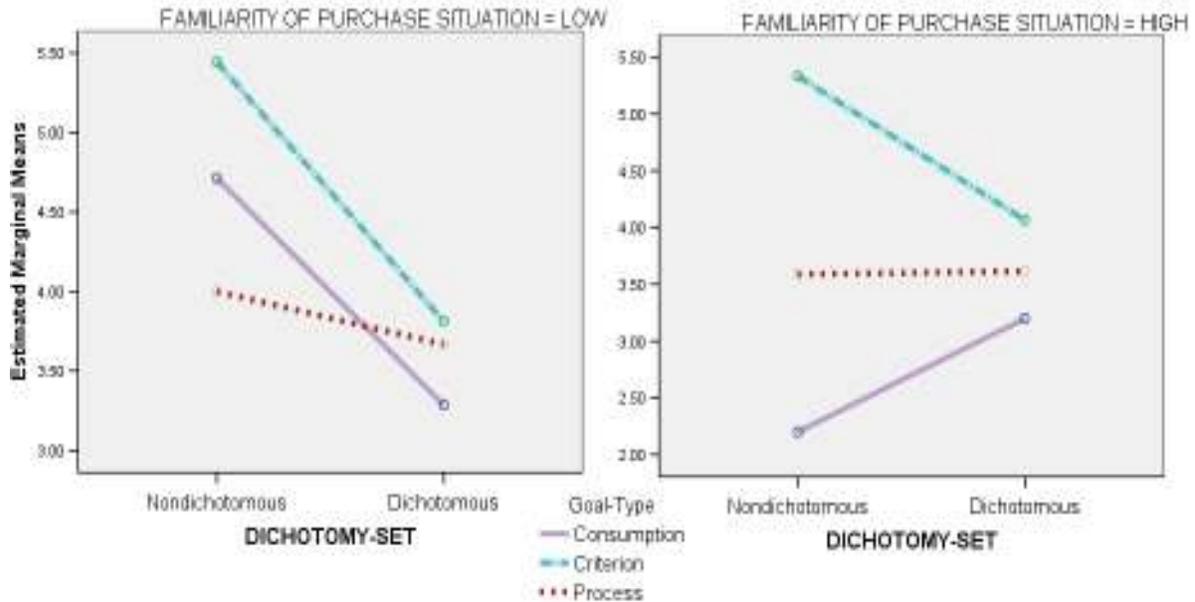
Figure 21: MAIN DEPENDENT VARIABLE: CHOICE PROCESS FRUSTRATION (STUDY 3)



Familiarity of purchase situation as an individual differences variable for Frustration. A 2 x 3 between-subjects ANOVA (dichotomy-set vs. goal-type) was run on frustration for the low and high groups of familiarity. For the low-familiarity group, dichotomy-set (nondichotomous $M = 4.68$ vs. dichotomous $M = 3.56$) was found to have a significant main effect, $F(1, 83) = 4.71, p = .03$. For the high-familiarity group, goal-type (consumption $M = 6.21$ vs. criterion $M = 5.67$ vs. process $M = 6.61$) had a significant main effect, $F(1, 71) = 4.69, p = .01$. Simple main effects analysis revealed that for the nondichotomous choice set, criterion goals had the highest frustration level ($M = 5.33$),

process goals were next ($M = 3.59$) and consumption goals the lowest ($M = 2.20$), $F(1, 71) = 5.47, p = .01$.

Figure 22: CHOICE PROCESS FRUSTRATION BY FAMILIARITY

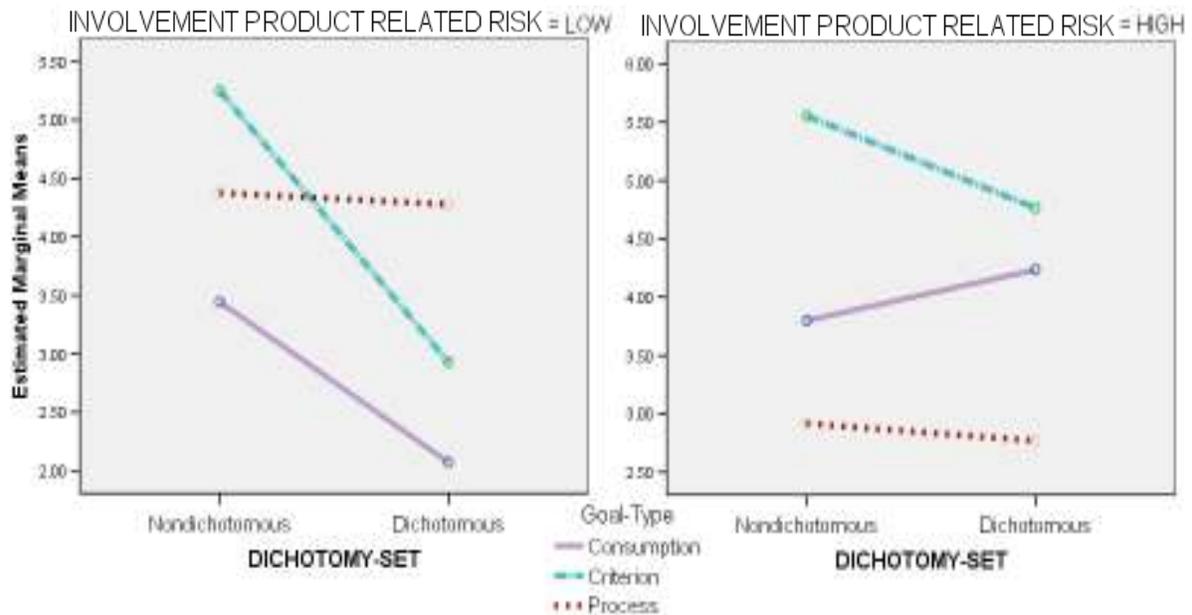


Involvement (Product-Related Risk Importance) as an individual differences variable for Frustration. A 2 x 3 between-subjects ANOVA (dichotomy-set vs. goal-type) was run on frustration for the low and high groups of involvement (product-related risk importance). Within the low-involvement group, both dichotomy-set (nondichotomous $M = 4.43$ vs. dichotomous $M = 3.20$) and goal-type (consumption $M = 2.61$ vs. criterion $M = 4.00$ vs. process $M = 4.32$) were found to have significant main effects, $F(1, 77) = 7.24, p = .01$ and $F(1, 77) = 4.04, p = .02$, respectively. Simple main effects clarified this further, showing, in particular, that in the low-involvement group, individuals presented with criterion goals had significantly higher frustration with a nondichotomous choice set ($M = 5.25$) than with a dichotomous choice set ($M = 2.93$), $F(1, 77) = 7.99, p = .01$. Also, for the

low-involvement group, dichotomous choice sets had a simple main effect such that process goals had the highest frustration, followed by criterion goals, and finally were consumption goals ($M = 4.28$ vs. $M = 2.93$ vs. $M = 2.07$), $F(1, 77) = 4.56, p = .01$.

For the high-involvement group, goal-type (consumption $M = 4.03$ vs. criterion $M = 5.04$ vs. process $M = 2.84$) had a significant main effect, $F(1, 77) = 5.91, p = 0$. Simple main effects analysis revealed that for the nondichotomous choice set in the high-involvement group, criterion goals had the highest frustration level ($M = 5.56$), consumption goals were next ($M = 3.80$) and process goals were the lowest ($M = 2.92$), $F(1, 77) = 3.30, p = .04$.

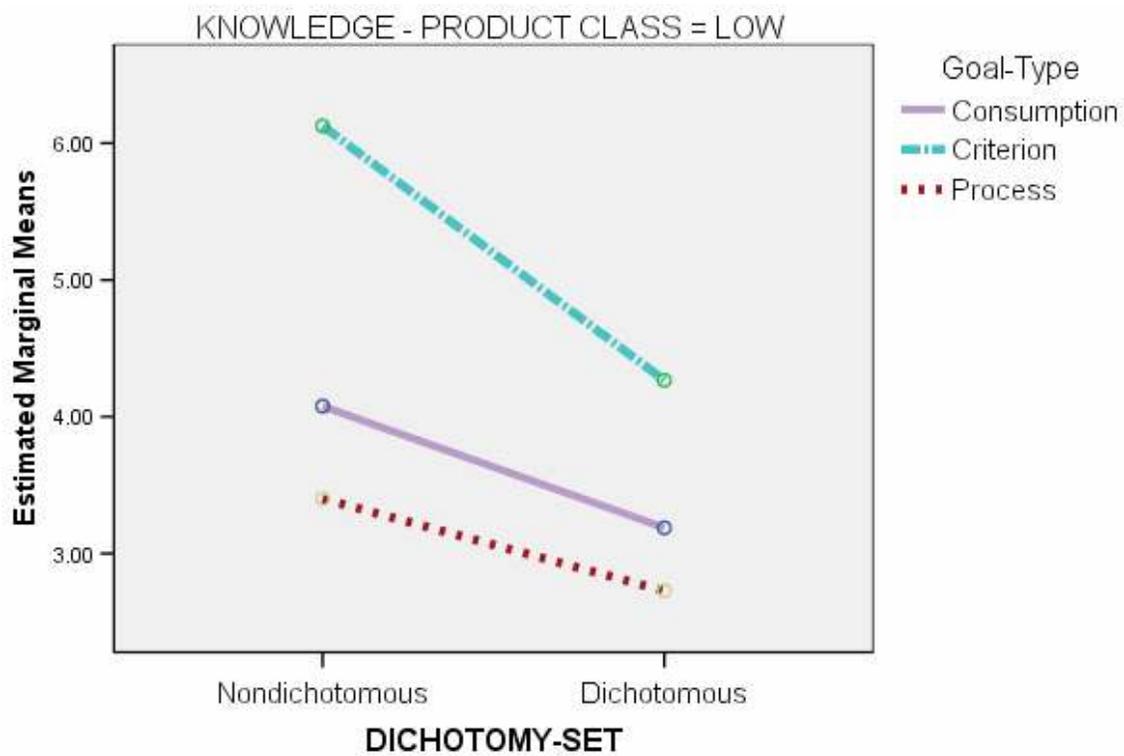
Figure 23: CHOICE PROCESS FRUSTRATION BY INVOLVEMENT – PRODUCT RELATED RISK



Knowledge (product class) as an individual differences variable for Frustration. A 2 x 3 between-subjects ANOVA (dichotomy-set vs. goal-type) was conducted on frustration for the low and high groups of knowledge (product class). For the

low-knowledge group, both dichotomy-set (nondichotomous $M = 4.39$ vs. dichotomous $M = 3.45$) and goal-type (consumption $M = 3.59$ vs. criterion $M = 5.87$ vs. process $M = 3.05$) were found to have significant main effects, $F(1, 67) = 3.78, p = .05$ and $F(1, 67) = 4.36, p = .02$, respectively. In the high-knowledge group ($M = 3.88$), there were no significant main effects, no interaction, and no simple main effects for frustration.

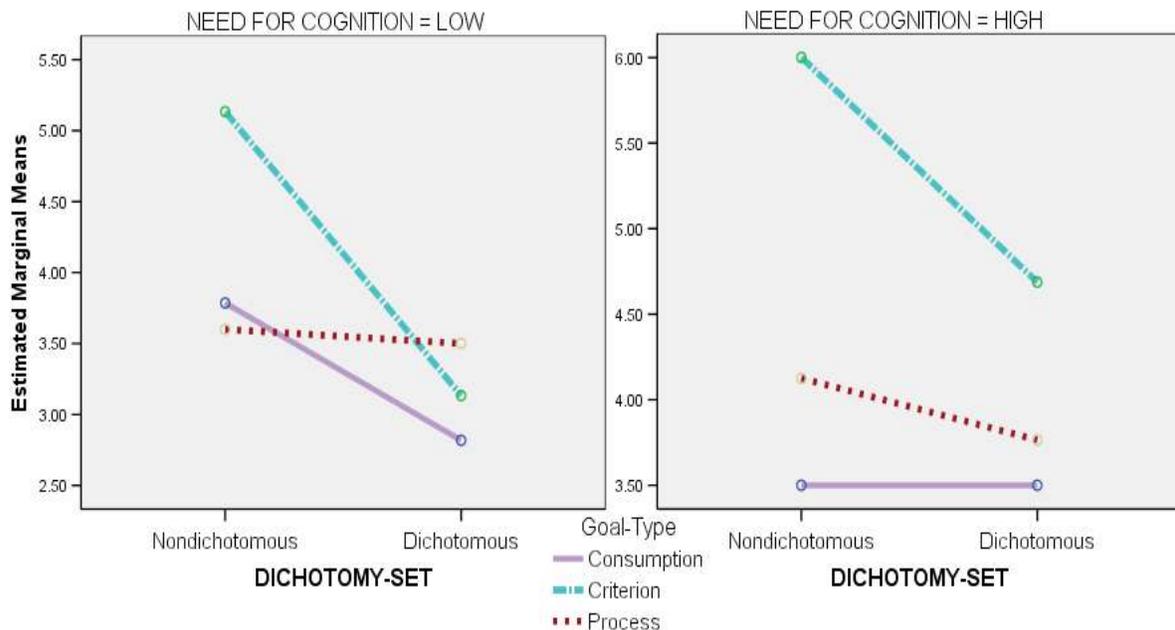
Figure 24: CHOICE PROCESS FRUSTRATION BY KNOWLEDGE-PRODUCT CLASS



Need for cognition (NFC) as an individual differences variable for Frustration. A 2 x 3 between-subjects ANOVA (dichotomy-set vs. goal-type) was run on frustration for the low and high groups of need for cognition (NFC). In the low-NFC group, dichotomy-set had a significant main effect such that nondichotomous sets had higher frustration ($M = 4.12$) than dichotomous ones ($M = 3.17$), $F(1, 83) = 4.36, p = .04$. Simple

main effects analysis showed that for criterion goals, nondichotomous ones created significantly more frustration ($M = 5.13$) than dichotomous ones ($M = 3.13$), $F(1, 83) = 5.79$, $p = .02$. In the high-NFC group, goal-type had a significant main effect (consumption $M = 3.50$ vs. criterion $M = 5.04$ vs. process $M = 3.88$), $F(1, 71) = 3.31$, $p = .04$.

Figure 25: CHOICE PROCESS FRUSTRATION BY NEED FOR COGNITION

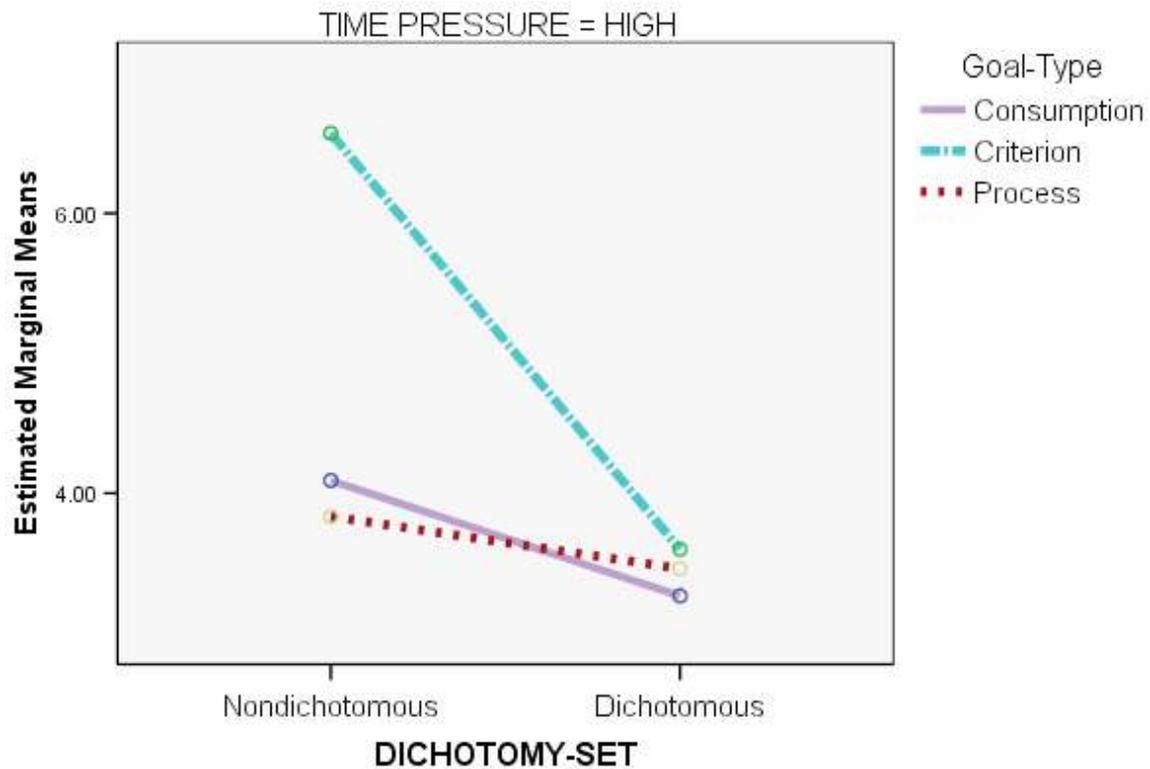


Time pressure (TP) as an individual differences variable for Frustration. A

2 x 3 between-subjects ANOVA (dichotomy-set vs. goal-type) was run on frustration for the low and high groups of time pressure. For the low-TP group ($M = 3.84$), there were no main effects, no interaction effect, nor any simple main effects. For the high-TP group, dichotomy-set had a significant main effect such that nondichotomous choice sets produced higher frustration ($M = 5.47$) than dichotomous ones ($M = 3.44$), $F(1, 67) = 6.03$, $p = .02$. Further

analysis revealed two simple main effects. The criterion goal-type had significant higher frustration for nondichotomous ($M = 6.57$) versus dichotomous ($M = 3.60$) choice sets, $F(1, 67) = 7.71, p = .01$. Also, for nondichotomous sets, the criterion goals had the highest frustration level ($M = 6.57$), next were consumption goals ($M = 4.09$), and lowest were process goals ($M = 3.83$), $F(1, 67) = 3.39, p = .04$.

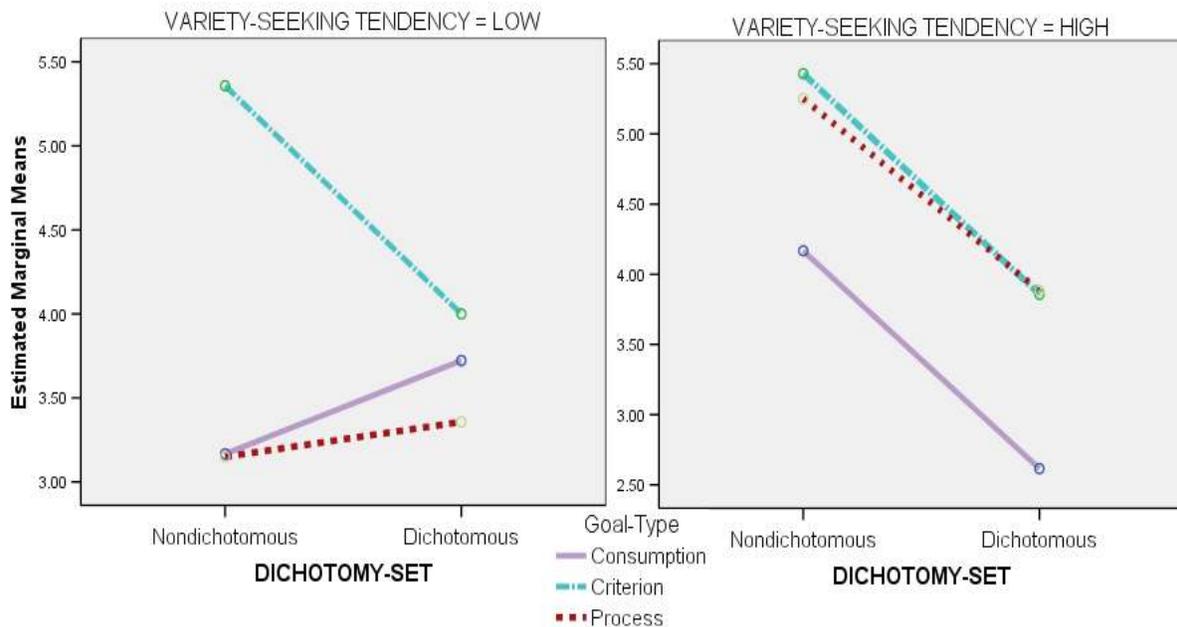
Figure 26: CHOICE PROCESS FRUSTRATION BY TIME PRESSURE



Variety-seeking Tendency (VST) as an individual differences variable for Frustration. A 2 x 3 between-subjects ANOVA (dichotomy-set vs. goal-type) was run on frustration for the low and high groups of variety-seeking tendency (VST). For the low-VST group, goal-type had a significant main effect such that the criterion goal produced the highest

frustration ($M = 4.61$), next was the consumption goal ($M = 3.50$) and lowest was the process goal ($M = 3.23$), $F(1, 89) = 3.99, p = .02$. One simple main effect was found such that for nondichotomous choice sets presented to the low-VST group, criterion goals produced the highest frustration ($M = 5.36$), followed by consumption goals ($M = 3.17$) and then process goals ($M = 3.15$), $F(1, 89) = 5.07, p = .01$. Within the high-VST group, dichotomy-set had a main effect wherein nondichotomous choice sets created higher frustration ($M = 4.81$) than dichotomous ones ($M = 3.50$), $F(1, 65) = 5.91, p = .02$.

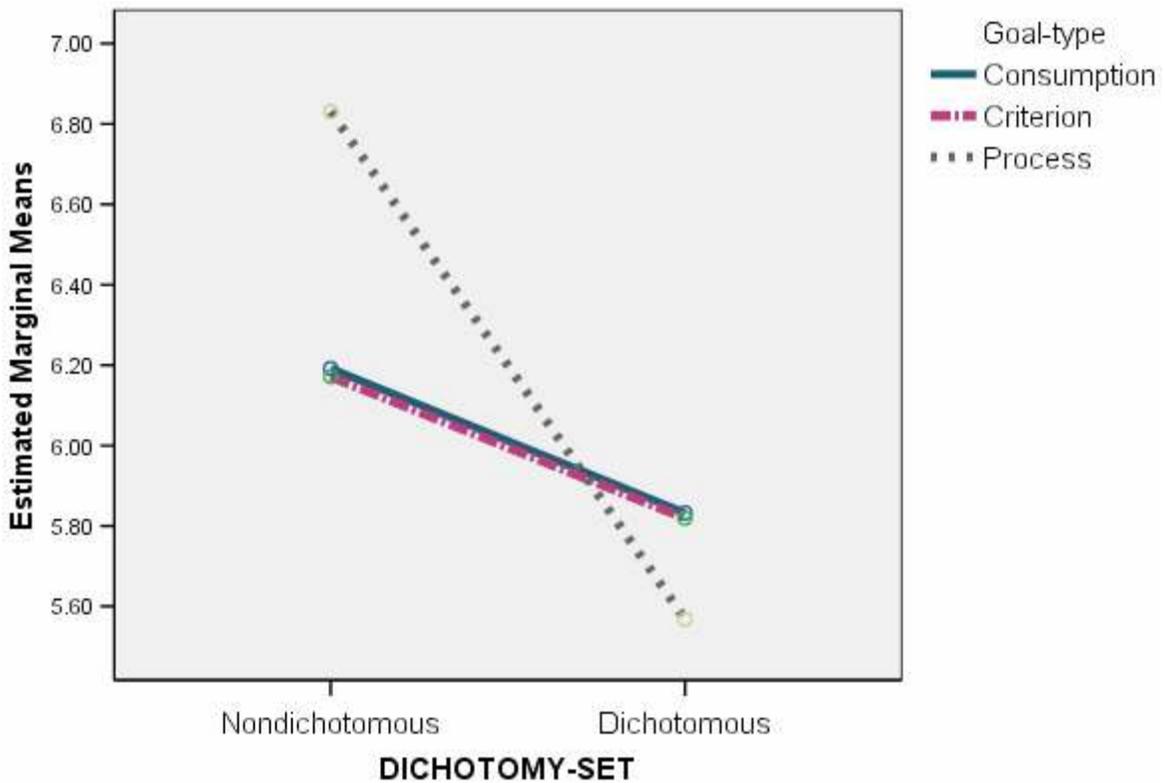
Figure 27: CHOICE PROCESS FRUSTRATION BY VARIETY-SEEKING TENDENCY



Choice process satisfaction. A 2 x 3 between-subjects ANOVA (dichotomy-set vs. goal-type) was performed on choice process satisfaction ($\alpha = .79$). Dichotomy-set (nondichotomous vs. dichotomous) was found to have a significant main effect such that nondichotomous sets ($M = 6.43$) had significantly higher perceived satisfaction than

dichotomous sets ($M = 5.74$), $F(1, 160) = 6.05, p < .02$. As expected in Hypothesis 18, the simple main effect of the dichotomy-set condition was significant for the goal-type of process goals such that nondichotomous sets with a process goal had significantly higher satisfaction ($M = 7.47$) than dichotomous sets with a process goal ($M = 6.17$), $F(1, 160) = 8.07, p < .01$.

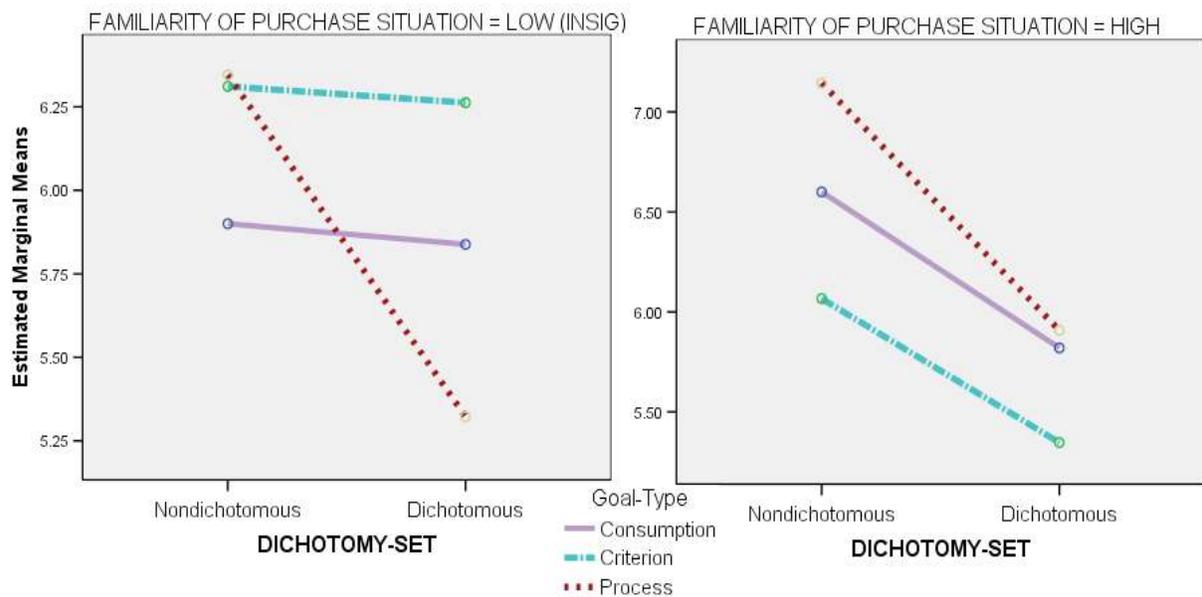
Figure 28: MAIN DEPENDENT VARIABLE: CHOICE PROCESS SATISFACTION (STUDY 3)



Familiarity of purchase situation as an individual differences variable for Choice Process Satisfaction. A 2 x 3 between-subjects ANOVA (dichotomy-set vs. goal-type) was run on choice process satisfaction for the low versus high groups of familiarity. For the low-familiarity group ($M = 5.93$), there were no main effects of either dichotomy-set or

goal-type, nor was there a significant interaction. In contrast, in the high-familiarity group, dichotomy-set had a significant main effect such that the dichotomous set ($M = 5.66$) had significantly lower choice process satisfaction than the nondichotomous set ($M = 6.67$), $F(1, 71) = 6.66, p = .01$. As predicted in Hypothesis 19, simple main effects analysis showed that for process goals, nondichotomous ones had significantly higher choice process satisfaction ($M = 7.14$) than dichotomous ones ($M = 5.91$), $F(1, 71) = 4.86, p = .03$.

Figure 29: CHOICE PROCESS SATISFACTION BY FAMILIARITY

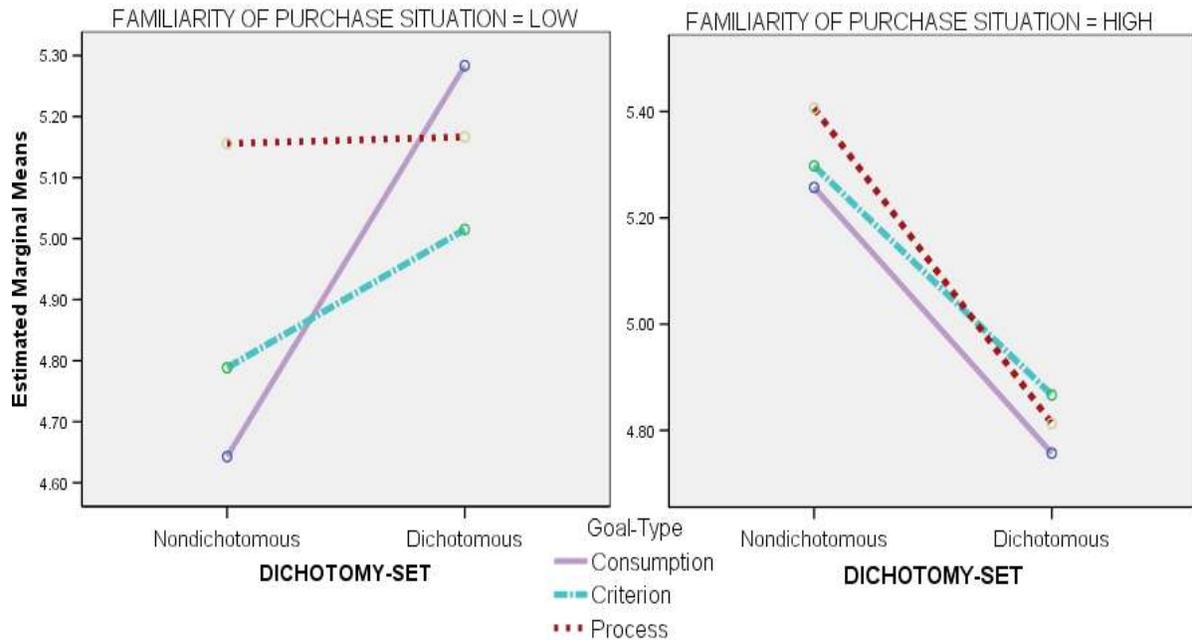


Decision satisfaction. A 2 x 3 (Dichotomy-set x Goal-type) between-subjects factorial ANOVA was performed on decision satisfaction ($\alpha=.89$). There were no significant main effects nor a significant interaction, i.e. decision satisfaction remained relatively constant regardless of the choice set structure and goal-type given to the subjects.

Familiarity of purchase situation as an individual differences variable for

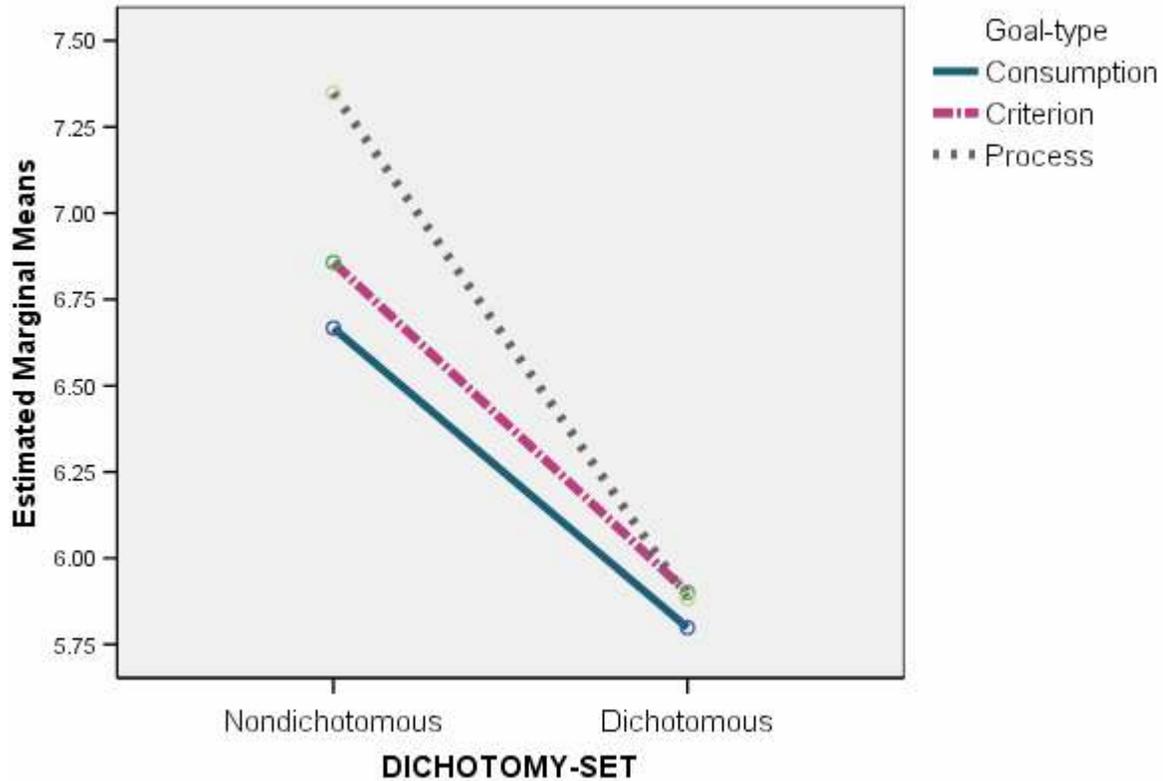
Decision Satisfaction. A 2 x 3 between-subjects ANOVA (dichotomy-set vs. goal-type) was run on decision satisfaction for the low versus high groups of familiarity. For the low-familiarity group ($M = 5.04$), there were no main effects of either dichotomy-set or goal-type, nor was there a significant interaction. However, simple main effects analysis showed that for the consumption goal, the nondichotomous choice set ($M = 4.64$) produced significantly lower decision satisfaction than the dichotomous choice set ($M = 5.28$), $F(1, 83) = 3.97$, $p = .05$. In the high-familiarity group, dichotomy-set had a significant main effect such that nondichotomous sets had significantly higher decision satisfaction ($M = 5.33$) than dichotomous sets ($M = 4.82$), $F(1, 71) = 7.94$, $p = .01$. In particular, simple main effects analysis indicated that when subjects in the high-familiarity group were presented with a process goal, they experienced lower decision satisfaction with a dichotomous set ($M = 4.81$) than for a nondichotomous one ($M = 5.41$), $F(1, 71) = 4.30$, $p = .04$, as was expected per Hypothesis 20.

Figure 30: DECISION SATISFACTION BY FAMILIARITY



Perceived Variety. A 2 x 3 (Dichotomy-set x Goal-type) between-subjects factorial ANOVA was performed on perceived variety ($\alpha=.81$). As Hypothesis 21 predicts, there was a significant main effect of dichotomy-set, such that nondichotomous sets were perceived to have significantly higher variety ($M = 6.98$) than dichotomous sets ($M = 5.86$), $F(1, 159) = 15.39$, $p < .01$. Simple main effects of the dichotomy-set condition illustrated significant effects for both criterion goals ($F(1, 159) = 3.63$, $p = .05$) and process goals ($F(1, 159) = 9.85$, $p < .01$), nondichotomous ones were perceived to have significantly more variety than dichotomous ones ($M = 6.86$ and $M = 7.35$ vs. $M = 5.90$ and $M = 5.88$).

**Figure 31: MAIN DEPENDENT VARIABLE:
PERCEIVED VARIETY (STUDY 3)**

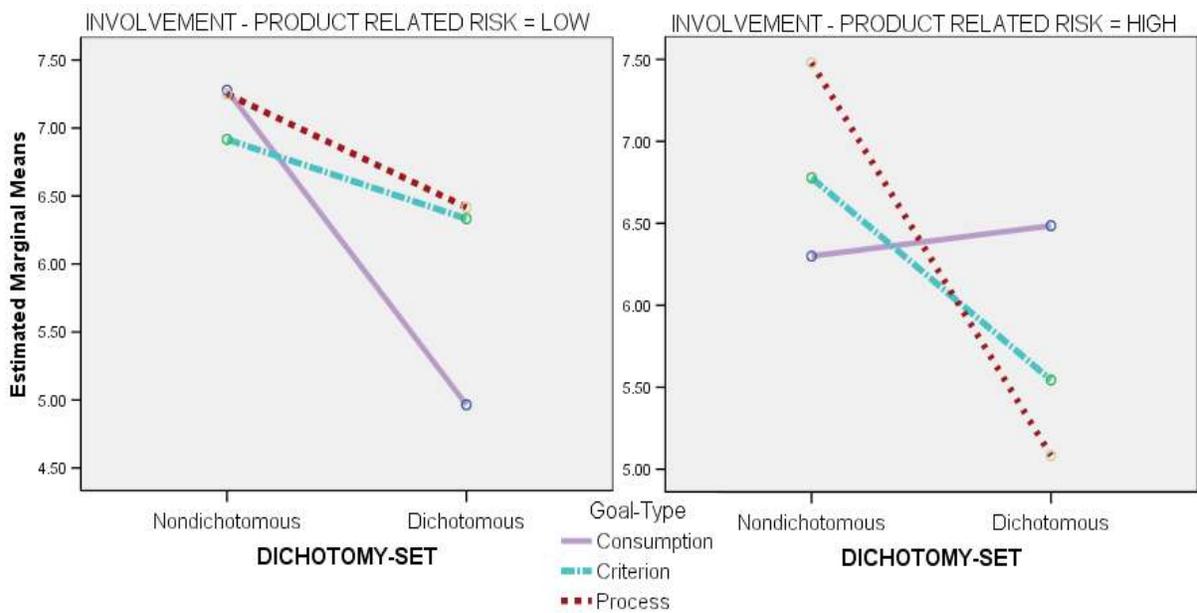


Involvement (Product-Related Risk Importance) as an individual differences variable for Perceived Variety. A 2 x 3 between-subjects ANOVA (dichotomy-set vs. goal-type) was run on perceived variety for the low and high groups of involvement (product-related risk importance). Within the low-involvement group, dichotomy-set (nondichotomous $M = 7.15$ vs. dichotomous $M = 5.95$) had a significant main effect, $F(1, 77) = 10.81, p = 0$. Simple main effects showed firstly that for consumption goals, the low involvement group perceived significantly higher variety for nondichotomous sets ($M = 7.28$) than for dichotomous ones ($M = 4.96$), $F(1, 77) = 10.37, p = 0$. Secondly, low-involvement individuals who were presented with dichotomous sets perceived significantly

more variety with process goals ($M = 6.42$), next with criterion goals ($M = 6.33$) and lowest with consumption goals ($M = 4.95$), $F(1, 77) = 3.46, p = .04$.

For the high-involvement individuals, there was a significant interaction between dichotomy-set and goal-type, $F(1, 76) = 3.63, p = .03$. Simple main effects analysis illustrated that for process goals, nondichotomous ones ($M = 7.48$) were perceived to have significantly higher variety than dichotomous ones ($M = 5.08$), $F(1, 76) = 10.78, p = 0$.

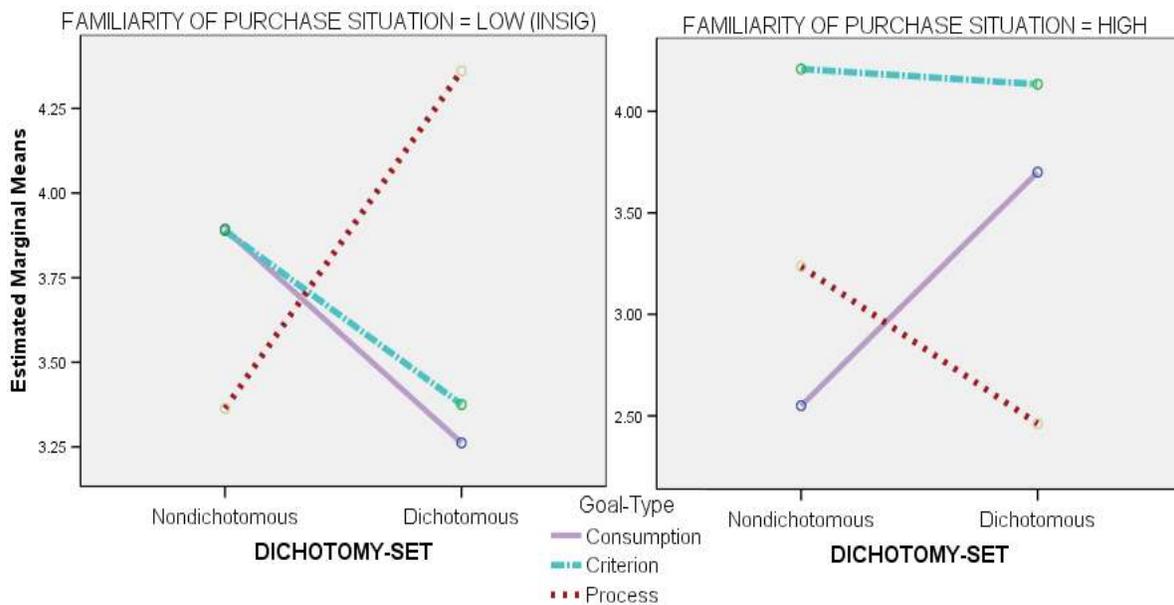
Figure 32: PERCEIVED VARIETY BY INVOLVEMENT – PRODUCT RELATED RISK



Decision Difficulty. A 2 x 3 (Dichotomy-set x Goal-type) between-subjects factorial ANOVA was performed on decision difficulty ($\alpha=.90$). There were no significant main effects nor was there a significant interaction, i.e. decision difficulty relatively constant regardless of the choice set structure and goal-type given to the subjects.

Familiarity of purchase situation as an individual differences variable for Decision Difficulty. A 2 x 3 between-subjects ANOVA (dichotomy-set vs. goal-type) was run on decision difficulty for the low versus high groups of familiarity. For the low-familiarity group ($M = 3.68$), there were no main effects of either dichotomy-set or goal-type, nor was there a significant interaction. In the high-familiarity group, goal-type (consumption $M = 3.12$ vs. criterion $M = 4.17$ vs. process $M = 2.90$) had a significant main effect, $F(1, 71) = 3.73, p = .03$.

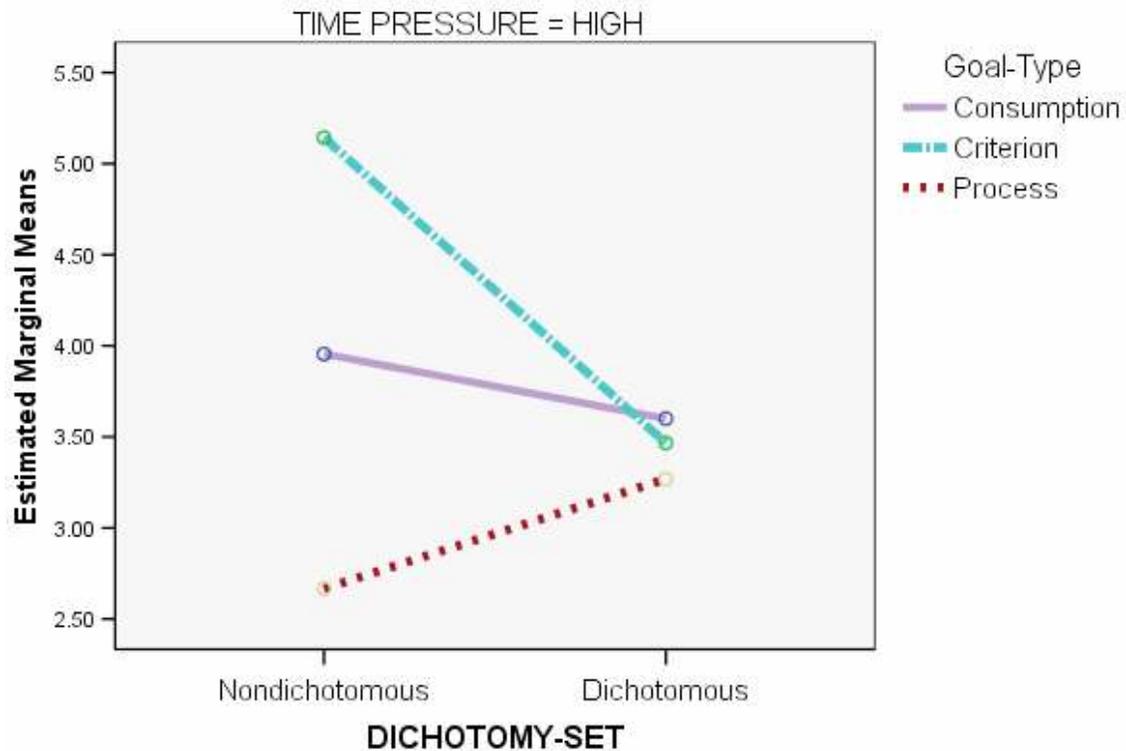
Figure 33: DECISION DIFFICULTY BY FAMILIARITY OF PURCHASE SITUATION



Time pressure (TP) as an individual differences variable for Decision Difficulty. A 2 x 3 between-subjects ANOVA (dichotomy-set vs. goal-type) was run on decision difficulty for the low and high groups of time pressure. For the low-TP group ($M = 3.54$), there were no main effects, no interaction effect, nor any simple main effects. For the high-TP group, goal-type had a marginally significant main effect (consumption $M = 3.45$,

criterion $M = 3.38$, process $M = 3.36$), $F(1, 67) = 2.89, p = .06$. Further analysis indicated two simple main effects. For criterion goals, nondichotomous ones had significantly higher decision difficulty ($M = 5.14$) than dichotomous ones ($M = 3.47$), $F(1, 67) = 3.84, p = .05$. For nondichotomous choice sets, criterion goals produced the highest decision difficulty ($M = 5.14$), followed by consumption goals ($M = 3.96$), and lowest was process goals ($M = 2.67$), $F(1, 67) = 4.02, p = .02$.

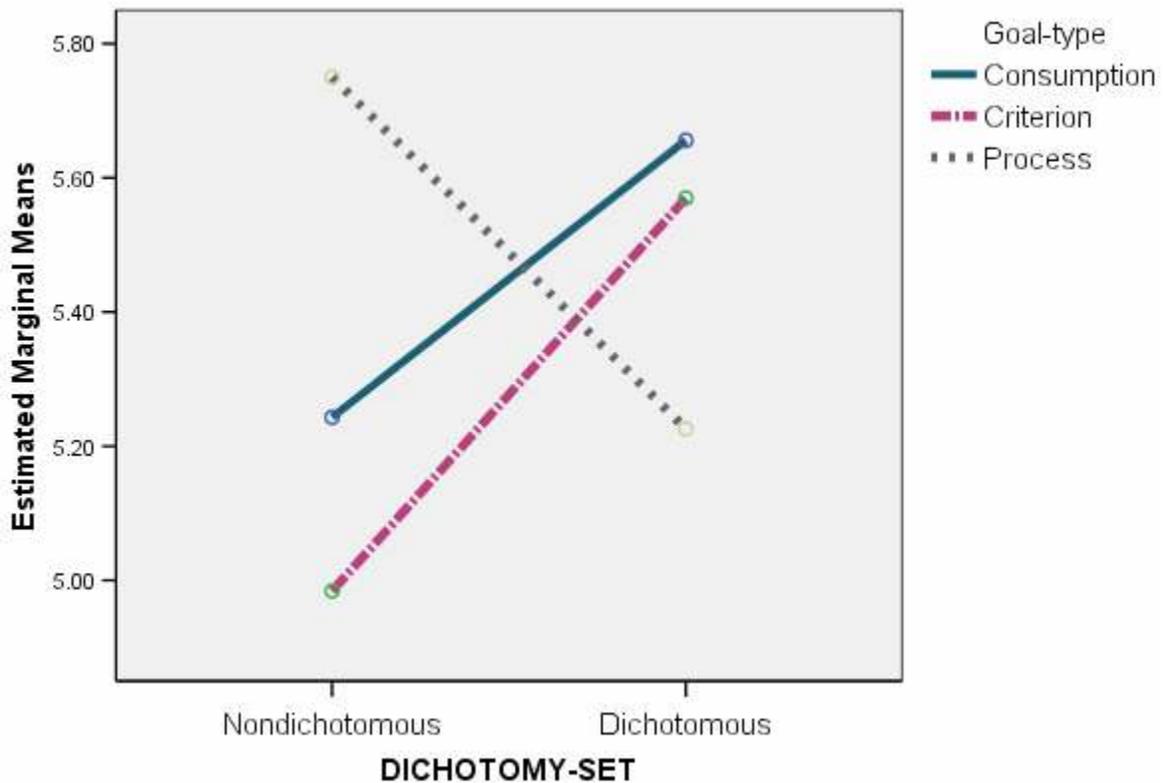
Figure 34: DECISION DIFFICULTY BY TIME PRESSURE



Confidence. A 2 x 3 (Dichotomy-set x Goal-type) between-subjects factorial ANOVA was performed on decision confidence ($\alpha=.94$). As Hypothesis 22 predicts,

there was a significant interaction between dichotomy-set and goal-type, $F(1, 160) = 3.01, p = .05$.

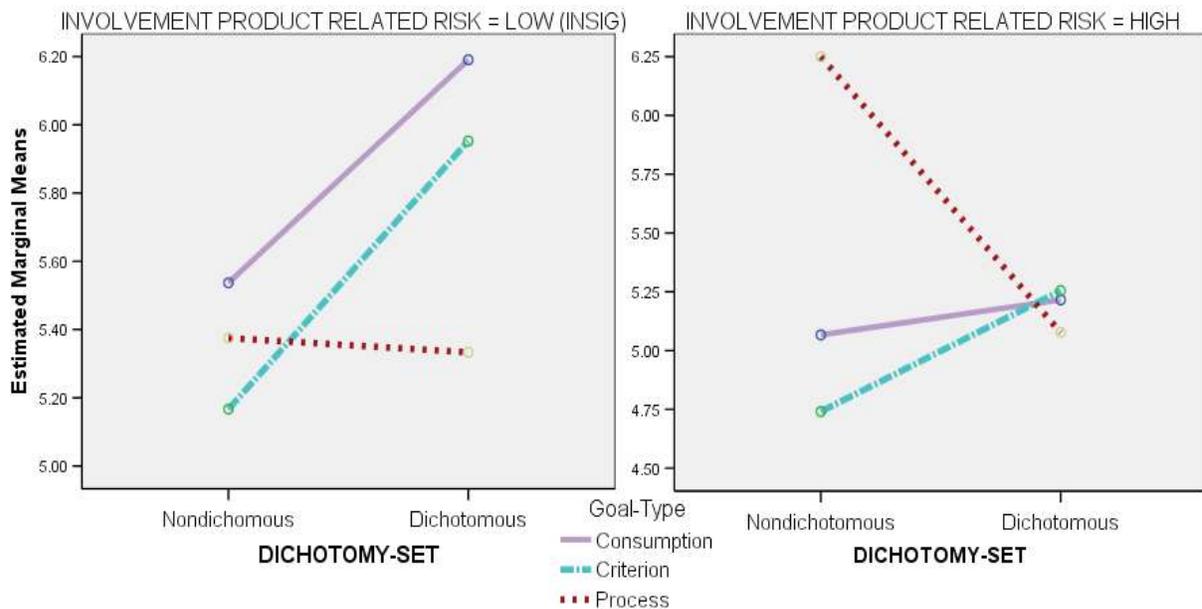
**Figure 35: MAIN DEPENDENT VARIABLE:
CONFIDENCE (STUDY 3)**



Involvement (Product-Related Risk Importance) as an individual differences variable for Confidence. A 2 x 3 between-subjects ANOVA (dichotomy-set vs. goal-type) was run on confidence for the low and high groups of involvement (product-related risk importance). Within the low-involvement group ($M = 5.59$), there were no main effects, no interaction, and no simple effects.

For the high-involvement group, there was a marginally significant interaction effect, $F(1, 77) = 2.91, p = .06$. Simple main effects revealed that for process goals, the high involvement group reported significantly more confidence for nondichotomous sets ($M = 6.25$) than for dichotomous ones ($M = 5.08$), $F(1, 77) = 5.08, p = .03$. Further, high-involvement individuals who were presented with nondichotomous sets had significantly more confidence with process goals ($M = 6.25$), next with consumption goals ($M = 5.07$) and lowest with criterion goals ($M = 4.74$), $F(1, 77) = 4.21, p = .02$.

Figure 36: CONFIDENCE BY INVOLVEMENT – PRODUCT RELATED RISK

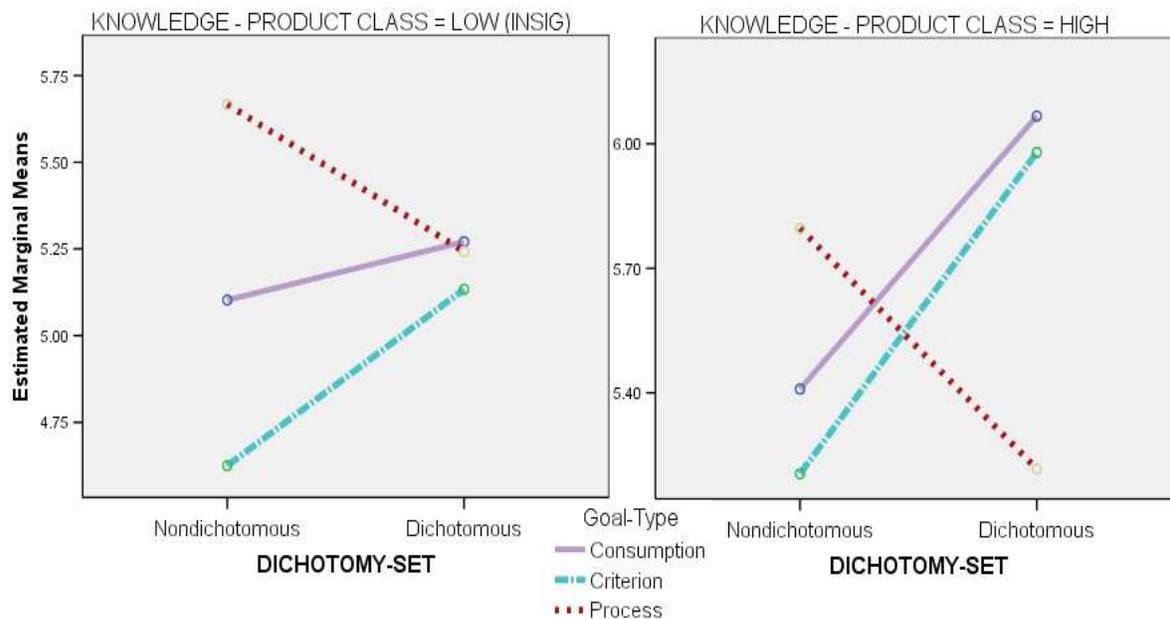


Knowledge (product class) as an individual differences variable for Confidence. A 2 x 3 between-subjects ANOVA (dichotomy-set vs. goal-type) was run on confidence for the low and high groups of knowledge (product class). In the low-knowledge

group ($M = 5.19$), there were no significant main effects, no interaction, and no simple main effects for confidence.

For the high-knowledge group, there was a significant interaction, $F(1, 87) = 3.94, p = .02$. Simple main effects analysis indicated that for dichotomous choice sets, individuals in the high-knowledge group had highest confidence when presented with consumption goals ($M = 6.07$), next with criterion goals ($M = 5.98$) and lowest with process goals ($M = 5.22$), $F(1, 87) = 3.31, p = .04$.

Figure 37: CONFIDENCE BY KNOWLEDGE – PRODUCT CLASS

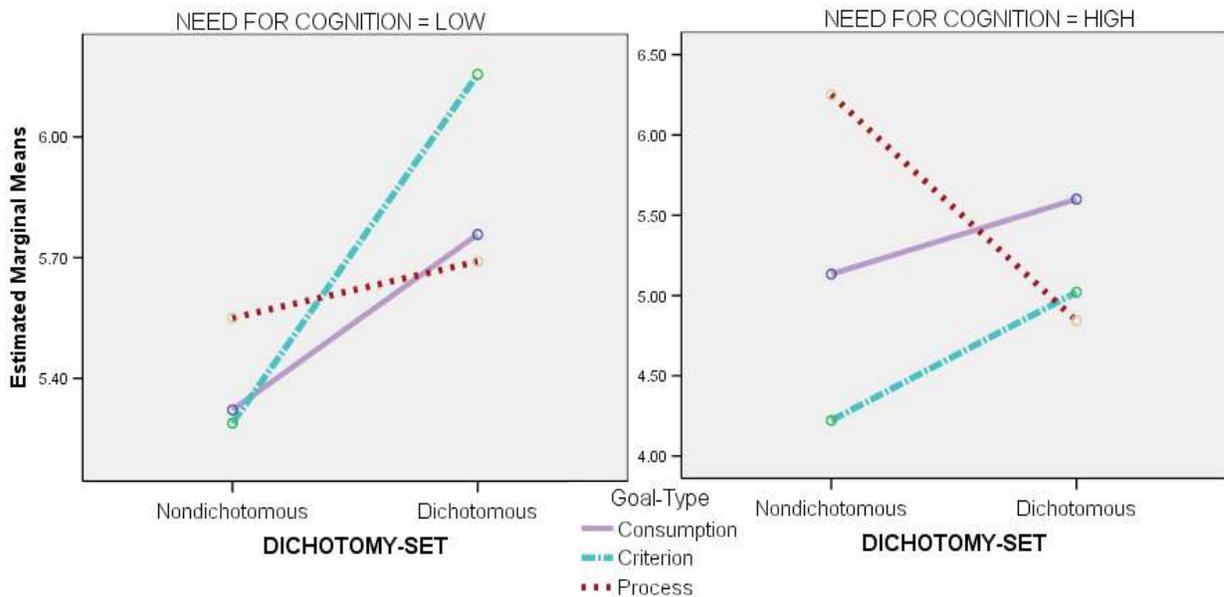


Need for cognition (NFC) as an individual differences variable for Confidence. A 2 x 3 between-subjects ANOVA (dichotomy-set vs. goal-type) was performed on confidence for the low and high groups of need for cognition (NFC). In the low-NFC group, dichotomy-set had a significant main effect such that nondichotomous sets

produced lower confidence ($M = 5.40$) than dichotomous ones ($M = 5.88$), $F(1, 83) = 3.96$, $p = .05$. Simple main effects analysis resulted with the finding that for criterion goals, dichotomous ones created significantly more confidence ($M = 6.16$) than nondichotomous ones ($M = 5.29$), $F(1, 83) = 4.46$, $p = .04$.

In the high-NFC group, there was a significant interaction effect between dichotomy-set and goal-type, $F(1, 71) = 3.86$, $p = .03$. This interaction is further understood by two simple main effects. Firstly, for process goals, nondichotomous sets produced higher confidence ($M = 6.25$) than dichotomous ones ($M = 4.84$), $F(1, 71) = 5.57$, $p = .02$. Secondly, in the high-NFC group, for nondichotomous sets, process goals produced the highest confidence ($M = 6.25$), next were consumption goals ($M = 5.13$), and lowest were criterion goals ($M = 4.22$), $F(1, 71) = 3.74$, $p = .03$.

Figure 38: CONFIDENCE BY NEED FOR COGNITION

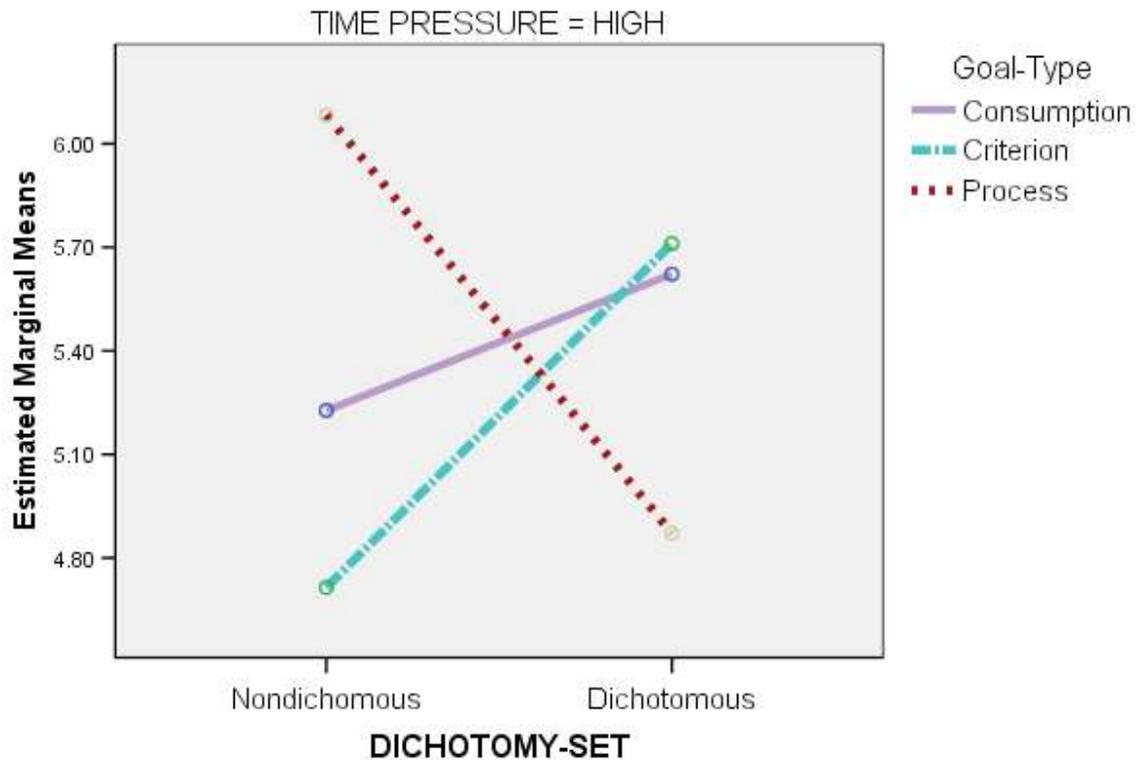


Time pressure (TP) as an individual differences variable for Confidence. A

2 x 3 between-subjects ANOVA (dichotomy-set vs. goal-type) was run on confidence for the low and high groups of time pressure. For the low-TP group ($M = 5.43$), there were no main effects, no interaction effect, nor any simple main effects.

For the high-TP group, there was a significant interaction between goal-type and dichotomy-set, $F(1, 67) = 4.05, p = .02$. Simple main effects resulted in the finding that, for process goals, nondichotomous sets produced higher confidence ($M = 6.08$) than dichotomous ones ($M = 4.87$), $F(1, 67) = 4.99, p = .03$.

Figure 39: CONFIDENCE BY TIME PRESSURE



Number of reasons. A 2 x 3 (Dichotomy-set x Goal-type) between-subjects factorial ANOVA was performed on number of reasons. There were no significant main effects nor a significant interaction, i.e. the number of reasons remained relatively constant regardless of the choice set structure and goal-type given to the subjects.

Preliminary Discussion: Understanding Goals with *Process versus Outcome Salience* and the Oppositional Framework

Table 20 depicts the most common categories of feelings discussed in the section which said “You just selected 1 item from the vending machine set shown to you. Please briefly discuss your feelings about the set of choices you were presented with.” Information in this qualitative inquiry was coded according to the following key areas (155 comments fit into these categories): (1) healthy aspect of set; (2) oppositional aspect of set; (3) discussion of actual choice made and (4) variety of the set discussion.

Table 20: CATEGORICAL CODING OF FEELINGS ABOUT CHOICE SET³

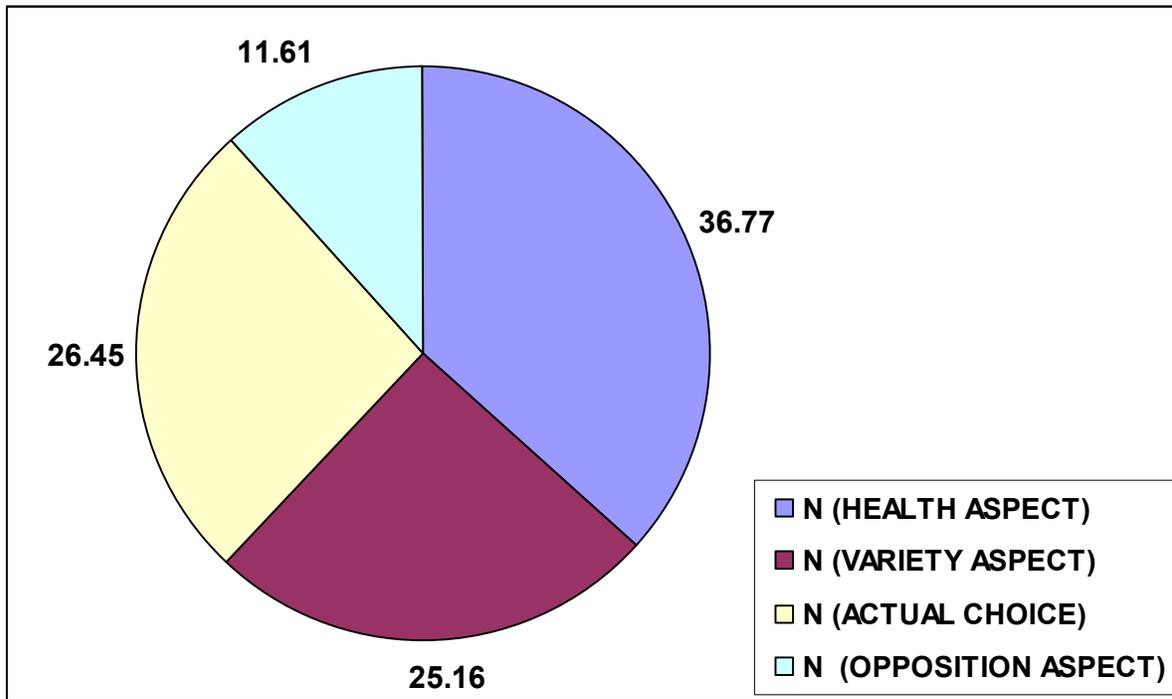
<i>CONDITION</i>		<i>N (FEELINGS – HEALTH ASPECT)</i>	<i>N (FEELINGS – VARIETY ASPECT)</i>	<i>N (FEELINGS – ACTUAL CHOICE)</i>	<i>N (FEELINGS – OPPOSITION ASPECT)</i>	<i>Total (N)</i>	<i>Total (Percentage)</i>
Consumption	Dich	7	9	8	3	27	17.42
Consumption	Nondich	8	3	12	1	24	15.48
Criterion	Dich	14	10	2	3	29	18.71
Criterion	Nondich	6	3	7	4	20	12.90
Process	Dich	11	9	4	4	28	18.06
Process	Nondich	11	5	8	3	27	17.42
<i>Total (N)</i>		57	39	41	18	155	
<i>Total (Percentage)</i>		36.77	25.16	26.45	11.61		

Note that the total number of health-related feelings was 57 (out of 155), or 36.77%, thus the respondents were most likely to discuss the health topic than they were to discuss the

³ Note that Table 21 below shows examples of the *healthy aspect* of the feelings coding. For sample comments from the other types of codings, see Appendix 4, Tables 27, 28, and 29.

other key areas, which were the actual choice itself, variety, and opposition in the set. Figure 40 depicts the relative percentages of the comments associated with health-related aspects of the set.

Figure 40: RELATIVE CATEGORICAL PERCENTAGES OF RESPONSES TO FEELINGS ABOUT SET



There are interesting distinctions in the criterion versus process case – namely, whereas criterion goals may have somewhat forced the issue of health (expert evaluation of the quality of the choice), there would normally be no direct relevance of health issues of the set and process goals (choosing quickly). It does appear however, that quick choice forced quick comparison and that lead to more salience of the health issues in the set itself. The dichotomous set seems to have brought about more guilt in the process goal case and more justification in the criterion goal case. Specific examples of the feelings are given in Table 21, which shows these linkages.

Table 21: SAMPLE FEELINGS COMMENTS WHICH DISCUSS THE *HEALTH ASPECT* OF THE CHOICE SET OR DECISION MADE

<i>CONDITION</i>		<i>Feelings Expressed: Health Aspect</i>
Criterion	Dich	“As far as the choices go for the vending machine, I thought that they were typical of any other type of vending machine. You have a little bit of everything to choose from which makes it nice for everyone. I would sometimes prefer that there were more healthy snacks in vending machines because I think that it would push people to eat healthier snacks instead of binging on tons of fat and carbs but I also realize that for many people a vending machine represents junk food..”
		“They all were greasy, salty snacks. Most were high in sodium, all were high in calories and carbs. A lot of them were high in fat. At least most had no trans fat. On top of them being high in calories, fat, sodium and carbs they were all only 2 oz. This doesn't make them much of a snack being only 2 oz., that is just enough to make you hungrier. Also this tells you how bad they really are for you. 2oz. of something that has 300 calories, 30 some grams of carbs, 20 some grams of fat, an average of 200 grams of sodium, but ooooh no trans fat, what a sly way of false advertisement of saying these are healthier for you!”
		“Majority of the choices were unhealthy, yet appetizing. I believe this shows a lot about our society, we would rather have something that tastes good than something that is good for us, despite the facts that were presented above. I bet that majority of the people will choose chips, or cookies. Those items have more of a variety within the vending machine and have more of each item because they sell out the most.”
Process	Nondich	“I was offered a few different choices but not as many as I would have liked to see. There was not many good options for healthy snacks. I think adding protein bars or breakfast bars would have made the options more complete. With the increased emphasis on living a healthy lifestyle there is no reason not to offer these products. Not all snacks have to be unhealthy like most believe.”
		“It would have been much easier to decide if I didn't have the health information. When I go to a vending machine I'm trying to make a quick decision, I ignored the health information because it seemed like a lot of work just for a bag of chips.”
		“I like more chips and cookies than any other snack so I was satisfied with the choices presented. There were some choices that are probably unhealthy because they have a lot of fat but since I am not health conscious I don't really care but since the current generation is more health conscious than the previous ones, so one might look into healthier products but don't completely eliminate the fatty foods for us unhealthy food lovers!”
Process	Dich	“There were not very many types of choices. I would have rather seen some sort of pretzels, or something that was not either full of sugar or fried. Usually that is the reason I don't buy things from vending machines, because everything is either full of calories or full of fat.”
		“Not very healthy, not very good for you, shouldn't be eating them. However, if I am eating at a snack machine, I will get something that tastes good over something that is healthier.”
		“I think there needed to be more healthy choices like fruit snack or peanut butter crackers.”

Thus the hypothesized difference (Hypothesis 18) in the process goal satisfaction level can be explained as follows. First, as other literature shows, variety is a key factor for satisfaction – individuals tend to equate more variety with greater satiation, or consume more food when presented with more variety (Kahn and Wansink 2004).

In the case of the process goal, it is clear that the individuals perceived much more variety in the nondichotomous set than in the dichotomous set (significant difference from the other two types of goals shown in perceived variety results, Figure 31). This difference in variety would then contribute to differing levels of satisfaction, but why? When variety became more salient, individuals were more aware of the differences in the sets themselves and the basic underlying information in the sets. Clearly, whether the sets are dichotomous or nondichotomous, snacks from a vending machine are by nature unhealthy. This is what formed the basis of their feelings being disproportionately more emphasized for the health aspect of the choices, regardless of the type of choice they were presented with. Now, in the case of dichotomous choice sets, though the decision was not ridden with frustration, the differing levels of healthiness in the set became more accentuated; as is apparent in Table 21, which quotes some of the feelings related to the sets. Thus whereas the process goal should make the process easier when dealing with a dichotomous set, it may also make it less satisfying when the set is ridden with dangerous potholes. If the process is easier, i.e. if the information is easier to digest, then the content should become more salient and hence more important. Thus, if I were to increase your fluency by making something easier to read, then make you more aware of the clarity of the font itself, then present you with a very sad or depressing passage, you should experience higher levels of those affective feelings after digesting it.

Individual Differences Summary Information

Tables 22 and 23 along with Figures 41 and 42 summarize and findings for the dichotomized individual differences variables as they impact each of the key dependent variables.

Table 22: RESULTS OF FRUSTRATION. PROCESS SATISFACTION, AND DECISION SATISFACTION WITH INDIVIDUAL DIFFERENCES VARIABLES (STUDY 3)

	<i>DICHOTOMY- SET FACTOR</i>	<i>GOAL-TYPE FACTOR</i>		
	Dichotomous vs. nondichotomous	Consumption	Criterion	Process
FRUSTRATION		Slightly lower for dich	Sig difference – lowest for dichotomous	Approximately constant
Familiarity	Low-familiarity – dich is significantly less frustrating	High-familiarity – lowest frustration nondich	High-familiarity – highest frustration nondich	High familiarity- no change in dich vs. nondich
Involvement – product-related risk	Low involvement – dich is significantly less frustrating; process goal frustration remained constant and was highest, regardless of dich factor	High involvement – medium frustration	Low involvement – significantly higher frustration for nondich ones; High involvement – highest frustration	High involvement – lowest frustration
Knowledge – product class	Low knowledge – significantly less frustrating	Low knowledge – medium frustration	Low knowledge – highest frustration	Low knowledge – lowest frustration
Need for cognition	Low NFC – significantly less frustrating	High NFC – lowest frustration	Low NFC – sig higher frustration with nondich; High NFC – highest frustration	High NFC – medium frustration
Time pressure	High TP – significantly less frustrating		High TP – significantly higher frustration with nondich	
Variety-Seeking Tendency	High VST – significantly less frustrating	Low VST – medium frustration	Low VST – highest frustration	Low VST – lowest frustration
SATISFACTION	Nondichotomous sets were found to have sig higher CPS			Nondich sets have sig higher CPS than dich sets
Familiarity	High familiarity – nondich has sig higher CPS			High familiarity – nondich have sig higher CPS
DECISION SATISFACTION				
Familiarity	High familiarity – nondich have sig higher dec sat	Low familiarity – dich produced sig higher dec. sat.		High familiarity – nondich have sig higher dec sat

Table 23: RESULTS OF VARIETY, DECISION DIFFICULTY AND CONFIDENCE WITH INDIVIDUAL DIFFERENCES VARIABLES (STUDY 3)

	<i>DICHOTOMY- SET FACTOR</i>	<i>GOAL-TYPE FACTOR</i>		
	Dichotomous vs. nondichotomous	Consumption	Criterion	Process
PERCEIVED VARIETY	Dich has significantly lower		Sig. lower variety for dich	Sig. lower variety for dich
Involvement – product-related risk	Low involvement – dich is significantly less variety	Low involvement – significantly less variety in dich; least variety	Low involvement – medium variety in dich	Low involvement – highest variety in dich
DECISION DIFFICULTY				
Familiarity		High familiarity – medium dec. diff; slightly lower dec diff for dich	High familiarity – highest dec. diff; no change b/w dich and nondich	High familiarity – lowest dec. diff.
Time pressure		High TP – medium dec. diff. for nondich	High TP – dich has sig. lower dec. diff.; highest dec. diff for nondich	High TP – lowest dec. diff. for nondich
CONFIDENCE		Higher confidence for dich (insig)	Higher confidence for dich (insig)	Less confidence for dich (insig)
Involvement – product-related risk		Low involvement – medium confidence for nondich	Low involvement – lowest confidence for nondich	Low involvement – highest confidence for nondich
Knowledge – product class		High knowledge – highest confidence for dich	High knowledge – medium confidence for dich	High knowledge – lowest confidence for dich
Need for cognition	Low NFC – dich had sig. higher confidence		Low NFC – dich had sig higher confidence	High NFC – nondich had sig higher confidence
Time pressure		High TP – dich slightly better	High TP – dich slightly better	High TP – nondich had sig higher confidence

Figure 41: REGIONS OF OPERATION FOR INDIVIDUAL DIFFERENCES WITH DICHOTOMY-SET FACTOR (STUDY 3)

LOW FAMILIARITY  	HIGH FAMILIARITY  
LOW INVOLVEMENT   	HIGH INVOLVEMENT
LOW KNOWLEDGE 	HIGH KNOWLEDGE
LOW NEED FOR COGNITION  	HIGH NEED FOR COGNITION
LOW VARIETY-SEEKING TENDENCY	HIGH VARIETY-SEEKING TENDENCY 
LOW TIME PRESSURE	HIGH TIME PRESSURE 

DICHOTOMY IS PREFERRED

 FRUSTRATION

 CHOICE PROCESS SATISFACTION

 CONFIDENCE

NONDICHOTOMY IS PREFERRED

 CHOICE PROCESS SATISFACTION

 DECISION SATISFACTION

 PERCEIVED VARIETY

Figure 42: REGIONS OF OPERATION FOR INDIVIDUAL DIFFERENCES WITH GOAL-TYPE FACTOR (STUDY 3)

LOW FAMILIARITY	HIGH FAMILIARITY
LOW INVOLVEMENT	HIGH INVOLVEMENT
LOW KNOWLEDGE	HIGH KNOWLEDGE
LOW NEED FOR COGNITION	HIGH NEED FOR COGNITION
LOW VARIETY-SEEKING TENDENCY	HIGH VARIETY-SEEKING TENDENCY
LOW TIME PRESSURE	HIGH TIME PRESSURE

CONSUMPTION GOAL IS PREFERRED

 FRUSTRATION

 CONFIDENCE

PROCESS GOAL IS PREFERRED

 FRUSTRATION

 DECISION DIFFICULTY

 CONFIDENCE

Correlation Analysis

For Study 3, we will begin with the overall correlation coefficients for the dependent variables (see Table 24), followed by the correlation matrices for the dichotomy-set factor (see Table 25) and finally present them for the goal-type factor (see Table 26). As expected, frustration is positively correlated with decision difficulty ($r = .66, p < .01$) and negatively correlated with decision satisfaction and confidence ($r = -.32, p < .01$ and $r = -.31, p < .01$, respectively). Also noteworthy is the fact that perceived variety is positively correlated with satisfaction ($r = .61, p < .01$) and decision satisfaction ($r = .32, p < .01$).

Table 24: OVERALL CORRELATION COEFFICIENTS (STUDY 3)

	FRUSTRATION	SATISFACTION	NO. OF REASONS	VARIETY	DEC. DIFFICULTY	DEC. SATISFACTION	CONFIDENCE
FRUSTRATION	1	-.051	-.019	.044	.662**	-.319**	-.306**
SATISFACTION	-.051	1	-.217	.609**	-.119	.512**	.246*
NO. OF REASONS	-.019	-.217	1	-.153	-.071	-.107	.006
VARIETY	.044	.609**	-.153	1	-.113	.324**	.191
DEC. DIFFICULTY	.662**	-.119	-.071	-.113	1	-.251*	-.411**
DEC. SATISFACTI	-.319**	.512**	-.107	.324**	-.251*	1	.594**
CONFIDENCE	-.306**	.246*	.006	.191	-.411**	.594**	1

** .Correlation is significant at the 0.01 level (2-tailed).

* .Correlation is significant at the 0.05 level (2-tailed).

Table 25: CORRELATION COEFFICIENTS FOR DICHOTOMY-SET FACTOR (STUDY 3)

DICHOTOMY-SET FACTOR							
NONDICHOTOMOUS SETS							
	FRUSTRATION	SATISFACTION	NO. OF REASONS	VARIETY	DEC. DIFFICULTY	DEC. SATISFACTION	CONFIDENCE
FRUSTRATION	1	-.051	-.019	.044	.662**	-.319**	-.306**
SATISFACTION	-.051	1	-.217	.609**	-.119	.512**	.246*
NO. OF REASONS	-.019	-.217	1	-.153	-.071	-.107	.006
VARIETY	.044	.609**	-.153	1	-.113	.324**	.191
DEC. DIFFICULTY	.662**	-.119	-.071	-.113	1	-.251*	-.411**
DEC. SATISFACTION	-.319**	.512**	-.107	.324**	-.251*	1	.594**
CONFIDENCE	-.306**	.246*	.006	.191	-.411**	.594**	1
** . Correlation is significant at the 0.01 level (2-tailed).							
* . Correlation is significant at the 0.05 level (2-tailed).							
DICHOTOMOUS SETS							
	FRUSTRATION	SATISFACTION	NO. OF REASONS	VARIETY	DEC. DIFFICULTY	DEC. SATISFACTION	CONFIDENCE
FRUSTRATION	1	-.213*	.000	-.116	.686**	-.534**	-.461**
SATISFACTION	-.213*	1	.102	.496**	-.246*	.333**	.149
NO. OF REASONS	.000	.102	1	-.071	-.040	.204*	.154
VARIETY	-.116	.496**	-.071	1	-.128	.165	.020
DEC. DIFFICULTY	.686**	-.246*	-.040	-.128	1	-.434**	-.570**
DEC. SATISFACTION	-.534**	.333**	.204*	.165	-.434**	1	.509**
CONFIDENCE	-.461**	.149	.154	.020	-.570**	.509**	1
* . Correlation is significant at the 0.05 level (2-tailed).							
** . Correlation is significant at the 0.01 level (2-tailed).							

**Table 26: CORRELATION COEFFICIENTS FOR GOAL-TYPE
FACTOR (STUDY 3)**

GOAL-TYPE FACTOR							
CONSUMPTION GOAL							
	FRUSTRATION	SATISFACTION	NO. OF REASONS	VARIETY	DEC. DIFFICULTY	DEC. SATISFACTION	CONFIDENCE
FRUSTRATION	1	.038	-.030	.012	.635**	-.534**	-.355**
SATISFACTION	.038	1	-.001	.613**	.165	.379**	-.047
NO. OF REASONS	-.030	-.001	1	-.003	-.040	.099	-.025
VARIETY	.012	.613**	-.003	1	-.024	.301*	.163
DEC. DIFFICULTY	.635**	.165	-.040	-.024	1	-.311*	-.463**
DEC. SATISFACTIO	-.534**	.379**	.099	.301*	-.311*	1	.502**
CONFIDENCE	-.355**	-.047	-.025	.163	-.463**	.502**	1
** . Correlation is significant at the 0.01 level (2-tailed).							
* . Correlation is significant at the 0.05 level (2-tailed).							
CRITERION GOAL							
	FRUSTRATION	SATISFACTION	NO. OF REASONS	VARIETY	DEC. DIFFICULTY	DEC. SATISFACTION	CONFIDENCE
FRUSTRATION	1	-.225	-.099	-.006	.737**	-.323*	-.536**
SATISFACTION	-.225	1	-.065	.514**	-.455**	.384**	.248
NO. OF REASONS	-.099	-.065	1	-.269	-.083	.141	.132
VARIETY	-.006	.514**	-.269	1	-.235	.112	-.110
DEC. DIFFICULTY	.737**	-.455**	-.083	-.235	1	-.359**	-.547**
DEC. SATISFACTIO	-.323*	.384**	.141	.112	-.359**	1	.516**
CONFIDENCE	-.536**	.248	.132	-.110	-.547**	.516**	1
** . Correlation is significant at the 0.01 level (2-tailed).							
* . Correlation is significant at the 0.05 level (2-tailed).							
PROCESS GOAL							
	FRUSTRATION	SATISFACTION	NO. OF REASONS	VARIETY	DEC. DIFFICULTY	DEC. SATISFACTION	CONFIDENCE
FRUSTRATION	1	-.135	-.002	-.022	.620**	-.426**	-.279*
SATISFACTION	-.135	1	-.027	.582**	-.260*	.464**	.330*
NO. OF REASONS	-.002	-.027	1	-.023	-.103	-.026	.177
VARIETY	-.022	.582**	-.023	1	-.106	.298*	.180
DEC. DIFFICULTY	.620**	-.260*	-.103	-.106	1	-.353**	-.472**
DEC. SATISFACTIO	-.426**	.464**	-.026	.298*	-.353**	1	.610**
CONFIDENCE	-.279*	.330*	.177	.180	-.472**	.610**	1
** . Correlation is significant at the 0.01 level (2-tailed).							
* . Correlation is significant at the 0.05 level (2-tailed).							

Preliminary Discussion: *Goals and Individual Differences with the Oppositional Framework*

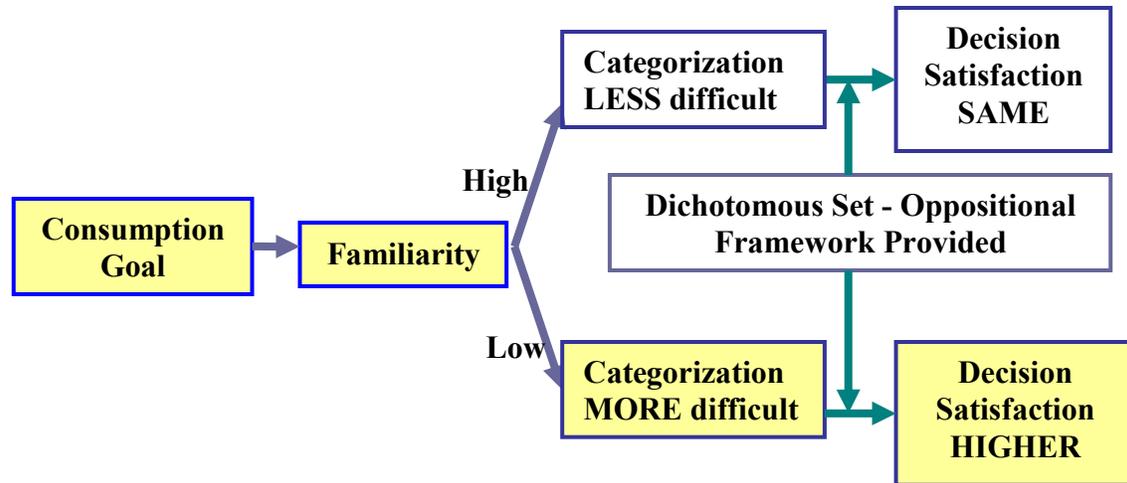
Consumption Goals

Taking a closer look at consumption goals, there were several interesting effects to note. First of all, consumption goals always produced the lowest frustration. This is not surprising, given the nature of these types of goals. After all, making a choice which is “tastiest and most desirable” should be enjoyable. In terms of choice process satisfaction, consumption goals produced almost the same amount of satisfaction as other types of goals. These goals also produced the highest confidence, regardless of the type of set. The dichotomy factor interacted with this particular goal type in two of the outcome variables, confidence and decision satisfaction. In terms of decision satisfaction, low familiarity individuals reported significantly higher decision satisfaction with dichotomous sets (see Figure 30) than with nondichotomous ones.

Cowley and Janus (2004) discuss two varieties of familiarity, one which deals more with experience with a situation and one which deals more with knowledge about a situation. The present measure of familiarity was based on the familiarity-as-experience construct. According to their work, less familiar individuals are more susceptible to the misinformation effect, and cannot as readily categorize stimuli. We can use their research to explain why consumption-oriented individuals would be more likely to find a dichotomous framework easier to categorize and thus have higher decision satisfaction after selecting an item. Perhaps unlike the other two types (criterion and process), consumption goals would tend to make respondents reach into their “bank of likes” (so to say) to make a decision on a specific item. Those who are less familiar with the choice domain, then, might tend to find it more

cumbersome to make a selection from a less-organized presentation of choices. This difficulty could then translate into lower decision satisfaction, or vice-versa, as is the present case.

Figure 43: EXPLANATION OF CONSUMPTION GOALS WITH DICHOTOMY FRAMEWORK AND FAMILIARITY



For consumption goals, individuals also felt more confident with dichotomous sets than with nondichotomous ones, although this difference was not significant. This can be further understood by Figure 37, where we can see that higher knowledge individuals had a significantly higher confidence level with consumption goals. The relationship between high-knowledge individuals and confidence has been well-researched in several domains, in terms of the feeling-of-knowing phenomenon (Hart 1965), overconfidence (Fischhoff, Slovic and Lichtenstein 1977), effects on product innovation (Wood and Lynch 2002), motivation of learning efforts (Bandura 1977), and so on.

To verify that higher knowledge always translated to higher confidence, a univariate ANOVA was run with confidence as the dependent variable and high versus low knowledge as the factor. This analysis showed that low knowledge individuals ($M = 5.19$) had

significantly lower confidence than high knowledge individuals ($M = 5.62$), $F(1, 162) = 4.30$, $p=.04$. The finding, then, that high knowledge individuals tended to be more confident in general is consistent with existing research. In particular, the fact that the high knowledge group reported higher knowledge with dichotomous sets when presented with a consumption goal, can be explained as follows. Wood and Lynch (2002) reason that high knowledge consumers may have more confidence than they should about a new stimulus and therefore may process it less extensively. This can explain why the consumption-goal group felt more confident with dichotomous sets. Namely, dichotomous sets allowed for less processing of information and with high knowledge individuals who would already tend to process less, especially with a taste goal, this gave rise to more subjective confidence.

Criterion Goals

Now in terms of criterion goals, frustration was highest no matter what type of set these individuals were presented with. These goals produced the same levels of choice process satisfaction, perceived variety, and confidence as the consumption goals. The dichotomy factor interacted in two interesting ways with criterion goals. Firstly, it created lowered frustration and second, higher confidence, in the case of criterion goals.

Van Osselaer et al. (2005) explain that previous success at achieving criterion goals can have a major impact on how an individual reacts to one. They further indicate that justification can play a role in subjective outcome measures such that choice may be made based on ease of justification for the individual. It is thus logical to investigate the number of reasons outcome measure in order to understand the increased confidence which criterion goal individuals felt when presented with a dichotomous set. In order to do this, a category-

based variable was created for number of reasons for high versus low number of reasons. The median was found to be 3.0 for number of reasons.

Number of reasons category (NORC) as an individual differences variable for Confidence with Criterion goals. A 2 x 3 between-subjects ANOVA (dichotomy-set vs. goal-type) was run on confidence for the low and high groups of number of reasons. For the low-NORC group ($M = 5.35$), there were no main effects, no interaction effect, nor any simple main effects.

For the high-NORC group ($M = 5.59$), there were neither main effects nor an interaction. However, further simple main effects analysis for the criterion goal factor showed that for the high-NORC group, there was a significant increase in confidence for the criterion goal individuals such that those presented with nondichotomous sets ($M = 4.93$) had significantly less confidence than those presented with dichotomous sets ($M = 5.93$), $F(1, 49) = 4.70, p = .04$. The consumption and process goals did not have significant differences in confidence in this same category.

Therefore, we can conjecture as to why criterion goal individuals felt more confident by noticing that those who were in the high-NORC segment had significantly higher confidence when presented with dichotomous sets. This means that they systematically provided more reasons for their choice, and since this was a voluntary task, we can take this to mean that they found it easier to justify. This ease of justification, in turn, may have given rise to increased confidence in their choice.

To further verify this claim, an independent samples t-test was performed on confidence for the NORC variable, high versus low number of reasons. The t-test showed that there was no significant difference in confidence between the high versus low groups of number of reasons ($M = 5.59$ vs. $M = 5.35$), $t(164) = -1.10$, $p = .27$. We know then that a higher number of reasons does not always mean higher confidence. In the other direction, in order to verify that increased confidence does not always mean an increase in the number of reasons, another independent samples t-test was run on the continuous number of reasons variable for a category variable of high versus low confidence (a median split was performed on confidence, which had a median of 5.67). The t-test validated that there was no significant difference in the number of reasons between the high versus low groups of confidence ($M = 3.14$ vs. $M = 2.92$), $t(164) = -1.05$, $p = .30$.

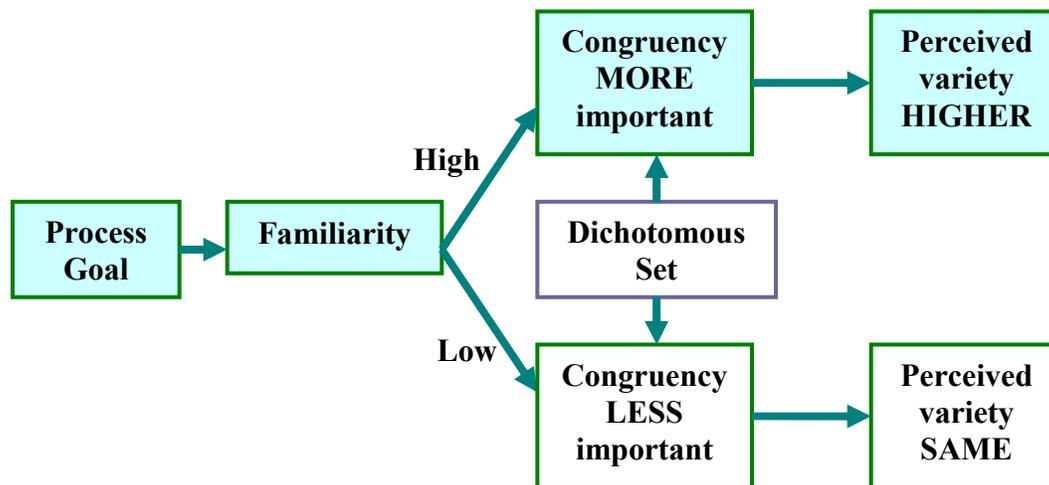
Process Goals

Finally, for process goals, individuals experienced a mid-level of frustration which was not altered by the dichotomy-set factor. However, choice process satisfaction and confidence were much lower for dichotomous sets when individuals were presented with process goals. Why? Why is it that when an individual is presented with a dichotomous set and given a process goal, they tend to be less satisfied and have lower confidence? These people tended to perceive significantly higher variety in the nondichotomous set than in the dichotomous set.

According to Morales et al. (2005), the concept of congruency between consumer expectations of an assortment and retail presentation of that assortment plays a major role in consumer outcome measures. This is further specified such that if the assortment is not

congruent with the expectations of the consumer, they will be confused and will have to expend additional processing effort. If they have to expend too much cognitive effort, they may not be able to perceive the extent of the variety offered. If they perceive less variety, they will have lower satisfaction. Stronger internal structures and category salience are caused by higher familiarity and higher product knowledge. Thus, we can see how this is explained in the next simple schematic shown (Figure 44).

Figure 44: EXPLANATION OF PROCESS GOALS WITH DICHOTOMY FRAMEWORK AND FAMILIARITY



This leads to the question as to what the differences were for perceived variety for dichotomous versus nondichotomous sets with a process goal. The perceived variety for high familiarity individuals presented with a process goal was significantly different for dichotomous ($M = 5.92$) versus nondichotomous ($M = 7.57$) sets, $F(1, 67) = 7.07, p = .01$. Clearly, the dichotomous sets were perceived to have much lower variety. However, even

though it was lower perceived variety for dichotomous than for nondichotomous, it was still higher than for the other two types of goals when it was dichotomous. Meaning, perceived variety for process goals was $M = 5.92$, for criterion goals $M = 5.83$ and for consumption goals $M = 5.43$ when sets were dichotomous. Could it be that the dichotomous framework was not congruent with their expectations when they were presented with a process goal?

This picture is not yet complete. We must compare this lower variety with that of the criterion goal low-familiarity individuals to put it into context. For the low familiarity group, though the differences are not significant within the goal-type factor, we can note that process goals have the lowest perceived variety for dichotomous sets ($M = 5.85$), with consumption and criterion goals almost equal ($M = 5.98$ and $M = 5.97$, respectively). Now notice – when dichotomous sets were presented, low familiarity had the *lowest* perceived variety for process goals whereas high familiarity had the *highest* perceived variety for process goals. This is in sync with the congruency explanation (Morales et al. 2005). Thus, since individuals had high familiarity, they experienced higher congruity with the dichotomous set, and since they experienced higher congruity, they perceived higher variety in the set. Not only did they perceive higher variety in the dichotomous sets when they were highly familiar, but they also had significantly lower decision difficulty.

Discussion

The final analysis in Study 3 has been well-summarized in Figure 41, which shows the regions of operation for the *oppositional framework* as they pertain to individual differences. In essence, individuals are most likely to find dichotomization less frustrating when they are in a low familiarity, low involvement, low knowledge, and low need for cognition state.

Using goal-type as a factor added substantially to understanding the oppositional framework proposed in this dissertation. In short, individuals who were primed with a consumption or criterion goal tended to feel less frustrated with dichotomous sets while maintaining a relatively constant level of satisfaction. On the other hand, process-goal oriented individuals experienced a constant level of frustration with nondichotomous versus dichotomous sets but had lower satisfaction when sets were dichotomous. As was previously discussed in detail, the fact that process goal-primed individuals were less satisfied with the dichotomous sets was expected. This fits with the explanation that dichotomous sets provided more clarity of the information to the process goal individuals than did nondichotomous ones, though both types of sets caused criterion or process goal-primed individuals to think more about the health aspects of the sets. In the case of dichotomous sets, the feelings codings (see Tables 20 and 21) reveal more detail about why dichotomous sets lead to lower satisfaction for process goal individuals. In short, clarity of the information made both the lack of variety and the health aspect more salient, leading to lowered satisfaction with the final choice. The individuals essentially shifted the importance from process-centric to outcome-centric and were thus disproportionately less happy (lack of variety and increased importance of health aspect combined in this case) with the dichotomous sets.

CHAPTER 5. GENERAL DISCUSSION

Whereas dichotomizing can be a functional method of partitioning the world, it can also be seen as a shortcut, a means of excluding information, and consequently, perhaps even a heuristic. If used in the right circumstances, i.e. too much information is presented and individuals are forced to preserve their cognitive state, the dichotomy framework can provide the necessary means to secure mood.

The three studies show that process frustration got lowered in most cases while satisfaction stayed constant – in other words, dichotomization brought out “feeling good about the process” while maintaining a level of satisfaction with the outcome choice. But, did the participants really get a full spectrum when they were selecting? Or, for that matter, was the systematic *lack* of variety in any way considered a negative when they were selecting? It appears that when they were prompted with certain types of goals (for example, the significant differences in frustration levels for criterion goals seen in Figure 21), they were not only okay with the dichotomization, they favored it.

This dissertation proposes an oppositional or dichotomous framework which it then empirically investigates in a choice context. The first contribution of this research is the introduction of a dichotomous framework to explain how choice can be impacted by dichotomy. Oppositional brand loyalty (Muniz and O'Guinn 2001) has been previously identified, but to my knowledge, no investigations have taken place to understand why and when this occurs and how broad (i.e. is it only brands?) it is. A second contribution of the research is to show in Study 1 that without the negative implications of the overchoice effect,

the dichotomy-mindset does not necessarily bring about significant differences in frustration levels with varying sizes of choice sets. Study 2 further developed the idea of dichotomy in choice processing by systematically changing the stimuli themselves. This study showed how decisions are easier and perceived complexity is lower when sets are dichotomous yet choice process satisfaction is not necessarily different. The implications of this study are that even though there is a documented social norm of variety-seeking (Ratner and Kahn 2002), dichotomy as a form of simplification could be a viable way to frame choice sets for consumers.

Finally, Study 3 extended the previous two studies by making dichotomous display in the choice set salient to the subject and identifying how the decisions made and the subjective outcomes experienced were impacted in a goals framework. In combination, this dissertation introduced and defined how dichotomy in a choice set impacts consumers and furthered the understanding of why opposition in a choice set, even if sometimes not an obvious characteristic, may be a preferred one.

CHAPTER 6. THEORETICAL AND MANAGERIAL IMPLICATIONS, FUTURE RESEARCH, AND LIMITATIONS

This research has many interesting potential commercial applications. First of all, in light of the adaptive nature of many of the choice sets which are currently provided in e-commerce settings, a dichotomous framework can be ex ante designed. For manufacturers, the structure of product sets can take into account how consumers may dichotomize their product offerings and avoid potential cannibalization of one set of offerings by another one. For retailers, subtle but powerful changes can be made to the design of shelving in a store (assortment and perceived variety) or the layout of items in a vending machine, in order to simplify consumer decision making with the dichotomy framework.

Competitive positioning is also an interesting facet to consider regarding future research with the oppositional framework. In essence, how should companies position against (or not) their competitors when they roll out new products? For that matter, how can they maintain their competitive advantage (i.e. be maximally different on key attributes) while staying in the right set of dimensions with the consumer (from the multiple dimensional scaling perspective)? Even mergers and acquisitions can be affected by such questions (for example, Ford with Volvo and GM with Saab).

In exploring the implications of the dichotomy framework, there are many sensory considerations – whereas the present dissertation focused on choice scenarios, what about color, flavor (taste), and so on? In terms of color, for example, two extremes might be black and white. While both colors represent conceptual extremes, they work very well hand-in-

hand (as can be seen with Apple Ipods which are manufactured in white or black and shampoo/conditioner combinations which come out in black and white such as the TRESemme brand) in manufacturing lines. Is the dichotomy framework perhaps a reason for this?

Design of advertisements is another interesting application of the oppositional framework developed in this dissertation and is worthy of future research. Often called “two-fers” (Felton 2006), there is an entire category of advertisements which uses information in sets of two, both visually and verbally. Comparative advertisements have been studied extensively as one particular example of two-fers. I ask about a specific type of advertisement design I will define as “oppositional.” In essence, when are oppositional advertisements created and why? Are they considered more creative, or more strategic? Is visual plus verbal opposition better than either of the two alone? There are several formats of advertisements which could be considered oppositional. For example, there could be verbal opposition (using contrasting words such as simple/complicated, exciting/boring, good/bad) or visual opposition (such as dark and light colored people, contrasting colors of images, and so on).

In today’s world of electronic commerce, consumers are often faced with two well-documented causes of judgment difficulty – information overload (Iyengar and Lepper 2000) and low fluency (Schwarz and Clore, in press). Information overload has been studied extensively in the context of how choice sets can be manipulated to produce or reduce difficult emotional tradeoffs (Bettman and Zins 1979; Bettman et al. 1991; Luce et al. 2001). Low preference fluency, which can be caused by changes outside of the actual choice set (Novemsky et al. 2004) causes consumers to experience more decision difficulty and therefore defer making a choice more often. The present research asks how consumers deal with these

problems and overcome them and proposes a novel cognitive mechanism for this, in the form of a dichotomization framework. Thus, this dissertation addresses the call which Lurie (2004) makes regarding "...an examination of mechanisms for reducing information overload" (p. 485).

This dissertation has several limitations which future studies and research could work towards eliminating. First of all, the domain of snack foods is not a high involvement one, so the findings are often limited in terms of this. To enhance and examine the dichotomy framework more closely, we could use high involvement products such as cameras, computers, or medical insurance. In general, lack of serious consequences is a limiting factor. Another limitation is the fact that choice sets were always structured in tabular format. Future research could use pictorial format, real displays, or other mechanisms to make sure that the findings are not limited to attribute-table displays. Finally, collecting only subjective measures is a research methodology limitation which could be dealt with by conducting studies which gather unconscious reactions to this framework (for example, using reaction times).

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APPENDICES

APPENDIX 1

CHOICE STIMULI

STUDY 1

Small Choice Set

Imagine that you are standing in front of a vending machine and have the following 6 options for snacks.

Which ones would you choose if you could pick up to 4 items?

You will be asked to provide your choices shortly.

Name	Price	Amount	No of Items	Shape	Calories	Total Carb.	Sodium	Total Fat	Trans Fat.	Description
A	\$1.00	2 oz.	4	Cookies	320	34 g	110 mg	18 g	0 g	Chocolate flavored with a hint of mint
B	\$0.75	1.25 oz.	Lots	Chips	200	19 g	212 mg	13 g	0 g	Corn chips
C	\$1.00	1.76 oz.	1	Bar	200	23 g	125 mg	6 g	0 g	Chocolate flavored energy bar
D	\$0.75	1 oz.	Lots	Chips	120	21 g	200 mg	3.5 g	0 g	Flavored tortilla chips
E	\$0.50	2 oz.	Lots	Raisins	154	42 g	5 mg	0 g	0 g	Box of raisins
F	\$0.75	1.25 oz.	Lots	Sticks	200	19 g	363 mg	13 g	0 g	Crunchy cheese snacks

Large Choice Set

Imagine that you are standing in front of a vending machine and have the following 12 options for snacks.

Which ones would you choose if you could pick up to 7 items?

You will be asked to provide your choices shortly.

Name	Price	Amount	No of Items	Shape	Calories	Total Carb.	Sodium	Total Fat	Trans Fat.	Description
A	\$1.00	2 oz.	4	Cookies	320	34 g	110 mg	18 g	0 g	Chocolate flavored with a hint of mint
B	\$0.75	1.25 oz.	Lots	Chips	200	19 g	212 mg	13 g	0 g	Corn chips
C	\$1.00	1.76 oz.	1	Bar	200	23 g	125 mg	6 g	0 g	Chocolate flavored energy bar
D	\$0.75	1 oz.	Lots	Chips	120	21 g	200 mg	3.5 g	0 g	Flavored tortilla chips
E	\$0.50	2 oz.	Lots	Raisins	154	42 g	5 mg	0 g	0 g	Box of raisins
F	\$0.75	1.25 oz.	Lots	Sticks	200	19 g	363 mg	13 g	0 g	Crunchy cheese snacks
G	\$0.75	1.25 oz.	Lots	Chips	150	26 g	250 mg	4 g	0 g	Baked ridged chips
H	\$0.50	1.3 oz.	1.3 oz.	Bar	140	28 g	105 mg	3 g	0 g	Fruity cereal bar
I	\$0.75	1.25 oz.	Lots	Pretzels	150	30 g	150 mg	1 g	0 g	Large size pretzels
J	\$0.50	2.05 oz.	1	Bar	260	41 g	95 mg	10 g	0 g	Chocolate with caramel candy bar
K	\$0.75	1.25 oz.	Lots	Chips	138	29 g	188 mg	2 g	0 g	Baked potato chips
L	\$1.00	2 oz.	4	Cookies	300	34 g	180 mg	16 g	0 g	Peanut butter with chocolate cover

STUDY 2

Small Nondichotomous Choice Set

Name	Amount	No of Items	Shape	Calories	Total Carb.	Sodium	Total Fat	Trans Fat.	Description
A	2 oz.	4	Cookies	320	34 g	110 mg	18 g	0 g	Chocolate flavored with a hint of mint
B	1.25 oz.	Lots	Chips	200	19 g	212 mg	13 g	0 g	Corn chips
C	1.76 oz.	1	Bar	200	23 g	125 mg	6 g	0 g	Chocolate flavored energy bar
D	1 oz.	Lots	Chips	120	21 g	200 mg	3.5 g	0 g	Flavored tortilla chips
E	2 oz.	Lots	Raisins	154	42 g	5 mg	0 g	0 g	Box of raisins
F	1.25 oz.	Lots	Sticks	200	19 g	363 mg	13 g	0 g	Crunchy cheese snacks

Small Dichotomous Choice Set

Name	Amount	No of Items	Shape	Calories	Total Carb.	Sodium	Total Fat	Trans Fat.	Description
A	2 oz.	Lots	Chips	320	30 g	340 mg	21 g	0 g	Corn chips
B	2 oz.	Lots	Chips	240	42 g	400 mg	7 g	0 g	Tortilla chips
C	2 oz.	Lots	Chips	300	30 g	360 mg	20 g	0 g	Potato chips
D	2 oz.	4	Cookies	320	34 g	110 mg	18 g	0 g	Chocolate flavored with a hint of mint
E	2 oz.	4	Cookies	300	34 g	180 mg	16 g	0 g	Peanut butter with chocolate cover
F	2 oz.	4	Cookies	270	38 g	105 mg	12 g	2 g	Chewy chocolate chip

Large Nondichotomous Choice Set

Name	Amount	No of Items	Shape	Calories	Total Carb.	Sodium	Total Fat	Trans Fat.	Description
A	2 oz.	4	Cookies	320	34 g	110 mg	18 g	0 g	Chocolate flavored with a hint of mint
B	1.25 oz.	Lots	Chips	200	19 g	212 mg	13 g	0 g	Corn chips
C	1.76 oz.	1	Bar	200	23 g	125 mg	6 g	0 g	Chocolate flavored energy bar
D	1 oz.	Lots	Chips	120	21 g	200 mg	3.5 g	0 g	Flavored tortilla chips
E	2 oz.	Lots	Raisins	154	42 g	5 mg	0 g	0 g	Box of raisins
F	1.25 oz.	Lots	Sticks	200	19 g	363 mg	13 g	0 g	Crunchy cheese snacks
G	1.25 oz.	Lots	Chips	150	26 g	250 mg	4 g	0 g	Baked ridged chips
H	1.3 oz.	1.3 oz.	Bar	140	28 g	105 mg	3 g	0 g	Fruity cereal bar
I	1.25 oz.	Lots	Pretzels	150	30 g	150 mg	1 g	0 g	Large size pretzels
J	2.05 oz.	1	Bar	260	41 g	95 mg	10 g	0 g	Chocolate with caramel candy bar
K	1.25 oz.	Lots	Chips	138	29 g	188 mg	2 g	0 g	Baked potato chips
L	2 oz.	4	Cookies	300	34 g	180 mg	16 g	0 g	Peanut butter with chocolate cover

Large Dichotomous Choice Set

Name	Amount	No of Items	Shape	Calories	Total Carb.	Sodium	Total Fat	Trans Fat.	Description
A	2 oz.	Lots	Chips	320	30 g	340 mg	21 g	0 g	Corn chips
B	2 oz.	Lots	Chips	240	42 g	400 mg	7 g	0 g	Tortilla chips
C	2 oz.	Lots	Chips	300	30 g	360 mg	20 g	0 g	Potato chips
D	2 oz.	Lots	Chips	300	36 g	220 mg	16 g	0 g	Kettle cooked potato chips
E	2 oz.	Lots	Chips	300	30 g	360 mg	20 g	0 g	Wavy potato chips
F	2 oz.	Lots	Chips	320	30 g	320 mg	20 g	0 g	Potato crisps
G	2 oz.	4	Cookies	320	34 g	110 mg	18 g	0 g	Chocolate flavored with a hint of mint
H	2 oz.	4	Cookies	300	34 g	180 mg	16 g	0 g	Peanut butter with chocolate cover
I	2 oz.	4	Cookies	270	38 g	105 mg	12 g	2 g	Chewy chocolate chip
J	2 oz.	Lots	Cookies	310	45 g	160 mg	13 g	2.5 g	Vanilla mini cookies
K	2 oz.	2	Cookies	360	60 g	480 mg	12 g	0	Large oatmeal raisin
L	2 oz.	2	Cookies	350	53 g	300 mg	14 g	2.5 g	Large fudge chocolate chip

STUDY 3: Choice Sets: Large Nondichotomous Choice Set

Name	Amount	No of Items	Shape	Calories	Total Carb.	Sodium	Total Fat	Trans Fat.	Description
A	2 oz.	4	Cookies	320	34 g	110 mg	18 g	0 g	Chocolate flavored with a hint of mint
B	1.25 oz.	Lots	Chips	200	19 g	212 mg	13 g	0 g	Corn chips
C	1.76 oz.	1	Bar	200	23 g	125 mg	6 g	0 g	Chocolate flavored energy bar
D	2.5 oz.	Lots	Chips	290	21 g	200 mg	3.5 g	0 g	Flavored tortilla chips
E	2 oz.	Lots	Raisins	154	42 g	5 mg	0 g	0 g	Box of raisins
F	1.25 oz.	Lots	Sticks	200	19 g	363 mg	13 g	0 g	Crunchy cheese snacks
G	1.95 oz.	Lots	Chips	195	26 g	250 mg	4 g	0 g	Baked ridged chips
H	1.3 oz.	1.3 oz.	Bar	140	28 g	105 mg	3 g	0 g	Fruity cereal bar
I	1.25 oz.	Lots	Pretzels	150	30 g	150 mg	1 g	0 g	Large size pretzels
J	2.05 oz.	1	Bar	260	41 g	95 mg	10 g	0 g	Chocolate with caramel candy bar
K	1.25 oz.	Lots	Chips	138	29 g	188 mg	2 g	0 g	Baked potato chips
L	2.5 oz.	4	Cookies	340	34 g	180 mg	16 g	0 g	Peanut butter with chocolate cover

Large Dichotomous Choice Set

Name	Amount	No of Items	Shape	Calories	Total Carb.	Sodium	Total Fat	Trans Fat.	Description
A	2 oz.	Lots	Chips	320	30 g	340 mg	21 g	0 g	Corn chips
B	2 oz.	Lots	Chips	280	42 g	360 mg	16 g	0 g	Tortilla chips
C	2 oz.	Lots	Chips	300	30 g	360 mg	20 g	0 g	Potato chips
D	2 oz.	Lots	Chips	300	36 g	340 mg	16 g	0 g	Kettle cooked potato chips
E	2 oz.	Lots	Chips	300	30 g	360 mg	20 g	0 g	Wavy potato chips
F	2 oz.	Lots	Chips	320	30 g	340 mg	20 g	0 g	Potato crisps
G	2 oz.	4	Cookies	320	34 g	115 mg	18 g	0 g	Chocolate flavored with a hint of mint
H	2 oz.	4	Cookies	300	34 g	115 mg	16 g	0 g	Peanut butter with chocolate cover
I	2 oz.	4	Cookies	270	38 g	105 mg	15 g	2 g	Chewy chocolate chip
J	2 oz.	Lots	Cookies	310	45 g	110 mg	13 g	2.5 g	Vanilla mini cookies
K	2 oz.	2	Cookies	360	60 g	115 mg	12 g	0	Large oatmeal raisin
L	2 oz.	2	Cookies	350	53 g	115 mg	14 g	2.5 g	Large fudge chocolate chip

APPENDIX 2

LENGTHY SCALES

Need for Cognition

1. I would prefer complex to simple problems.
2. I like to have the responsibility of handling a situation that requires a lot of thinking.
3. Thinking is not my idea of fun.
4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.
5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.
6. I find satisfaction in deliberating hard and for long hours.
7. I only think as hard as I have to.
8. I prefer to think about small, daily projects to long-term ones.
9. I like tasks that require little thought once I have learned them.
10. The idea of relying on thought to make my way to the top appeals to me.
11. I really enjoy a task that involves coming up with new solutions to problems.
12. Learning new ways to think doesn't excite me very much.
13. I prefer my life to be filled with puzzles that I must solve.
14. The notion of thinking abstractly is appealing to me.
15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.
16. I feel relief rather than satisfaction after completing a task that required a lot of mental effort.
17. It's enough for me that something gets the job done: I don't care how or why it works.
18. I usually end up deliberating about issues even when they do not affect me personally.

Style of Processing

1. I enjoy doing work that requires the use of words.
2. There are some special times in my life that I like to relive by mentally "picturing" just how everything looked.
3. I can never seem to find the right word when I need it.
4. I do a lot of reading.
5. When I'm trying to learn something new, I'd rather watch a demonstration than read how to do it.
6. I think I often use words in the wrong way.
7. I enjoy learning new words.
8. I like to picture how I could fix up my apartment or a room if I could buy anything I wanted.
I often make written notes to myself.
9. I like to daydream.
10. I generally prefer to use a diagram rather than a written set of instructions.
I like to "doodle."
11. I find it helps to think in terms of mental pictures when doing many things.
12. After I meet someone for the first time, I can usually remember what they look like, but not much about them.
13. I like to think of synonyms for words.
14. When I have forgotten something I frequently try to form a mental "picture" to remember it.
15. I like learning new words.
16. I prefer to read instructions about how to do something rather than have someone show me.
17. I prefer activities that don't require a lot of reading.³³ I seldom daydream.
18. I spend very little time attempting to increase my vocabulary.
19. My thinking often consists of mental "pictures" or images.

Choices in the scale:

- always true usually true usually false always false

APPENDIX 3

SURVEYS

STUDY 1

FIRST SURVEY

Please enter your study id number

Imagine that you are standing in front of a vending machine and have the following 6 choices.

Which ones would you choose if you could pick up to 4 items?

Name	Price	Amount	No of Items	Shape	Calories	Total Carb.	Sodium	Total Fat	Trans Fat.	Description
A	\$1.00	2 oz.	4	Cookies	320	34 g	110 mg	18 g	0 g	Chocolate flavored with a hint of mint
B	\$0.75	1.25 oz.	Lots	Chips	200	19 g	212 mg	13 g	0 g	Corn chips
C	\$1.00	1.76 oz.	1	Bar	200	23 g	125 mg	6 g	0 g	Chocolate flavored energy bar
D	\$0.75	1 oz.	Lots	Chips	120	21 g	200 mg	3.5 g	0 g	Flavored tortilla chips
E	\$0.50	2 oz.	Lots	Raisins	154	42 g	5 mg	0 g	0 g	Box of raisins
F	\$0.75	1.25 oz.	Lots	Sticks	200	19 g	363 mg	13 g	0 g	Crunchy cheese snacks

A B C D E F

SECOND SURVEY

1) Please enter your study id number

2) Please enter your age

3) I found the process of deciding which product to buy frustrating.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

4) Several good options were available for me to choose among.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

5) How satisfied or dissatisfied are you with your experience of deciding which product option to choose?

1 extremely satisfied 2 3 4 5 6 7 8 9 10 extremely dissatisfied

6) I thought the choice selection was good.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

7) I would be happy to choose from the same set of product options on my next purchase occasion.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

8) I found the process of deciding which product to buy interesting.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

STUDY 2

FIRST SURVEY (INDIVIDUAL DIFFERENCES MEASURES)

1) Please enter your study code.

2) What is your age?

3) I enjoy doing work that requires the use of words.

- always true usually true usually false always false

4) There are some special times in my life that I like to relive by mentally "picturing" just how everything looked.

- always true usually true usually false always false

5) I can never seem to find the right word when I need it.

- always true usually true usually false always false

6) I do a lot of reading.

- always true usually true usually false always false

7) When I'm trying to learn something new, I'd rather watch a demonstration than read how to do it.

- always true usually true usually false always false

8) I think I often use words in the wrong way.

- always true usually true usually false always false

9) I enjoy learning new words.

- always true usually true usually false always false

10) I like to picture how I could fix up my apartment or a room if I could buy anything I wanted.

- always true usually true usually false always false

11) I often make written notes to myself.

- always true usually true usually false always false

12) I like to daydream.

- always true usually true usually false always false

13) I generally prefer to use a diagram rather than a written set of instructions.

- always true usually true usually false always false

14) I like to "doodle".

- always true usually true usually false always false

15) I find it helps to think in terms of mental pictures when doing many things.

- always true usually true usually false always false

16) After I meet someone for the first time, I can usually remember what they look like, but not much about them.

always true usually true usually false always false

17) I like to think of synonyms for words.

always true usually true usually false always false

18) When I have forgotten something I frequently try to form a mental "picture" to remember it.

always true usually true usually false always false

19) I like learning new words.

always true usually true usually false always false

20) I prefer to read instructions about how to do something rather than have someone show me.

always true usually true usually false always false

21) I prefer activities that don't require a lot of reading.

always true usually true usually false always false

22) I seldom daydream.

always true usually true usually false always false

23) I spend very little time attempting to increase my vocabulary.

always true usually true usually false always false

24) My thinking often consists of mental "pictures" or images.

always true usually true usually false always false

25) I would prefer complex to simple problems.

1 strongly disagree 2 3 4 5 strongly agree

26) I like to have the responsibility of handling a situation that requires a lot of thinking.

1 strongly disagree 2 3 4 5 strongly agree

27) Thinking is not my idea of fun.

1 strongly disagree 2 3 4 5 strongly agree

28) I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.

1 strongly disagree 2 3 4 5 strongly agree

29) I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.

1 strongly disagree 2 3 4 5 strongly agree

30) I find satisfaction in deliberating hard and for long hours.

1 strongly disagree 2 3 4 5 strongly agree

31) I only think as hard as I have to.

1 strongly disagree 2 3 4 5 strongly agree

32) I prefer to think about small, daily projects to long-term ones.

1 strongly disagree 2 3 4 5 strongly agree

33) I like tasks that require little thought once I have learned them.

1 strongly disagree 2 3 4 5 strongly agree

34) The idea of relying on thought to make my way to the top appeals to me.

1 strongly disagree 2 3 4 5 strongly agree

35) I really enjoy a task that involves coming up with new solutions to problems.

1 strongly disagree 2 3 4 5 strongly agree

36) Learning new ways to think doesn't excite me very much.

1 strongly disagree 2 3 4 5 strongly agree

37) I prefer my life to be filled with puzzles that I must solve.

1 strongly disagree 2 3 4 5 strongly agree

38) The notion of thinking abstractly is appealing to me.

1 strongly disagree 2 3 4 5 strongly agree

39) I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.

1 strongly disagree 2 3 4 5 strongly agree

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

1 strongly disagree 2 3 4 5 strongly agree

41) It's enough for me that something gets the job done: I don't care how or why it works.

1 strongly disagree 2 3 4 5 strongly agree

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

1 strongly disagree 2 3 4 5 strongly agree

SECOND SURVEY (PRE-CHOICE)

1) Please enter your study code

2) Imagine that you are standing in front of a vending machine and have the following 6 choices.

Name	Amount	No of Items	Shape	Calories	Total Carb.	Sodium	Total Fat	Trans Fat.	Description
A	2 oz.	4	Cookies	320	34 g	110 mg	18 g	0 g	Chocolate flavored with a hint of mint
B	1.25 oz.	Lots	Chips	200	19 g	212 mg	13 g	0 g	Corn chips
C	1.76 oz.	1	Bar	200	23 g	125 mg	6 g	0 g	Chocolate flavored energy bar
D	1 oz.	Lots	Chips	120	21 g	200 mg	3.5 g	0 g	Flavored tortilla chips
E	2 oz.	Lots	Raisins	154	42 g	5 mg	0 g	0 g	Box of raisins
F	1.25 oz.	Lots	Sticks	200	19 g	363 mg	13 g	0 g	Crunchy cheese snacks

Thinking of the choice set above, please answer the following questions.

3) I would find the process of deciding which product to buy frustrating.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

4) Several good options are available for me to choose among.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

5) If I had to choose, how satisfied or dissatisfied would I be with my experience of deciding which product option to choose?

1 extremely satisfied 2 3 4 5 6 7 8 9 10 extremely dissatisfied

6) I think the choice selection is good.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

7) I would be happy to choose from the same set of product options on my next purchase occasion.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

8) I found the process of deciding which product to buy interesting.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

Please select the response that best fits your assessment of the choice set presented to you above (7 questions follow)

9)

1 not complex 2 3 4 5 6 7 complex

10)

1 not dense 2 3 4 5 6 7 dense

11)

1 not crowded 2 3 4 5 6 7 crowded

12)

1 no variety 2 3 4 5 6 7 lots of variety

13)

1 inefficient 2 3 4 5 6 7 efficient

14)

1 not overwhelming 2 3 4 5 6 7 overwhelming

15)

1 simple 2 3 4 5 6 7 complicated

16) Overall, what are your feelings about this choice set?

17) What is your gender?

female male

18) What is your age?

For the following 3 questions, please describe how important snack foods are to you.

19)

1 nonessential 2 3 4 5 6 7 essential

20)

1 not beneficial 2 3 4 5 6 7 beneficial

21)

1 not needed 2 3 4 5 6 7 needed

THIRD SURVEY (POST-CHOICE)

1) Please enter your study code

2) Please enter your age

Imagine that you are standing in front of a vending machine and have the following 6 options for snacks. Now please choose one of the snacks.

Name	Amount	No of Items	Shape	Calories	Total Carb.	Sodium	Total Fat	Trans Fat.	Description
A	2 oz.	4	Cookies	320	34 g	110 mg	18 g	0 g	Chocolate flavored with a hint of mint
B	1.25 oz.	Lots	Chips	200	19 g	212 mg	13 g	0 g	Corn chips
C	1.76 oz.	1	Bar	200	23 g	125 mg	6 g	0 g	Chocolate flavored energy bar
D	1 oz.	Lots	Chips	120	21 g	200 mg	3.5 g	0 g	Flavored tortilla chips
E	2 oz.	Lots	Raisins	154	42 g	5 mg	0 g	0 g	Box of raisins
F	1.25 oz.	Lots	Sticks	200	19 g	363 mg	13 g	0 g	Crunchy cheese snacks

A B C D E F

Now that you have made your decision, please answer the following questions with regards to your decision.

3) I found the process of deciding which product to buy frustrating.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

4) Several good options were available for me to choose among.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

5) How satisfied or dissatisfied are you with your experience of deciding which product option to choose?

1 extremely satisfied 2 3 4 5 6 7 8 9 10

6) I thought the choice selection was good.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

7) I would be happy to choose from the same set of product options on my next purchase occasion.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

8) I found the process of deciding which product to buy interesting.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

How difficult was the decision? (2 questions follow)

9)

1 not at all difficult 2 3 4 5 6 7 very difficult

10)

1 not at all easy 2 3 4 5 6 7 very easy

11) If you had to take the choices presented above and put them into sets of products, how many sets would you put them into?

12) Briefly describe how you would break these products into sets.

For the following 7 questions, please rate your opinion of the purchase choice task you just completed. In making your choice task, were you:

13)

1 dissatisfied 2 3 4 5 6 7 satisfied

14)

1 displeased 2 3 4 5 6 7 pleased

15)

1 unfavorable 2 3 4 5 6 7 favorable

16)

1 unpleasant 2 3 4 5 6 7 pleasant

17)

1 I didn't like it at all 2 3 4 5 6 7 I liked it very much

18)

1 frustrated 2 3 4 5 6 7 contented

19)

1 terrible 2 3 4 5 6 7 delighted

For the following 3 questions, please rate the confidence you have in your completion of the choice task you just completed:

20)

1 uncertain 2 3 4 5 6 7 certain

21)

1 not sure 2 3 4 5 6 7 sure

22)

1 not confident 2 3 4 5 6 7 confident

For the following questions, please briefly list as many reasons as you would like (up to 6) for why you chose the product you chose above (leave blank if you have none).

23) Reason 1

24) Reason 2

25) Reason 3

26) Reason 4

27) Reason 5

28) Reason 6

STUDY 3

FIRST SURVEY (INDIVIDUAL DIFFERENCES MEASURES)

PART 1 of Comparison Study: General Questions

1) What is your age?

2) What is your Study ID number?

3) I enjoy doing work that requires the use of words.

- always true usually true usually false always false

4) There are some special times in my life that I like to relive by mentally "picturing" just how everything looked.

- always true usually true usually false always false

5) I can never seem to find the right word when I need it.

- always true usually true usually false always false

6) I do a lot of reading.

- always true usually true usually false always false

7) When I'm trying to learn something new, I'd rather watch a demonstration than read how to do it.

- always true usually true usually false always false

8) I think I often use words in the wrong way.

- always true usually true usually false always false

9) I enjoy learning new words.

- always true usually true usually false always false

10) I like to picture how I could fix up my apartment or a room if I could buy anything I wanted.

- always true usually true usually false always false

11) I often make written notes to myself.

- always true usually true usually false always false

12) I like to daydream.

- always true usually true usually false always false

13) I generally prefer to use a diagram rather than a written set of instructions.

always true usually true usually false always false

14) I like to "doodle".

always true usually true usually false always false

15) I find it helps to think in terms of mental pictures when doing many things.

always true usually true usually false always false

16) After I meet someone for the first time, I can usually remember what they look like, but not much about them.

always true usually true usually false always false

17) I like to think of synonyms for words.

always true usually true usually false always false

18) When I have forgotten something I frequently try to form a mental "picture" to remember it.

always true usually true usually false always false

19) I like learning new words.

always true usually true usually false always false

20) I prefer to read instructions about how to do something rather than have someone show me.

always true usually true usually false always false

21) I prefer activities that don't require a lot of reading.

always true usually true usually false always false

22) I seldom daydream.

always true usually true usually false always false

23) I spend very little time attempting to increase my vocabulary.

always true usually true usually false always false

24) My thinking often consists of mental "pictures" or images.

always true usually true usually false always false

25) I would prefer complex to simple problems.

1 strongly disagree 2 3 4 5 strongly agree

26) I like to have the responsibility of handling a situation that requires a lot of thinking.

1 strongly disagree 2 3 4 5 strongly agree

27) **Thinking is not my idea of fun.**

1 strongly disagree 2 3 4 5 strongly agree

28) **I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.**

1 strongly disagree 2 3 4 5 strongly agree

29) **I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.**

1 strongly disagree 2 3 4 5 strongly agree

30) **I find satisfaction in deliberating hard and for long hours.**

1 strongly disagree 2 3 4 5 strongly agree

31) **I only think as hard as I have to.**

1 strongly disagree 2 3 4 5 strongly agree

32) **I prefer to think about small, daily projects to long-term ones.**

1 strongly disagree 2 3 4 5 strongly agree

33) **I like tasks that require little thought once I have learned them.**

1 strongly disagree 2 3 4 5 strongly agree

34) **The idea of relying on thought to make my way to the top appeals to me.**

1 strongly disagree 2 3 4 5 strongly agree

35) **I really enjoy a task that involves coming up with new solutions to problems.**

1 strongly disagree 2 3 4 5 strongly agree

36) **Learning new ways to think doesn't excite me very much.**

1 strongly disagree 2 3 4 5 strongly agree

37) **I prefer my life to be filled with puzzles that I must solve.**

1 strongly disagree 2 3 4 5 strongly agree

38) **The notion of thinking abstractly is appealing to me.**

1 strongly disagree 2 3 4 5 strongly agree

39) **I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.**

1 strongly disagree 2 3 4 5 strongly agree

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

1 strongly disagree 2 3 4 5 strongly agree

41) It's enough for me that something gets the job done: I don't care how or why it works.

1 strongly disagree 2 3 4 5 strongly agree

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

1 strongly disagree 2 3 4 5 strongly agree

For the following three questions, please describe how difficult it is for you to buy vending machine snack foods:

43)

1 It is not annoying to make an unsuitable purchase

2

3

4

5

6

7 It is really annoying to make an unsuitable purchase

44)

1 A poor choice would not be upsetting

2

3

4

5

6

7 A poor choice would be upsetting

45)

1 Little to lose by choosing poorly

2

3

4

5

6

7 A lot to lose by choosing poorly

46) I like to try different things.

1 strongly disagree 2 3 4 5 6 7 strongly agree

47) I like a great deal of variety.

1 strongly disagree 2 3 4 5 6 7 strongly agree

48) I like new and different styles.

1 strongly disagree 2 3 4 5 6 7 strongly agree

For the next three questions, answer questions regarding purchasing vending machine snack foods:

49) I have a lot of experience with vending machine snack foods.

1 strongly disagree 2 3 4 5 6 7 strongly agree

50) As compared to the average person, I would say that I am highly knowledgeable about vending machine snack foods.

1 strongly disagree 2 3 4 5 6 7 strongly agree

51) I would describe myself as being very familiar with vending machine snack foods.

1 strongly disagree 2 3 4 5 6 7 strongly agree

52) I am too busy to relax.

1 strongly disagree 2 3 4 5 6 7 strongly agree

53) I am often juggling my time between too many things.

1 strongly disagree 2 3 4 5 6 7 strongly agree

54) "So much to do, so little time;" this saying applies very well to me.

1 strongly disagree 2 3 4 5 6 7 strongly agree

55) How familiar do you think people in general are with purchasing vending machine snack foods?

1 not at all familiar 2 3 4 5 6 7 8 9 very familiar

56) How familiar are you with purchasing vending machine snack foods?

1 not at all familiar 2 3 4 5 6 7 8 9 very familiar

57) How frequently have you seen or heard of vending machine snack foods being purchased?

1 not at all frequently 2 3 4 5 6 7 8 9 very frequently

58) In general, I have a strong interest in vending machine snack foods.

1 strongly disagree 2 3 4 5 6 7 strongly agree

59) Vending machine snack foods are very important to me.

1 strongly disagree 2 3 4 5 6 7 strongly agree

60) Vending machine snack foods matter a lot to me.

1 strongly disagree 2 3 4 5 6 7 strongly agree

61) I get bored when other people talk about vending machine snack foods.

1 strongly disagree 2 3 4 5 6 7 strongly agree

SECOND SURVEY

You will be asked to answer a number of questions, some of which might seem quite similar to others. Please work through the questionnaire to provide honest and complete answers to all sections. There are no “right” or “wrong” answers, and your responses are completely confidential. We appreciate your participation.

1) Please enter your name

2) Please enter your study id number

Imagine that you are standing in front of a vending machine with the following 12 options for snacks.

Please choose the tastiest and most desirable product from the choice set. Alternatively, you can choose at a later time by clicking the "choose later" option.

Name	Amount	No of Items	Shape	Calories	Total Carb.	Sodium	Total Fat	Trans Fat.	Description
A	2 oz.	Lots	Chips	320	30 g	340 mg	21 g	0 g	Corn chips
B	2 oz.	Lots	Chips	280	42 g	360 mg	16 g	0 g	Tortilla chips
C	2 oz.	Lots	Chips	300	30 g	360 mg	20 g	0 g	Potato chips
D	2 oz.	Lots	Chips	300	36 g	340 mg	16 g	0 g	Kettle cooked potato chips
E	2 oz.	Lots	Chips	300	30 g	360 mg	20 g	0 g	Wavy potato chips
F	2 oz.	Lots	Chips	320	30 g	340 mg	20 g	0 g	Potato crisps
G	2 oz.	4	Cookies	320	34 g	115 mg	18 g	0 g	Chocolate flavored with a hint of mint
H	2 oz.	4	Cookies	300	34 g	115 mg	16 g	0 g	Peanut butter with chocolate cover
I	2 oz.	4	Cookies	270	38 g	105 mg	15 g	2 g	Chewy chocolate chip
J	2 oz.	Lots	Cookies	310	45 g	110 mg	13 g	2.5 g	Vanilla mini cookies
K	2 oz.	2	Cookies	360	60 g	115 mg	12 g	0	Large oatmeal raisin
L	2 oz.	2	Cookies	350	53 g	115 mg	14 g	2.5 g	Large fudge chocolate chip

A B C D E F G H I J K L

Choose Later

Now that you have made your decision, please answer the following questions with regards to your decision.

3) I found the process of deciding which product to buy frustrating.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

4) Several good options were available for me to choose among.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

5) How satisfied or dissatisfied are you with your experience of deciding which product option to choose?

1 extremely satisfied 2 3 4 5 6 7 8 9 10 extremely dissatisfied

6) I thought the choice selection was good.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

7) I would be happy to choose from the same set of product options on my next purchase occasion.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

8) I found the process of deciding which product to buy interesting.

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

How difficult was the decision? (2 questions follow)

9)

1 not at all difficult 2 3 4 5 6 7 8 9 10 very difficult

10)

1 not at all easy 2 3 4 5 6 7 8 9 10 very easy

11) If you had to take the choices presented above and put them into sets of products, how many sets would you put them into?

12) Briefly describe how you would break these products into sets.

For the following 7 questions, please rate your opinion of the purchase choice task you just completed. In making your choice task, were you:

13)

1 dissatisfied 2 3 4 5 6 7 satisfied

14)

1 displeased 2 3 4 5 6 7 pleased

15)

1 unfavorable 2 3 4 5 6 7 favorable

16)

1 unpleasant 2 3 4 5 6 7 pleasant

17)

1 I didn't like it at all 2 3 4 5 6 7 I liked it very much

18)

1 frustrated 2 3 4 5 6 7 contented

19)

1 terrible 2 3 4 5 6 7 delighted

For the following 3 questions, please rate the confidence you have in your completion of the choice task you just completed:

20)

1 uncertain 2 3 4 5 6 7 certain

21)

1 not sure 2 3 4 5 6 7 sure

22)

1 not confident 2 3 4 5 6 7 confident

For the following questions, please briefly list as many reasons as you would like (up to 6) for why you chose the product you chose above (leave blank if you have none).

23) Reason 1

24) Reason 2

25) Reason 3

26) Reason 4

27) Reason 5

28) Reason 6

29) This assortment of snacks gave me a lot of variety for me to enjoy

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

30) This assortment of snacks gives me at least one type I like

1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

31) This assortment of snacks offers more ways to enjoy it

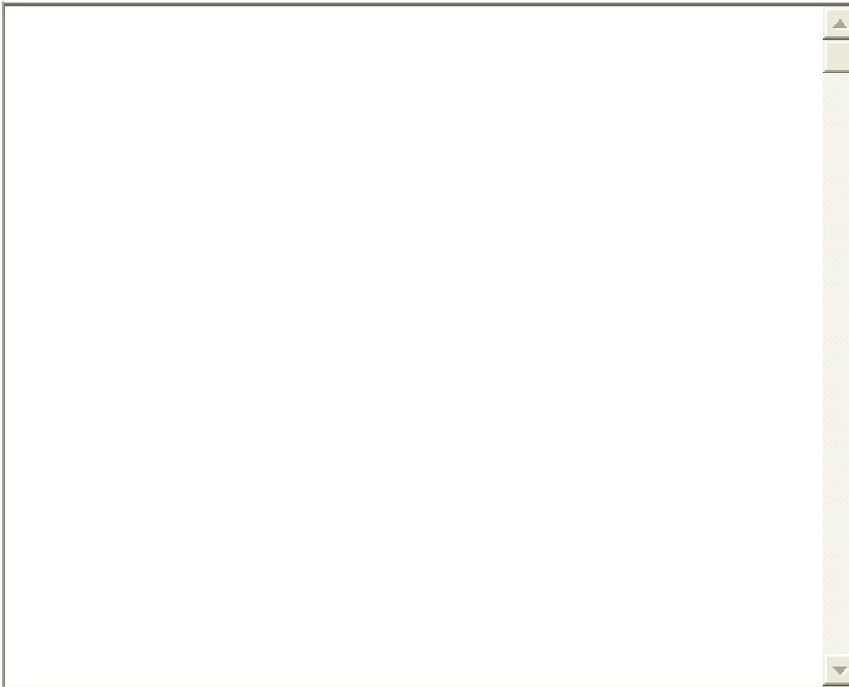
1 strongly agree 2 3 4 5 6 7 8 9 10 strongly disagree

32) How much variety do you think there is in this assortment?

1 lots of variety 2 3 4 5 6 7 8 9 10 no variety

33) Please enter your major:

You just selected 1 item from the vending machine set shown to you. Please briefly discuss your feelings about the set of choices you were presented with.



That is all of the questions for this questionnaire. Thank you so much for your participation.

APPENDIX 4

SAMPLE FEELINGS COMMENTS FOR ACTUAL CHOICE ASPECT, VARIETY ASPECT, AND OPPOSITIONAL ASPECT OF CHOICE

Table 27: SAMPLE FEELINGS COMMENTS WHICH DISCUSS THE *ACTUAL CHOICE ASPECT* OF THE CHOICE SET OR DECISION MADE

<i>CONDITION</i>		<i>Feelings Expressed: Actual Choice Aspect</i>
Consumption	Dich	“I didn’t mind them but I also didn’t find one that truly jumped out at me. I don’t eat cookies often and the only flavored kind of chip I like is BBQ so kettle cooked was the best option. I also don’t eat chips or buy from vending machines often so this decision did not strike me as overly important and stressful. I do have cravings for certain chips sometimes and in this case if BBQ had been there I would have bought them without a question. there was variety but not my kind of taste. “
		“Unless the cookies were homemade, which they couldn't be, I wouldn't buy any of them. The flavor of potato chips would decide my choice more than the way they were cooked.”
Consumption	Nondich	“The one I choose sounds a lot like a Twix bar, which I love. Right now, I am kind of in a chocolate mood, most of the time I feel like chips however. Choice K probably would have been my choice on most days.”
		“Overall I was happy with my choices. I found at least one item that I would actually enjoy. The item I chose is what I would prefer if I could choose anything most likely.”
Process	Nondich	“I chose what I did because you don’t see those chips in too many places. But all the other choices you see in every vending machine. With a vending machine I don’t think people sit there and think too long about what they want, rather they make an impulse buy, like I did.”
		“I thought that while overall the selection was pretty good, however it was quite vague. For instance some people prefer snickers to milky way candy bars. Both would fall into the chocolate bar with caramel category, so there in lies a flaw I think. People are far to committed to brand loyalty, even when it comes to vending machine fare.”
Criterion	Dich	“I did not like the set of choices I was presented with because they seemed to plain. They were not associated with anything I was familiar with (brand name). Tortilla chips seemed to be too bland, and not to my liking, if they were doritos and a specific flavor, I may have chosen differently. However, my choice for oatmeal raisin was because I was familiar with the product, it is something I have had before and perhaps the most straightforward description.”
		“The options were very similar to those in a real vending machine. I found it easy to decide what i wanted to purchase, however at a different time of day in a different setting i might have chosen differently.”

Table 28: SAMPLE FEELINGS COMMENTS WHICH DISCUSS THE *VARIETY ASPECT* OF THE CHOICE SET OR DECISION MADE

CONDITION		<i>Feelings Expressed: Variety Aspect</i>
Consumption	Dich	“The set of choices was well rounded, offering multiple cookie flavors and a variety of chips to choose from. My decision came easy because I knew what I liked from previous experience.”
		“Generally, when I am faced with choosing a product from a vending machine there is a little more frustration in choosing between products. This, however, is not necessarily a good thing, for the only reason it was easier for me is because there was less variety and overall satisfying choices. Generally when i get something from a vending machine, I want either something sweet, or something different like cheetoahs. I personally would have preferred a mixture of candy bars, cheetoahs, oreo cookies, chewy choc. chip cookies, cheezits, reecy cups, etc. Basically, though it would be satisfying, chewy chocolate chip was chosen by default rather than complete satisfaction.”
Consumption	Nondich	“I believe that there should have been more variety in the chips. While there was variety in terms of texture, both options were baked. Both cookies and the candy bar, which make for a sugar treat, had chocolate. If the purchaser does not care for chocolate, as I do not, then those options are not attractive. There were no cakes, donuts, or honey buns, which are more enjoyable in the morning when I am thinking about breakfast. All the snacks appeared more like mid-day treats that I would have between a lunch and a dinner. Therefore, I wish there were more fruity candy options for when I want candy, better chip options for when I want to enjoy a shameless fatty snack, better breakfast options such as small cakes and donuts for when I want something more substantial as an actual substitute meal rather than snack, and perhaps a plain peanut butter cookie or sugar cookie that lacks chocolate. Last but not least, I don't feel like raisins are a very popular choice, throughout my life it has been rare that I should know someone who really likes raisins. Perhaps if there were some other sort of healthy snack in there as well, I'm not sure what, but I might want something healthy if it were more appealing than raisins.”
		“I thought there was somewhat of a variety. It was hard to decide between the baked chips.”
Process	Nondich	“I was presented with a wide variety of choices. Although many, it was not hard to choice for me because I usually buy the same thing from vending machine which are chips. Therefore, that narrowed my choices down. Also, when I buy from a vending machine I don't care for the health content because I usually purchase items during study time- narrowing my choices even further.”
		“There was a variety of choices to satisfy most anything that you were in the mood for. There was a choice of healthy, moderately healthy, and junk food, which it what most people are looking for in a vending machine.”
Criterion	Dich	“I felt like the choices offered a fair variety, however there could have been a wider variety where the products were more differentiated and offered more categories to choose from.”
		“Not much variety. Where are the pretzels, honeybuns, candy, sunchips, popcorn?”

Table 29: SAMPLE FEELINGS COMMENTS WHICH DISCUSS THE *OPPOSITION ASPECT* OF THE CHOICE SET OR DECISION MADE

<i>CONDITION</i>		<i>Feelings Expressed: Opposition Aspect</i>
Consumption	Dich	“Offers both sweet and salty, something for everyone.”
		“The choices basically gave me the options to choose between cookies and chips. In reality, when I snack I prefer something like crackers, pretzels, or fruit snacks. But I still was satisfied with the oatmeal cookie because it would probably taste good.”
		“I wasn't fond of any of the choices. I'm not much into salt or sugar. I only purchase sugar when I have a craving for it and I much rather prefer fruit items such as jolly ranchers and starburst if I get anything from a vending machine.”
Consumption	Nondich	“There wasn't a whole lot of selection. It was either chocolate, chips, or bar-like snacks. I love chocolate, somewhat like chips, and rather dislike bar-like snacks. I would rather have more of a choices other than just salty or sweet.”
Process	Nondich	“I think that pretty much anyone could find something they liked in that vending machine. There are healthy and unhealthy alternatives, light and heavy snacks as well.”
		“There was a wide range of snacks to choose from. There were also items for people that choose healthy snacks and also items that will hold you over until you get a meal. The snacks are all easy to eat on the go.”
Process	Dich	“I think that the choices were fairly diverse. There were no fruity snacks available, but there were salty and sweet choices. Overall, I think it was a good set to be able to choose from.”
Criterion	Nondich	“I thought about whether I was hungry or in the mood for a treat. If i wanted a treat, maybe after a test or long day of classes I would have gone with a candy bar or chocolate. If i was on the way to class though and needed something to munch on or stay awake (what i assumed for this) then I wanted something salty that had more than one so I could eat for a while. Raisins are sick, take them out of there.”
		“They offered good variety. Some were healthy, some were not. Some could satisfy hunger easier than others, while some could satisfy a particular craving.”
		“I thought there was a large range of items to choose from. The set provided enough salty vs. sweet options to choose from, as well as different varieties from each set. There were multiple types of chips, as well as multiple types of sweets.”
Criterion	Dich	“I think that there should have been a variety of options. Not all people like chips and cookies. there should have been fruit snacks and or candy bars. Other than that I thought that the vending machine was good as long as there is a drink one beside it.”
		“I like the variety. It has something for snack food people and something for bakery type people. There were a decent amount of snack foods for me to pick from. They had my favorite (corn chips). They go well with soda, which is probably in the vending machine right next to this one.”

APPENDIX 5

**INSTITUTIONAL REVIEW BOARD APPROVALS FOR
DISSERTATION: ORIGINAL PLUS TWO AMENDMENTS**



Institutional Review Board

Carmen Green
IRB Administrator
Research Compliance Office
1880 Pam Drive, Suite 2000A497, Blacksburg, VA 24061
Office: 540/231-4338, FAX: 540/231-0939
cmg@vt.edu

DATE: November 15, 2005

MEMORANDUM

TO: Kent Nakamoto Marketing 0236
Anjala Kristen 0236

FROM: Carmen Green *CG*

SUBJECT: **IRB Exempt Approval:** "The Choice Set Study 1" IRB # 05-696

I have reviewed your request to the IRB for exemption for the above referenced project. I concur that the research falls within the exempt status. Approval is granted effective as of November 10, 2005.

Virginia Tech has an approved Federal Wide Assurance (FWA00000572, exp. 7/2007) on file with OHRP, and its IRB Registration Number is IRB00000667.

cc: File

Department Reviewer: Edward H. Fern

DATE: August 30, 2006

MEMORANDUM

TO: Kent Nakamoto
Anjala Krishen

FROM: Carmen Green 

SUBJECT: IRB Amendment 1 Approval: "When Comparison Becomes Contrast: Choice in an Oppositional Framework", IRB # 05-896

This memo is regarding the above referenced protocol which was previously granted approval by the IRB on November 10, 2005. You subsequently requested permission to amend your IRB application. Approval has been granted for requested protocol amendment, effective as of August 29, 2006.

As an investigator of human subjects, your responsibilities include the following:

1. Report promptly proposed changes in previously approved human subject research activities to the IRB, including changes to your study forms, procedures and investigators, regardless of how minor. The proposed changes must not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the subjects.
2. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

cc: File
Department Reviewer: Edward F. Fern

Invent the Future

DATE: October 17, 2008

FWA00000573 expires 7/2007
IRB # is IRB00000857.

MEMORANDUM

TO: Kent Nakamoto
Anjala Krishen

FROM: Carmen Green 

SUBJECT: IRB Amendment 2 Approval: "When Comparison Becomes Contrast: Choice in an Oppositional Framework", IRB # 05-898

This memo is regarding the above referenced protocol which was previously granted approval by the IRB on November 10, 2005. You subsequently requested permission to amend your IRB application. Approval has been granted for requested protocol amendment, effective as of October 17, 2008.

As an investigator of human subjects, your responsibilities include the following:

1. Report promptly proposed changes in previously approved human subject research activities to the IRB, including changes to your study forms, procedures and investigators, regardless of how minor. The proposed changes must not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the subjects.
2. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

cc: File

Department Reviewer: Edward F. Fern

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APPENDIX 6

ANJALA KRISHEN: VITA

Anjala Krishen graduated from Rice University in 1990 with a B.S. in Electrical Engineering and the coursework required for a B.A. in Anthropology. From 1990 to 2003 (13 years), she worked full-time in Information Technology positions, while also completing her MBA part-time in 1996. Following her MBA, she moved into the upper management of several organizations. In 2003, she decided to return to higher education full-time, and embarked on her M.S. and Ph.D. in Marketing at Virginia Tech under the guidance of Dr. Kent Nakamoto. She was recently selected as the recipient of the 2007 Pamplin College Graduate Teaching award.