THE INFLUENCE OF PREVIOUS DECISION ON SUBSEQUENT DECISION

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I dedicate this dissertation to my parents, Byungsoo Kim and Okhyung Lee.

ABSTRACT

We often make decisions repeatedly. In these repeated-decision situations, consumers' prior knowledge and experiences based on consumption have been assumed to influence their current choice processes and outcomes. However, the research literature is currently silent as to how the influence of prior decision processes or outcomes operates in making subsequent decisions. To fill this gap, this dissertation investigates the impact of previous decisions on subsequent ones.

We propose that the decision structure of an initial decision can differentially affect a subsequent one. Specifically, we compare the impact of trade-off- (i.e., the decision when no option is superior to the other option among all attributes) versus dominance-related initial decisions (i.e., the decision when one option is superior to and at least not inferior to the other option among all attributes). Based on the different research streams, we suggest competing predictions regarding the role of previous decision structure on subsequent choices. One stream of research from resource- or effort-based explanations (e.g., effort-as-information and resource availability) suggests that the tendency to keep a previous choice will be stronger in the trade-off versus the dominance condition. On the other hand, the other research stream from non-resource- or non-effort-based explanations (e.g., justification and regret/negative emotional research) suggests the opposite prediction (i.e., the tendency to keep a previous choice will be stronger in the dominance versus the trade-off condition).

In six studies, we found empirical evidence for the impact of previous decisions on subsequent ones. We mainly found that people who made an initial trade-off decision (vs. those who made a dominance decision) were more likely to stick to their previously chosen alternative. In addition, the empirical studies supported the notion that the underlying mechanism of this pattern was due to the "resource availability" mechanism rather than the "effort-as-information: previous effort spending as a source of information for judgment" mechanism.

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Chapter I. INTRODUCTION

1.1 Statement of Problem and Research Objective

There is no denying that the choices we make are oftentimes made repeatedly. For example, even though the golf season is limited to 7-8 months in Minnesota because of its long winter season, an individual named John Furin chooses to play 503 rounds of golf in 2005. Scanner panel data also show that our own choices are made repeatedly. As another example, each household from Kansas City buys an average of 9.6 pounds of coffee during each 32-week period (Guadagni and Little 1983), and each household from the Midwest market buys an average of 12.0 sticks of butter and an average of 13.5 bottles of liquid detergent during each 48-week period (Zhang and Krishnamurthi 2004).

In these repeated choice situations, how do decision-makers choose one option (e.g., a golf course, a brand of ground coffee, or a brand of butter)? Previous research has suggested that consumers' prior knowledge and experiences based on consumption are assumed to influence their current choice processes and outcomes (e.g., Alba and Hutchinson 1987; Bettman and Park 1980). However, the literature is currently silent as to how the influence of prior decision processes or outcomes operates in making subsequent decisions. To fill this gap, this research will investigate the impact of previous decisions on subsequent ones. We expect experiences associated with previous decisions to systematically influence later ones.

The above examples illustrate the basic research question investigated in this paper: How can previous choices affect subsequent judgments or choices? This research question is quite important, as decisions are rarely made in isolation from previous choices, as in the above examples.

1.2 Overview of Conceptualization

The research question of this paper is the impact of previous decisions on subsequent ones. We propose that the decision structure of an initial decision can differentially affect a subsequent one. Specifically, we will compare the impact of trade-off- vs.

dominance- related decisions. We mainly argue that decisions involving trade-off and dominance are different in terms of the effort expended. Simply put, trade-off-related decisions require more effort in making decisions, compared to dominance-related decisions. Furthermore, we also propose that people with depleted resources (vs. those who have not depleted them) in an initial decision are more likely to stick to their previously chosen alternative when they have an opportunity to switch to another alternative. Consequently, we predict that in repeated-decisions situations, initial decision structures systematically influence one's tendency to retain a previously chosen alternative.

In addition, we expect the above expectation to be mediated by two possible mechanisms. The first mechanism involves "effort-as-information: previous effort spending as a source of information for judgment" in subsequent decisions. Put differently, we argue that under repeated-decision situations, people have a tendency to make decisions by using the previous effort spending as a source of information. Therefore, people who make a trade-off- vs. a dominance-related decision in an initial decision will not move onto other alternatives. The other mechanism concerns "resource availability." We argue that after depleting their resources in initial decisions, people will use simple decision heuristics in making subsequent decisions. Therefore, we also expect that people who make a trade-off- vs. a dominance-related decision in an initial decision will tend to stick to the previously chosen alternative in the subsequent decision. These two explanations have similar assumptions regarding the different resources spent from trade-off and dominance decisions. However, the manner of resource expending is unique in each case. In this paper, we also propose the time interval between two decisions as a theoretical and empirical method to separate these two mechanisms.

Furthermore, we suggest a study to test the assumption of resources (i.e., *decisions involving trade-offs require decision-makers to expend many more resources than those involving dominance),* in terms of whether or not people with depleted resources (vs. those who have not depleted them) in an initial decision are likely to stick

to a previously chosen alternative. We expect these additional studies to fortify our theoretical argument.

1.3 Significance of Research

This research will investigate the impact of previous choices on subsequent ones. The issue of investigating choice in repeated situations is important from a theoretical perspective for four reasons. First, the current research can provide a comprehensive and integrated perspective on how people make decisions or how they choose one option. We can further understand an individual's decision-making by incorporating the impact of previous choice. Put differently, we can increase our understanding and our prediction of an individual's decision-making from what we currently understand. Second, this research may provide a new perspective concerning the role of decision-making in consumer behavior. The current research on consumer behavior usually regards choice as a dependent variable and attempts to find significant independent variables or moderating variables toward the choice variable (e.g., the dependent variable). If we investigate this choice variable as an independent variable in repeated-choice situations, we can further extend our understanding of decision-making in the consumer behavior literature. Third, by incorporating previous decisions, this research can extend the decision-making literature in terms of the time perspective. This extension of the time perspective is different from intertemporal choice[1]. Finally, this research finding can be extended to the quantitative approach of marketing. Specifically, to the best of our knowledge, there is no empirical paper analyzing scanner panel data which incorporates previous decision experiences. As a result, our research can provide a theoretical framework for this issue.

In sum, theoretically, an investigation regarding the impact of previous choices on subsequent ones can enhance our understanding of decision-making. Along the same lines, Hastie (2001) suggests in a critical review of decision-making that it is useful to know how a previous choice influences a subsequent one; by knowing this information,

[1] For details on the distinction between the current research and intertemporal research, please refer to Section 2.3.

we can develop a theory that provides us with an integrated account of one-shot decisions and sequences of linked decisions.

From a managerial and a practical standpoint, this research is important. First, practically, most consumer behavior or decision-making is based on repeated decisions (Bagozzi 1981; Betsch, Fiedler, and Brinkmann 1998; Betsch, Haberstroh, Glockner, Haar, and Fiedler 2001; Betsch and Haberstroh 2005; Bentler and Speckart 1979; Norman and Smith 1995; Verplanken, Aarts, and Van Knippenberg 1997). For example, as consumers, people typically purchase both non-durable goods and durable ones repeatedly. In these repeated buying situations, previous decisions can systematically influence later ones. Second, this research can provide managerial implications for marketing activities, including price management, product positioning, and sales promotions. With typical marketing tools, marketing managers can easily influence consumers' decision experiences. These different experiences can then affect subsequent choices. Therefore, this research can provide strategic implications for marketing managers.

1.4 Chapter Summary and Overview of Forthcoming Chapters

This chapter introduces the phenomenon related to the research question of this paper: how do previous choices affect subsequent judgments or choices? Specifically, we will investigate the impact of the decision structure (i.e., trade-off vs. dominance) of an initial decision on a subsequent one. It is proposed that people who make a trade-off- vs. a dominance-related decision will tend to stick to a previously chosen alternative in a subsequent decision.

The remainder of this proposal is organized as follows. Chapter II will first review the traditional economic model of individual decision-making. It then will examine the existing literature on repeated choice in decision-making and social psychology, including the influence of various prior factors on subsequent choices, and the impact of previous ownership (i.e., the endowment effect and the status quo effect).

Next, we will review trade-offs and people's reactions to them, people's attitudes toward decision-making, and decision-related costs. At the end of this chapter, we will suggest the need to investigate our research question.

Chapter III will present falsifiable propositions derived from the literature review. First, we will suggest the main effect of the impact of the decision structure on a subsequent one. Next, we will suggest a situation in which we can separate the two underlying mechanisms.

Chapter IV will introduce the testable hypotheses and the methodology used in order to test these hypotheses. Specifically, this chapter will describe the pretests and will suggest further proposed studies.

Chapter V will report the data collection and analyses for the six main studies in detail. Chapter VI will summarize the all empirical studies and discuss the theoretical and managerial implications of the current studies. It will conclude with limitations of the current research and suggest for future research.

Chapter II. REVIEW OF LITERATURE

2.1 Overview

2.1.1 Introduction

While the ultimate goal of this paper is to investigate the impact of previous choices on subsequent ones, we begin with a set of more fundamental questions: (i) What is the traditional model of decision-making? (ii) What is the status of the current research regarding repeated choice?/What is the framework of the impact of prior choices on subsequent ones? and (iii) How do people solve decision-making problems?/ How does solving decision-making problems influence subsequent choices? In order to answer these questions, it is necessary to gain an understanding of how people make decisions in isolated as well as in repeated situations. Toward this end, this paper will critically examine the literature addressing the impact of previous decision-making on subsequent choices.

2.1.2 Overview of forthcoming sections

In order to understand the impact of previous choices on subsequent ones, we will review three important research streams: (i) the traditional economic model of individual decision-making; (ii) repeated choice in the decision-making and social psychology literature; and (iii) general decision-making.

(i) The traditional economic model of individual decision-making: In the first part, we will briefly review the traditional economic model of individual decision-making, including the assumptions of this model. We will then look at the research regarding the violations of these traditional assumptions. The purpose of this part is to skim through the history of individual decision-making in order to the check the status of the current research in decision-making. This review will be addressed in Section 2.2.

(ii) Repeated choice in the decision-making and social psychology literature: The second part of this review pertains to the phenomenon of repeated choice in the

decision-making and social psychology literature. The basic goal of this part is to review the status of the current research regarding repeated choice, describing the influence of various prior factors on subsequent choices in the decision-making and social psychology literature. This review will be addressed in Section 2.3. Specifically, we will review various factors, including previous goals, habitual choice, previous priming, previous ownership, previous preference, and choice bracketing. However, the current literature in this area does not provide a rigorous theoretical explanation for how prior choices (and *not* other external factors) influence subsequent ones. In order to answer the "how" question, we must break "choice" down into two parts: "choice processes" and "choice outcomes." This breakdown is critical in order to understand the role of the impact of previous choice. Specifically, we will review the process and outcome research in decision-making and social psychology. Next we will provide an overall framework for repeated-choice contexts, based on the distinction between choice processes and outcomes. We will then review the prior literature regarding repeated choice, based on the overall framework. Throughout this review, we will again evaluate the status of the current research. This review will be addressed in Section 2.4.

Additionally, we will address previous ownership separately in Section 2.5, as it is closely related to the above-mentioned "how" research question and has attracted considerable research attention. This review is helpful for understanding the impact of previous ownership on subsequent choices.

(iii) General decision-making: The final part of this review will focus on general decision-making. The basic goal is to provide an overview of individual decision-making in order to gain a better understanding of repeated-choice contexts. To achieve this goal, we must first review trade-offs and conflicts, as they are an essential part of decision-making. Specifically, we will review the definition and different types of conflicts or trade-offs. We will then examine how people react to or solve these trade-offs. The review concerning trade-offs and the reactions to these trade-offs yields a basic understanding of individual decision-making and provides a building block for predicting repeated decision-making. This review will be addressed in Section 2.6.

The ways in which people make decisions can be influenced by many factors. One important factor is one's attitude toward decision-making itself. The same decisions or the same trade-offs can be solved differently, based on people's attitudes toward making decisions. The basic goal of this part is to examine different attitudes toward making decisions. Specifically, we will review the positive preference for choice and its underlying mechanisms, as well as the opposite phenomenon: the tendency to avoid choice. We will then review the research of the moderators involved in attitudes toward making decisions. The review of this area yields a basic understanding of the role of decision attitudes in repeated-choice situations. This review will be addressed in Section 2.7.

Finally, we will focus on the cost of decision-making, as it is a critical factor that can determine people's attitudes toward making decisions. In this review, we will suggest three important decision-related costs: (i) cognitive costs; (ii) emotional costs; and (iii) self-regulation costs. This review will be addressed in Section 2.8.

[Table 2.1.1 about Here]

2.2 Review of the Traditional Economic Model of Individual Decision-Making

2.2.1 Traditional Economic Model

In this section, we will review the economic model of decision-making. The traditional model of individual decision-making is based on the *Expected Value* (EV) theory. EV theory assumes that decision-makers rationally choose the option with the highest expected value (EV). If an option is a risky gamble, EV can be defined as:

$$EV = \sum_{i=1}^{n} p_i x_i \qquad \text{(Equation 2.2.1)}$$

where, p_i = the probability for each outcome (i = 1, 2,…, n) of an option, and

x_i = the amount of money for each outcome (i = 1, 2,…, n) of an option.

For example, if a gamble involves a 50% chance of winning \$10 and a 50% chance of winning \$5, then the EV is \$7.50 because EV = $\sum p_i x_i$ = (.5 * \$10) + (.5*\$5) = \$7.50.

However, this EV theory ran into trouble when the *St. Petersburg paradox* was introduced by Daniel Bernoulli (1738/1954). The St. Petersburg paradox involves a gambling game played by flipping a fair coin until it comes up tails; the total number of flips, n, determines the prize. The St. Petersburg paradox game can be specified by the following formula:

$$\text{Payoff} = (\$2)^n \qquad \text{(Equation 2.2.2)}$$

where, n = the total number of tosses.

According to the EV formula, the expected value of the Petersburg paradox game is infinite because EV = (.5 * \$2) + (.5*.5*\$4) + (.5*.5*.5*\$8)+ … = 1+1+1+…. = ∞. Even though the expected value of the Petersburg paradox game is infinite, people usually pay a small amount for this game. In order to solve this paradox, Bernoulli (1738/1954) suggested the concept of *Expected Utility* (EU), which replaces the objective money amount in the Expected Value model with subjective utilities. Specifically, he suggested that the utility of money increases nonlinearly with a decreasing rate as absolute money increases (See Figure 2.2.1).

[Figure 2.2.1 about Here]

EU can be defined as:

$$EU = \sum_{i=1}^{n} p_i \, u(x_i) \qquad \text{(Equation 2.2.3)}$$

where, p_i = the probability for each outcome (i = 1, 2,…, n) of an option, and

$u(x_i)$= a positive, but decelerating function of the monetary amount x_i.

Therefore, Bernoulli (1738/1954) argued that this paradox could be solved if decision-makers try to maximize expected utility rather than expected monetary value. Later Von Neumann and Morgenstern (1947) first axiomatized EU theory. Savage (1954) also further developed this theory by integrating the notion of subjective probability into EU theory (Tversky 1975). The theory by Savage (1954) is known as *Subjective Expected Utility Theory*. The basic assumption of subjective expected utility theory is that people's utility is based on the subjective belief of probability, and not on objective probability[2].

The basic assumption of EU theory is that each alternative course of action or choice should be evaluated by weighting its expected outcome with the probability that the outcome will occur, as in Equation 2.2.2. In addition, EU theory assumes that people try to maximize the expected utility of the choice outcome and try to choose the option that provides the highest expected utility to them (Baron 2000, p. 223). The EU theory model has been extended to algebraic models of judgment and decision-making (Pitz and Sachs 1984).

However, researchers have also demonstrated that decision-making or making judgments is significantly different from the prescription of formal decision theory. For instance, (i) the framing effect (Kahneman and Tversky 1979); (ii) the endowment or status quo effect (Kahneman , Knetsch, and Thaler 1990; Samuelson and Zeckhauser 1988); (iii) inconsistencies between response modes, such as choice versus matching (Tversky, Sattath, and Slovic 1988); (iv) the escalation of commitment or the sunk cost effect (Staw 1976; 1981; Brockner 1992); (v) violations of the independence of irrelevant alternatives, such as the decoy or compromise effect (Huber, Payne, and Puto 1982; Simonson 1989); (vi) the diversification bias or variety-seeking tendency (Read, Antonides, Ouden, and Trienekens 2001; Simonson 1990); (vii) mental accounting (Thaler 1985; Thaler and Johnson 1990); (viii) the hindsight bias (Fischhoff 1975; Hawkins and Hastie 1990); (ix) availability heuristics (Tversky and Kahneman 1973);

[2] In Subjective Expected Utility theory, people choose the option that maximizes their expected utilities, weighting each outcome by the probability that it will occur. Therefore, Subjective EU can be defined as: $EU = \sum_{i=1}^{n} f(p_i)u(x_i)$, *where* $f(p_i)$ = the subjective probability for each outcome (i = 1, 2,…, n).

or (x) the anchoring effect (Tversky and Kahneman 1974) are all illustration of deviation from the norm[3]. In the next section, we will try to categorize some of these "biases".

2.2.2 Assumptions and Violations of the Economic Model

In this section, we will review the basic assumptions and violations of EU theory. Additionally, we will categorize some decision biases based on different violations.

2.2.2.1 Independent assumptions and violations.

EU theory assumes that an individual's decision-making should not be influenced by any irrelevant information or irrelevant alternatives. An individual considers only relevant information that affects an individual's economic outcome. A key feature of EU theory is *independence*, according to which the attractiveness of an alternative is independent of other alternatives in the choice set (Schoemaker 1982).

However, many studies have shown that the *independence* assumption of EU theory can be violated in certain situations. The *framing effect* is one example showing the influence of irrelevant information. Based on EU theory, the value of an option should not be influenced by the framing of information about an option. However, Levin and Gaeth (1988) found that people preferred a product with positive framing (e.g., 90% lean) to that with negative framing (e.g., 10% fat), even though both positive and negative framing describe the same information.

The *decoy effect* is another example of a violation of the independence assumption from irrelevant alternatives. The decoy effect (or attraction effect) refers to the possibility that adding a new alternative to the choice set increases the choice for an existing alternative that dominates the new alternative (Huber, Payne, and Puto 1982). In the decoy effect literature, researchers have found that adding a dominating decoy alterative can increase the choice share of a dominating alternative. Therefore, the decoy effect is a violation of the independence assumption of EU theory, in that a decoy alternative can influence the relative choice share between two other alternatives.

[3] For details of each bias, please refer to the later section. In this section, we merely want to name a few biases in the decision-making literature.

2.2.2.2 Consistency assumptions and violations.

As we mentioned previously, EU theory assumes that decision-makers try to maximize the expected utility of choice outcomes and try to choose the option that provides the highest expected utility to them. Even though EU theory has been extended into many advanced models, the most basic EU theory concerns decision-making in single-decision situations. Therefore, the most current decision theories based on EU theory have been developed to account for the decision-making involved in one-shot decision-making situations[4]. However, in the repeated-choice situation where decision-makers make a series of choices over time, we can infer from EU theory that decision-makers try to maximize expected utility every time in repeated- choice situations. Therefore, decisions cannot be changed by different time perspectives[5].

Nevertheless, many studies have shown that this assumption of EU theory can be violated. The *endowment effect* is one example showing the influence of previous status on the next decision (Kahneman, Knetsch, and Thaler 1990). This endowment effect refers to people's tendency to place a higher value on objects they own relative to objects they do not own, suggesting that an individual's decision-making is influenced by a previous action or status.

Another violation is closely related to the previous one. Based on the *independenc*e assumption of EU theory, we can infer that EU theory assumes that the number of choice options over time cannot affect a decision. Specifically, based on EU theory, the decision outcome should be the same for: (i) multiple choices at the same time (e.g., *simultaneous choice*- choosing three alternatives out of six at one time); or (ii) a single choice at repeated times (e.g., *sequential choice*-choosing one alternative out of six in three repeated conditions). Many studies have shown that this assumption

[4] In this paper, we regard a one-shot decision as "one decisive action at one time point" (Hastie 2001, p. 665). Therefore, in the one-shot decision, decision-makers can choose one or multiple alternatives at one time. The opposite concept is a repeated decision or the multi-shot decision.

[5] In this paper, the time perspective is not directly related to intertemporal choice or different choices over time, such as hyperbolic discounting (see Loewenstein and Elster 1992; Loewenstein, Read, and Baumeister 2003). Studies of intertemporal choice mainly investigate different evaluations across different time periods (e.g., a choice between $10 now versus $20 one year later), whereas we are mainly interested in the impact of previous decisions on subsequent decisions (e.g., a gamble of a 50% chance to win $10 versus the same gamble after winning a previous gamble).

of EU theory can also be violated in certain situations. The *diversification bias* is an example showing the influence of choice frames. Diversification bias refers to people's tendency to seek more variety when choosing multiple alternatives at the same time, as opposed to when choosing single alternatives sequentially (Read, Antonides, Ouden, and Trienekens 2001). In sum, Table 2.2.1 describes EU theory assumptions and violations across the time perspective, as well as the number of choice options.

[Table 2.2.1 about Here]

EU theory proposes that each alternative course of action or choice is evaluated by weighting its expected outcome with the probability that the outcome will occur, as in Equation 2.2.3. EU theory also assumes that people try to maximize the expected utility of the choice outcome and try to choose the option providing them with the highest expected utility. However, researchers have also demonstrated that decision-making or making judgments deviates significantly from the prescription of formal EU theory. Specifically, researchers have shown the violation of the independence assumption of EU theory and the assumption of consistency with time or the number of choices option. However, researchers have not provided us with a comprehensive understanding regarding repeated choice, especially, the impact of previous choices on subsequent choices[6].

In a later section, we will review the relevant literature concerning this issue. First, we will review the repeated-choice literature.

2.3 Subsequent/Repeated Choice

In this section, we will review the repeated choice literature. Choice in repeated decision-making situations can be influenced by many factors to which decision-makers may be exposed before making a choice. Specifically, we will review the influence of these various prior factors on subsequent choices.

[6] Some may argue that research concerning sequential versuss simulataneous choice provides us with some findings in terms of repeated-choice situations. However, we will describe the difference between this approach (sequential versus simulataneous choice) and our approach in the next section (Section 2.3.1).

Before that, we will define the key terms of this paper and will try to articulate the differences between our research stream and other research streams. In this paper, we regard the one-shot decision as "one decisive action at one time point," whereas we define repeated choice as "multiple decisive actionsover multiple instances of time" (Hastie 2001, p. 665).

The research framework and research question of this paper are different from those of other research studies, in that we are mainly interested in the impact of previous choices on subsequent ones. First, this research is different from the research stream of *intertemporal choice* or *choice-over-time*: the intertemporal choice or choice-over-time framework is mainly interested in how people form preferences for future events. A typical example of intertemporal choice research examines preferences for outcomes in different future time frames[7]. One major finding of this type of research is *hyperbolic discounting*, which refers to people's tendency to discount payoffs as a function of time (Frederick, Loewenstein, and O'Donoghue 2003, pp. 24-25). In other words, hyperbolic discounting involves the empirical finding that people generally prefer smaller to larger payoffs when the smaller payoffs come sooner in time than the larger ones (Loewenstein and Elster 1992; Loewenstein, Read, and Baumeister 2003).

For example, Thaler (1981) asked participants to specify the amount of money they would require in 1 month, 1 year, and 10 years in order to induce them to feel indifferent to receiving $15 at that moment. The responses imply that the average discount rate for 1 month is 345 percent (e.g., $20), the average discount rate for 1 year is 120 percent (e.g., $50), and the average discount rate for 10 years is 19 percent (e.g.,

[7] Another example of intertemporal choice involves research of savoring and dread. Loewenstein (1987) provided the concept of "savoring and dread" in intertemporal contexts. He argues that people derive utility from "savoring" a positive outcome and also suffer disutility from the "dread" associated with negative outcomes. As an example of savoring, he provides empirical evidence from a participant's willingness to pay for a kiss from the movie star of their choice either immediately, in 3 hours, 24 hours, 3 days, or 1 year from the current moment. The participants in his study preferred to delay the kiss (e.g., their willingness to pay was the lowest in the immediate condition). Along the same lines, Loewenstein and Prelec (1993) also provide empirical evidence that people prefer to defer favorable events in order to savor the event that is expected to occur in the future. These concepts of savoring and dread are also related to people's preference for improvement. For example, Ross and Simonson (1991) provide empirical evidence that people have a preference for happy endings. Specifically, given the occurrence of one positive and one negative sequence, people generally prefer the event sequence in which the positive event occurs last.

$100). Therefore, as we can see in Figure 2.3.1.a, the intertemporal choice research stream concerns decisions occurring in the current period, even though these decisions involve the near or far future. Put differently, in Thaler (1981)'s example, even though participants were asked to show their preferences for different time perspectives, they *answered* at the current time. However, our repeated/subsequent choice issue differs from intertemporal ones. As we can see in Figure 2.3.1.c, our repeated/subsequent choice framework mainly focuses on the impact of previous choices on subsequent ones across different time perspectives.

Additionally, our repeated/subsequent choice framework is different from the *choice bracketing* research stream, which is mainly interested in different choices resulting from a different breadth of choice option. However, as we can see in Figure 2.3.1.b, choice bracketing research stream compares decision outcomes when choosing multiple alternatives at the same time (e.g., simultaneous choice), as opposed to choosing single alternatives repeatedly (e.g., sequential choice). The main finding of this research stream centers on the diversification bias or variety-seeking tendency[8] (Read and Loewenstein 1995; Read, Antonides, Ouden, and Trienekens 2001; Kahn, Ratner and Kahneman 1997). Both the repeated/subsequent choice framework and the choice-bracketing framework are similar, in that both frameworks involve repeated choices over time.

Nevertheless, the critical difference between our repeated/subsequent choice framework and the choice-bracketing framework is that the latter framework does not focus on the impact of previous choices on the next ones. Put differently, the choice-bracketing framework only focuses on the difference in choice outcome (e.g., the final chosen options) between simultaneous choice and sequential choice, whereas the repeated/subsequent choice framework focuses on the previous choice impact on the next choice in the sequential choice situation. Therefore, the repeated/subsequent choice framework is different from both the intertemporal choice and choice-bracketing frameworks.

[8] For details, please refer to Section 2.3.5.

Additionally, the impact of previous consumption can also affect the next choice. However, the repeated/subsequent choice framework only focuses on the impact of previous choice on the next one.

[Figure 2.3.1 about Here]

From here, we will review the previous literature, which illustrates the influence of these various prior factors on subsequent choices. In this section, we will review various factors, including: (i) previous goals; (ii) habitual choices; (iii) previous priming; (iv) previous preferences; (v) choice bracketing; (vi) previous outcomes; (vii) previous affect; and (viii) previous ownership;. This review can provide us with a general understanding of the current research status regarding repeated choice situations.

2.3.1 The influence of previous goals on choice

Goals are a very important construct to understand when discussing consumer choice behavior. Goals are often described as "the desirable state of affairs that people intend to attain through action" (van Osselaer, Ramanathan, Campbell, Cohen, Dale, Herr, Janiszewski, Lee, Read, Russo, and Tavassoli 2005, p. 336). In many consumption situations, goals are closely related to services or products. Specifically, goals are abstract benefits that are available through the feature of a product (Huffman and Houston 1993, p. 191).

For example, hunger makes people perceive a piece of food as a goal. The goal of automobile safety can be satisfied through product features, such as air bags. Goals can also guide consumers when buying products. For example, Huffman and Houston (1993) provide empirical evidence that the mere presence of a goal in a choice situation can help a complete novice to acquire, process, and learn goal-relevant information.

Recently, researchers have started investigating the influence of previous goals on subsequent choices. Several researchers (Dhar and Simonson 1999; Khan and Dhar 2006; Novemsky and Dhar 2005) have shown the impact of goals. First, Khan and Dhar

(2006) provide evidence regarding the influence of previous decisions on subsequent choices. They propose the concept of the *licensing effect*, which can be defined as "a prior intent to be virtuous [which] boosts people's self-concepts, thus reducing negative self-attributions associated with the purchase of relative luxuries" (p. 259). Based on the assumption that purchasing luxury goods is associated with guilt and feelings of responsibility, they propose that the expression of an intention to act virtuously in a prior task can license the subsequent purchase of luxury goods. In other words, they argue that a prior intent to perform a virtuous act reduces the negative self-attribution associated with purchasing luxury goods.

In their experiment, Khan and Dhar (2006) manipulated the intention to perform a virtuous act. Specifically, participants in the licensed condition were asked to select one volunteering service from two options and to state the reasons for their choice. They were then asked to choose between luxury goods (e.g., a pair of designer jeans) and necessary goods (e.g., a vacuum cleaner). Participants in the control condition were merely asked to choose between luxury goods and necessary goods.

The results indicate that significantly more participants in the licensed condition chose the luxury goods than those in the control condition. In addition, the participants rated themselves more positively in the licensed condition than in the control condition in terms of self-concept (such as being compassionate, sympathetic, warm, and helpful). Khan and Dhar (2006) also show that a changed self-concept mediates the relationship between a prior intent to perform a virtuous act and the choice of a luxury good. In conclusion, Khan and Dhar (2006) provide empirical evidence that prior commitment to a virtuous act has an evident effect on subsequent choices.

Second, Dhar and Simonson (1999) also provide empirical evidence for the balancing/highlighting strategy in subsequent choice situations (such as entrée and dessert choices). Specifically, they investigated the influence of a previous choice (e.g., entrée) on a subsequent one (e.g., dessert). They argue that if choice involves a trade-off between two goals (e.g., pleasure and good health), consumers tend to prefer the balancing strategy because focusing on a single goal can generate satiation or boredom. For instance, they found that the choice of an unhealthy pizza dish was more preferable

to participants after a workout versus after watching television. This result indicates that people try to balance two different goals, such as health and enjoyment.

On the other hand, if choice involves a trade-off between a goal (e.g., pleasure) and a resource (e.g., money), consumers tend to prefer the highlighting strategy. In this case, consumers do not want to be adversely affected by the less enjoyable component (such as an inexpensive dessert ruining the taste of a previously expensive and delicious entrée) by adopting the balancing option. For example, the researchers show that compared to people who order an inexpensive main course, those who order an expensive main course are also likely to choose an expensive dessert (Dhar and Simonson 1999).

In summary, Dhar and Simonson (1999) show that decisions involving consecutive choices can be changed by different goals (e.g., balancing versus highlighting goals).

Finally, Novemsky and Dhar (2005) examined the influence of consumers' goal targets on consumer choice in subsequent choice situations. They propose that choice can be influenced by earlier experiences via specific goals activated by these experiences. Specifically, they compared the tendency to choose the variable option (i.e., the risky option) over the consistent option (i.e., the non-risky option) based on previously positive or negative experiences. They theorize that if previous positive experiences can generate a higher goal target[9] (defined as the "target level of goal achievement for a specific content goal," p. 396), then the higher goal target will drive subsequent choices toward an option that can fulfill this higher target. They also theorize that people with a high goal target will be more likely to choose the variable option over the consistent one because the positive outcome from the variable option may satisfy this higher goal target.

Consequently, Novemsky and Dhar (2005) propose that the outcome of the previous task influences the goal target of the individual. Specifically, they predict that a consumer with a good first experience will subsequently choose a risky option through changing the level of goal target. Empirically, the results indicate that following

[9] For example, when people seek the goal of spending their vacation in a hotel, the goal target can be either high (e.g., spending a vacation in a luxury hotel) or low (e.g., spending a vacation in an inexpensive hotel).

a positive outcome (e.g., having a nice main course), consumers tend to choose the risky option, which can provide them with a higher level of the goal target.

On the other hand, following a negative outcome (e.g., having a bad main course), consumers tend to choose the non-risky option. In sum, Novemsky and Dhar (2005) provide empirical evidence concerning the relationship between a goal target due to previous consumption and different preferences for the risky option in making subsequent choices.

In conclusion, researchers (Dhar and Simonson 1999; Khan and Dhar 2006; Novemsky and Dhar 2005) have shown that making choices can be influenced by goals, which can be generated by previous choices or consumption. Specifically, different goals can influence subsequent choice, including the following: (i) a prior intent to perform a virtuous act can increase purchasing luxury goods (Khan and Dhar 2006); (ii) consecutive choices can be influenced by balancing or highlighting goals (Dhar and Simonson 1999); and (iii) a different goal target generated by a previous choice can affect subsequently risky decisions (Novemsky and Dhar 2005).

2.3.2 The influence of habitual choice

Traditionally in decision-making research, researchers have studied the impact of past behavior on future behavior (Bagozzi 1981; Bentler and Speckart 1979; Norman and Smith 1995). In particular, recent researchers have started focusing on decision routines, or habits, and how these decision routines affect the decision-making process (Betsch, Fiedler, and Brinkmann 1998; Betsch, Haberstroh, Glockner, Haar, and Fiedler 2001; Betsch and Haberstroh 2005; Verplanken, Aarts, and Van Knippenberg 1997). Betsch and his colleagues define a routine as "a behavioral option that comes to mind as a solution when the decision-maker is confronted with a certain decision problem" (1998, p. 862). Put differently, they do not consider a "routine" as a decision strategy, but rather as a particular option activated from memory by encountering a specific decision problem.

Several researchers provide evidence attesting to the relationship between a decision routine and the decision-making process. Routines can influence a decision-

maker's information search in the decision-making process. For example, participants with strong routines tend to have a low propensity to search for new information (Betsch, Haberstroh, Glockner, Haar, and Fiedler 2001; Verplanken, Aarts, and Van Knippenberg 1997). In other words, those who do not have a routine (versus those who *do* have a routine) are likely to seek new information for decision-making.

Additionally, routines can generate a confirmation bias in information searching. That is, routines generate the tendency to neglect new information that disfavors these routines (Betsch, Haberstroh, Glockner, Haar, and Fiedler 2001). Routines can also affect the decision process itself. For instance, Verplanken et al. (1987) provide evidence that participants with strong routines do not use fewer elaborate choice strategies or fewer compensatory decision rules than those with weak routines. Betsch et al. (2001) found that although new evidence clearly suggests the negative effect of routines (such as the possibility that deviating from a routine can sometimes be beneficial), participants with strong routines are reluctant to give them up.

In sum, research involving decision routines or habits shows that people have a tendency to use their previous experience in future decision-making.

2.3.3 The influence of previous priming on choice

Priming refers to activating particular representations, concepts, or associations in one's memory. Priming studies in psychology have shown that priming can influence people's interpretations of subsequent ambiguous information. For example, Higgins, Rholes, and Jones (1977) provide a seminal example of priming. The participants performed two distinct and separate tasks. At first, they performed a memory task. Half of the participants were given a list of positive words, such as *self-confident, persistent, adventurous,* and *independent*. The other half of the participants were given a list of negative words, such as *reckless, aloof, conceited,* and *stubborn*. They were then asked to evaluate a person named Donald, based on a given description. The description was an ambiguous one, which could be interpreted as positive (e.g., *adventurous*) or negative (e.g., *reckless*). The results of the study showed that the participants who had

memorized the positive words perceived Donald more positively, whereas those who had memorized the negative words perceived him more negatively.

In consumer behavior, researchers (Herr 1989; Meyers-Levy and Sternthal 1993; Yi 1990) have shown that judgments of a product or service can be influenced by previous activation of concepts. For example, Yi (1990) showed that the evaluation of a target brand was influenced by an ad context priming different product attributes. Specifically, the main task of the study was to evaluate a PC, which had many functions. Having many functions could be interpreted positively in terms of its "versatility" dimension, or negatively in terms of its "difficulty of use" dimension. The results indicate that the participants in the "versatility" priming condition evaluated the PC more positively than those in the "difficulty of use" priming condition.

Recently, Mandel and Johnson (2002) have provided empirical evidence that the background of a Web page can affect the choice of a target product in e-shopping situations. Participants in their study were exposed to an initial screen, which had either a "green with pennies" background (the price-priming condition) or a "blue with clouds" background (the comfort-priming condition). They were then asked to choose one sofa, given the options of an economical, but less comfortable sofa, and a comfortable, but more expensive one. The results show that the participants in the price-priming condition were more likely to prefer the economical, but less comfortable sofa, and those in the comfort-priming condition were more likely to prefer the more comfortable, but more expensive sofa.

In sum, priming studies suggest that the previous concept of activation can influence people's evaluation of products.

2.3.4 The influence of previous preference on choice (pre-decisional distortion)

Based on Festinger (1957)'s cognitive dissonance theory, people have a motivation to reduce discrepancies between their beliefs and actions. In choice contexts, this theory predicts that, after decision-making, people tend to distort incoming information in favor of the chosen option in order to reduce cognitive dissonance. This theory assumes that people form relatively strong attitudes in terms of making choices.

Recently, Russo and his colleagues have provided evidence that people sometimes try to distort information even before they choose an alternative. For example, when one option emerges as the tentative leader in a choice process, people have a tendency to disregard subsequent new negative information in favor of the tentative option. This phenomenon is known as *pre-decisional distortion* (Carlson and Russo 2001, p. 91). Russo and his colleagues provide empirical evidence that this pre-decisional distortion can occur in consumer choice contexts (Russo, Meloy, and Medvec 1998; Carlson, Meloy, and Russo 2006) as well as in professional decisions (Russo, Meloy, and Wilks 2000) and in mock jurors' verdicts (Carlson and Russo 2001).

For example, Carlson, Meloy, and Russo (2006) show empirical evidence that initially small differences in preference from early information can change the process of interpreting subsequent information. The participants in their study were asked to choose between two restaurants. The restaurants were described by six different attributes. The first information attribute was manipulated so that the participants would prefer Restaurant B to Restaurant A, based on small differences between the two restaurants. They were then subsequently given equivalent (or neutral) attribute information about Restaurant A and Restaurant B, or an unfavorable attribute for Restaurant B. The results of the study show that the evaluation of subsequently neutral attributes or unfavorable attributes for Restaurant B was biased toward Restaurant B. Specifically, the evaluation of neutral attributes involving Restaurant B was higher when Restaurant B was preferred in the first information attribute. In sum, the results show the phenomenon of subsequent biased information processing based on the first information received.

In conclusion, researchers have shown that making choices can be influenced by subsequent information about products. *Pre-decisional* distortion illustrates the importance of initial information.

2.3.5 The influence of choice bracketing on choice

In recent years, researchers have shown that choices can differ based on the *type* of choice. Specifically, the breadth of choice options can influence the choice result and process.

Read, Loewenstein, and Rabin (1999) use the concept of (*narrow* and *broad*) *choice bracketing*, which designates the grouping of individual choices together into sets (p. 172). *Narrow* choice bracketing involves a small set of choices, containing one or very few choices, whereas *broad* choice bracketing involves a larger set of choices (p. 172). One example to consider could be the decision to smoke or abstain. Narrow choice bracketing would involve the consumer's decision to smoke one cigarette at a time. However, broad choice bracketing would more likely involve the consumer's decision to smoke 7,300 cigarettes over a one-year period. Read, Loewenstein, and Rabin (1999) suggest that broad choice bracketing usually yields higher utility because it allows people to take into account all of the consequences of their actions. However, people often fail to bracket broadly when it would be feasible for them to do so.

Similarly, Simonson (1990) uses sequential and simultaneous choice, while Kahneman and Lovallo (1993) use narrow and broad decision frames. Simonson (1990) showed that the number of choices made at one time can influence the diversity of choice. He argues that people tend to choose more diverse alternatives when they simultaneously choose multiple items than when they sequentially make the same number of choices. Specifically, the participants in his study were asked to choose three out of six snacks during three consecutive weeks. Half of the participants were asked to choose all three snacks in the first week (i.e., the simultaneous-choice condition), although they did not receive their snacks until the appointed times. The other participants were asked to choose one snack for each week (i.e., the sequential-choice condition).

The results showed that the participants in the simultaneous-choice condition were more likely to select a variety of items than those in the sequential-choice condition. He explained these phenomena using theoretical reasons, in that uncertainty about future preferences and the difficulty of choosing among many alternatives enhanced the variety-seeking tendency.

In a follow-up study, Simonson and Winer (1992) replicated the previous findings using actual supermarket scanner data. Based on scanner data regarding yogurt, they showed that consumers were likely to select product variants (i.e., different yogurt flavors based on their regular items) when they bought several containers of yogurt versus when they bought only one or two. In sum, Simonson (1990; Simonson and Winer 1992) provide empirical evidence that people show high levels of *variety-seeking* when they are engaged in broad versus narrow choices.

Similar phenomena were proposed by Read and Loewenstein (1995). They (also Read, Antonides, Ouden, and Trienekens, 2001) introduced the concept of *diversification bias*. This type of bias concerns people's tendency to adopt more variety when choosing multiple alternatives at the same time, as opposed to choosing a single alternative sequentially (Read and Loewenstein 1995). One of their studies shows the *diversification bias* in children's candy bar choices for Halloween. Some children chose two candy bars at one house (i.e., the combined or simultaneous choices), whereas others chose one candy bar at two adjacent houses (i.e., the separate or sequential choices). The results of their study showed that all children in the combined-choice condition chose two different candy bars, whereas only 48% of the children in the separate-choice condition chose two different candy bars. The results of this study indicate that people included more various options when they chose multiple options at the same time rather than when they chose a single option sequentially.

In sum, both *variety-seeking* in the simultaneous-choice condition and *diversification bias* in the separate-choice condition indicate that the breadth of choice can affect the choice outcome.

In a later section, we will briefly review the variety-seeking literature in consumer behavior. Many researchers have shown that consumers often tend to seek variety (Chintagunta 1998; Kahn, Ratner and Kahneman 1997; Inman 2001; Menon and Kahn 1995; Ratner and Kahn 2002; Ratner, Kahn, and Kahneman 1999). This tendency is a powerful motivation for consumers, in that they sometimes include the less-preferred items for the sake of variety. For example, Ratner, Kahn, and Kahneman

(1999) provide empirical evidence of choosing less-preferred options. Participants were asked to rate the experience of listening to multiple songs. Half of them were exposed only to their favorite song (i.e., the repeated-favorite condition), whereas the other half of the participants were exposed to both their favorite and not favorite songs (i.e., the mixed- sequence condition). The results indicate that the participants' reported listening experience declined more steeply in the repeated-favorite condition than in the mixed-sequence condition. In summary, Ratner, Kahn, and Kahneman (1999) assert that including less-preferred items in multiple alternative-choice conditions can increase the overall evaluation of a consumption experience.

Previous research also provides explanations for variety-seeking, such as uncertainty about future preferences and information gathering (Kahn and Lehmann 1991; Ariely and Levav 2000), satiation (McAlister 1982), increasing satisfaction of overall experiences by maximizing retrospective experiences (i.e., variety-seeking is reinforced by favorable memories of a varied sequence, Ratner, Kahn, and Kahneman 1999), reducing regret (Ariely and Levav 2000), or interpersonal influence/self-presentation (i.e., variety-seeking is stronger in public consumption situations, Ratner and Kahn 2002).

This variety-seeking can occur in a manner by which consumers choose items, as well as in the items they choose. Recently, Drolet (2002) provides evidence that variety- seeking can be extended to decision processes. Specifically, the participants in her study were asked to make three sets of choices between a high-quality/high-price option and a low-quality/low-price option. The results indicate that consumers who selected the high-quality/high-price option [low-quality/low-price option] in the first two choices were likely to select the low-quality/low-price option [high-quality/high-price option] for the third choice. In sum, the results suggest that consumers have a tendency to vary their use of decision rules. In a follow-up study, Kim and Drolet (2003) replicated the previous findings and additionally suggest that this variety-seeking in choice rules is stronger for people in individualist cultures than for those in collectivistic cultures.

2.3.6 The influence of previous outcomes on choice

Thaler and Johnson (1990) investigated the effect of prior outcomes on subsequent risky choices. They demonstrated that prior gains or losses can affect one's willingness to choose risky options. Specifically, the participants in their study were first asked to imagine that they had just won $30, or that they had just lost $30. They were then asked to make a decision between a safe and a risky option: (i) no further gain or loss (e.g., the safe option) and (ii) a 50% chance of gaining $9, and a 50% chance of losing $9 (e.g., the risky option). The results showed that 77% of the participants chose the risky option after a gain, whereas only 38% of the participants chose the risky option following a loss. Thaler and Johnson (1990) refer to this phenomenon as the *house-money effect*; that is, a tendency to increase risk-seeking in the presence of a prior gain.

In addition, they also provide empirical evidence that a prior loss can increase risk-seeking. Specifically, in their experiment, the participants were asked to imagine that they had just lost $9 and were then asked to make a decision between: (i) no further gain or loss (e.g., the safe option) and (ii) a 50% chance of gaining $9, and a 50% chance of losing $9 (e.g., the risky option). In this case, a large percentage (e.g., 60%) of the participants chose the risky option. Thaler and Johnson (1990) term this as the *break-even effect*; that is, a tendency to increase the attractiveness of an option that offers the chance to break even following a prior loss.

Related to Thaler and Johnson (1990), Chen and Rao (2002) also investigated how people feel after being exposed to a series of two events of equal magnitude, but opposite valence. They found that people prefer a loss-followed-by-gain sequence to a gain-followed-by-loss one, even if both sequences are economically equivalent. In addition, they provide empirical evidence that this order effect becomes stronger as the temporal distance between the two events increases. To explain this phenomenon, they argue that the decision-makers' reference point is labile, rejecting alternative explanations, such as the recency or contrast effects.

In conclusion, Thaler and Johnson (1990) and Chen and Rao (2002) have shown that previous outcomes can influence subsequent choices.

2.3.7 The influence of previous affect on choice

People who face decisions oftentimes generate emotional responses. Specifically, decisions can evoke negative emotions when they require conflict resolution between goals that are very important to decision-makers (Luce 1998; Luce, Bettman, and Payne 1997, 2001; Luce, Payne, and Bettman 1999) [10]. In an repeated-choice situations, the first choice can generate positive or negative emotions or moods. These emotions or moods can then affect subsequent choices.

In this paper, *affect* refers to "the specific quality of 'goodness' or 'badness' (i) experienced as a feeling state (with or without consciousness) and (ii) demarcating a positive or negative quality of a stimulus" (Slovic, Finucane, Peters, and MacGregor 2002, p. 329). Furthermore, based on Bagozzi, Gopinath, and Nyer (1999), *affect* is the concept of "an umbrella for a set of more specific mental processes including emotion, moods, and attitudes (p. 184)."

The influence of affect on decision-making has been conducted by many researchers (for a review, see Isen 1993; 2000; 2001). Generally, the influence of affect on decision-making generally depends on the type of affect, the type of tasks, and other aspects of the context (Isen 1993). However, in this paper, we will briefly look at the impact of affect on decision-making. For example, Wright and Mischel (1982) provide empirical evidence of the relationship between affect and expectation. Specifically, they found that positive affect induced by thinking about happy/bad events can yield more/less optimistic expectations for future performance. Moreover, Isen and Means (1983) suggest that people with positive affect are more efficient in the ways that they go about completing complex tasks. Put differently, under the condition of positive affect, people tend to integrate decision-making and are less confused by a large set of options. This efficiency of decision-making allows people to solve decision problems faster and to focus on more important information. Kahn and Isen (1993) also maintain that positive affect can increase one's tendency to seek variety.

Additionally, researchers have investigated the relationship between affect and risk assessment. For instance, Isen and Patrick (1983) show that people with a positive

[10] For details, please refer to Section 2.8.2.

affect tend to be more risk-averse compared with people in control conditions. Specifically, when participants were betting chips representing their credit for participating in their study, the participants in the positive-affect condition bet less. Additionally, Johnson and Tversky (1983) investigated the impact of affect on the estimation of risks. They found that positive affect decreased the judgment of frequency regarding major risks, including diseases, accidents, and disasters, whereas negative affect increased the assessment of risk frequency.

Recently, Monga and Rao (2006) extended the study of Johnson and Tversky (1983) by incorporating domain-specific factors. First, they show that the expectation of a positive future outcome is higher when the prior outcome is positive, rather than negative. Specifically, the participants first experienced a series of two positive/negative prior outcomes (e.g., winning/losing the first two lotteries). They were then asked to evaluate their expectations of the subsequent third lottery. The results indicate that the participants who had won the first two lotteries showed a higher expectation of winning the third lottery than those who had lost the first two lotteries. In addition, Monga and Rao (2006) suggest that this effect is qualified by the domain. Based on loss aversion, they predicted that prior outcomes would have a stronger effect on expectations about a future outcome when the prior outcomes were in the domain of losses than in the domain of gains. This prediction was also supported. Therefore, the results from Johnson and Tversky (1983) and Monga and Rao (2006) show that prior outcomes can definitely influence subsequent decisions. Specifically, the expectation of subsequent choice is higher when the previous outcomes are positive versus negative.

Based on these summaries, we can infer that affect from previous decisions can affect subsequent choices. However, this influence depends on various factors, including the type of affect, tasks, and contexts.

2.3.8 The influence of previous ownership on choice

Previous ownership can also affect subsequent choice. Specifically, people have a tendency to evaluate previously owned objects more positively than objects not

previously owned. We will review this "endowment effect" (or "status quo effect") in Section 2.5.

Research on the endowment effect or the status quo effect has shown that choice can be influenced by the previous ownership, which can be slightly or significantly relevant to owners.

2.3.9 Summary and review

In this section, we have reviewed the influence of various prior factors on subsequent choices. As we have noted, consumers' current choices can be influenced by previous goals (Huffman and Houston 1993; Kahn and Dahr 2006), habitual choice (Betsch, Fiedler, and Brinkmann 1998; Betsch, Haberstroh, Glockner, Haar, and Fiedler 2001; Betsch and Haberstroh 2005; Verplanken, Aarts, and Van Knippenberg 1997), priming or concept activation (Mandel and Johnson 2002), pre-decisional distortion (Russo, Meloy, and Medvec 1998; Carlson, Meloy, and Russo 2006), breadth of choice/choice bracketing (Read, Loewenstein, and Rabin 1999; Simonson 1990), previous outcomes (Thaler and Johnson 1990; Chen and Rao 2002), previous affect (Johnson and Tversky 1983; Monga and Rao 2006) and previous ownership (Thaler 1980).

Having reviewed the research literature relating to repeated/subsequent choice, we can identify two weaknesses in its current status:

First, it appears that previous research concerning repeated/subsequent choice does not focus on the specific impact of previous *choice* itself on subsequent ones. For example, previous goals and previous ownership can be activated or can occur, regardless of previous decisions. Prior research has failed to look at the impact of previous choice on subsequent ones. Moreover, previous research in this stream has failed to perform precise scrutiny in terms of the underlying mechanism of the impact of previous choice. For example, although the habitual choice literature (Betsch, Fiedler, and Brinkman 1998) suggests that previous experiences of choice can generate routines (e.g., a behavioral option that comes to mind when the decision-maker faces a certain decision problem), it does not show how previous choice can affect the formation of

certain options. Moreover, studies of variety-seeking in the choice bracketing literature have only focused on the differences between narrow and broad choice bracketing, but have failed to provide the answer to the following question: "How does previous choice affect subsequent choice?" In conclusion, we do not exactly know how previous decisions affect subsequent choices.

Second, related to the first weakness, the existing research has failed to break down previous choice into a subordinate concept (e.g., process and outcomes). Although several research studies have focused on the impact of previous choice on subsequent ones, they simply consider the previous choice itself and do not consider it as a subordinate concept. For example, previous outcomes or processes can separately affect subsequent choices. However, the existing studies have only focused on the choice outcomes themselves (e.g., the previously chosen options or goal fulfillment from previous choices). These studies ignore that the process (e.g., the decision style or the amount of effort) of previous choices can also affect subsequent choices. We do not know how previous processes or outcomes interactively influence subsequent choices. Therefore, it is useful to investigate the impact of previous choice as a subordinate concept on subsequent choice. In a later section, we will review the literature concerning decision processes and outcomes, and we will argue why this distinction is important.

2.4 Choice Process versus Outcome

2.4.1 Difference between the decision process and outcome

In this section, we will review the research involving the decision process and outcome. First, we will review the literature of the various roles of process versus outcome in decision-making. The examples regard different mental simulations (process-focused versus outcome-focused simulations), different accountabilities (procedural versus outcome accountability), different fairness perception studies (procedural fairness versus outcome favorability), or availability heuristics (process versus outcome of recall on judgments). We will then review the decision process and outcome in repeated-

choice situations.

2.4.1.1 Process-focused versus outcome-focused mental simulations

First, we consider the different roles of process-focused and outcome-focused mental simulations on judgment. (Mental) Simulation is "the imitative representation of the functioning or the process of some event or series of events (Taylor and Schneider 1989, p. 175)". Taylor and her colleagues distinguish between process-focused and outcome-focused simulations. They (Taylor, Pham, Rivkin, and Armor 1998; Pham and Taylor 1999) have shown that by focusing on process-focused rather than on outcome-focused simulations, people perform better. For example, Pham and Taylor (1999) assert that students who engage in process-focused simulations (e.g., "Visualize when, where, and how you might study for an exam") score higher on exams and spend more time studying for exams than those who engage in outcome-focused simulations (e.g., "Visualize yourselves receiving a very high score on an exam"). Put differently, they show that the participants who envision the detailed steps to goal achievement show higher performance than those who focus on the outcome they want to achieve. In addition, they show that this beneficial effect of process-focused simulation is mainly due to the regulation of emotional states (e.g., reducing anxiety) and planning (e.g., simulating specific problem-solving activities). In sum, Pham and Taylor (1999) show a positive effect for process-focused versus outcome-focused simulations in performance-related tasks.

In the consumer behavior domain, Escalas and Luce (1993, 1994) show similar results in the context of the persuasion effect of advertising. For example, Escalas and Luce (1993) provide empirical evidence of the stronger effect of process-focused thought. They theorize that process-focused thought can enhance planning, and that this planning increases behavioral intentions. Empirically, the participants in their study were exposed to the same vitamin advertisements and were then asked to evaluate their purchase intentions. The participants in the process-focused thought condition were asked to focus on the process of using the vitamins, and how they would feel as they used the advertised product. On the other hand, participants in the outcome-focused

thought condition were asked to focus on the benefits of using the vitamins, and how they would feel as a result of using the advertised product. They found that participants in the process-focused thought condition showed higher behavioral intentions compared to those in the outcome-focused thought condition, especially when the advertisement arguments were strong (versus weak) arguments.

In sum, both Pham and Taylor (1999) and Escalas and Luce (1993) compared process-focused with outcome-focused simulations. They found that process-focused simulations have a better impact on one's performance and on higher purchase intentions with advertised products.

2.4.1.2 Procedural versus outcome accountability

The second research stream involves different accountabilities, such as procedural versus outcome accountabilities. *Accountability* can be defined as "the implicit or explicit expectations that one may be called on to justify one's beliefs, feelings, and actions to others" (Lerner and Tetlock 1999, p. 225). In addition, procedural accountability refers to "accountability for the procedures used to arrive at a decision," whereas outcome accountability refers to "accountability for the quality of the outcome of a decision" (Zhang and Mittal 2005, p. 465).

Researchers have distinguished between procedural and outcome accountabilities in various domains. For example, procedural accountability has been shown to increase one's systematic processing (Tetlock, Skitka, and Boettger 1989), to enhance one's motivation to use diagnostic information in one's decision (Tetlock and Boettger 1989), to reduce the self-justification bias (or sunk cost bias) (Simonson and Staw 1992), and to improve decision quality (Siegel-Jacobs and Yates 1996; Simonson and Nye 1992; Tetlock and Kim 1987). On the other hand, outcome accountability has been shown to increase the self-justification bias for the sunk cost (Simonson and Staw 1992) and to reduce decision quality (Siegel-Jacobs and Yates 1996).

For instance, Siegel-Jacobs and Yates (1996) empirically found a similar result. Specifically, the participants in their study judged the likelihood that a set of individuals held a particular attitude on the basis of background information about those individuals

(e.g., juror selection task based on personal background such as age, education, gender, and so on). The participants could increase their decision quality by using relevant information when they made a decision. The research findings indicated that procedural accountability increased the quality of decisions mainly by encouraging decision-makers to take more available information into account. On the other hand, outcome accountability decreased the quality of decisions mainly by the stress created from outcome accountability. In sum, it appears that procedural accountability has a beneficial effect on decision quality, whereas outcome accountability has a negative effect on it.

In the consumer behavior domain, Zhang and Mittal (2005) investigated the effects of procedural and outcome accountabilities on the perceptions of decision difficulty. They compared two different accountability concepts in the domains of decisions based on *better-than¯reference (BTR)* options and on *worse-than¯reference (WTR)* ones. In their paper, decisions based on BTR options involved a choice between relatively attractive options, whereas decisions involving WTR options involve a choice between unattractive options (p. 465). They theorize that people can easily justify the outcome for BTR choices (versus WTR choices) because in the BTR choice, they can rationalize their chosen option compared to the worse-than-reference options.

Yet, inasmuch as no such outcome focus exists in procedural accountability, there is no significant difference between BTR and WTR choices in terms of procedural accountability. The results indicate that only in the high-outcome-accountability condition are WTR decisions perceived as more difficult than the BTR ones. Therefore, Zhang and Mittal (2005) provide empirical evidence of the different roles of procedural and outcome accountabilities in consumer decision-making.

In summary, the research has shown important differences between procedural and outcome accountabilities on decision-making in various aspects.

2.4.1.3 Perceived fairness versus outcome favorability

The third research stream involves differences in fairness perceptions. Fairness is a key issue for understanding social behavior. Researchers have proposed several models of

perceptions of social fairness, including the *fairness heuristic theory* (Brockner 2002; Lind and Tyler 1988; Van Den Bos, Lind, Vermunt, and Wilke 1997; Van Den Bos, Vermunt, and Wilke 1997). This theory suggests that people's perceptions about fairness are determined by two distinctive elements: perceived fairness and outcome favorability.

For example, Van Den Bos, Lind, Vermunt, and Wilke (1997) provide empirical evidence for two distinctive elements of social fairness regarding outcome judgment. The participants in their study evaluated their payoffs while the researchers manipulated both procedure and outcome fairness. Specifically, procedural fairness was manipulated in terms of whether or not the participants were allowed an opportunity to voice their opinions, whereas outcome fairness was manipulated so that either the outcomes of the participants would be better/worse than those of the other participants, or the participants would not know the outcomes of the other participants. Van Den Bos, Lind, Vermunt, and Wilke (1997) found that when people did not have the outcome information of the other participants, they were likely to use procedural fairness in order to evaluate their own outcomes. Therefore, their evaluations about their own outcomes were higher when they were allowed an opportunity to voice their opinions than when they were not allowed to do so. However, if they received the outcome information of the other participants' performances, they were less likely to use information regarding procedural fairness. Therefore, their evaluations about their own outcomes were higher when their outcomes were better than those of the others than when their outcomes were worse, regardless of the information regarding procedural fairness. In sum, the fairness heuristic theory suggests that both the process and outcome are important factors in evaluating social exchanges.

In the consumer behavior domain, Hui, Zhao, Fan, and Au (2004) argue that procedural fairness and outcome favorability can be used for the evaluation of services. The participants in their study were asked to read a service scenario and evaluate that service. The service scenario was systematically manipulated by 2 (process quality: unfavorable versus favorable) by 2 (outcome quality: unfavorable versus favorable) between-subjects factors. Specifically, the participants in their study were asked to

evaluate customer service quality involved in purchasing computers. Process quality was manipulated by the (good versus bad) behavior of the sales representative in the order-making process, whereas outcome quality was manipulated by whether or not there was a delay in the delivery of the purchase order. The results of their study indicate a significant interaction between process quality and outcome quality on the overall evaluation of service. That is, the evaluation of the service was high only when both the process and outcome quality were favorable. In summary, Hui, Zhao, Fan, and Au (2004) provide empirical evidence that consumers use both process and outcome information in order to evaluate social exchanges.

2.4.1.4 Availability heuristic

Tversky and Kahneman (1973)'s *availability heuristic* theory shows that judgments of estimating the frequency of an event can be influenced "by the ease with which instances or associations come to mind" (p. 208). For example, Tversky and Kahneman (1973) found that the participants in their study overestimated the number of words that began with the letter *r* and underestimated the number of words that had *r* as the third letter.

Two different mechanisms can explain the availability heuristic. People's judgments can be based on a number of recalled examples (e.g., outcomes of recalled examples). For example, with respect to Tversky and Kahneman (1973)'s empirical finding about estimating the number of words, the participants could list more words that began with the letter *r* than they could list words that had *r* as the third letter. On the other hand, people's judgments, indeed, can be based on phenomenal experiences of ease or difficulty of recall (e.g., the process of recalling experiences). For example, the participants may have felt more difficulty listing words that had *r* as the third letter versus words that began with the letter *r*.

Schwarz and his colleagues (Schwarz, Bless, Strack, Klumpp, Rittenaurer-Schatka, and Simons 1991; Schwarz and Clore 1996; Schwarz 1998) tried to find one mechanism from two competing possibilities for the availability heuristic. Schwarz, Bless, Strack, Klumpp, Rittenaurer-Schatka, and Simons (1991) asked their study

participants to generate 12 or six examples of their assertiveness behaviors. When participants were asked to recall 12 examples of their assertive behaviors, they rated themselves as less assertive than when they were asked to recall only six examples. Moreover, when participants were asked to recall 12 examples of their unassertive behaviors, they rated themselves as more assertive than when they were asked to recall only six examples of unassertive behaviors. The results of this experiment provide empirical evidence for the ease-of-retrieval mechanism (e.g., the process of recalling experiences) rather than the content itself (e.g., the outcomes of recall) to explain the availability heuristic.

In consumer choice contexts, Wanke, Bohner, and Jurkowitsch (1997) extend the role of ease-of-retrieval in an automobile advertising evaluation situation. They provide evidence that "anticipated" ease-of-retrieval can be functionally equivalent to "actually experienced" ease-of-retrieval in advertising situations. Specifically, they found that a BMW car was evaluated more favorably when their study participants were asked to think of one rather than ten reasons to drive a BMW, and also when the participants were asked to think of ten reasons rather than one to drive a competitor's car.

This research about the *availability heuristic* shows the differential impact between process and outcome on overall evaluations. One implication of these studies by Schwarz and his colleagues is that the impact of process on overall evaluations is stronger than that of outcomes in employing the availability heuristic.

2.4.1.5 Summary of the difference between decision process and outcome.

To this point, we have reviewed the differences between processes and outcomes in the contexts of different mental simulations (process-focused versus outcome-focused simulations), different types of accountability (procedural versus outcome accountability), fairness perception studies (procedural fairness versus outcome favorability) and underlying mechanisms for the availability heuristic (process versus outcome of recall on judgment). Specifically, the research indicates that: (i) process-focused simulation has a better impact on one's performance and on higher purchase

intentions with advertised products (Pham and Taylor 1999; Escalas and Luce 1993); (ii) procedural accountability has a beneficial effect on decision quality, whereas outcome accountability has a negative effect on decision quality (Siegel-Jacobs and Yates 1996); and (iii) both process and outcome are important factors in evaluating social exchanges (Van Den Bos, Lind, Vermunt, and Wilke 1997). Finally, (iv) the process of recall has a stronger impact on overall evaluations than do the outcomes of recall (Schwarz, Bless, Strack, Klumpp, Rittenaurer-Schatka, and Simons 1991; Wanke, Bohner, and Jurkowitsch 1997).

In sum, it appears that there is a difference between the outcomes and processes in decision-making. In addition, with respect to judgment domains, people generally use process (versus outcome) information heavily in their judgments, and decision quality can be enhanced when people focus on the process rather than on the outcome. One exception is the *outcome bias*, which we will review later.

2.4.2 Decision process and outcome research in repeated-choice situations

In this section, we will review the decision process and outcomes in repeated-choice situations. In this paper, we define *choice outcome* as the consequence of making a choice. Therefore, choice outcomes can include the chosen alternative, foregone alternative(s), and cognitive/emotional consequences of that choice. On the other hand, we define the *choice process* as a cognitive and emotional process leading to the selection of a course of action among alternatives. Thus, the choice process can include the specific choice heuristics[11] (e.g., the *weighted-additive [WADD]* rule, the *equal-weighted-additive [EQW]* rule, the *lexicographic [LEX]* rule, the *eliminiation-by-aspects [EBA]* rule, the *satisfying [SAT]* rule, and the *majority-of-confirming-dimensions [MCD]* rule),
the degree of decision–related processes (e.g., a deliberate process versus a simple process), and the amount of cogitive and emotion resources expended.

First, we will suggest a general framework. Figure 2.4.1 illustrates the entire framework concerning decision outcomes and the decision process. In this paper, we

[11] For details of different choice heuristics, please see Appendix A, as well as Bettman, Johnson, and Payne (1990, p. 117) and Bettman, Luce, and Payne (1998, pp. 190-191).

assume that the choice process occurs prior to choice outcomes. Therefore, the choice process generally affects choice outcomes (e.g., Route A in Figure 2.4.1). However, sometimes choice outcomes can affect the evaluation of the choice process (e.g., Route B). We will review this in a later section (2.4.2.6).

As depicted in Figure 2.4.1, in repeated-choice situations, we can conceptualize four different routes of the influence of previous choices on the next choice.
The first route involves the influence of previous choice outcomes on the next choice outcome (e.g., Route 1 in Figure 2.4.1). The second route concerns the influence of previous choice outcomes on the next choice process (e.g., Route 2). The third route relates to the influence of the previous choice process on the next choice outcome (e.g., Route 3). The final and fourth route involves the influence of the previous choice process on the next choice process (e.g., Route 4).

[Figure 2.4.1 about Here]

In this section, we will review the relevant literature showing the six different routes.

2.4.2.1 General influence of the decision process on decision outcomes

Overall the quality of the choice outcome is heavily influenced by the decision process (Route A in Figure 2.4.1). A typical example would be different choice outcomes from different choice heuristics. Based on the *adaptive decision-making* concept (Payne, Bettman, and Johnson 1993; Bettman, Luce, and Payne 1998), relative accuracy or decision quality is different for different choice heuristics. Generally, compensatory decision rules (e.g., WADD or EQW) yield high-quality decisions or high accuracy, whereas noncompensatory decision rules (e.g., LEX, EBA, or SAT) yield low-quality decisions or low accuracy[12].

[12] In compensatory decision rules, decision-makers use all of the salient information about the choice alternatives in order to form an overall evaluation. On the other hand, in noncompensatory decision rules, decision-makers use only part of the information about the choice alternatives in order to form an overall evaluation.

2.4.2.2 Cognitive dissonance

Making a choice can generate psychological responses. Specifically, selecting one option from many can increase psychological discomfort, known as *dissonance* (Festinger 1957; Harmon-Jones and Mills 1999). Cognitive dissonance can be defined as "a psychologically uncomfortable condition brought about by an imbalance in thoughts, beliefs, attitudes, or behavior" (Peter and Olson 2002, p. 548). Based on Festinger (1957), people have a strong motivation to reduce this cognitive dissonance after making a choice. After making such a choice, people try to increase their liking of the chosen object and decrease their liking of the rejected object. For example, when people are exposed to incoming information, they tend to focus on the positive information of the chosen alternative rather than focus on the negative information for the unchosen alternative(s) after making a choice. Therefore, cognitive dissonance theory and its research findings are closely related to Route 1 in Figure 2.4.1 inasmuch as the evaluation of options can be affected by previous choice results. In other words, the less preferred option in the initial choice is likely to become less attractive later.

2.4.2.3 Regret

Regret can be defined as "a negative, cognitively based emotion that we experience when realizing or imagining that our present situation would have been better had we acted differently" (Zeelenberg, Inman, and Pieters 2001, p. 136). Recently Zeelenberg and Beattie (1997) have shown that experienced regret can affect subsequent decisions. Specifically, the participants in their study played the role of "proposers" in a repeated-choice ultimatum game. This ultimatum game was a bargaining game with two different roles. One player (e.g., the role of "proposer") was given a sum of money and could offer part of the money to other players (e.g., the role of "responders"). The other players could either accept the offer or reject it, in which case neither player would receive any money. In their experiment, Zeelenberg and Beattie (1997) manipulated regret by giving different feedback to the participants. These participants received feedback on how much less they could have offered (either a small versus a large amount of money) and would still have had their offer accepted. The participants in the

large-amount-of-money condition generated stronger regret than those in the small-amount-of-money condition. More importantly, the participants who experienced strong regret (versus weak regret) significantly reduced their offers to other players in subsequent games. These results indicate that people's decisions can be influenced by previous regret. In sum, this experiment in regret research also illustrates Route 1 in Figure 2.4.1.

2.4.2.4 Two-stage choice model and image theory

In the decision-making literature, researchers (Wright and Barbour 1977; Bettman 1979; Gensch 1987) have theorized a two-stage choice model in choices with many alternatives. That is, consumers first select a subset of alternatives to form a consideration set (stage one) and then choose one alternative from that consideration set (stage two). In addition, they also suggest that the decision rules can be different in stages one and two.

Specifically, in stage one, consumers are likely to use noncompensatory rules in order to reduce the number of alternatives. They do so because if consumers use compensatory rules, they will need to spend considerable cost and effort, mainly due to the existence of a large number of alternatives. Therefore, consumers use noncompensatory rules to reduce the costs of decision-making. Next, in stage two, consumers are likely to use compensatory rules in order to select one option from a small number of options in the consideration set. Again, they do so because in this stage, the costs of using compensatory rules are not excessive, and the benefits to consumers of finding the best option are significant.

Beach (Beach 1990; 1993; 1998) provides a similar argument about the two-stage model of choice through *image theory* (Beach 1990; 1993; 1998), which describes the decision-making process as involving two distinct phases: pre-choice screening and choice. Pre-choice screening involves reducing a set of objects by selecting unacceptable options based on a lack of compatibility between the feature of an object and the decision-makers' standards for those features. This is the *compatibility test*, which is similar to a *disjunctive* decision heuristic (i.e., reject if the features of an option

do not reach an acceptable threshold), and therefore comprises noncompensatory rules. In other words, screening is a conservative process that serves to prevent the options of dubious or unknown quality from entering the choice set (Beach 1993). Afterward, decision-makers choose to select the best option from among those that have survived the screening process.

Both the two-stage choice model and image theory suggest that decision-makers first use noncompensatory rules in order to reduce the number of alternatives, and then use compensatory rules to select the best option in later stages. Changing the decision process can occur in variety-seeking situations. Drolet (2002) provides evidence that consumers have a tendency to vary their use of decision rules in repeated-choice situations (For details, please refer to Section 2.7.6.).

In sum, researchers have shown that decision rules can change in repeated-choice tasks. These findings illustrate Route 4 in Figure 2.4.1.

2.4.2.5 Escalation of commitment

People have a tendency to increase their investment efforts or money in a decision, despite new evidence suggesting that the decision was probably wrong. This phenomenon is known as the "*escalation of commitment*" or "sunk cost fallacy." *Escalation of commitment* can be defined as "people's greater tendency to continue an endeavor once an investment in money, time or effort has been made" (Arkes and Blumer 1985, p. 124). Studies of escalation of commitment have shown that people's previous investment decisions can affect their future decision-making (Staw 1981; Brockner 1992; Staw and Hoang 1995; Biyalogorsky, Boulding, and Staelin 2006).

For example, Staw and Hoang (1995) provide empirical evidence for the escalation of commitment in the NBA. They predicted that the draft order of a specific player in the NBA could affect a team's decision about that player. Specifically, they predicted that the lower the draft number (i.e., their previous decision), the higher the escalation of commitment effect. They found that several dependent variables (e.g., playing time, survival in the league, and the likelihood of being traded) are significantly

affected by the draft order after controlling for other predictors, such as performance, injury, and trade status.

There are several potential explanations for the escalation of commitment, including: (i) the desire not to appear wasteful (Arkes and Blumer 1985); (ii) the need to justify one's previous decision (Staw 1981; Brockner 1992); and (iii) the tendency to be risk-seeking in light of previous losses in decision-making (Garland and Newport 1991; Thaler 1980). Along the same lines, Biyalogorsky, Boulding, and Staelin (2006) have recently provided two important sources of escalation of commitment: previous belief structure and involvement in the previous decision. Therefore, escalation of commitment is closely related to Route 3 in Figure 2.4.1, in that the previous decision process or commitment can affect the decision for continuing or repeating the course of action.

2.4.2.6 Outcome/Hindsight bias

Outcome bias occurs when people make judgments based mainly on the outcome of a performance. This type of bias is not based on the performance itself, even when the outcome is determined by random or arbitrary rules (Allison, Worth, and King 1990; Baron and Hershey 1988; Agrawal and Maheswaran 2005). For instance, in consumer product evaluation contexts, Agrawal and Maheswaran (2005) provide empirical evidence of the outcome bias. The participants in their study were asked to read an article and to evaluate a product (e.g., a Personal Digital Assistant [PDA]). The outcome of the product test was manipulated to be either positive or negative. Even though the results of the product test was the same across the two conditions in the range of 6.5-7.5 on five attributes, the participants in the positive (negative) outcome condition were informed that the PDA succeeded (failed) in meeting a qualifying standard of scoring at least 6.0 (8.0) points. The results indicate that the participants in the positive outcome condition evaluated the product more positively than those in the negative outcome condition. In addition, Agrawal and Maheswaran (2005) show that the outcome bias can be attenuated by accuracy motivation. Empirically, the evaluation

of the PDA was the same across the positive and negative outcome conditions in the context of accuracy motivation.

Recently, Ratner and Herbst (2005) have articulated the role of negative emotional responses in outcome bias involving repeated-choice situations. They empirically tested whether negative emotions following an unfavorable outcome can induce people to stray from a better alternative to one less likely to succeed. They predicted that the feeling of regret could induce switching in repeated-choice situations. The participants in their study first made a choice between two stockbrokers (Broker A had a 43% chance success rate, and Broker B had a 54% chance). Most participants chose Broker B. They were then informed whether Broker B's investment was successful or not, manipulating the positive- and negative-outcome conditions. Then, the participants were asked to make a decision for the next investment. The results of the study indicate that switching to obviously inferior alternatives (e.g., Broker A due to a lower change of success rate [43%] versus Broker B [54%]) in subsequent investments was much higher for the participants in the negative-outcome condition than for those in the positive one.

Ratner and Herbst (2005) also argue that the feeling of regret mediates the relationship between outcome and the switching tendency in making subsequent decisions. Therefore, this study shows that people feel regret and tend to switch their previous choices if the decision outcome is unfavorable, even though they have chosen the clearly better alternative in the previous choice. As a result, Ratner and Herbst (2005) show that a negative emotional response following a bad outcome can lead people to abandon a previous good decision. In sum, studies of the outcome bias in repeated-choice situations suggest that people's decision-making is heavily influenced by previous outcomes. These findings illustrate Routes 1 and 2 in Figure 2.4.1.

One type of outcome bias is known as the "hindsight bias" (Fischhoff 1975; Hawkins and Hastie 1990). This type of bias can be defined as "people's tendency to overestimate how well they would have predicted events in foresight once they know how actual events turned out" (Fisher and Seiling 1993, p. 98). For example, Fischhoff (1975) provided seminal evidence of the hindsight bias. In his study, the participants were presented with descriptions of historical events and were asked to assess the

likelihood of different outcomes. The outcome was manipulated afterward. Some participants were given actual outcomes, but were told to ignore this information, whereas other participants received no information on the actual outcomes. They were then asked to assess again the likelihood of different outcomes. The results indicated that the probability estimates were systematically influenced by the outcomes that the participants were told had occurred. In other words, the participants who received the outcome information estimated a higher probability for the received outcome than did those not receiving the outcome information. In sum, the hindsight bias shows the influence of outcome on previous beliefs. Therefore, hindsight bias is related to Route B in Figure 2.4.1 inasmuch as outcome knowledge can affect previous beliefs. [13]

2.4.2.7 Variety-seeking

The variety-seeking tendency is a common phenomenon in consumer choice behavior. Many researchers have shown that consumers often tend to seek variety (Chintagunta 1998; Kahn, Ratner and Kahneman 1997; Inman 2001; Menon and Kahn 1995; Ratner and Kahn 2002; Ratner, Kahn, and Kahneman 1999; See Kahn). This tendency is a powerful motivation for consumers, in that they sometimes include the less-preferred items for the sake of variety (See Section 2.3.5 for details). The variety-seeking tendency shows the influence of previous choice outcomes on the next choice outcome. People tend to switch from previous chosen alternatives. Therefore, variety-seeking illustrates Route 1 in Figure 2.4.1.

In this section, we have reviewed decision processes and outcomes in repeated-choice situations. Several theories can be interpreted as influencing previous choice processes or outcomes on the next choice. Specifically, (i) previous choice outcomes can influence the next choice outcomes (e.g., Route 1; cognitive dissonance, regret, outcome bias, variety-seeking); (ii) previous choice outcomes can influence the next choice processes (e.g., Route 2; outcome bias); (iii) previous choice processes can influence the next choice outcomes (e.g., Route 3; escalation of commitment); and (iv)

[13] In this paper, we regard "previous belief" as the process of decision-making because we focus on the process of retrieving previous information in the hindsight bias.

previous choice processes can influence the next choice processes (e.g., Route 4: the two-stage choice model, or variety-seeking in the choice process).

2.4.3 Summary and review

Decision processes and outcomes are different constructs. In this paper, we define *choice outcome* as "the consequence of making a choice" and *choice process* as a "cognitive and emotional process leading to the selection of a course of action among alternatives."

In this section, we first reviewed the difference between process and outcome in the contexts of different mental simulations, different types of accountability, fairness perception studies, and the underlying mechanisms for availability heuristics. We then reviewed the related literature of the decision process and outcomes in repeated-choice situations. Based on a review of the previous literature, we can make certain conclusions about the different roles of process and outcome on decision-making.

First, we observe that there is a difference between outcome and process in decision-making. Specifically, people usually use process (versus outcome) information heavily in their judgments, and decision quality can be enhanced when people focus on the process rather than on the outcome. One exception is the outcome bias. Second, we observe that previous choice can influence the next choice. However, it appears that little research in the area of distinguishing between the decision outcome and decision process has been conducted up to this point. Furthermore, there is little research regarding the role of decision outcomes or the decision process in repeated-choice situations or in multiple periods.

It seems that investigating repeated choices that incorporate the distinctive concept of the decision process or outcomes can better enhance our knowledge of consumer choice for two reasons. First, one decision can imply totally different meanings for decision-makers in terms of the decision processes and outcomes. Traditionally, researchers have assumed that good [bad] decision processes result in good [bad] decision outcomes. However, sometimes one's best decision processes can

generate unwanted outcomes. For example, as we have reviewed in 2.8.2.6, Ratner and Herbst (2005) provide empirical evidence that negative affect generated by unfavorable outcomes can lead people to abandon the previous decision process having the best chance of meeting their needs in the future. In sum, because the same decision can yield good [bad] decision outcomes and can affect bad [good] decision processes, this implication can differentially affect subsequent choices. In this sense, the distinction between decision processes and outcomes is essential in order to closely investigate choice phenomena.

Second, the evaluation of a decision (e.g., decision quality) can be different in terms of the decision processes and outcomes. For example, Yates, Veinott, and Patalano (2003) reported the results of an empirical study involving subjectively bad or good decision quality. The participants in their study were asked to describe their good or bad decisions. Based on a content analysis, Yates, Veinott, and Patalano (2003) provide subcategories for bad or good decisions (please refer to Table 2.4.1 for details). As can be seen in Table 2.4.1, the subcategories for good or bad decisions can also be categorized as decision outcomes (such as *expected outcomes, missed outcomes*, and *affect*) or decision processes (such as *options* and *process*). Thus, Yates, Veinott, and Patalano (2003) illustrate the distinction between decision process and outcome in the domain of decision quality.

[Table 2.4.1 about Here]

In sum, the same decision can be evaluated in terms of good [bad] decision outcomes and bad [good] decision processes. In this sense, the distinction between decision processes and outcomes with respect to decision quality is essential in order to closely investigate choice phenomena.

In this section (2.4), we review the research involving decision processes and decision outcomes. We will then review the decision process and outcomes in repeated-

choice situations. Mainly we observe the differential roles of decision outcomes and processes. In addition, a review of the previous research suggests the need to investigate the different roles of decision outcomes and processes in repeated-choice situations.

Next, we will review the literature regarding the impact of previous ownership on the next choice: the endowment effect and the status quo effect.

2.5 The Endowment Effect and the Status Quo Effect

In this section, we will address previous ownership separately, as it is closely related to this research question and has a considerable amount of previous literature. First, we will review the phenomenon and explanations of the endowment effect. We will then review the phenomenon and explanations of the status quo effect. Finally, we will summarize the endowment and status quo effects.

2.5.1 Endowment effect

2.5.1.1 Definition of the endowment effect

People have "a tendency to place a higher value on objects they own relative to objects they do not" (Kahneman, Knetsch, and Thaler 1990; Knetsch 1989; Knetsch and Sinden 1984; Thaler 1980; Van Boven, Dunning and Loewenstein 2000). In other words, objects that are considered by people to be part of their current endowment are likely to be valued more highly than objects that are not. This phenomenon is known as the *endowment effect,* which was first labeled by Thaler (1980). Traditionally in economics, this effect has been described as an inconsistency between the amount a person is willing to pay (WTP) to buy an object, and the amount a person is willing to accept (WTA) to sell the same object. Normally, people's WTA is higher than their WTP for the same object. That is, the price people demand to sell an object is higher than the price they are willing to pay in order to acquire it.

An example of early empirical testing of the endowment effect was a study by Knetsch and Sinden (1984). They tested this effect in a lab experiment. Participants were endowed with either a lottery ticket or with $2.00. Later, they were offered an opportunity to trade the lottery ticket for the money, or vice-versa. Knetsch and Sinden

(1984) found that very few participants chose to switch to the other object. In other words, people who were endowed with a lottery ticket evaluated their lottery ticket at the value of $2 or higher. On the other hand, people who were not endowed with a lottery ticket evaluated the lottery ticket at the value of $2 or less. In sum, they demonstrated the endowment effect in the context of choosing between money and an object.

This endowment effect can be found in transactions involving a choice between two objects. For instance, Knetsch (1989) showed empirical evidence of this type of endowment effect. One group of participants was first given mugs, and later they were told that they could either keep their mugs or receive chocolate bars. The other group of participants was first given chocolate bars, and then they were told that they could either keep their chocolate bars or receive mugs. Knetsch found that a majority (89%) of people who were endowed with mugs chose the endowed mugs over the candy bars, and that the majority (90%) of people who were endowed with candy bars chose the candy bars over the mugs. In sum, Knetsch and his colleagues showed that the endowment effect could occur in the context of choosing between money and an object, as well as in the context of choosing between two objects.

In typical laboratory experiments of the endowment effect, participants receive endowed objects, such as gifts or appreciation for participating in these experiments. In a theoretical view, researchers have ignored *how* the endowed object was obtained. One exception is Loewenstein and Issacharoff (1994)'s "source dependence" study. Based on the "*associationist explanation"* (such as the notion that high performance is related to a positive association, whereas luck is related to a relatively low positive association*)*, they theorize that people are likely to evaluate an object more highly when they obtain it by their own effort than when they obtain it by chance; they also theorize that the value of an object depends on how it is obtained. They show empirically that people evaluate an endowed object more highly when the object is obtained by one's own efforts (e.g., people receive mugs due to their higher performance on an exercise task) than when the object is obtained by chance (e.g., people are told that the mugs are

randomly assigned). In sum, Loewenstein and Issacharoff (1994) show that the magnitude of the endowment effect can be changed by how the endowed object was obtained.

2.5.1.2 Explanation of the endowment effect

The endowment effect has been mainly explained by *loss aversion* (Kahneman and Tversky 1979); i.e., people's tendency to place greater weight on losses than on gains of a similar absolute magnitude (Thaler 1980). That is, people subjectively perceive a greater magnitude of loss from selling than a gain from buying. Consequently, after owning an object, people consider selling the object as a loss, and they are more likely to be reluctant to sell it.

Recently, Van Boven, Dunning and Loewenstein (2000) have proposed another explanation for the endowment effect. They argue that the endowment is due to *egocentric empathy gaps*, or people's tendency to overestimate the similarity between their own and another role player's evaluation of an object. In their experiment, participants were designated as sellers or buyers. The participants who were endowed with mugs (i.e., the "seller's" role) were asked to state their lowest selling price (s) and to estimate the average buyer's maximum purchase price (b'). On the other hand, the participants who were not endowed with mugs (i.e., the "buyer's" role) were asked to state their maximum purchase price (b) and to estimate the average seller's minimum selling price (s'). Van Boven et al. (2000) identified the endowment effect ($s>b$) in their experiment. More importantly, the sellers overestimated the buyers' maximum purchase price ($b'> b$), and the buyers underestimated the sellers' minimum selling price ($s' < s$). The results indicate that sellers overestimate buyers' valuations and that buyers underestimate sellers' valuations.

In sum, loss aversion and egocentric empathy gaps appear to be the underlying mechanisms for the endowment effect. At the same time, several other explanations of the endowment effect have been ruled out. The first criticism regarding the endowment effect is that it is based on hypothetical scenarios, so that the effect is an artificial one. Knetsch and Sinden (1984) ruled out this criticism with a lab experiment in which

participants used actual lottery tickets and money. Second, Kahneman, Knetsch, and Thaler (1990) found that this endowment effect was not a *market bargaining strategy* (such as the strategy that sellers usually demand high prices initially to sell an object with a high price, and buyers demand low prices initially to buy an object with a low price in repeated- and negotiable-exchange situations), but rather a fundamental characteristic of preference. Kahneman, Knetsch, and Thaler (1990) theorized that the endowment effect will be reduced in repeated games if the endowment effect is simply based on the *market bargaining strategy*. However, they found a significant endowment effect in repeated market experiments (i.e., a series of market experiments). A third explanation for the inconsistency between a WTP and a WTA is *sentimental attachment* to objects (Kahneman, Knetsch, and Thaler 1990). That is, the personal attachment to objects in a long time period can generate the endowment effect. However, researchers (e.g., Knetsch 1989; Knetsch and Sinden 1984) have also found an *instant* endowment effect. In other words, endowment can occur as soon as participants in experiments are given objects, such as mugs, pens, chocolate bars and lottery tickets. Therefore, the endowment effect cannot be explained solely by sentimental attachment.

2.5.1.3 Endowment effect in consumer behavior

In the context of consumer decision-making, several researchers have investigated the endowment effect. We will briefly review two papers: Strahilevitz and Loewenstein (1998) and Carmon and Ariely (2000).

First, Strahilevitz and Loewenstein (1998) investigated the effect of ownership history on the valuation of objects. Their assumption was that people adapt to ownership gradually. In other words, based on the assumption of *gradual adaptation*, people are not likely to consider an endowed object as their property immediately after they receive the object. Rather, they need a period of time to fully consider the object as their property. Therefore, the perception of loss regarding the object is greater when people fully consider the endowed object as their own property within a long time period versus when people partially consider the endowed object as their own property

in a short time period. Based on this assumption of gradual adaptation, they found that the endowment effect can increase as a function of how long an object has been owned. For example, people who were endowed with a keychain for one hour evaluated the endowed object higher than those who were endowed with it for only a few minutes. In sum, Strahilevitz and Loewenstein (1998) use the concept of reference point lability in the endowment effect[14].

Second, Carmon and Ariely (2000) tried to explain the endowment effect in that "sellers and buyers tend to focus on outcomes of the exchange that reflect what they stand to forgo (p. 368)." They empirically showed that buyers focus on expenditures (i.e., the money necessary to spend in order to acquire an object), whereas sellers emphasize the endowed objects themselves. In other words, both buyers and sellers attach higher value to objects that they have, and they are reluctant to become involved in exchanges mainly due to different foci. Specifically, buyers consider the loss of cash as more than the gains from acquiring an object. On the other hand, sellers consider the loss of an endowed object as more than the gains acquired from money. Similarly, Zhang and Fishbach (2005) provide empirical evidence that the anticipated negative emotions from losses influence the magnitude of the endowment effect.

2.5.2 Status Quo Effect

2.5.2.1 Definition of the Status Quo Effect

Related to the area of the endowment effect is the *status quo effect*, which has been defined as "a people's tendency to do nothing or to maintain one's current or previous decision (Samuelson and Zechkhauser 1988, p. 8)."

The status quo effect has been replicated in laboratory experiments (i.e., Samuelson and Zechkhauser 1988) as well as in field experiments. For example, Johnson, Hershey, Meszaros, and Kunreuther (1993) provide empirical evidence of the status quo effect. In the early 1990s, the states of New Jersey and Pennsylvania offered

[14] For another research study about reference point lability, please refer to Chen and Rao (2002).

a choice between two types of automobile insurance: an expensive option giving individuals the full right to sue, and a less expensive option with restricted rights to sue. However, the default option was different across the two states. The more expensive option was the default in New Jersey, and the less expensive option was the default in Pennsylvania. The actual choice showed that 75% of citizens in New Jersey selected the expensive insurance option, while 80% of citizens in Pennsylvania selected the less expensive one. That choice difference could generate a huge economic impact, in that the citizens of New Jersey would have paid over $200 million for auto insurance. Therefore, Johnson et al. (1993) demonstrated evidence of people's tendency to maintain their current positions.

The status quo effect has been studied in various experiments. However, we can categorize the status quo effect into two different types. The first type regards choice about the "default" option, which is given to decision-makers randomly or by chance. In short, people tend to choose the default option. The auto insurance case by Johnson, Hershey, Meszaros, and Kunreuther (1993) is a typical example.

The second type regards choice between a previously chosen option and a new one (i.e., a decision between choosing the same option versus switching to another option). Typically in these experiments, participants are asked whether they selected the previously chosen option or a new one (i.e., Samuelson and Zechkhauser 1988). In a similar context, they are sometimes asked to evaluate (e.g., regret or satisfaction) the outcome from two-choice options (Ritov and Baron 1992). Most participants show a higher preference for the previously chosen option and a higher negative evaluation of the new option outcome. The second type of status quo effect is similar to the endowment effect, in that there are two different time frames in both the status quo and the endowment effects.

However, there is a critical difference between the two effects. In the endowment effect, the participants are usually given an object in the endowment stage, and then they evaluate the object. On the other hand, in the status quo effect, participants are usually assumed to have had a previously chosen option, and then they

make a second choice involving an opportunity to switch to another option. Put differently, research on the endowment effect uses strong manipulation of the endowment stage in experiments (e.g., participants are asked to choose an option in the endowment stage), whereas research on the status quo effect simplifies the endowment stage (e.g., participants are asked to assume that they have an option)

2.5.2.2 Explanation of the Status Quo Effect

Samuelson and Zechkhauser (1988) provide three explanations for the status quo effect. The first explanation is that the status quo effect is the consequence of *rational decision-making* in the presence of transition costs. For instance, we can consider that decision-makers face new decisions after making a previous one. The first explanation for the status quo effect assumes that decision-makers make the same decision if they face a similar decision setting, and if there is no change in their preference. That is, the status quo effect can be explained by *transition costs* (i.e., the cost of change) because rational decision-makers should make the same decision when the cost of switching is higher than the gains of switching to the other alternative. This explanation tries to understand the status quo effect based on the assumption of rationality. However, the second and third explanations assume that the status quo effect occurs with irrationality.

The second explanation is that the status quo effect is due to *cognitive misperceptions* of retaining the status quo and opting for a new alternative. For example, *loss aversion* predicts that decision-makers stick to a specific option if that option is considered to be the reference point. In such a situation, switching from a status quo alternative can be categorized as a loss. Therefore, the status quo effect can be explained by *cognitive misperceptions* of retaining or switching from a status quo option.

The final explanation is that the status quo effect is due to *psychological commitment.* Based on the sunk cost or commitment literature (please refer to Section 2.4.2.5 for details), decision-makers are likely to be reluctant to “cut their losses” (p. 37) or appear wasteful and tend to justify their previous commitment to a course of action. Therefore, Samuelson and Zechkhauser (1988) predict that “the larger the past

resource investment in a decision, the greater the inclination to continue the commitment in subsequent decisions" (p. 37). Although Samuelson and Zechkhauser (1988) propose two other different mechanisms, the status quo effect has been traditionally explained by loss aversion (e.g., Chernev 2004).

Recently, Ritov and Baron (1990, 1992) have attempted to isolate what the two biases are regarding the status quo effect. The first one involves an exaggerated "preference for the current state (namely, the *status quo bias,* Ritov and Baron 1992, p. 51)". The second one concerns an exaggerated "preference for inaction (namely, the *omission bias* Ritov and Baron 1992, p. 51)". In order to test these two biases, they systematically manipulated commissions/non-commissions and status quo options/non-status quo options, based on four different scenarios. They found that participants in their study put more weight on the negative consequences of the commission than the positive consequences of the commission. This pattern was not influenced by the current status quo. In sum, they found that the main mechanism of the status quo effect is based on the omission bias rather than on the status quo bias. Schweitzer (1994) also investigated the same research question. However, he found that both status quo and omission biases can occur additively. Therefore, it appears that the relative magnitude of the status quo bias and the omission bias is unsolved up to this point.

2.5.2.3 Status Quo Effect in consumer behavior

In the context of consumer decision-making, Chernev (2004) investigated the effects of goal orientation on the status quo effect. Goal orientation is likely to influence consumer preference for the status quo effect by changing consumers' sensitivity to gains and losses. Specifically, in self-regulation theory (Higgins 1997), the sensitivity to losses (versus gains) is greater in the prevention condition than it is in the promotion condition. Based on this theorizing, he empirically showed that the status quo effect was greater for prevention-focused versus promotion-focused consumers.

In addition, Luce (1998) also investigated the influence of decision task difficulty on the magnitude of the status quo effect. She argues that choosing the status

quo option is one coping strategy in the face of making a difficult decision. She provides empirical evidence that the status quo effect is greater when decision-makers face difficult decisions (i.e., a trade-off condition) versus when decision-makers face easy decisions (i.e., a dominance condition).

In the domain of default options, Brown and Krishna (2004) showed a reverse effect of the default option in a consumer choice situation. They argue that the default option can invoke consumers' marketplace metacognition[15] and counterargument thoughts about the default option. They provide empirical evidence that participants choose the default option less when their marketplace metacognition is made more accessible.

In sum, researchers in consumer decision-making have investigated the moderators of the status quo effect, such as goal orientation, decision difficulty, and consumers' marketplace metacognition.

2.5.3 Summary and review

In this section, we reviewed the endowment effect and the status quo effect. First, the endowment effect refers to people's tendency to place a higher value on objects they own relative to objects they do not. The endowment effect has been replicated in many situations, including consumer choice. Researchers have proposed loss aversion in order to explain the endowment effect (i.e., Thaler 1980; Kahneman, Knetsch, and Thaler 1991) and have proposed other underlying mechanisms (i.e., Van Boven, Dunning and Loewenstein 2000). Second, the status quo effect refers to people's tendency to do nothing or to maintain one's current or previous decision (Samuelson and Zechkhauser 1988). The status quo effect has also been replicated in many situations, demonstrating consumer choice and loss aversion as the main explanation for the status quo effect. In sum, loss aversion is the dominant explanation for both the status quo effect and the endowment effect.

[15] Marketplace metacognition refer to people's beliefs about their own mental states and the mental states, strategies, and intentions of others as these pertain directly to the social domain of marketplace interactions (Wright 2002).

The review of the endowment effect and the status quo effect suggest the need for future research. First regarding the endowment effect, we need to investigate the impact of the process of endowment on subsequent evaluation. The basic task regarding the endowment effect is related to the multiple stages of decision-making, in that the typical experiment concerning the endowment effect consists of the *endowment stage* and the *evaluation stage*. The endowment stage itself can systematically influence the evaluation stage, as shown in research by Loewenstein and Issacharoff (1994). However, although Loewenstein and Issacharoff (1994) show that the magnitude of the endowment effect can be changed by how an endowed object is obtained, they merely manipulated the endowment by the external aspects of decision-making (i.e., by one's own efforts of an unrelated task or by chance).

In sum, we know little about the impact of the decision-making process itself on making subsequent decisions. Therefore, future research is needed to investigate the decision task-induced impact (i.e., the decision difficulty in the endowment stage) rather than the ambient impact (i.e., endowed by one's own efforts of an unrelated task or by chance) on subsequent decision-making. This investigation can be part of a growing body of literature positing that decision-making should be analyzed by task-induced factors rather than by external factors (e.g., task-induced affect versus ambient affect; see Shiv and Fedorikhin 1999) or by decision process-induced affect versus ambient affect (Garbarino and Edell 1997).

Second, the status quo studies by Ritov and Baron (1990; 1992) and by Schweitzer (1994) are interesting in terms of the decision process and outcomes. Based on the results of Ritov and Baron (1990; 1992), it appears that the status quo bias is related to decision outcomes rather than the decision process inasmuch as the status quo bias (e.g., an exaggerated preference for the current state of affairs) is related to decision outcomes. Indeed, the status quo bias suggests that people will display a tendency to stick to a specific option or to make a decision based on previous decision outcomes. On the other hand, the omission bias (e.g., an exaggerated preference for inaction) is related to the decision process, in that the omission bias suggests that people will

display a tendency to do nothing. In sum, we can infer from Ritov and Baron (1990, 1992) that the impact of the process is much greater than the impact of the outcome in the context of the status quo effect. Future study is needed to investigate the different roles of previous decision outcomes versus the process on subsequent decision-making in the contexts of the status quo effect or the endowment effect.

To this point, we have reviewed the literature related to the endowment effect and the status quo effect. Now we will examine the literature regarding the general decision-making, including trade-offs and conflict, preference for choice and the tendency to avoid choice, and the cost of decision-making.

2.6 Trade-offs and Conflicts

In the previous sections (Section 2.3, 2.4, and 2.5), we reviewed the repeated-choice literature. In this section, we will review general decision-making in order to better understand decision-making. Specifically, in this section, we will first review trade-offs/conflicts. We will then look at how people react upon having to make difficult decisions.

2.6.1 Definition and types of conflicts

Trade-offs or conflicts are an essential part of decision-making. Generally, all decision-making requires decision-makers to solve conflicts or trade-offs. Conflicts can be defined as "the competing response tendencies arising when one of a set of multiple alternatives must be chosen" (Luce, Payne, and Bettman 2000, p. 276). This definition implies that conflicts can exist only in multiple-alternative decisions. However, conflicts can also exist in single-alternative decisions. In other words, there are two different types of conflicts: *between-alternative* conflicts and *within-alternative* conflicts. Between-alternative conflicts occur in cases where decision-makers must choose between two options, and one option is superior in some respects, while the other option is superior in other aspects. On the other hand, within-alternative conflicts occur in cases where decision-makers must form an evaluation of an alternative that is good in some respects, but bad in others (Fisher, Luce, and Jia 2000, p. 91). Typically,

between-alternative conflicts form the main research area in behavioral decision-making. Consequently, in this paper we will focus mainly on between-alternative conflicts.

Other types of conflicts are related to the valence of attribute values. Miller (1944; 1959) suggests that conflict can be described as having features of approach and avoidance: *approach-approach, avoidance-avoidance, and approach-avoidance* conflicts. An approach-approach conflict can be defined as a decision involving desired options, whereas an avoidance-avoidance conflict can be defined as a decision involving undesired options. The final approach-avoidance conflict can be defined as a choice between desired and undesired characteristics. Miller (1959) suggests that approach-approach conflicts can be resolved relatively easily. However, he argues that avoidance-avoidance and approach-avoidance conflicts are generally more difficult to resolve because Miller (1959) assumes that people have a stronger tendency to avoid a feared stimulus than to approach a goal (p. 205).

Empirical studies show that approach-approach conflicts are resolved more rapidly and easily than avoidance-avoidance conflicts (Epstein and Smith 1967; Murray 1975). These findings can be explained by loss aversion or the negativity bias in personality evaluation, which suggests the greater weight of potential costs over potential gains (Murray 1975). Put differently, the impact of negative aspects or outcomes of decision-making is greater than that of positive ones.

Chatterjee and Heath (1996) provide empirical evidence for Miller's argument in consumer decision-making situations. They manipulated approach-approach and avoidance-avoidance conflicts by providing reference alternatives. These researchers used a camera decision scenario situation in which there were two important attributes: quality and price. The decision to be made involved choosing one of two target alternatives: Camera A or Camera B. An approach-approach conflict was manipulated by providing an inferior reference state, such as Camera I, because both Cameras A and B were considered to be better than Camera I. On the other hand, an avoidance-

avoidance conflict was manipulated by providing a superior reference state, such as Camera S. Please refer to Table 2.6.1 below for the actual examples. They found that the avoidance-avoidance conflict (i.e., the superior reference condition) increased subjective decision difficulty, whereas the approach-approach conflict (i.e., the inferior reference condition) reduced subjective decision difficulty. Chatterjee and Heath (1996) suggest that this finding is consistent with loss aversion (p. 150). In sum, Chatterjee and Heath (1996) provide empirical evidence regarding different decision difficulty for approach-approach and avoidance-avoidance conflicts. Recently, Zhang and Mittal (2005) replicated Chatterjee and Heath (1996)'s study. Based on their experiment, this effect is stronger in the condition of high outcome accountability.

[Table 2.6.1 about Here]

In addition, Chatterjee and Heath (1996) argue that the size of a trade-off can influence the decision difficulty. Specifically, based on prospect theory, they propose that large trade-offs generate greater decision difficulty than do small trade-offs. This is because comparisons between alternatives in large trade-offs are related to comparisons of large gains and losses. On the other hand, comparisons between options in small trade-offs are related to comparisons of small gains and losses. Based on loss aversion, people perceive a large loss when they have large gains and large losses versus when they have small gains and small losses. In other words, the absolute difference between large and small losses is greater than the absolute difference between large and small gains when people evaluate options with trade-offs. Their empirical results support this prediction. In sum, Chatterjee and Heath (1996) provide empirical evidence that the type and size of trade-off can affect the perception of the decision difficulty.

Houston and his colleagues (Houston and Doan 1996; Houston and Sherman 1995; Houston, Sherman, and Baker 1991, Houston, Sherrill-Mittleman, and Weeks 2001) also extend Miller's argument into the decision-making realm, involving both unique and common features. If two alternatives in a binary choice situation have the

same attributes, these attributes are common features; whereas if each alternative has its own features (which do not belong to another alternative), these attributes are unique features. They assume that unique features have a larger impact on choice than do common features because decision-makers are likely to discount the common features and focus on the remaining unique features during the choice situation.

Sometimes a choice can involve a unique-good pair of choices or a unique–bad pair of choices. For example, the choice between automobiles A and B in Table 2.6.2 involves a unique-good pair of choices because their two bad attributes are common features. On the other hand, the choice between automobiles B and C in Table 2.6.2 involves a unique-bad pair of choices. Houston and his colleagues show that when a choice involves a unique-good pair, such a choice process is easy and psychologically pleasant. On the other hand, when a choice involves a unique-bad pair, such a choice process is difficult and psychologically unpleasant. Specifically, they show that a unique-bad pair of choices (versus a unique-good pair of choices) generates: (i) longer decision times (Houston, Sherman, and Baker 1991); (ii) lower post-choice satisfaction (Houston and Sherman 1995); and (iii) lower evaluation of the chosen option (Houston and Sherman 1995).

[Table 2.6.2 about Here]

Beattie and Barlas (2001) also investigate the different perceptions of trade-off difficulty. They suggest that trade-off difficulty can be different with respect to various categories of decision problems. Their categorization of objects is the following: (i) commodities (objects that are appropriately bought and sold in the market, such as cameras or CDs); (ii) currencies (objects that act as stand-ins for commodities, such as money or coupons); and (iii) noncommodities (objects that either cannot be transferred or that lose some of their value by being traded in markets, such as pain or friendship). Their empirical study supports the idea that trade-off difficulty is affected by trade-offs involving different categories. Specifically, they find that decisions between commodities and currencies are easier to make than are decisions between

noncommodities. They theorize that the difference in decision difficulty is based on the characteristics of the attributes. For example, people have a difficult time trading their friendships with other attributes in noncommodity cases.

In summary, conflicts or trade-offs can be categorized differently. One category concerns *between-alternative* versus *within-alternative* conflicts (Fisher, Luce, and Jia 2000). The other category involves *approach-approach, avoidance-avoidance, and approach-avoidance* conflicts (Miller 1956). Moreover, the size and type of trade-off, as well as the decision domain can affect perceptions of decision difficulty. We will now examine how people respond to conflicts or decision difficulty. Several researchers have provided their own answers to this question.

2.6.2 Response to conflicts

Theoretically, Einhorn and Hogarth (1981) provide two different strategies in high-conflict conditions. They assume that there are no dominant alternatives in a choice set, and that conflicts are due to the negative correlations of attributes. The first strategy is to reduce conflict through compensatory decision heuristics. Under high-conflict conditions, decision-makers will attempt to process all relevant information because these decision-makers can easily lose decision accuracy in negative correlation situations. The second strategy is to avoid explicit trade-offs and to use noncompensatory decision heuristics because decision-makers want to avoid confronting conflict-laden decision problems. Later, Bettman, Johnson, Luce, and Payne (1993) empirically tested this argument. They systematically manipulated negative correlations between attributes. Their findings support Einhorn and Hogarth (1981)'s first strategy. In other words, in a high-conflict decision situation, people tend to face the conflict rather than avoid it. That is, they process more information and use a less selective, more alternative-based processing style in negatively correlated decision problems.

Montgomery (1983) proposes a similar argument regarding decision heuristics in conflict situations. He argues that decision-makers try to search for dominance structures. Based on his argument, decision-makers seek to avoid conflicts by finding decision heuristics in which one choice alternative can be seen as dominant over the others.

Another form of difficult decision-making is related to choice between economically equivalent alternatives. Slovic (1975) provides early work for difficult decision-making, such as a choice between equally valued alternatives. Participants in his study were asked to provide their underlying preferences, such as the importance of attributes. In addition, they were asked to perform a matching task in order to generate two equally valued alternatives. They were then asked to choose one alternative from two equally valued alternatives. The results indicate that the participants resolved the difficult task by choosing the alternative that was superior on the dimension most important to them. From this finding, Slovic (1975) theorizes that this kind of choice can be easy to explain or justify.

Choosing the asymmetrically dominant alternative or non-extreme alternative is one way to avoid a trade-off. For example, Huber, Payne, and Puto (1982) describe the *decoy effect* (or the *attraction effect*), which refers to the possibility that adding a new alternative in the choice set increases the choice of one of the existing alternatives that dominates the new one. For example, if there are only options A and B in the market as Figure 2.6.1.a shows, their positions can generate a strong trade-off to the extent that option A is superior to option B on attribute 1, whereas option A is inferior to option B on attribute 2. In this situation, if option C enters the market, it can change the relative preference among options A and B. Specifically, Huber, Payne, and Puto (1982) provide empirical evidence that adding option C increases the absolute share of option B. Put differently, the choice probability of option B can be increased by adding option C: $p\{B; A, B, C\} > p\{B; A, B\}$.

This effect has been replicated in a wide variety of choice situations involving not only commercial products (Ariely and Wallsten 1995; Dhar and Simonson 2003; Pettibone and Wedell 2000; Sen 1998; Simonson 1989), but also gambling (Wedell 1991), jobs (Highhouse 1996) and political candidates (Pan, O'Curry, and Pitts 1995). This decoy effect can be generated by: (i) an asymmetric dominance relationship (e.g., only option B dominates option C); and/or by (ii) different attribute perceptions due to adding a new option (i.e., Dhar and Glazer 1996; Park and Kim 2005; Pettibone and Wedell 2000).

[Figure 2.6.1 about Here]

The *compromise effect* also provides similar results. The compromise effect was first suggested by Simonson (1989). This type of effect refers to the possibility that adding a new alternative to the choice set increases the choice for one of the existing alternatives that has a non-extreme attribute. For example, if there are only options A and B in the market, as Figure 2.6.1.b shows, their positions can generate a strong trade-off. In this situation, if option D enters the market, it can change the relative preference among options A and B. Specifically, Simonson (1989) provides empirical evidence that adding option D increases the relative share of option B. In other words, the relative choice probability of option B can be increased by adding option D: p{B; A, B with D} > p{B; A, B without D}.

In sum, studies of both the decoy effect and the compromise effect show that choosing the asymmetric dominant alternative or non-extreme alternative is one way to avoid a trade-off.

Another way to respond to a conflict is to postpone making a decision. Tversky and Shafir (1992) provide empirical evidence involving the role of decision difficulty in decision deferrals. In their first study, participants were asked to choose one from two gamble options. Half of the participants were assigned to the dominance-option

condition (i.e., a choice between [65% to win $15] versus [65% to win $14]). On the other hand, half of them were assigned to the conflict-option condition (i.e., a choice between [65% to win $15] versus [30% to win $35]). In their choice task, the participants could search the other option. The results indicate that the participants showed a higher tendency to "search the other option" in the conflict- versus the dominance-option condition. In their second study, Tversky and Shafir (1992) replicated their previous study in a different context. They compared the choice condition, providing only one option (i.e., the non-conflict condition) with the other choice condition, providing two conflicting options (i.e., the conflict condition). In each condition, the participants were asked either to choose one option or to select the no-choice option (such as waiting until they learn more about the other products). Again, the participants showed a higher preference for the no-choice option in the conflict versus the non-conflict condition. Based on their studies, we can infer that decision deferral is one way to avoid making conflict decisions.

The findings of Tversky and Shafir (1992) are similar to those of other researchers. For example, Greenleaf and Lehmann (1995) empirically show that the main reason for people delaying consumer decision-making is the difficulty they experience in selecting one alternative. In addition, Dhar (1997) also provides empirical evidence that consumers' preference for the no-choice option increases (or decreases) with the introduction of a new alternative that is relatively equal with (or is clearly inferior to) another alternative in overall attractiveness.

In the research literature concerning within-alternative conflict, Fischer, Luce, and Jia (2000) find that in higher conflict situations, participants take a longer amount of time to make judgments, show greater uncertainty regarding their overall evaluations of the alternatives, and exhibit a greater response error (such as a greater inconsistency between decisions across different occasions).

Decision conflicts can be observed within the domain of goal conflicts. Upon examining the research literature on goal conflicts, it is evident that people can sometimes hold multiple goals in decision-making. For example, people want to do well academically and want to socialize with friends actively. However, having multiple goals simultaneously can generate goal conflict. People usually cope with such goal conflicts by pursuing a single goal (e.g., just trying to focus on studying hard, in our example) or by adapting an integrative goal (e.g., trying to do group study, in our example).

If this coping strategy is not available, people may try to balance multiple goals. Dhar and Simonson (1999) provide direct evidence for this balancing strategy. Based on the theory that focusing on a single goal can generate satiation or boredom, they show that consumers are more likely to prefer balancing their consumption experiences when making choices that involve a trade-off between two goals. For instance, individuals may find an unhealthy pizza dish as more preferable after a workout rather than after watching television. This result indicates that people try balancing two different goals, such as health and enjoyment.

Recently, Fishbach and Dhar (2005) have provided similar findings for this previous work. They examined the initial goal pursuit effect on subsequent consumer decision-making under goal conflict situations. They found that pursuing an initial goal liberates individuals to subsequently pursue conflicting goals. Put differently, more progress toward achieving a goal increases the pursuit of other substitute goals. Specifically, in their first study, the participants were manipulated to have a perception of high (versus low) progress in dieting. Afterward, they were asked to choose between a chocolate bar and an apple. The results indicate that the participants of high (versus low) progress in dieting generally chose the chocolate bar. Therefore, the more progress is perceived, the more likely people are to choose inconsistent activities. To sum up, in the goal conflict literature, we find that balancing two different goals is one way of avoiding conflict in one's mind.

Compared to buying necessity goods, buying luxury goods is harder to justify and oftentimes evokes feeling of guilt (Prelec and Loewenstein 1988; Kivetz and Simonson 2002a: 2002b; Strahilevitz and Myers 1998). Consumers' feelings of guilt regarding the purchase of luxury goods is sometimes based on the consumers' perception that buying luxury (versus necessity) goods is wasteful. When consumers buy luxury goods, they sometimes reduce their feelings of guilt by donating money to charity (Strahilevitz and Myers 1998) or by prepaying the costs of luxury goods (Thaler 1980). Recently, Kivetz and Simonson (2002a) propose that choice between necessity and luxury goods as rewards for frequency programs can be influenced by their effort in these frequency programs. They theorize that increasing efforts can reduce feelings of guilt in terms of choosing luxury goods. Specifically, they manipulated a program requirement as easy (e.g., "rent a car 10 times to get rewards") or difficult (e.g., "rent a car 20 times to get rewards"). The participants were then asked to select one reward program between luxury goods (e.g., "a luxurious one-hour sports massage") and necessity goods (e.g., "local grocery store credit"). The results showed that when the program requirement was difficult, the participants were more likely to choose the luxury reward over the necessity reward.

In sum, based on the study by Kivetz and Simonson (2002a), we can infer that making a great deal of effort can help decision-makers justify making difficult decisions.

2.6.3 Summary and review

In sum, we examined several strategies for making difficult decisions. When people must make high-conflict decisions, they tend to: 1) process more information; 2) use a more elaborate processing style (Bettman, Johnson, Luce, and Payne 1993); 3) find a dominant structure (Montgomery 1983); 4) postpone the decision itself (Tversky and Shafir 1992; Dhar 1997); 5) use a specifically simple decision strategy (i.e., choose the alternative that is superior on the dimension more important to them) (Slovic 1975); 6) balance two competing goals (Dhar and Simonson 1999); 7) make a great deal of effort in order to justify making difficult decisions (Kivetz and Simonson 2002); or 8) show

the attraction effect or the compromise effect (Huber, Payne, and Puto 1982; Simonson 1999).

To this point, we are aware of different strategies for making difficult decisions in the short term. However, we have much less knowledge concerning the long-term impact of different strategies on future decision-making behavior. For example, under difficult decision-making circumstances, people use either: 1) relatively deep processing strategies, such as an elaborate processing style (Bettman et al. 1993) and exerting a great deal of effort (Kivetz and Simonson 2002); or 2) relatively simple processing strategies, such as postponing the decision itself (Tversky and Shafir 1992) and choosing the alternative that is superior on the dimension most important to them (Slovic 1975). Theoretically, different processing strategies in making previous decisions can influence making similar future decisions. Therefore, extending the study of trade-offs within a broad time perspective can further contribute to the existing knowledge base of making difficult decisions.

Until now, we have reviewed the literature about trade-offs and conflicts. In the next section, we will review attitudes regarding decision-making.

2.7 Preference for Choice versus the Tendency to Avoid Choice

Researchers (e.g., Langer 1975; Brehm 1971; Iyengar and Lepper 2000) have long been interested in people's attitude toward choice. There are three main streams of this research. The first and most traditional research stream concerns the positive preference for choice. That is, people generally prefer choices when they face decisions. The second research stream involves the tendency to avoid choices, which reports results that are directly contrary to the first approach. The final stream examines the moderators that determine the direction of preference for choice. We will first address the positive preference for choice.

2.7.1 Positive preference for choice

In this section, we will first review the positive preference for choice. We will then review similar studies in assortment studies.

2.7.1.1 Positive preference for choice in general

Traditionally in psychology, many researchers have demonstrated that the provision of choice can generate higher intrinsic motivation, more enjoyment, higher task performance, and higher perceived control, self-esteem and psychological well-being (Botti and Iyengar 2004; Burger 1989; Cordova and Lepper 1996; Deci 1981; Iyengar and Lepper 2000; Langer 1975; Langer and Rodin 1976; Peterson and Seligman 1984; Ryan and Deci 2000; Taylor and Brown 1988). Based on the general finding that choice can increase the overall satisfaction of a task, researchers in the decision-making arena have also found that providing choice opportunities can enhance the satisfaction or quality of choice outcomes (Langer 1975; Suzuki 1997; Bown, Read, and Summers 2003).

Empirically, providing choice opportunities for decision-makers has usually been assessed by providing subjects with multiple options. That is, providing multiple options for decision-makers is assumed to provide choice opportunities, while providing a single option is assumed not to provide a choice opportunity. Therefore, in this paper, we will consider providing decision-makers with two or more alternatives to be providing a choice opportunity.

The preference for choice itself has been found not only in human decision-making, but also in animal decision-making. Catania (1975, 1980) found that animals (rats, pigeons, and monkeys) preferred multiple options to a single one. For example, Catania (1975) conducted an empirical study with pigeons. In order to obtain food, pigeons were to choose one terminal link out of two. One of the terminal links had only one key, while the other terminal link had two keys and the pigeons could select between the keys. The final reinforcement was the same, whether the pigeons chose one or the other terminal links. However, Catania found that pigeons preferred a terminal link that had two alternatives to one that had only a single alternative, even though the reinforcement was the same. This finding suggests that animals prefer having multiple

options as well. Suzuki (1997) tested the impact of the amount of reinforcement in the context of Catania's experimental paradigm in human decision-making. He manipulated the reinforcement with a single- versus multi-alternative options. The results showed that people preferred multi-alternative options to single-alternative ones when the amount of reinforcement produced by the multi-alternative option was equal to or larger than that of the alternatives in the single-alternative option. In sum, the preference for choice is a common tendency for human beings and animals alike.

There are several possible explanations for the positive preference for choice. Later we will review the underlying mechanism of the preference for choice. Early work in the area of positive preference for choice with respect to control was conducted by Langer (1975). Specifically, she tested the impact of choice on the evaluation of lotteries. She found that participants evaluated the possibility of winning the lottery highly when they could choose the lottery numbers by themselves as opposed to when they could not. Put differently, participants appeared to believe that picking their own lottery numbers could increase their subjective probability of winning the lottery. Langer termed this as the *illusion of control*; that is, the expectancy of success is inappropriately higher than the objective probability would warrant. She provided an explanation for this illusion of control, suggesting that people have a motivation to control their environments. In other words, people have the motivation to master their environments, including the ability to "beat the odds" or to control chance events. Therefore, the greatest satisfaction or feeling of competence would result from being able to control the seemingly uncontrollable. In sum, based on Langer's study, one can infer that the positive preference for choice is based, in part, on people's intrinsic motivation to control their environments.

Another typical explanation of preference for choice refers to *preference matching* (Loewenstein 1999; Botti and Iyengar 2004; Chernev 2003a; 2003b). This preference matching phenomenon tells us that providing many alternatives can be helpful for decision-makers inasmuch as a large number of alternatives can provide

decision-makers with ways to find a better match between their preferences and the characteristics of their alternatives. A simple example is ice cream flavor. If each consumer has a different preference for ice cream flavors, it would be better to provide 30 flavors than only three in order to satisfy each consumer. Lancaster (1990), who approaches the issue from utility theory in economics, also asserts that larger assortments can offer consumers a greater variety of alternatives, which can then increase the probability of a better match between consumers' preferences and the characteristics of their alternatives. In sum, preference matching can be another reason for preference for choice. In the view of economic theory, this explanation is related to individual utility maximization through matching individuals' preferences.

The other explanation for preference for choice is related to the expectation of outcome. As mentioned before, Suzuki (1997) found that people preferred the multi-alternative option to the single-alternative one when the amount of reinforcement produced by the multi-alternative option was equal to or larger than that of the alternatives in the single-alternative option. However, when the amount of reinforcement produced by the multi-alternative option was smaller than that of the alternatives in the single-alternative one, there was no difference among the participants' preferences between multi-alternative and single-alternative options. In sum, the results indicate that the preference for a multi-alternative option versus a single-alternative option is based on the different outcomes from the multi-alternative option versus the single-alternatives option. In other words, the reason for preferring multiple alternatives is that people expect better outcomes when choosing one among multiple alternatives than when receiving a single alternative. Therefore, one reason for a positive preference for choice is related to higher expected outcomes (i.e., higher reinforcement) from multiple alternatives versus a single alternative.

However, Shin and Ariely (2004) have recently provided evidence that sometimes people sacrifice a better outcome in order to preserve an alternative, or to maintain an opportunity of choice. In this case, individuals play a "door game," in

which a door represents the option whose payoff is based on random probability. Participants can select one door from multiple doors and can then find out the results of their choices. However, the door in this game is eliminated if the participants do not open the door frequently. The results of this study demonstrate that participants invest more effort and money in keeping options that are in danger of disappearing (i.e., via the threat of their unavailability), even when these options do not provide higher expected outcomes. In sum, their findings suggest that people are willing to sacrifice consumption pleasure in order to increase their freedom of choice.

Another explanation for the preference for choice is the "*preference for flexibility*" literature (Koopmans 1964; Kreps 1979). The "preference for flexibility" can be interpreted in a consumer choice context: consumers prefer multiple items to a single one because choosing multiple items can delay the ultimate decision to be made. This preference comes about mainly from consumer uncertainty or ambiguity concerning future tastes. Empirically, Kahn, Moore, and Glazer (1987) provided empirical evidence for this preference for flexibility. In their study, the participants were asked to choose between two stores. One store offered a single item in terms of soda (e.g., Coke), whereas the other store offered two soda items (e.g., Diet Coke and 7-Up). The results indicate that the participants preferred the store that provided multiple options.

Bown, Read and Summers (2003) provide other explanations concerning the positive preference for choice. They demonstrate that people prefer options allowing them to make further choices (i.e., multiple options) over those that do not (i.e., a single option), even when these extra choices cannot provide ultimate outcomes. These researchers refer to this phenomenon as the *lure of choice*. In their study, participants make a decision between a one-option versus a two-option condition. In the two-option condition, one alternative obviously dominates the other option. Therefore, the expected outcomes from the one-option versus the two-option condition are similar. However, most of the participants preferred the two-option condition, which provided them with

the opportunity of choice. Two explanations are provided for this result. The first explanation focuses on the *choice-is-better heuristic.* This explanation is based on the assumption that people do not pay attention to all options carefully, but rather use simple decision heuristics, such as, "It is better to choose from a larger selection than a smaller one" (p. 306). That is, people prefer the choice process itself. The second explanation is based on e*volution.* This explanation assumes that people know evolutionarily that choice leads to the best outcome. This explanation regards the preference for choice as a fundamental part of our genetic constitution.

Finally, the preference for choice is related to Brehm's *reactance theory* (Brehm 1966; Brehm and Brehm 1981). Reactance theory posits that when people believe they are free to engage in a given behavior, they will generate psychological reactance if that freedom is eliminated or threatened with elimination. In other words, if individuals face limited freedom, they will develop a strong motivational state directed toward re-establishing the threatened or eliminated freedom. Thus, the typical outcome of psychological reactance is an individual's attempt to reassert freedom through behavior. Another outcome is to increase the preference for threatened behaviors or objects. For instance, when freedom in selecting a specific object is threatened, people are likely to begin wanting it more than beforehand (Brehm and Brehm 1981). In sum, reactance theory suggests that people have a fundamental motivation in their preference for choice.

2.7.1.2 Positive preference for choice in assortment studies

In the marketing literature, researchers have studied the impact of the amount of assortment on consumer satisfaction. Providing a large assortment is the same as providing many alternatives. Generally, researchers have found that a large assortment can generate high consumer satisfaction. This literature will be discussed in this section.

A larger assortment can lead to stronger preferences because it can increase one's *perceived decision freedom*. Reibstein, Youngblood, and Fromkin (1975)

provided empirical evidence for this idea. The participants in their study were given two (versus four) soft drinks with different flavors and were asked to perceive their decision freedom by using a 6-point scale: "How much freedom did you feel you had in selecting a flavor of soft drink?" Reibstein, Youngblood, and Fromkin (1975) found that the participants with only two choices perceived less subjective decision freedom than those with four choices.

Furthermore, a larger assortment is related to future consumption. Kahn and Lehmann (1991) assume that consumers are uncertain about their future preferences. Therefore, they theorize that consumers evaluate assortments in terms of their flexibility for future choices. Consequently, they posit that consumers prefer a large assortment (versus a small one) because choosing from a large assortment can reduce consumers' uncertainty about their future preferences. The researchers argue that consumers prefer choosing from large assortments in order to reduce future efforts required to weed out unacceptable options. In other words, a larger assortment can allow consumers to reduce their uncertainty concerning future preferences.

Along the same lines, other researchers (Greenleaf and Lehmann 1995; Karni and Schwartz 1977) have proposed that assortment is related to differential uncertainty. The number of alternatives can be related to consumers' uncertainty about whether the choice set presents all potentially available options. A larger assortment can reduce this type of uncertainty. For example, consumers with a larger assortment from which to choose have higher confidence that the available set at hand is representative of the entire set of possible alternatives. On the other hand, consumers with a small assortment from which to choose have lower confidence of the same belief. In this paper, we will term this type of uncertainty as the "uncertainty of sampling."

In this section, we have reviewed the positive preference for choice. We have found that decision-makers usually like the provision of choice opportunities and prefer a large assortment. Put differently, people prefer choice to non-choice. This positive preference for choice is based on different reasons, such as the illusion of choice

(Langer 1975), preference matching (Loewenstein 2000), simple decision heuristics (Bown, Read, and Summers 2003), preference for flexibility (Kahn, Moore, and Glazer 1987), psychological reactance (Brehm 1971), perceived decision freedom (Reibstein, Youngblood, and Fromkin 1975), reducing the uncertainty of future preferences (Kahn and Lehmann 1991), or reducing the uncertainty of sampling (Greenleaf and Lehmann 1995). It appears that these explanations are not mutually exclusive. In fact, some explanations may overlap with others. For example, preference for flexibility is closely related to reducing the uncertainty of future preferences. In addition, regardless of whether the outcome from multiple alternatives is better or worse than that from a single alternative, people are more likely to prefer choice (Suzuki 1997; Shin and Ariely 2004).

To this point, the literature showing people's positive preference for choice has been examined. However, researchers have recently also started to investigate the tendency of people to avoid choice, inasmuch as people sometimes try to avoid choice opportunities or to prefer relatively few options. This literature will be addressed next.

2.7.2 The tendency to avoid choice

A large number of alternatives can reduce consumer satisfaction because consumers may have to spend many of their mental resources and effort in order to evaluate the alternatives in such large assortments. Based on Bettman, Luce, and Payne (1998), consumers may have a decision goal that emphasizes *minimizing the cognitive effort required to make the choice*. Therefore, people have a tendency to avoid choice if the decision-making itself requires considerable effort. Many researchers (Hauser and Wernerfelt 1990; Jacoby, Speller, and Kohn 1974; Malhotra 1982; Shugan 1980) have theorized that large alternatives can lead to cognitive overload. As an early example, Jacoby, Speller, and Kohn (1974) compared consumers' decision accuracy with varying the amount of product information. They found that consumers made poor purchase decisions when provided with more information.

Malhotra (1982) also theorized that if consumers were provided with too much information (such that it exceeded their processing capacities), they would face information overload, and would therefore make poorer decisions. He empirically found that consumers showed dysfunctional effects of information overload if they were provided with ten or more alternatives, or with 15 or more pieces of attribute information in the choice set.

Schwartz (2000) asserts a similar argument. He argues that freedom can become excessive and can be experienced as a kind of "tyranny." He maintains that modern American society's emphasis on freedom increases people's expectations concerning control, with a resulting increase in people's dissatisfaction when their expectations are not met. Put differently, people experience the *tyranny of choice* in excessive freedom when they realize that they cannot make a "perfect" choice. Additionally, the *tyranny of choice* exerts pressure on people when they are faced with difficult choices, resulting in dissatisfaction after decision-making. In sum, based on the concept of the *tyranny of choice,* Schwartz (2000) suggests that people may be better off with limited versus unconstrained choices.

Recently, Iyengar and Lepper (2000) have provided evidence for the disadvantage of providing many alternatives. As previously explained, they assume that providing a large number of alternatives can generate complexity in the decision-making process. They extend decision-related costs into psychological ones. As the complexity of making choices rises, decision-makers must spend more effort and time in making a selection, possibly inducing outcome dissatisfaction and the experience of anxiety and depression. In other words, decision-makers in large-alternative conditions may feel more responsible for their choice decisions, resulting in frustration with the decision-making process and dissatisfaction with their choices. These researchers provide empirical evidence with a field experiment. They showed the negative effects of providing individuals with many alternatives. The participants were shoppers at a local grocery store and were given jams as samples. The number of jams at a tasting

booth was either six (the limited-choice condition) or 24 (the extensive-choice condition). After having the opportunity to sample the jams, the participants received a coupon to buy a jar of jam at a discounted price. The results of this field experiment are interesting, in that although more shoppers were attracted to the tasting booth in the extensive-choice condition, they were much more likely to buy a jar of jam with the coupon in the limited-choice condition.

This result can be explained by the cost of decision-making. In the extensive choice condition, shoppers may find it difficult to choose one jam out of 24 alternatives. In other words, shoppers may face information overload in a short period of time. In contrast, in the limited condition, shoppers' decision difficulty was not as high. However, Iyengar and Lepper (2000) did not empirically show the underlying mechanism or explanation. These findings challenge the fundamental assumption underlying traditional economic and psychological theories that providing choice opportunities is desirable and intrinsically motivating.

One aspect of this study was the number of alternatives across different experimental conditions. The researchers manipulated the provision of six alternatives as the limited-choice condition, and the provision of 24 alternatives as the extensive-choice condition. However, in traditional studies of choice preferences, researchers have compared experimental conditions either by providing only one alternative or a small number of alternatives (i.e., usually between two and six alternatives). The number of alternatives in the choice set may be related to the preference for choice. That is, people may prefer a small number of alternatives (i.e., between two and six options) to only one alternative, or to a very large number of alternatives. When people are exposed to a small number of alternatives, they can process the option information quite well and may feel a sense of control concerning the choice process. However, when people are exposed to a large number of alternatives, they may tend to experience more difficulty processing all of the information about the options and selecting one out of a large number of alternatives. This conjecture can be supported by a famous psychological finding (Miller 1956) that human short-term memory can process only 7

± 2 information units ("chunks"). In addition, results from research by Jacoby, Speller, and Kohn (1974) and Malhotra (1982) also support this conjecture. These results indicate an inverted-U shape relationship between decision quality and the amount of information (See the Figure 2.7.1).

[Figure 2.7.1 about Here]

People sometimes have a tendency to avoid choice. This is especially true when: 1) they are exposed to a large number of alternatives at once, when they cannot fully process all information; or 2) they cannot efficiently control their decision processes. This tendency to avoid choice is based on different reasons, such as decision-related costs (Hauser and Werner 1990; Jacoby, Speller, and Kohn 1974; Malhotra 1982; Shugan 1980; Loewenstein 2000) or taking responsibility for one's own choices and experiencing frustration from that decision (Iyengar and Lepper 2000).

2.7.3 Moderators of preference for choice

To this point, the literature showing people's positive and negative preferences for choice has been examined. However, several studies have provided evidence that specific moderators can determine the direction of one's preference for choice.

First, as mentioned previously, based on previous studies (Jacoby, Speller, and Kohn 1974; Malhotra 1982; Iyengar and Lepper 2000), the number of alternatives in a choice set may moderate preference for choice versus non-choice. There may be an inverted U-shaped relationship between the number of choices and a positive preference for choice. That is, people prefer a small number of alternatives (usually between two and six) to only one alternative, or a large number of alternatives.

The second moderator variable can be cultural background. Schwartz (2000) theoretically argues that the preference for choice can be a cultural outcome. He argues that people in American culture have been educated to believe that freedom and autonomy are valued above all else. On the other hand, people in other cultures (e.g.,

Asian people) may have different preferences for choice if they have not been educated to believe that freedom and autonomy are the best values in their society. Empirically, his argument is supported by Iyengar and Lepper (1999). These researchers found that offering a choice opportunity does not always generate positive responses, such as a high level of intrinsic motivation.

In their study, children from two different cultures (Anglo-American versus Asian-American) tried to solve an anagram task across two experimental conditions. In the "personal choice" condition, the anagram task was selected by the participants. In contrast, in the "another's choice" condition, the anagram task was selected by the mothers of the participants. The Anglo-American children showed high intrinsic motivation in the "personal choice" condition and low intrinsic motivation in the "another's choice" condition. On the other hand, the Asian-American children showed the opposite pattern. That is, they displayed high intrinsic motivation in the "another's choice" condition and low intrinsic motivation in the "personal choice" condition. Therefore, compared with the Anglo-American children, the Asian-American children preferred to have choices made for them by significant others. In sum, Iyengar and Lepper provide empirical evidence that different values about freedom and autonomy across different cultures can work as a moderator of the preference for choice.

This preference for choice can be relatively strong, especially in Western versus Eastern cultures because of different cultural values. Specifically, people in Western cultures tend to prefer choice and control by themselves, whereas people in Eastern cultures tend to prefer non-choice and control by others. These researchers argue that the main reason for this different preference across the two cultural orientations is due to differential cultural values and educational systems.

The third moderator is a decision type. Botti and Iyengar (2004) have suggested that the decision type (i.e., choice in a positive versus a negative domain) can be a moderator of the preference for choice. These researchers argue that in the positive domain, decision-makers can benefit from a positive effect resulting from a pleasurable decision process. On the other hand, in the negative domain, decision-makers face an

emotional burden when choosing from unwanted alternatives. Based on this logic, they predict that non-choosers are more satisfied with their decision outcomes than choosers when selecting an alternative among less preferred ones (e.g., menu selections from unattractive alternatives). On the other hand, choosers are more satisfied with their decision outcomes than are non-choosers when selecting an alternative among more preferred ones (e.g., menu selections from attractive alternatives). The attractiveness of a menu can be manipulated by presenting an imagined scenario, such as stating the following: "You really like pasta" (attractive condition) versus "You really dislike pasta" (unattractive condition). These researchers' prediction was supported by their research. When a decision task was pleasurable, choosers (versus non-choosers) found more pleasure in the decision process, whereas when the decision task was less pleasurable, choosers (versus non-choosers) felt more negativity with respect to the decision process. These feelings seem to be transferred to their evaluations about decision outcomes. Therefore, choosers tend to show high satisfaction with decision outcomes when the decision task is pleasurable, and tend to show low satisfaction when the decision task is not pleasurable.

The fourth moderator is ideal point availability. Chernev (2003b) proposes that the availability of an ideal point can also be a moderator of the preference for choice. He theorizes that consumers without an ideal point engage in a complex task because they must simultaneously form their ideal point and must search for the best option that matches their ideal point. In contrast, consumers with an existing ideal point engage in a relatively simple task because they merely need to search for the option that best matches their ideal point. Therefore, when choosing from a larger assortment, consumers with an ideal point have a stronger preference for the chosen option than those without an ideal point. However, ideal point availability can have an opposite impact on preferences when choosing from a smaller assortment. In this case, consumers with an ideal point have a low chance of finding an option that matches their preferences. In contrast, consumers without an ideal point are likely to construct their preferences based on the given alternatives, and their preferences are likely to reflect the available options in a smaller set. Therefore, when choosing from a smaller assortment,

consumers with an ideal point tend to have a weaker preference for the chosen option than those without such an ideal point. Empirically, Chernev compared four and 16 alternatives as small and large assortments, respectively. He found that ideal point availability moderates the impact of assortment on consumer preference. In choices from the 16-alternative condition, participants without an ideal point showed a higher switching tendency (i.e., weaker preference), while participants with an ideal point showed a lower switching tendency (i.e., stronger preference). On the other hand, in choices from the four-alternative condition, participants without an ideal point showed a lower switching tendency, while participants with an ideal point showed a higher switching tendency.

Finally, Beattie, Baron, Hershey, and Spranca (1994) introduce decision seeking and decision aversion as similar concepts to preference for choice and the tendency to avoid choice. They define *decision-seeking* as people's preference to make decisions, and *decision aversion* as people's preference to avoid decisions. These researchers suggest several moderators in the tendencies of decision-seeking and decision aversion. The first moderator is *anticipated regret* or *rejoicing*. They argue that anticipated regret may lead to decision aversion because people may regret their actions when they compare the outcomes they get to what they would have wanted to receive. Specifically when people must choose one option from two equally attractive options, they generally feel regret after making their choice because the foregone option has some advantage compared to the chosen option. Beattie, Baron, Hershey, and Spranca (1994) argue that this feeling of anticipated regret can enhance the tendency of decision aversion. In other words, if making a choice is related to regret, then people tend to avoid making that decision. On the other hand, anticipated rejoicing over a relatively good outcome may lead to strong decision-seeking. This moderator is conceptually similar to that suggested by Botti and Iyengar (2004). However, Beattie, Baron, Hershey, and Spranca (1994) focus on the role of *anticipated* regret or rejoicing in the decision attitude, whereas Botti and Iyengar (2004) emphasize the role of *experienced* regret or rejoicing.

The second moderator suggested by Beattie, Baron, Hershey, and Spranca (1994) is the *decision target* (i.e., a decision made for oneself versus a decision made for others). They argue that decision seeking is dominant when the decision is made for oneself, and decision aversion is dominant when the decision is made for others. This result can be explained by the Western cultural influence emphasizing personal autonomy. Put differently, people who have strong autonomy want to make decisions by themselves when they need to make decision for themselves.

Researchers have proposed several moderators as preferences for choice, such as anticipated regret/rejoicing and decision target (Beattie et al. 1994), the number of alternatives (Iyengar and Lepper 2000), cultural orientation (Schwartz 2000; Iyengar and Lepper 1999), the decision type (Botti and Iyengar 2004), and ideal point availability (Chernev 2003b).

2.7.4 Summary and review

In sum, the research has recently attempted to determine and explain people's preference for choice. There are three main streams of research regarding the preference for choice. The first one concerns the positive preference for choice. The second stream focuses on the tendency to avoid choice. Finally, the third stream involves research on the moderators in the preference for choice. For a detailed summary, please refer Figure 2.7.2.

[Figure 2.7.2 about Here]

An evaluation of the current research will be discussed here, with three points to be made.

First, it appears that the underlying mechanism explaining people's tendency to seek or avoid choice has been well investigated. Based on these three streams of research, one can infer the underlying mechanisms for positive and negative preferences for choice.

The reasons explaining the positive preference for choice will be examined first, followed by reasons explaining the negative preference. The positive preference for choice exists for two main reasons. The first reason explaining positive preference deals with people's expectations of choosing a better option when faced with multiple options. The preference matching concept (Loewenstein 2000; Botti and Iyengar 2004), high expectations of choice outcomes (Suzuki 1997), and the "choice-is-better" heuristic (Bown, Read, and Summers 2003) all constitute good examples. The second reason involves people's positive feelings and perceptions regarding the decision process. Providing multiple options can increase decision-makers' perceptions of control (Langer 1975) and tends to generate positive feelings about the decision-making process itself (Beattie et al. 1994; Botti and Iyengar 2004).

The tendency to avoid choice also exists for two main reasons. The first reason regards decision-related costs. In particular, when people face a large number of options at one time, limited resources prevent them from processing all information about the alternatives and result in suboptimal choices. In this type of situation, people prefer non-choice over choice. Time/error costs (Loewenstein 2000) and having a large number of alternatives (Iyengar and Lepper 2000) are both good examples. The second reason involves people's negative feelings and perceptions regarding the decision process. For example, when decisions involve negative domains (Botti and Iyengar 2004), providing a choice opportunity can generate negative feelings (e.g., frustration, anxiety, and other bad feelings).

Second, it appears that the moderators of people's tendency to seek or avoid choice have also been investigated quite well. Several concepts (e.g., anticipated regret/rejoicing, the decision target, the number of alternatives, cultural orientation, the decision type, and ideal point availability) have been proposed and empirically confirmed. These moderators can contribute to accurately predicting preference for choice.

Finally, this research has certain theoretical and practical contributions for consumer decision-making. Theoretically, this research stream has expanded previous consumer research into consumers' evaluations of a choice itself. Traditionally, consumer decision research (e.g., Bettman 1979) has focused on how consumers choose one option from multiple alternatives. Practically, this research stream can help marketing managers promote the marketing exchange experience itself. For example, reducing decision-related costs and elaborating one's ideal point are ways to increase consumer satisfaction.

Based on the literature review regarding the preference for choice, one can understand people's preference for choice and tendency to avoid choice, along with their reasons and moderators. However, one can also find several limitations in the previous research, which suggests the need for further research in this field.

First, most studies have focused on the preference for choice at one specified time, or within a short time period. While most researchers have been interested in the short-term impact of independent variables (e.g., decision-related costs) on the preference for choice, they have tended to ignore the long-term impact. The typical research studies are based on a single point of observation. For example, the concept of decision-related efforts emphasizes the immediately negative impact of choice within a short period of time. However, as one can see in the previous Section 2.3, decision-makers often face similar decision problems repeatedly. In such situations, large amounts of prior effort can facilitate decision quality in the long run or in repeated-choice situations.

Therefore, it may be useful to investigate the preference for choice in such repeated-choice situations, as such studies can increase our understanding of the preference for choice. One example of such a study is that the direction between independent variables and the preference for choice can be reversed if the time perspective is extended. Specifically, because individuals do not like to expend considerable effort or decision-related costs, making a decision from many alternatives

can generate a negative response (e.g., low satisfaction, low re-purchase intentions) within a short time period. However, in repeated-choice situations, the same decision can generate a positive response (e.g., high re-purchase intentions). In the example of purchasing liquid detergent, consumers are likely to show low satisfaction after they spend much of their time or resources choosing one brand of liquid detergent. However, for the next purchase, they may be more likely to re-purchase the same brand. This phenomenon may result because decision-makers who spend considerable effort in their previous choices are likely to show high re-purchase intentions in the future for similar decisions, mainly due to the sunk cost bias. In other words, the direction of preference for choice can be changed in repeated-choice situations.

Second, in Section 2.3, we reviewed the decision processes and outcomes and suggest the need to make a distinction between decision processes and outcomes. Even though some researchers have tried to separate the roles of decision processes and outcomes in terms of preference for choice (for example, Botti and Iyengar 2004), they have not focused sufficiently on the differences between decision processes and outcomes. In addition, other researchers have not investigated the preference for choice by separating the decision outcomes from the processes.

One can categorize the previous literature in terms of decision processes and decision outcomes. For example, people's positive preference for choice can be explained by the decision process. The concept of the illusion of choice (Langer 1975) and psychological reactance (Brehm 1966) are good examples of the preference for choice based on the *decision process*. Empirical findings by Shin and Ariely (2004) suggest that the preference for choice is based on the decision process rather than on decision outcomes. Additionally, people's negative preference for choice in terms of decision-related costs is based on the decision process rather than on decision outcomes. However, in *preference matching* or the *choice-is-better-heuristic* cases, it is not clear as to whether the decision outcomes (i.e., people can choose the better alternative from multiple ones) or the decision processes (i.e., people prefer the choice process inasmuch as they can match their preferences from multiple alternatives) are dominant. Therefore,

it is useful to investigate the preference for choice in terms of both decision outcomes and processes.

This research can contribute to the current theory of choice, in that decision outcomes and processes can predict totally opposite patterns for the preference of choice. For example, a previously difficult [easy] choice can generate a negative [positive] effect mainly because of the decision process. The reason for this argument is based on the premise that people dislike spending much of their effort or time making decisions. However, the same difficult [easy] choice can generate a totally opposite effect, such as a positive [negative] effect in terms of the decision outcome. Therefore, the same decision can be evaluated differently by the focus on the decision (e.g., processes or outcomes). That is a reason for investigating the preference for choice based on the distinction between choice processes and outcomes. The reason for this argument is based on the premise that people can show high confidence in a chosen option through a difficult versus easy choice.

Finally, researchers (Hauser and Wernerfelt 1990; Iyengar and Lepper 2000; Jacoby, Speller, and Kohn 1974; Malhotra 1982; Shugan 1980; Loewenstein 2000) have investigated the impact of the amount of information on decision processes and outcomes. Based on these research studies, we can surmise an inverted-U shaped relationship between decision quality and the amount information, as shown in Figure 2.6.1. However, little research has examined the impact of the decision structure on decision processes and outcomes while controlling the amount of information. The same amount of information can be different in the decision structure; for example, the information of two alternatives along two attributes of information can be different in the decision structure if the two alternatives are in a trade-off versus a dominance relationship. Therefore, future research regarding decision structures while controlling the amount of information appears promising.

In sum, the research suggested in this review is important in the sense that people's preference for choice can be positive or negative due to decision outcomes and processes. If a specific relationship between the preference for choice and decision

outcomes/processes can be found, it can increase our understanding of the decision-making process.

Up to this point, the literature showing people's positive and negative preferences for choice has been examined. Benefits and costs co-exist when people face a choice opportunity or multiple options. The next section will discuss the different types of decision-related costs. We will then review the decision-making literature, illustrating how people solve trade-offs between costs and benefits (such as in adaptive decision-making).

2.8 The Costs of Decision-Making

Researchers have long attempted to identify decision-related costs. Based on the previous literature (Baumeister, Heatherton, and Tice 1994; Baumeister, Bratslavsky, Muraven, and Tice 1998; Bettman, Johnson, and Payne 1990; Luce1998; Luce, Bettman, and Payne 1997, 2001; Shugan 1980; Vohs and Schmeichel 2003; Vohs and Baumeister 2004), we can categorize three different types of costs: (i) cognitive cost; (ii) emotional cost; and (iii) self-regulation cost. What follows is a review of these three different costs.

2.8.1 Cognitive cost

Cognitive cost has been regarded as a basic cost of decision-making by many researchers in this field. One early example in the consumer decision-making literature has been proposed by Shugan (1980). He proposed that the *cost of thinking* can be calculated by "measurable units of thought (p. 100)." He defined the cost of thinking as a cost associated with the act of making a decision. In addition, he argued that the cost of thinking is closely related to the difficulty of choice. In other words, the more difficult the decision-making, the more cost decision-makers must incur. He assumed that consumers wish to choose the best product from several products available, and that decision-making is occurring for the first time in this context. He also assumed that the cost of comparing two products can be different, such that some products are harder to

compare with each other than are other product pairs. Furthermore, he proposed that the difficulty of choice is a function of multiplication between the number of product comparisons (m) and the average cost of comparing two products (f) (i.e., the general difficulty of a choice = m • f). Based on this equation, we can infer that the more comparisons made during decision-making, the more effortful the choice for decision-makers. In sum, Shugan's cost of thinking is an early theory concerned with simplifying decision strategies into components (the number of comparisons is one example of a component).

Several researchers in psychology (e.g., Newell and Simon 1972; Chase 1978) have proposed that human mental tasks or problem-solving tasks can be isolated and measured by elementary processes. Based on these works, Huber (1980) and Bettman, Johnson, and Payne (1990) suggest that decision strategies can be described by basic components known as *Elementary Information Processes (EIPs)*. These EIPs represent a sequence of mental events in decision-making, such as reading an alternative's value of an attribute into short-term memory, comparing two alternatives with respect to an attribute, adding the value of an attribute in short-term memory, and so on. Researchers assume that EIPs represent a cognitive resource during decision-making. Please refer to Table. 2.8.1 for details regarding EIPs.

[Table 2.8.1 about Here]

For example, Bettman, Johnson, and Payne (1990) conducted an empirical study regarding EIPs. Partcipants were trained to use several different decision strategies, such as the WADD, EQW, LEX, EBA, SAT, and MCD rules. They were then asked to make 20 decisions for decision problems ranging in size from two to six options; moreover, they were asked to rate the subjective decision difficulty of making various decisions. At the same time, a computer-based information acquisition system (MOUSELAB) recorded the overall time needed for each problem. The EIPs were calculated theoretically by different decision strategies. Bettman, Johnson, and Payne

found that the amount of EIPs was strongly related with the decision strategies used by the decision-makers. For example, the compensatory decision heuristic strategy (i.e., the *weighted additive model*) required several EIPs, whereas the non-compensatory decision heuristic strategy (i.e., the *lexicographic* or *elimination by aspects* rules) required relatively small amounts of EIPs. In addition, they found that the EIP model provided good predictions for response times and subjective effort across decision strategies. Specifically, they ran a regression analysis using "response time" or "subjective effort" as the independent variable, and "EIP" as the dependent variable. They found that response time and subjective effort were modeled very well by the amounts of EIPs expended in the decision-making processes examined.

This cognitive cost is strongly related to consumers' decision goals, which are discussed by Bettman, Luce, and Payne (1998). Specifically, this cost is related to "minimizing the cognitive effort required to make the choice" and "maximizing the accuracy of the choice" goals. They argue that each decision heuristic strategy (e.g., the *weighted-additive (WADD)* rule, the *equal-weighted-additive (EQW)* rule, the *lexicographic (LEX)* rule, the *eliminiation-by-aspects (EBA)* rule, the *satisfying (SAT)* rule and the *majority-of-confirming-dimensions (MCD)* rule) is different in terms of accuracy and effort. Decision-makers usually try to use a specific heuristic decision, which is optimal in both accuracy and effort, based on the given decision situation. Therefore, if the decision requires a high level of accuracy, decision-makers will spend a considerable amount of cognitive resources or will use more compensatory decision heuristics, such as the WADD or EQW rules. On the other hand, if the decision does not require a high level of accuracy, decision-makers will tend to spend relatively small amounts of cognitive resources or will tend to use more noncompensatory decision heuristics, such as the LEX or EBA rules.

In sum, Bettman, Johnson, and Payne provide empirical evidence that EIPs are a good measurement tool for the cognitive cost of decision-making.

A cognitive resource is a typical and basic resource used by decision-makers. These decision-makers should spend cognitive resources in order to make choices. The cost of thinking by Shugan (1980) and the Elementary Information Processes (EIPs) by Bettman, Johnson, and Payne (1990) are good examples of the cognitive aspects related to decision-making. Both researchers have attempted to simplify decision-making into basic cognitive costs. They also assume that the basic components of decision-making, or decision strategies, are required in spending cognitive resources. In addition, their research mainly focuses on what cognitive resources are, how to measure cognitive costs, and what the relationship is between cognitive resources and decision heuristics. Recently, Luce (1998) proposed that consumers sometimes face emotion-laden choices. Thus, in the next section, we will review the emotional costs involved in decision-making.

2.8.2 Emotional cost

Luce and her colleagues (Luce, 1998; Luce, Bettman, and Payne 1997, 2001; Luce, Payne, and Bettman 1999) argue that decisions can generate negative emotions when they require conflict resolution between goals that are very important to decision-makers.

For example, in an automobile decision-making situation, there are two important attributes, such as the safety attribute (i.e., the Occupant Survival Index) and the price. Each attribute is related to an individual's specific goals (i.e., "safety of a car" can be related to a "family safety" goal, while "price" can be related to a "saving money" goal). If there is a negative correlation between the attributes, decision-makers cannot choose an option that has the best value on every attribute. Because of trade-offs between the two attributes, they must give up something on one important attribute in order to attain more of another important attribute. In our example, car buyers should spend additional money in order to buy safer cars, or should buy less safe cars in order to spend less money . In other words, in the trade-off condition, decision-makers cannot achieve multiple goals at the same time. In our example, car buyers should sacrifice the "saving money" goal for the "family safety" goal, or vice-versa. Such choices in trade-

off conditions can increase negative emotions because the trade-off threatens valued goals (Lazarus, 1991). Empirically, Luce (1998) showed that trade-off difficulty can generate negative emotions. In a high trade-off difficulty condition, participants reported highly negative emotions. On the other hand, in a low trade-off difficulty condition, they showed a lower degree of negative emotions.

How do decision-makers try to reduce negative emotions generated by decision tasks? Based on Lazarus' (1991; Folkman and Lazarus, 1988) coping strategy model, Luce (1998) proposed two different approaches: *problem-focused coping* and *emotion-focused coping*. Generally, in the decision-making domain, the problem-focused copiing strategy is related to involving attempts to increase decision accuracy, or to use more compensatory decision heuristics. Meanwhile, the emotion-focused coping strategy involves attempts to simply avoid negative emotions, or to use more noncompensatory decision heuristics. Both strategies can work simultaneously. Empirically, Luce, Bettman, and Payne (1997) found that in a negatively emotion-laden choice condition, decision-makers use both the problem-focused coping strategy (i.e., to process information more extensively) and the emotion-focused coping strategy (i.e., to process information in a more attribute-based fashion). Luce (1998) also found that in a high trade-off difficulty condition, decision-makers used both the problem-focused coping strategy (i.e., to spend more time in making the decision) and the emotion-focused coping strategy (i.e., to choose the avoidant option, such as the status quo option or the asymmetric dominating option). This emotional cost is strongly related to the "minimizing the experience of negative emotions" goal by Bettman, Luce, and Payne (1998). They assume that decision-makers have a fundamental motivation to reduce negative emotions when making choices.

Decision-makers oftentimes face emotional burdens when making choices. Luce and her colleagues propose that choices in trade-off conditions can increase negative emotions because trade-offs can threaten valued goals. In sum, their research focuses mainly on the antecedents and consequences of emotional cost. They find that the

antecedents of emotion cost are trade-offs between two important goals, whereas the consequences of emotional cost are the two different coping strategies for negative emotions: *problem-focused* and *emotion-focused* coping.

2.8.3 Self-regulation cost

Recently, researchers have proposed that choices are related to expending self-regulation resources. Therefore, we will discuss self-regulation cost in this section.

Recently, researchers (Baumeister, Heatherton, and Tice 1994; Baumeister, Bratslavsky, Muraven, and Tice 1998; Muraven and Baumeister 2000; Vohs and Schmeichel 2003; Vohs and Baumeister 2004) in the psychology of self-regulation have started to regard the human self as having limited resources for its executive activities. They define *self-regulation* as "the self exerting control to change its own responses in an attempt to pursue goals and standards" (Vohs and Baumeister 2004, p. 2). Baumeister and his colleagues (Baumeister and Heatherton 1996; Baumeister, Bratslavsky, Muraven and Tice 1998) suggest that self-regulation resources are limited. Therefore, performing one act of regulating the self can impair performance on a subsequent, ostensibly unrelated act of self-control. For example, Baumeister, Bratslavsky, Muraven and Tice (1998) illustrated the impact of previous self-regulation on subsequent anagram-solving tasks. Their study participants in the self-regulation-resource-depleted condition were instructed to suppress their emotional responses to a humorous or sad video clip. In contrast, participants in self-regulation-resource-no-depleted condition were instructed to let their emotions flow while watching the same video clip.

After seeing a 10-minute video clip, the participants were asked to solve anagrams. Baumeister et al. (1998) found that the participants who suppressed their emotional responses showed poorer performance at solving anagrams compared to those in the no self-regulation condition. This result suggests that ability can be temporarily depleted or fatigued by effortful self-regulation. They call this theory the

"self-regulatory resource model" or the "resource-depletion model" (Vohs and Schmeichel 2003, p. 218).

In addition, Baumeister and his colleagues assume that self-regulatory resources are much more than simply general resources. Empirically, they provide evidence that there is difference between two resources (Study 3 in Muraven, Baumeister, and Tice 1998; study 2 in Vohs and Schmeichel 2003; study 3 in Schmeichel, Vohs, and Baumeister 2003; study 2 in Vohs, Baumeister, Schmeichel, Twenge, Nelson, and Tice 2008). For example, Vohs et al. (2008) in study 2 compared a choice task (i.e., the self-regulation-resource-depleted condition) and a rating task (i.e., the self-regulation-resource-no-depleted condition) regarding a list of 60 different products. The participants in the self-regulation-resource-depleted condition were instructed to make a binary choice between varieties of consumer products, such as magazines, colored pens, and t-shirts. In contrast, participants in the self-regulation-resource-no-depleted condition were instructed to rate products, but were not asked to choose between the products. After finishing either the choice or rating task, the participants were asked to drink as much of an ill-tasting beverage as they could. Even though the two tasks of choice and ranking were perceived equally in terms of the feeling of tiredness, Vohs et al. (2008) found that participants who had to make binary choices between several products drank fewer ounces of the ill-tasting beverage than those who merely rated the products.

Furthermore, Schmeichel, Vohs, and Baumeister (2003) in study 3 found that the depletion of self-regulatory resources only impaired the self's ability to reason actively and manage its cognitive activity, whereas simple information processing was unaffected. These results indicate that self-regulatory resources are not merely general resources. Also, based on Schmeichel and Baumeister (2004), self-regulation resources are required for cognitive processing (e.g., planning and problem- solving) as well as for emotional processing (e.g., controlling emotions or inhibiting impulses). Therefore, we can infer that self-regulation resources are related to both cognitive and emotional resources. Recent research on the resource-depletion model suggests that self-

regulation resources are required not only for active self-regulation, but also for other executive activities, such as solving complex problems, making active choices, or switching tasks. For example, Vohs, Baumeister, Schmeichel, Twenge, Nelson, and Tice (2008) theorize that there is a hidden cost to choosing, which is different from merely thinking about options. In other words, the process of choosing, in and of itself, can expend some resources, thereby leaving the executive functioning less capable of carrying out other activities. Vohs et al. (2008) hypothesize that making a choice can deplete resources, which may impair subsequent self-regulation. As mentioned before, they found that the participants who had to make binary choices between several products drank fewer ounces of the ill-tasting beverage than those who merely rated the products in study 2. In studies 3 and 4, they replicate a similar study which controlled time for the resource-depleted or not-depleted conditions. In sum, their series of experiments show strong evidence that decision-making requires self-regulation resources.

2.8.4 Summary and review

Up to this point, we have summarized three different types of costs related to making choices or decisions. The first cost is cognitive. Elementary Information Processes (EIPs) are a typical example, and it has been shown that EIPs represent cognitive cost regarding choice very well. The second cost is emotional. Luce and her colleagues argue that trade-offs between attributes can generate negative emotions. Decision-makers show different types of coping with these emotions. The final cost is self-regulation. Vohs and her colleagues provide empirical evidence that making active choices can expend self-regulation resources. Researchers have shown evidence of these different costs and the antecedents/consequences of these costs. For example, Shugan, as well as Bettman and his colleagues, have conducted research regarding the conceptualization and measurement of cognitive resources. Luce and her colleagues have conducted research regarding the antecedents (i.e., trade-offs concerning multiple goals) or consequences (i.e., two different coping strategies) of emotional cost.

Vohs and her colleagues have also conducted research showing that decision-making requires self-regulation resources. However, we do not know the different costs' impact on future decision-making. Although Vohs et al. (2008) used multiple tasks, the subsequent tasks (e.g., drinking an ill-tasting beverage or practicing math problems) were mainly used in order to show the effect of the expenditure of self-regulation resources. The subsequent tasks were not directly related to decision-making.

Therefore, it appears that examining different costs' impact on future decision-making is a promising area for future research. In other words, we can extend our understanding of decision-related costs if we conduct research incorporating the impact of costs in repeated decision-making situations. Researchers have traditionally regarded decision-related costs or resources as limited. Thus, they have shown the impact of limited resources in the short term. However, they have ignored another important aspect of decision-related costs, which is that depleted resources cannot be restored[16]. Therefore, if we conduct research in repeated decision-making situations, we must examine this aspect of decision-related costs. Actually, this suggestion is the same as future research suggested by Bettman, Luce, Payne (1998, p. 208). For example, they emphasize that we need to conduct research regarding the impact of trade-offs over time, such as trade-offs between long-term and short-term conditions.

2.9 Summary of Literature Review

The research question of this paper is, "How do previous choices affect subsequent judgments or choices?" In order to investigate the impact of previous choices on subsequent ones, we did a literature review in the area of decision-making. We reviewed three important research streams: (1) the traditional economic model of individual decision-making; (2) repeated choice in the decision-making and social psychology literature; and (3) general decision-making.

[16] Linville and Fischer (1991) provide the empirical evidence that depleted resources can be restored. They suggest a *renewable resources model* that explains the preferences for separating or combining events. For example, their study indicates that people prefer separate two losses on different days to one combined loss on same days, because people have a limited resource and the depleted resource is naturally renewable over time.

Specifically, we reviewed: (i) the traditional economic model of individual decision-making; (ii) subsequent/repeated choice; (iii) choice processes and outcomes; (iv) the endowment effect and the status quo effect; (v) trade-offs and conflicts; (vi) preference for choice and the tendency to avoid choice; and (vii) the costs of decision-making. This review generally suggests that little empirical research has been conducted in terms of the influence of prior decision processes or outcomes in making subsequent choices. In a later section, we will look at the specific hypothesis of the relationship between previous choice processes/outcomes and subsequent choice.

Chapter III. PROPOSITIONS

In the previous chapter, we reviewed: (i) the traditional economic model of individual decision-making; (ii) subsequent/repeated choice; (iii) choice processes and outcomes; (iv) the endowment effect and the status quo effect; (v) trade-offs and conflicts; (vi) preference for choice and the tendency to avoid choice; and (vii) the costs of decision-making. This review generally suggests the need to conduct research regarding the influence of prior decision processes or outcomes on making subsequent choices. Therefore, this chapter develops predictions for the impact of previous choice on subsequent ones.

3.1 Decision difference between trade-off and dominance

Decision-making usually involves a trade-off among attributes (e.g., Bettman, Luce, and Payne 1993). For example, consumers face decision problems, such as choosing between high-priced, high-quality products and low-priced, low-quality products. In this situation, the relationship between price and quality involves a trade-off. An alternative to trade-offs in decision-making would be for one option to dominate another. Several researchers have emphasized that decision-makers use the dominance relationship among alternatives as an important decision heuristic for selecting one out of several alternatives (e.g., Montgomery 1983; Huber, Payne, and Puto 1982). Therefore, we can infer from the previous literature that decision-making may involve a trade-off whether alternatives or one alternative may dominated the other. Furthermore, the literature assumes a significant difference in effort between making a decision based on a trade-off and one based on a dominance relationship.

In this section, we will investigate the impact of previous decisions (i.e., trade-off and dominance decisions). First, we will examine the systematic differences in effort between trade-off and dominance decisions. Second, we will look at the relationship between effort and decision-making, as well as the consequences of expending effort or resources. We will then propose our Propositions regarding the research question.

3.1.1 Systematic differences in effort between trade-off and dominance decisions

Decision-making typically involves a trade-off or dominance among alternatives. For example, as illustrated in Figure 3.1.1, the relationship between Options A and B is based on dominance because Option A is better than Option B in terms of the two attributes. However, the relationships between Options A and C and between Options B and C are based on trade-off because no option is superior to the other option among all attributes.

[Figure 3.1.1 about Here]

One critical difference between trade-off and dominance decisions is that the amount of effort or resources required to make a decision varies. In this section, we will examine the systematic differences in effort between trade-off and dominance decisions.

3.1.1.1 Differences between trade-off and dominance decisions

Decision-related effort is one important factor in decision-making. Several research streams suggest that trade-off and dominance decisions are obviously different in terms of effort.

First, Klein and Yadav (1989) investigated the impact of including dominated alternatives in decision outcomes. The participants in their study were asked to select an MBA programs that had been manipulated with respect to the degree of dominance. Mainly, Klein and Yadav (1989) found that decision accuracy improved when dominated alternatives were included. At the same time, the participants in their study spent less time on decision-making and felt they had expended less effort in decision-making in the dominance versus non-dominance condition.

Second, decoy studies (e.g., Huber, Payne, and Puto 1982; Park and Kim 2005; Simonson 1998) illustrate the impact of dominance relationships in decision-making. The results of these studies suggest that adding a new alternative (i.e., option C in

Figure 2.6.1) to the existing choice set increases the choice share of an existing alternative dominating the new alternative (i.e., option B in Figure 2.6.1), and decreases the choice share of the other existing alternative (i.e., option A in Figure 2.6.1). One explanation for the decoy effect is based on an asymmetric dominance relationship among alternatives (Park and Kim 2005; Pettibone and Wedell 2000). That is, decision-makers are likely to choose option B in the presence of option C, only because option A dominates option C, and option B does not dominate option C. In addition, Luce (1998) maintains that choosing the asymmetrically dominating option is one way of avoiding trade-off conflicts. Therefore, based on these research studies, we can infer that dominance relationships provide decision-makers with an easy way of choosing among alternatives.

Finally, other researchers have also argued that selecting the alternative dominating another alternative is one way of resolving decision problems. For example, Montgomery (1983) proposes a decision heuristic in decision-making. He argues that decision-makers try to search for dominance structures. Based on his argument, decision-makers seek to avoid conflicts by finding decision heuristics according to which the choice alternative is seen as dominant over others. In addition, the decision heuristic of the lexicographic rule (LEX) is also related to the dominance structure, in that this rule requires decision-makers to first find the mort important attribute (i.e., the attribute with the largest weight) and then to search for the values on that attribute for the alternative with the highest value.

In conclusion, we infer that dominance-related decisions require less effort than trade-off related decisions. Put differently, decision-making involving trade-off relationships requires more decision-related efforts or costs than one involving a dominance relationship. Specifically, it assumes that trade-off related decisions need additional cognitive or emotional effort in order to make decisions[17].

3.1.2 The relationship between effort and decision-making

[17] For details regarding different types of decision-related costs or efforts, please refer to Section 2.8.

In the previous section, we concluded that decisions involving trade-off and dominance are different in terms of effort expended. Trade-off-related decisions require more effort to make decisions, compared to dominance-related decisions. In this section, we will review the relationship between effort and decision-making. We will then look at the consequences of expending effort.

Several research streams suggest a direct relationship between effort and decision-making.

3.1.2.1 Effort and decision heuristics

The amount of effort needed to make a decision is strongly related to decision heuristics. As mentioned before, Bettman, Luce, and Payne (1998; also Payne, Bettman, and Johnson 1993) suggest two important goals of consumers: (i) to maximize the accuracy of decision-making; and (ii) to minimize the effort of decision-making. These researchers have also suggested that decision-makers try to find decision rules or heuristics, adaptively based on external and internal factors. For example, they provide empirical evidence that: (i) when decision-makers focus more on effort-saving than on decision accuracy or when they have limited resources, they use the *eliminiation-by-aspects* (EBA) decision heuristic; (ii) when decision-makers focus more on accuracy than on reducing effort or when they have relatively many resources, they use the *weighted-additive* (WADD) decision heuristic; and (iii) when decision-makers focus on both effort-saving and accuracy or when they have moderate resources, they use the *equal-weighted-additive* (EQW) or *lexicographic* (LEX) decision heuristics (Payne, Bettman, and Johnson 1993, pp.97-98). Therefore, there exists a strong relationship between effort and the use of different decision heuristics. The relationship suggests that: (i) different decision heuristics require different levels of effort; and (ii) different resource availabilities can influence the selection of decision heuristics**.**

3.1.2.2 Effort and justification of decisions

Recently, Kivetz and his colleagues suggested the role of effort in decision-making within various domains. First, Kivetz and Simonson (2002a) suggest a relationship

between effort and choice between necessity and luxury goods. Specifically, they propose that choice between necessity and luxury goods as rewards for frequency programs can be influenced by effort expended in these frequency programs. These researchers theorize that increasing effort can reduce guilt feelings in terms of choosing luxury goods. In an experiment, they manipulated a program requirement as easy (e.g., "rent a car 10 times to get rewards") or difficult (e.g., "rent a car 20 times to get rewards"). The participants were then asked to select one reward program between a luxury good (e.g., "a luxurious one-hour sports massage") and a necessity good (e.g., "local grocery store credit"). The results showed that when the program requirement was difficult, the participants were more likely to choose the luxury over the necessity reward. Based on the study by Kivetz and Simonson (2002a), we can infer that expending a great deal of effort can help decision-makers justify making self-indulgent decisions, such as choosing luxury over necessity goods. Second, Kivetz (2003) suggests a relationship between the effort requirement of reward programs and the choice of reward programs (i.e., a trade-off between payoff and probability). Specifically, he compares people's preference for a risky option between a situation when they are rewarded after expending effort and a situation when they are rewarded without any effort. He found that participants preferred the less-risky reward (i.e., "the sure-small reward") to the risky reward ("the large-uncertain reward") when the reward was given after expending effort (vs. not expending effort). This result occurs because participants who expend effort try to avoid getting nothing from the risky reward in order to compensate for their previous effort. Finally, based on similar logic, Kivetz (2005) investigated the relationship between effort and the congruity of a reward. Specifically, the participants in his study were first asked to review either 30 movies or 30 songs. They were then asked to choose among three music CDs and three movie DVDs as a reward. Kivetz (2005) found a congruity effect between effort and reward, in that more participants chose music CDs [movie DVDs] after reviewing songs [30 movies].

In sum, Kivetz and his colleagues' study suggest a significant effect of expending effort in various decision-making problems, such as the choice between

luxury and necessity goods, the choice between more- and less-risky options, and the choice between effort-congruent and effort-incongruent rewards. The results of these studies altogether suggest that decision-making is influenced by previously expending effort. Specifically, after expending effort, decision-makers try to make decisions in the direction of justifying their previous effort.

3.1.2.3 Effort as information and effort heuristics

Sometimes effort can be used as a cue for evaluation. Recently, researchers have proposed that people have a tendency to use effort as a basis of their evaluations (Godek, Nayakankuppum, and Yates 2001; Kruger, Wirtz, Boven, and Altermatt 2004). Put differently, people use effort as a heuristic for judgments or preferences. For example, Godek, Nayakankuppum, and Yates (2001) provide empirical evidence showing that participants were happier with their choices and were willing to pay more for their chosen options when they made a choice with more effort (e.g., representing information about options with a difficult-to-read font) than when they made a choice with less effort (e.g., representing information about options with an easy-to-read font). The results provide support for the "effort as information" perspective, which shows that people have a tendency to use "effort" when evaluating their decision-making or judgments. In addition, Kruger, Wirtz, Boven, and Altermatt (2004) provide the empirical evidence of "effort heuristics" that people use effort as an evaluation criterion for an object. For example, the participants in their study evaluated a poem more favorably when they thought that the poet took more time (i.e., 18 hours) to write the poem than when they thought that the poet took less time (i.e., 4 hours).

In sum, we reviewed the literature illustrating the relationship between effort and decision-making. We found that effort influenced: (i) the selection of decision heuristics (e.g., compensatory vs. noncompensatory rules, Payne, Bettman, and Johnson 1993); (ii) the justification for choosing luxury over necessity goods or choosing a more-risky over a less-risky option (Kivetz 2003; Kivetz and Simonson 2002a); and

(iii) the direct evaluation of objects (Kruger, Wirtz, Boven, and Altermatt 2004). In the next section, we will focus on the consequences of expending resources.

3.1.3 Consequences of expending resources

Several research streams suggest the impact of expending resources on subsequent decisions.

3.1.3.1 Time pressure research

One research stream related to the consequences of expending resources concerns research regarding time pressure. Having limited time when making decisions is considered to be similar to having limited resources when making decisions. The literature indicates four different responses under time pressure.

First, decision-makers tend to accelerate information processing (Miller 1960; Ben Zur and Breznitz 1981) when under time pressure. Accelerating information usually generates systematic bias or error in decision-making, especially under high time pressure.

Second, decision-makers tend to change their decision strategy or decision heuristics (Dhar and Nowlis 1999; Dhar, Nowlis, and Sherman 2000; Payne, Bettman, and Johnson 1988) when under time pressure. For example, Dhar, Nowlis, and Sherman (2000) provide empirical evidence that the compromise effect was reduced or eliminated under time pressure. They suggest that this finding is mainly based on a change in decision strategy. Specifically, consumers use compensatory decision rules (such as weighted-additive [WADD]) without time pressure and noncompensatory rules (i.e., eliminiation-by-aspects [EBA] or *lexicographic* [LEX]) under time pressure. This result occurs because under time pressure, decision-makers have limited resources, so they tend to focus on limited information about the alternatives. If they use EBA or LEX, they will choose an extreme option (i.e., a non-middle option). Therefore, the compromise effect was reduced or eliminated under time pressure. On the other hand, without time pressure, decision-makers have relatively more resources and can process

all information regarding all of the alternatives. If they use WADD, they will not avoid the middle option.

Third, decision-makers tend to focus on selective information, or they weigh selective information heavily when making decisions under time pressure (Ben Zur and Breznitz 1981; Wright 1974). For example, Ben Zur and Breznitz (1981) found that time pressure causes decision-makers to focus on selective information regarding a risky option. The participants in their study frequently chose less risky options under time pressure compared to no-time pressure. Ben Zur and Breznitz (1981) explain this finding as selective attention (e.g., focusing on an amount to lose or the probability of losing under time pressure). Along the same lines of logic, in the domain of automobile evaluation, Wright (1974) found that people under time pressure put more weight on negative versus positive information in forming evaluations.

Finally, decision-makers tend to postpone or defer their decision under time pressure (Dhar and Nowlis 1999). For example, Dhar and Nowlis (1999) provide empirical evidence that decision deferral is high under time pressure (vs. no-time pressure) when the decision involves common bad attributes and unique good features. These results indicate that decision-makers under time pressure usually focus on unique attributes, whereas under no-time pressure, they focus both on unique and common attributes.

In sum, the literature on time pressure indicates that, under time pressure, decision-makers tend to: (i) accelerate their information processing (Miller 1960; Ben Zur and Breznitz 1981); (ii) change their decision strategy or decision heuristics (Dhar and Nowlis 1999; Dhar, Nowlis, and Sherman 2000; Pay, Bettman, and Johnson 1988); (iii) focus on selective information or weight selective information heavily on decision-making (Ben Zur and Breznitz 1981; Dhar and Nowlis 1999; Wright 1974); and (iv) postpone or defer their final decisions (Dhar and Nowlis 1999)

3.1.3.2 Decision heuristics research

As mentioned before, *adaptive decision-making* assumes that decision-makers choose specific decision heuristics after considering the expected effort needed to solve the

problem, and after considering the required accuracy of the decision (Bettman, Luce, and Payne 1998; Payne, Bettman, and Johnson 1993). What happens if decision-makers have limited resources after expending their resources in a previous task? They probably try to use noncompensatory decision rules, such as EBA or LEX, inasmuch as these decision rules require less effort. This argument is also supported by research on time pressure by Dhar and Nowlis (1999).

3.1.3.3 Resource depletion research

Researchers suggest that expending resources on a previous task will have an impact on subsequent tasks**.** For example, Vohs et al. (2008) found that participants who expended resources in an initial binary choice showed lower levels of self-regulation in a subsequent task (e.g., they drank fewer ounces of an ill-tasting beverage). In addition, Vohs and Faber (2007) found that participants who had depleted resources in an initial task showed high levels of impulsive buying intentions in the subsequent task. Specifically, those participants who performed a difficult task (vs. an easy one) in the first task showed a high willingness to pay for various products and spent more money on unplanned products.

Dholakia, Gopinath, and Bagozzi (2005) have also provided empirical evidence demonstrating the consequence of resource depletion in the domain of making impulsive choices. They theorize that when people exert self-control in one task, their ability to exert self-control in a second task consisting of impulsive choices declines significantly. The participants in their study responded to a "gourmet sandwich" scenario alone (i.e., the no-resource-depletion condition) or completed a "sweater" scenario first, followed by the gourmet sandwich scenario (i.e., the resource-depletion condition). The authors assumed that the participants in their study needed to spend their resource in the initial task of sweater choice. The gourmet sandwich scenario is as follows: "*Imagine that you have gone to a cafeteria to get a healthy and nutritious salad for lunch. As you are looking through the display case while standing in line, you see a special gourmet sandwich*". (p. 185). The participants were then asked to respond to the likelihood that they would purchase the gourmet sandwich. The results showed

that the participants in no-resource-depletion condition indicated a significantly lower likelihood of purchasing the gourmet sandwich than did those in the resource-depletion condition.

3.1.3.4 Escalation of commitment research

As mentioned in Section 2.4.2.5, *Escalation of commitment* can be defined as "people's greater tendency to continue an endeavor once an investment in money, time or effort has been made" (Arkes and Blumer 1985, p. 124). Put differently, people try to preserve the decision outcome associated with previous effort in their subsequent choices. Therefore, we can expect that decision-makers who expend resources in a previous task try to maintain resources by sticking with its original choice. In sum, escalation of commitment research suggests that people have a motivation to preserve the decision outcome associated with previous effort in the subsequent tasks or decisions.

To summarize, several research studies suggest significant consequences of expending resources. Based on previous literature, we can infer that, after expending resources, decision-makers tend to change their decision process (i.e., simplifying the decision heuristic or focus on specific information; Dhar and Nowlis 1999; Dhar, Nowlis, and Sherman 2000; Payne, Bettman, and Johnson 1988) or tend to show some bias (i.e., increasing impulsive buying; Dholakia, Gopinath, and Bagozzi 2005; Vohs and Faber 2007), mainly based on the limitations of the resources available. In addition, decision-makers try to maintain previous effort in making subsequent choices (Arkes and Blumer 1985).

3.2 Impact of previous decision structure (competing propositions)

In the previous sections, we argue that trade-off related and dominance related decisions are different mainly in terms of effort. The previous literature has also suggested resource availability, in that different decision structures (e.g., trade-off and dominance) can affect subsequent decision-making.

However, other decision outcomes, such as decision confidence or justification for decision-making, can also result from different decision structures. These different decision outcomes also affect subsequent decision-making. Therefore, we try to examine the impact of previous decision structures (e.g., trade-off vs. dominance) on subsequent decisions after considering all of the aspects of previous decision outcomes (i.e., effort as well as other factors).

Specifically, in this dissertation we will focus on the tendency to retain previously chosen alternatives in subsequent choice situations, as the past literature of consumer decision-making emphasizes the importance of repeating or switching decisions in repeated-choice situations (e.g., Inman and Zeelenberg 2002; Luce 1998; Hoyer 1984; Tsiros and Mittal 2000; Oliver 1980).

First, we will examine the literature suggesting that people tend to retain a previously chosen alternative when decision-makers make a decision using the trade-off structure (vs. the dominance structure). We will then examine the literature showing an opposite pattern.

3.2.1 Proposition 1a

Much of the literature has shown that the tendency to retain a previously chosen alternative is higher when people make a decision with the trade-off vs. the dominance structure in the first choice, including: (1) Effort-as-information: Previous effort spending as a source of information for judgment; and (2) regulatory resource theory. These theories are mainly related to the resources or effort expended in the first choice.

3.2.1.1 Effort-as-information: Previous effort spending as a source of information for judgment

The following three areas of research have shown that people are likely to have the motivation to preserve previous effort in making the next decision: (1) commitment theory; (2) endowment effect; and (3) “effort heuristics” theory.

The first research study illustrating the motivation to preserve previous effort concerns commitment theory. As mentioned in Section, 2.4.2.5, people have a strong tendency to continue an endeavor once an investment in money, time or effort has been made (Arkes and Blumer 1985). This phenomenon is known as the "*escalation of commitment*" or "sunk-cost fallacy." Studies of escalation of commitment have shown that people's previous investment decisions can affect their future decision-making (Staw 1981; Brockner 1992; Staw and Hoang 1995; Biyalogorsky, Boulding, and Staelin 2006).

We expect that the tendency to repeat a decision can be changed by the previous decision structure. Specifically, in repeated-choice situations, we expect that people's sunk costs are much greater in the trade-off versus the dominance condition because people need to spend relatively much of their effort or time to choose one option in the trade-off vs. the dominance condition. Previous effort or money is an important factor for the tendency of escalation of commitment. For example, Arkes and Blumer (1985) illustrate this phenomenon:

> Assume that you have spent $100 on a ticket for a weekend ski trip to Michigan. Several weeks later you buy a $50 ticket for a weekend ski trip to Wisconsin. You think that you will enjoy the Wisconsin ski trip more than the Michigan ski trip. As you are putting your just-purchased Wisconsin ski trip in your wallet, you notice that the Michigan ski trip and the Wisconsin ski trip are for the same weekend! It's too late to sell either ticket, and you cannot return either one. You must use one ticket and not the other. Which trip will you go on? (Arkes and Blumer 1985, p.126)

The result indicates that more than half of the participants (56%) in their study examining the above scenario choose the Michigan trip, even though the trip to Wisconsin is considered to be more enjoyable. Put differently, people have a tendency to make a decision in order to preserve their previous money in their subsequent choices, even though their decision is not optimal. Based on the same logic, in decision-making, the difficulty associated with choosing an alternative in the trade-off condition

can yield a higher commitment to one's initial choice. As such, people tend to keep their previous commitment in making their next choice. Therefore, people are likely to retain a previously chosen alternative in their subsequent choice when they make a decision from the trade-off versus the dominance relationship. Therefore, based on commitment theory and sunk-cost theory, we can infer that the tendency to retain a previous choice will be stronger in the trade-off versus the dominance condition.

The second research study illustrating the motivation to preserve previous effort is endowment effect. As explained in Section 2.5.1, endowment effect is people's tendency to place a higher value on objects they own relative to objects they do not. For example, based on the "*associationist explanation"* (such as the notion that high performance is related to a positive association, whereas luck is related to a relatively low positive association*)*, Loewenstein and Issacharoff (1994) theorize that people are likely to evaluate an object more highly when they obtain it by their own effort than when they obtain it by chance; they also theorize that the value of an object depends on how it is obtained. They show empirically that people evaluate an endowed object more highly when the object is obtained by one's own efforts (e.g., people receive mugs due to their higher performance on an exercise task) than when the object is obtained by chance (e.g., people are told that the mugs are randomly assigned). Therefore, we can infer from Loewenstein and Issacharoff (1994) that endowment effect is relate to the motivation to preserve previous effort in the subsequent task.

The final research study illustrating the motivation to preserve previous effort is "effort heuristics" theory. This theory suggests that people have a tendency to use effort as the basis of their evaluation (Godek, Nayakankuppum, and Yates 2001; Kruger, Wirtz, Boven, and Altermatt 2004) [18].

[18] Generally, people have a motivation to reduce their effort when making decisions. For example, Garbarino and Edell (1997) provide empirical evidence that people prefer alternatives that are less effortful to process over more effortful ones. In contrast, the "effort-as-information" perspective implies that after people expend their effort, they attempt to preserve the decision outcome associated with previous effort in subsequent tasks.

If people use the "effort heuristics" in contexts involving repeated choice situations, they will retain a previously chosen alternative more frequently in the trade-off versus the dominance condition. This result can be explained by the idea that they made more effort in the trade-off condition, and that they will then try to preserve their previous effort for the next task while retaining the previously chosen alternative.

Therefore, based on the previous effort spending as a source of information for judgment, we can infer that the tendency to retain a previous choice will be stronger in the trade-off versus the dominance condition.

3.2.1.2 Resource theory

Consumers' resources are an important factor for understanding consumer behavior and decisions (e.g., Bettman, Luce, and Payne 1998; Meyers-Levy and Tybout 1997). Traditionally, researchers have assumed that consumer behavior is based on *bounded rationality* (Simon 1955), which describes the phenomenon as decision-makers having limited capacities or resources for processing information when making decisions. Under some situations, consumer resources can be limited or depleted temporarily. For example, decision-making or the process of choosing can expend some resources, thereby leaving limited resources to carry out other activities. Therefore, we expect that different resource availabilities due to previous decision-making can influence the subsequent decision-making.

In repeated decision-making situations, we expect that decisions involving trade-offs require decision-makers to expend much more effort and time than in making decisions of dominance. Therefore, people who made choices in a trade-off condition (vs. a dominance condition) have limited resources for upcoming tasks. What is the impact of limited resources for decision-making? As mentioned in Section 3.1.3, after spending the resource, decision-makers tend to change their decision process such as using simple decision heuristics (Payne, Bettman, and Johnson 1988), focusing on specific information (Dhar, Nowlis, and Sherman 2000), postponing the decision (Dhar

and Nowlis 1999), or increasing impulsive buying (Dholakia, Gopinath, and Bagozzi 2005; Vohs and Faber 2007).

Based on these findings, we can predict that the tendency to retain a previous choice will be stronger in the trade-off versus the dominance condition, based on two reasons. First, in repeated-choice situations, limited resources can decrease one's ability to process new information. In other words, switching to unknown alternatives from a previously chosen alternative requires a great amount of resources, such as time or effort. On the other hand, sticking with a previously chosen alternative is relatively simple and does not require so many resources. Therefore, for resource-depleted people, it is much easier to stick with a previously chosen alternative when they have the chance to switch to other alternatives. Second, decision-makers who have depleted their resources in an initial task may use simple decision heuristics, such as choosing the status quo option (i.e., Luce 1998). Therefore, the tendency to retain a previous choice will be stronger for resource-depleted decision-makers than for non-depleted individuals.

Therefore, based on decision-related resource theory, we can infer that the tendency to retain a previous choice will be stronger in the trade-off versus the dominance condition, mainly due to the role of limited resources.

3.2.1.3 Proposition 1a

In conclusion, two different research theories [i.e., (1) effort-as-information: previous effort spending as a source of information for judgment; and (2) regulatory resource theory] suggest that the tendency to retain a previous choice will be stronger in the trade-off condition versus the dominance condition. Two explanations are similar in terms of the key assumption regarding the role of resources. Specifically, they both assume that decisions involving trade-offs require decision-makers to expend many more resources than those involving dominance. However, the two explanations are different in terms of the underlying mechanism. Specifically, the explanation based on effort-as-information: previous effort spending as a source of information for judgment focuses on the information usage of decision-making (e.g., the tendency to use the

previous effort spending on the subsequent decision), whereas the explanation based on resource theory focuses on the decision outcome of the first choice (e.g., the tendency to use different decision strategy based on the resource available after the first decision). Based on this reasoning, the first proposition is:

Proposition 1a: The tendency to retain a previously chosen alternative will be stronger when the alternative is chosen from a trade-off relationship than when it is chosen from a dominance relationship.

3.2.2 Proposition 1b

Other literature suggests an opposite pattern. The tendency to retain a previously chosen alternative is higher when people make a decision using the dominance structure vs. the trade-off structure in previous choices (Inman and Zeelenberg 2002; Luce 1998; Simonson 1989; Shafir, Simonson, and Tversky 1993; Zhang and Mittal 2005; Zeelenberg and Beattie 1997). We select two major literature streams to show this tendency: (1) justification mechanism research; and (2) regret/negative emotional research. These theories are mainly related to decision outcomes that are not due to resources or effort expended in the first choice, but due to other factors.

3.2.2.1 Justification mechanism: Easy-to-justify motivation

The decision-making literature has shown that people are likely to seek reasons for their choices (Simonson 1989; Shafir, Simonson, and Tversky 1993). In other words, people have a tendency to justify their decision-making or to explain their decision to others. This tendency is related to people's desire to enhance their self-esteem, to reduce cognitive dissonance, or to perceive themselves as rational beings (Simonson 1989). Therefore, the need to provide reasons has a great impact on decision-making (Bettman, Luce, and Payne 1998).

For example, Simonson (1989) shows that the dominance relationship between alternatives is closely related to justification. Based on the theoretical assumption that

an asymmetric dominance relationship provides decision-makers with good reasons for choosing specific options, he predicts that: (i) the decoy effect[19] will be stronger among decision-makers who expect to justify their decisions to others; and (ii) a dominating alternative will be perceived as easier to justify. He provides empirical evidence that the decoy effect is stronger when participants expect to provide reasons for their decisions to others. He also finds that the choice of a dominating alternative significantly reduces the perceived difficulty of justifying a participant's choice to others. On the other hand, the choice of trade-off alternatives is perceived as difficult for people to justify their decisions. Based on his research, we can infer that a decision based on the dominance relationship is easier to justify. On the other hand, a decision based on the trade-off relationship is not easy to justify.

It appears that decision-making via the dominance structure among alternatives is one way of providing good reasons for decision-makers. The dominance structure can work not only in comparisons among alternatives, but also in comparisons between alternatives and reference alternatives. For example, as mentioned in Section 2.4.1.2, Zhang and Mittal (2005) investigated the effects of accountability on the perceptions of decision difficulty. They compared two different accountability concepts in the domains of decisions based on *better-than reference (BTR)* options and on *worse-than reference (WTR)* options. In their paper, the researchers asserted that decisions based on BTR options involve a choice among relatively attractive options, whereas decisions involving WTR options involve a choice among unattractive options. They theorize that people can easily justify the outcome for BTR choices (vs. WTR choices) because in the BTR choice, they can rationalize their chosen option compared to the worse-than-reference options.

In sum, based on the previous literature streams, we can infer that when decision-makers find a dominance relationship among alternatives (e.g., Simonson 1989) or between an alternative and a reference alternative (e.g., Zhang and Mittal 2005), they are likely to easily justify their decisions.

[19] The decoy effect is preserved when a new (irrelevant) alternative is added to the choice set and increases the choice share of one of the existing alternatives that dominates the new one. For the details regarding the decoy effect, please refer to Section 2.6.

Furthermore, we can assume that people have a motivation for justification over time. Therefore, if people have a strong reason for their prior decision, they are likely to retain a previously chosen alternative in their subsequent choices. Therefore, on account of justification, we can infer that the tendency to retain a previous choice will be stronger in the dominance condition than in the trade-off condition.

This prediction can work through different mechanisms. Put differently, in the context of the comparison between trade-off and dominance relationships, justification can works in two different ways. The first way is to justify a decision based on a specific attribute (hereafter referred to as *attribute-based justification*), whereas the second way is to justify a decision based on the overall relationship between alternatives (hereafter referred to as *relationship-based justification*).

First, *attribute-based justification* assumes that decision-makers can easily find a way to justify their decisions based on a specific attribute, which is related to the dominance relationship. However, decision-makers cannot find a way to justify their decisions based on an attribute when facing trade-off decisions. For example, in the dominance decision situation, decision-makers can easily justify their decisions based on *Attribute 1,* as illustrated in Figure 3.2.1.a. (e.g., "*In terms of Attribute 1, Option A is obviously better than Option B. Therefore, I will choose Option A*"). On the other hand, in the trade-off decision situation, decision-makers cannot justify their decisions based on specific attributes, as illustrated in Figure 3.2.1.b. This result occurs because each option has superiority on different attributes. This approach is similar to *weight-change* accounts by Wedell and Pettibone (1996), in that the dominance relationship can increase the weight of a specific attribute. In this situation, if decision-makers face another decision, they will use weighted attribute information heavily.

[Figure 3.1.1 about Here]

Second, *relationship-based justification* assumes that decision-makers can easily find a way to justify their decisions based on the dominance relationship. Put differently, it assumes that preference or justification is not directly dependent on weights and dimensional value, but on the relationship between alternatives, such as a dominance or trade-off relationship. For example, in the dominance decision situation, decision-makers can easily justify their decisions based on the relationship illustrated in Figure 3.2.1.a. (e.g., "*Option A obviously dominates Option B. Therefore, I will choose Option A*"). On the other hand, in the trade-off decision situation, decision-makers cannot justify their decisions based on the relationship illustrated in Figure 3.2.1.b. This result occurs because there is no dominance relationship in this case. This approach is similar to *value-added accounts* by Wedell and Pettibone (1996), in that the dominance relationship can increase the overall attractiveness of an option, regardless of weights. In this situation, if decision-makers face another decision later, they will stick to previously chosen alternatives because of the previous dominance experience.

In sum, based on the justification mechanism, we can infer that the tendency to retain a previous choice will be stronger in the dominance versus the trade-off condition.

3.2.2.2 Regret/negative emotional research

The second research study illustrating above prediction is regret and negative emotional research. Justification and regret are also related. Recently Inman and Zeelenberg (2002) have argued that decisions not supported by good reasons are likely to produce regret. This is because: (i) people feel more regret when they can easily imagine a better alternative outcome than when it is hard to imagine a better outcome (Kahneman and Miller 1986); (ii) people usually easily generate a better decision outcome from a decision with bad reasons than from a decision with good reasons; and (iii) people feel more regret when they cannot rationalize their decision. In addition, regret is recognized as a primary negative emotion (Mellers, Schwartz, and Ritov 1999; Tsiros and Mittal

2000). Therefore, in this section we examine the research on regret and negative emotion.

Regret [20]can be influenced by a comparison between what is and what could have been (Tsiros and Mittal 2000). Regret has a negative influence on decision-making satisfaction. Decision-making based on the trade-off relationship (vs. the dominance relationship) is likely to result in regret. Put differently, the probability of generating regret is much higher for decision-makers when they select one option from the trade-off versus the dominance relationship. This happens because decision makers choosing one option from a trade-off relationship may have to give up some good aspects or attributes from the foregone alternative. After making decisions, they may generate regret for the foregone alternative, due to foregone attributes or aspects. However, it is more difficult to invoke regret when decision-makers choose one option from the dominance structure because the aspects or attributes of the foregone alternative are inferior to the chosen alternative. Empirically, researchers show that people may easily feel regret for foregone alternatives in trade-off decisions (Carmon, Wertenbroch, and Zeelenberg 2003; Inman and Zeelenberg 2002).

Recently Zeelenberg and Beattie (1997) have shown that experienced regret can affect subsequent decisions. Specifically, the participants in their study played the role of "proposers" in a repeated-choice ultimatum game. This ultimatum game was a bargaining game with two different roles. One player (e.g., the role of "proposer") was given a sum of money and could offer part of that money to other players (e.g., the role of "responders"). The other players could either accept the offer or reject it, in which case neither player would receive any money. In their experiment, Zeelenberg and Beattie (1997) manipulated regret by giving different feedback to the participants. These participants received feedback on how much less they could have offered (either a small vs. a large amount of money) and would still have had their offer accepted. The participants in the large-amount-of-money condition generated stronger regret than those in the small-amount-of-money condition because the participants in the large-

[20] For details, please see Section 2.4.2.3.

amount-of-money condition missed an opportunity to get a large amount of money. More importantly, the participants who experienced strong regret (vs. weak regret) significantly reduced their offers to other players in subsequent games. These results indicate that people's decisions can be influenced by previous regret. That is, after experiencing regret, decision-makers tend to change their prior decision in the subsequent decision-making.

Based on previous literature streams of regret (Carmon, Wertenbroch, and Zeelenberg 2003; Inman and Zeelenberg 2002; Zeelenberg and Beattie 1997), we expect that people are likely to feel more regret in a trade-off decision rather than in a dominance decision. This is mainly because of the role of the foregone alternative. Put differently, the attractiveness of the foregone alternative is much better in a trade-off decision than in a dominance decision. The attractiveness of the foregone alternative is directly related to the tendency to generate regret. Also, we predict that people are likely to change their decision-making after experiencing regret. Therefore, people are less likely to retain a previously chosen alternative when their first choice generates a high level of regret. In other words, a high level of regret regarding a previous choice can induce a high tendency to change a previously chosen alternative (Tsiros and Mittal 2000). In conclusion, based on regret research, we can infer that the tendency to retain a previous choice will be stronger in the dominance versus the trade-off condition.

We examined the role of regret in repeated-choice situations. Now, we will examine the broader concept of regret, which is a negative emotion. As mentioned in Section, 2.8.2, decisions can generate negative emotions when they require conflict resolution among goals that are very important to decision-makers (Luce 1998; Luce, Bettman, and Payne 1997, 2001; Luce, Payne, and Bettman 1999). Based on the literature on mood management motivation, people try to maintain their positive affective states, whereas they tend to repair their negative affective states (Larsen 2000; Isen 1984). In the repeated-situation context, if people generate negative emotions in an initial decision task, they are likely to repair their negative emotions in subsequent choices. The tendency to repair negative emotions is related to the tendency to switch to another option in making a subsequent choice (Inman and Zeelenberg 2002). This

tendency is especially true when the chosen option is an outcome from a negative emotional decision (Larsen 2000)[21]. In other words, we expect that, after experiencing a task-related negative emotion, people are likely to change their previous decision, due to a negative association with a previous-choice outcome. Specifically, people are less likely to retain an initial chosen alternative when their initial choice generates a high level of negative emotion.

Therefore, based on negative emotion research, we can infer that the tendency to retain a previous choice will be stronger in the dominance versus the trade-off condition.

3.2.2.3 Proposition 1b

In conclusion, two different research streams [e.g., (1) justification research and (2) regret/negative emotional research] suggest that the tendency to retain a previous choice will be stronger in the dominance versus the trade-off condition. Two explanations share some common background, although they are different. Specifically, the explanation based on justification research focuses on the motivational aspects of decision-making (e.g., to justify the decision-making), whereas the explanation based on regret/negative emotional research focuses on the role of negative emotion on subsequent choice. Formally, a prediction that is a rival to Proposition 1a is:

Proposition 1b: The tendency to retain a previously chosen alternative will be stronger when the alternative is chosen from a dominance relationship than when it is chosen from a trade-off relationship.

Until now, we have examined different predictions regarding the role of previous decision structures on subsequent choices. One stream of research from resource- or effort-based explanations (e.g., effort-as-information: previous effort

[21] Previous literature streams have shown that people experiencing negative emotions have a tendency to do nothing or process information less systematically (i.e., Anderson 2003; Raghunathan and Pham 1999; Sanbonmatsu and Kardes 1988). However, this finding is true, especially when the affect is not a task-relevant, but an incidental one. We expect that people with task-related affect are likely to repair their negative emotions by doing something, including switching to other options.

spending as a source of information for judgment; and regulatory resource theory) suggests that the tendency to retain a previous choice will be stronger in the trade-off versus the dominance condition. On the other hand, the other research stream from non-resource- or non-effort-based explanations (e.g., justification and regret/negative emotional research) suggests the opposite prediction. Figure 3.2.2 illustrates a summary of the prediction of Proposition 1. As we can see, it is difficult to predict the magnitude of two competing explanations and the direction of the impact of previous decision structures on subsequent choices. However, if the resource-based explanations are accurate, we should find the pattern for supporting Proposition 1a. In addition, we assume that the two different predictions work simultaneously; however, their magnitude can be changed by other factors. Therefore, we can predict the direction based on moderating variables which are theoretically related to the explanation that have been developed thus far. In the next section, we will examine the moderators for Propositions 1a and 1b.

[Figure 3.2.1 about Here]

3.3 The moderator of the impact of previous decision structure: Time interval

In this section, we will examine a moderator of the impact of previous decision structure. The key research question examined here is the impact of a prior decision on a later one. That is, what showed the consistency or inconsistency in decisions separated in time? Propositions 1a and 1b offer competing predictions regarding the impact of an initial (trade-off vs. dominance) decision on a subsequent decision. Here, the argument is developed that the time intervals between the two decisions will have an impact on the outcome. Unless it has been long time, the initial decision will likely influence the subsequent one. Thus, under ordinary time intervals between two decisions, the amount of the time interval can influence the relationship between the initial decision and the subsequent one. In this section, we will investigate this effect.

3.3.1 Previous literature on time

We will investigate the time interval variable as a theoretically drivable moderator for the core prediction. First, we will examine the research streams related to time. Specifically, we will review the literature on: (i) intertemporal choice; (ii) temporal construals; and (iii) time in marketing. Second, we will examine the research streams related to time intervals and decisions. We will then propose our propositions regarding the moderating role of time intervals.

3.3.1.1 Intertemporal choice research

The first research regarding time involves the research stream of *intertemporal choice* or *choice-over-time*: the intertemporal choice or choice-over-time framework is mainly interested in how people form preferences for future events. A typical example of intertemporal choice research examines preferences for outcomes in different future time frames. One major finding of this type of research is *hyperbolic discounting*, which refers to people's tendency to discount payoffs as a function of time (Frederick, Loewenstein, and O'Donoghue 2003, pp. 24-25). In other words, hyperbolic discounting involves the empirical finding that people generally prefer smaller to larger payoffs when the smaller payoffs come sooner in time than the larger ones. Angeletos, Laibson, Repetto, Tobacman, and Weinberg (2001), for instance, suggest that the shape of the discount function is better estimated by a generalized hyperbolic function than by an exponential function, as illustrated in Figure 3.3.1. As can be seen in this Figure, the value decreases steeply early on. Then, after a 10-year-delay period, the value decreases less rapidly. This hyperbolic function is different from an exponential function, according to which the discount function will decline at a constant rate over time.

[Figure 3.3.1 about Here]

For another example of hyperbolic discounting, Thaler (1981) asked participants to specify the amount of money they would require in 1 month, 1 year, and 10 years in order to induce them to feel indifferent to receiving $15 at that moment. The responses imply that the average discount rate for 1 month is 345 percent (e.g., $20), the average

discount rate for 1 year is 120 percent (e.g., $50), and the average discount rate for 10 years is 19 percent (e.g., $100). Therefore, the intertemporal choice research stream concerns decisions occurring in the current period, even though these decisions involve the near or far future. Put differently, in Thaler (1981)'s example, even though participants were asked to show their preferences for different time perspectives, they *answered* at the current time.

3.3.1.2 Temporal construal theory

Trope and Liberman (2003) suggest that people's judgments regarding future events can be changed by temporal distance from those events. Specifically, they argue that people have high-level construals (e.g., abstract, simple, superordinate, and goal-relevant construals) regarding distant-future events. On the other hand, people have low-level construals (e.g., concrete, complex, subordinate, and goal-irrelevant construals) regarding near-future events. This difference in the type of temporal construal can affect people's judgments and choices. For example, Liberman and Trope (1998) asked participants to choose one option between possibilities with high desirability/low feasibility (e.g., an interesting/inconvenient lecture) and with low desirability/high feasibility (e.g., an uninteresting/convenient lecture) under different temporal frames. They found that the distant-future participants preferred the desirable option (e.g., an interesting/inconvenient lecture), whereas the near-future participants chose the feasible option (e.g., the uninteresting/convenient lecture). In addition, Sagristano, Trope, and Liberman (2002) asked participants to choose one option from a set of bets that varied in expected value and probability of winning. They found that the participants preferred the option with a high probability of winning under the near-future condition. In contrast, they preferred the option with a high payoff under the distant-future condition.

3.3.1.3 Time concept in marketing and consumer behavior

In consumer behavior, several researchers have emphasized that consumers' perceptions of time are dependent on situational factors (e.g., music during waiting time or information during waiting time - Kellaris and Kent 1992; Antonides, Verhoef, and

Aalst 2002), the way time is represented (e.g., framing- LeBoeuf 2006), and personal factors (e.g., participant involvement – Meyers-Levy and Maheswaran 1992).

Researchers have also investigated time pressure on consumer decision-making. As mentioned before[22], the literature on time pressure indicates that, under time pressure, decision-makers tend to: (i) accelerate their information processing (Miller 1960; Ben Zur and Breznitz 1981); (ii) change their decision strategy or decision heuristics (Dhar and Nowlis 1999; Dhar, Nowlis, and Sherman 2000; Pay, Bettman, and Johnson 1988); (iii) focus on selective information or weight selective information heavily on decision-making (Ben Zur and Breznitz 1981; Dhar and Nowlis 1999; Wright 1974); and (iv) postpone or defer their final decisions (Dhar and Nowlis 1999)

3.3.2 Previous literature on time intervals

In this section, we will review the literature on time intervals. Specifically, we will investigate the time interval in various domains: (i) brand loyalty; (ii) persuasion for request (i.e., foot-in-the-door effect); and (iii) resource replenishment.

First, researchers have found that time intervals influence brand loyalty. The major finding of these studies is that the longer the time interval between previous and subsequent purchases, the lower the brand loyalty. For example, Kuehn (1962) provided evidence that the probability of a consumer's buying the same brand on two consecutive purchases of frozen orange juice decreased with an increase in the time interval between the two purchases. This phenomenon can be explained by the fact that the brand a consumer has last bought has little influence on his/her current choice of brand when a great amount of time has elapsed from the last purchase. In addition, based on the assumption that the motivation for an information search will increase when a great amount of time has elapsed from the previous purchase experience, Bucklin (1965) provided empirical evidence that the probability of checking an advertisement (i.e., a consumer's information search) was greater with an increase in the time interval between the two purchases. Finally, by using scanner panel data and hazard rate models,

[22] For details, please refer to Section 3.1.3.1.

Helsen and Schmittlein (1993) also provided evidence that the repurchasing of saltine crackers was lower for households with larger-than-average interpurchasing times.

Second, time intervals can also influence persuasion effects. For example, time intervals can affect the magnitude of the foot-in-the-door (FITD) effect. This FITD effect illustrates the positive effect of compliance with a small request on subsequent compliance with a more substantial request (Ross and Dempsey 1979, p. 580). In a recent meta-analysis, Burger (1999) found that the FITD effect is more powerful when two requests are continuous, such as making the second request immediately after participants agree to the first one.

Finally and more important for our prediction, time intervals can influence the replenishment of resources. Time is an important factor in replenishing depleted resources (Muraven and Baumeister 2000; Schmeichel and Baumeister 2004). We will examine this effect in section 3.3.4.1.

3.3.3 Summary of literatures of time and time interval

In the previous section, we reviewed the literature on time and time intervals and found that: (i) people have a tendency to prefer smaller to larger payoffs when the smaller payoffs come sooner in time than the larger ones; (ii) people have different construals for the future, depending on temporal distance; (iii) people perceive time depending on various factors; and (iv) time intervals can influence brand loyalty, persuasion effects, and resource replenishment. In sum, time and time intervals are important factors in understanding consumer judgment and decision-making. However, we also found that there is room for extending time research in repeated situations.

First of all, most previous research (i.e., intertemporal choice or temporal construal theory) focus on preferences for future events. Put differently, they are mainly interested in the different preferences for different temporal distances from the current status. However, there is a critical difference between the previous literature and our approach. We are mainly interested in the role of time on the impact of previous decisions on subsequent ones. For details, please refer to Section 2.3.

Second, most researchers have previously found that time intervals can decrease brand loyalty (Kuehn 1962; Bucklin 1965; Helsen and Schmittlein 1993). Our approach can broaden the previous time interval impact of consumer decision-making. Specifically, previous researchers simply suggest that time intervals can decrease brand loyalty. Our research can broaden the previous literature, in that decision structures can color the impact of time intervals on brand loyalty.

Finally, the time interval between two consecutive choices is also important from a practical standpoint. In normal repeated-choice situations, consumers will face different time intervals between two choices. Sometimes consumers make a similar choice repeatedly in a short-time period, such as buying grocery products or gambling. On the other hand, they may make other choices repeatedly within a long-time period, such as buying a house or a car.

3.3.4 Time interval between decisions as moderator

In the previous section, we found that the time interval was an important factor in understanding consumers' judgment and decision-making when they make repeated decision. In this section, we will develop the theoretical importance of time interval as it relates to our research question.

In our framework, it is important to determine the specific mechanisms for some patterns. As mentioned before in Proposition 1a, based on two mechanisms, we predict that the tendency to retain a previously chosen alternative will be higher when people make a decision using the trade-off versus the dominance structure in previous choices. In this dissertation, we focus on a moderator which separates the two mechanisms[23]. Regarding the underlying mechanisms of "resource spending," and "effort-as-information: previous effort spending as a source of information for judgment", we select the potential moderator variable of the *time interval between two choices*. This is

[23] We selected the time interval between two decisions because it is closely related to the route that supports Proposition H1a in Figure 3.2.2. We can consider other moderating variables affecting other routes, which supports Proposition H1b. One example can be accountability regarding the initial decision. We will suggest the moderating role of accountability in Section 4.3.3. However, in this paper, we will mainly focus on the time interval variable.

mainly because the impact of resource spending on the initial choice on subsequent choice can decline if people have the time to replenish resources. Time is one of the critical variables needed for decision-makers to replenish their resources (Muraven and Baumeister 2000; Schmeichel and Baumeister 2004), whereas time does not influence effort-as-information: previous effort spending as a source of information for judgment. Therefore, the time interval variable can separate two underlying mechanisms regarding Proposition 1a. On the one hand, if the mechanism for Proposition 1a is based on "resource spending," we can expect a significant interaction effect between: (i) the time interval between two choices; and (ii) the decision structure of a previous choice regarding the tendency to repeat a previously chosen alternative. Specifically, we can expect that Proposition 1a will be supported in a short-time interval between two choices and will be not supported in a long-time interval. On the other hand, if the mechanism for Proposition 1a is based mainly on "effort-as-information: previous effort spending as a source of information for judgment," we do not expect the moderating role of the time interval. Consequently, we can expect that Proposition 1a will be supported, regardless of the time interval between the two choices.

In sum, the time interval between an initial choice and the subsequent choice is important theoretically. In next section, we will examine the moderator role of the time interval between two choices in detail.

3.3.4.1 Time interval between decisions as a moderator based on the "resource spending" mechanism.

In Section 3.2.1.2, we predict that the tendency to retain a previous choice will be stronger for resource-depleted decision-makers than for non-depleted individuals, mainly due to resource spending in the initial choice. This phenomenon is expected to be stronger when there is a short time interval between two choices. This is because the limited resource model assumes that people have a limited resource for decision-making (Baumeister and Heatherton 1996; Baumeister, Bratslavsky, Muraven and Tice 1998), and decision-making can impair performance on subsequent decision making (Vohs et

al. 2008). Based on the previous literature on regulatory resources, we can expect that when the time interval between two choices is short, people will be temporarily short in their resource.

Therefore, as Proposition 1a states, the tendency to retain a previously chosen alternative will be stronger when the alternative is chosen from a trade-off relationship than when chosen from a dominance relationship. This is mainly due to the resource spending shown in Figure 3.2.2.

What happens when the time interval between two choices is long? In other words, after depleting the resource, what happens as time passes? Muraven and Baumeister (2000) suggest that the resource of executive function can be replenished as time passes. They theorize that executive function may be depleted or diminish one's capacity in a short period of time, whereas the capacity can be replenished after rest and the passage of some period of time. In the long run, frequent exercise of executive function followed by the opportunity for full rest and replenishment can gradually increase people's capacity for executive function. Along the same line, Schmeichel and Baumeister (2004) argue that "… *resource takes time and rest to be replenished* (p. 87)." In addition, Linville and Fischer (1991) also provide empirical evidence that depleted resources can be restored. They suggest a *renewable resources model* that explains the preferences for separating or combining events. For example, their study indicates that people prefer to separate two losses that occur on different days to one combined loss on the same day, because people have limited resources and the depleted resource is naturally renewable over time.

Therefore, we can expect that the temporarily depleted resource can be replenished after time. In the repeated-choice situation, the resource depleted by the initial choice can be replenished if there is a longer time interval between the initial choice and the subsequent choice. Consequently, compared to a short time interval between two choices, people with a long time interval are likely to consider the new alternative actively and are less likely to use simple heuristics such as choosing the status quo option. Therefore, we can expect that the tendency to retain a previously

chosen alternative will be the same both (i) when the alternative is chosen from a dominance relationship and (ii) when it is chosen from a trade-off relationship. This prediction is based on the assumption that the underlying mechanism of Proposition 1a is based on "resource availability."

In sum, we can predict the moderating role of the time interval between two decisions on the impact of decision structure on the subsequent decision[24]:

Proposition 2: The time interval between two decisions will moderate the relationship between the decision structure of a previous choice and the tendency to repeat a previously chosen alternative. Specifically:

Proposition 2a: In a long time interval between two decisions, the tendency to retain a previously chosen alternative will be the same, both when the alternative is chosen from a dominance relationship and when it is chosen from a trade-off relationship.

Proposition 2b: In a short time interval between two decisions, the tendency to retain a previously chosen alternative will be stronger when the alternative is chosen from a trade-off relationship than when it chosen from a dominance relationship (support for P1a).

3.3.4.2 Time interval between decisions as a moderator based on the "effort-as-information" mechanism.

What happens if the underlying mechanism of Proposition 1a is based on the "effort-as-information: previous effort spending as a source of information for judgment"? We can generate different scenarios. First, if the tendency to use previous effort spending as a source of information can increase or does not change as time goes by after the initial choice, it is expected to show a different pattern from Proposition 3 in Figure 3.3.2b. Specifically, the tendency to retain a previously chosen alternative in a trade-off

[24] For a detailed pattern of Proposition 2, please refer to Figure 3.3.2a

relationship will not decease if the time interval between the two choices is long. Second, if the tendency to use previous effort spending as a source of information decreases as time elapses, we can expect the same pattern from Proposition 3 in Figure 3.3.2a. Specifically, the tendency to retain a previously chosen alternative in a trade-off relationship will decease if the time interval between the two choices is long. In this case, we cannot separate the two mechanisms. However, previous research suggests that the tendency to use previous effort spending as a source of information will not decrease as time passes. For example, as mentioned in Section 2.5.1.3, Strahilevitz and Loewenstein (1998) investigated the effect of ownership history on the valuation of objects. They found *gradual adaptation*; that is, people are not likely to consider an endowed object as their property immediately after they receive the object. Rather, they need a period of time to fully consider the object as their property. Based on this assumption of gradual adaptation, we can infer that people try to maintain their previous effort gradually. Therefore, the tendency to use previous effort spending as a source of information will not decrease within a short period of time after an initial choice.

[Figure 3.3.2 about Here]

In sum, based on the tendency to use previous effort spending as a source of information, we do not expect the moderating role of the time interval. Specifically, if the underlying mechanism of Proposition 1a is based on the "effort-as-information: previous effort spending as a source of information for judgment," there is no difference in the tendency to retain a previously chosen alternative across a long or short time interval between two choices. Therefore, we can conceptually test the two mechanisms[25].

[25] Here, we mainly focus on separating the two explanations of Proposition 1a (i.e., effort-as-information: previous effort spending as a source of information for judgment and resource availability). However, the time interval is also not directly related to the two explanations of Proposition 1b (i.e., the justification and the regret/negative emotional explanation). For example, the effect of justification is significant, regardless of the time interval. Therefore, we can also argue that if Proposition 2 is accurate, it can support the "resource availability" explanation, as opposed to the three other explanations.

3.4 The moderator of the impact of previous decision structure: Involvement

In this section, we will examine another moderator of the impact of previous decision structures. Previously, we assumed that different decision structures (i.e., trade-off vs. dominance decisions) should affect the resources required to make a decision, as explained in Section 3.2.1.3. That is, *decisions involving trade-offs require decision-makers to expend many more resources than those involving dominance*. For example, people who make a trade-off decision will spend more resources or effort than those who make a dominance decision. The resources spent can consequently affect the tendency for people to retain previously chosen alternatives in subsequent choice situations, as illustrated in Figure 3.4.1.

[Figure 3.4.1 about Here]

In this section, we will directly test the above assumption that trade-off-related decisions require a greater amount of cognitive/emotional effort than do dominance decisions in making decisions. If our original assumption regarding the different effort requirements for trade-off vs. dominance decisions is accurate, then under the condition that the amount of resources required to make trade-off and dominance decisions are equal, we should not observe any differences in our dependent variable between trade-off and dominance decisions.

If our original theorizing in Figure 3.4.1 is accurate, the effect of different decision structures (i.e., trade-off vs. dominance) on the tendency to retain previously chosen alternatives is mediated by resource spending. On the other hand, if it is not mediated by resource spending, as illustrated in Figure 3.4.2, then the significant difference in the tendency to retain previously chosen alternatives can be attributed to an alternative mechanism, and *not* resource spending. In other words, if a variable can affect the relationship between a decision structure and resource spending under our original assumption, then that variable should affect the main result of the tendency to retain previously chosen alternatives. In contrast, if our original theory is wrong, then

that variable should not affect the main result of the tendency to retain previously chosen alternatives.

The variable that can affect the relationship between decision structure and resource spending is *involvement*. Involvement can generally be defined as "a person's perceived relevance of the object based on inherent needs, values, and interests" (Zaichkowsky 1985, p. 342). The concept of involvement can be classified into three categories (Bloch and Richins 1983; Zaichkowsky 1985): personal involvement, physical involvement and situational involvement[26]. In this dissertation, we will focus on situational involvement, specifically, situational decision involvement[27].

Some decisions are high involvement, whereas other decisions are not. Previous literature has suggested that decision-makers engage in different decision processes under high vs. low involvement conditions. For example, in a high- involvement condition, people are likely to process decision-related information deeply and are likely to spend more time, even if they face a trade-off decision (Celsi and Olson 1988; Tyebjee 1979). In contrast, in a low-involvement condition, people are likely to show the opposite pattern of showing a low level of effort for decision-making.

Now, we will examine the relationship between involvement and our two mechanisms (i.e., "resource availability" and the "effort-as-information: previous effort spending as a source of information for judgment"). As explained previously, the two mechanisms both assume that trade-off-related decisions require a greater amount of cognitive/emotional effort than do dominance decisions in making decisions. Therefore, we will examine different decision processing styles under high- and low-involvement conditions.

[26] Based on Zaichkowsky (1985, p. 342), personal involvement concerns the "inherent interests, values, or needs that motivate one toward the object." Physical involvement involves the "characteristics of the object that cause differentiation and increase interest." Finally, situational involvement deals with "something that temporarily increases relevance or interest toward the object."

[27] The reason we focus on the situation involvement rather than physical involvement (or product involvement) is that we do not want to use the different product for testing the physical involvement. On the other hand, if we manipulate situational involvement, we can use the same target product in the empirical testing.

First, we will examine the decision processing style under high involvement. In this situation, people try to process decision-related information deeply (Celsi and Olson 1988; Petty, Cacioppo, and Schumann 1983; Tyebjee 1979) and will spend more effort and time, especially when facing trade-off versus dominance conditions. This phenomenon results because people under trade-off decisions will take more time and will exert more effort in selecting one option. In contrast, people under the dominance decision will tend to find one option easily. Therefore, we expect the assumption that trade-off-related decisions require a greater amount of cognitive/emotional effort than do dominance decisions in making decisions will be supported for the high-involvement condition.

On the other hand, we expect a different decision processing style under low involvement. In this situation, people try to make quick decisions by using simple decision heuristics (Payne, Bettman, and Johnson 1993). Therefore, we expect that even if people face a trade-off decision under a low-involvement condition, they will not fully expend their effort or resources. In other words, the assumption that trade-off-related decisions require a greater amount of cognitive/emotional effort than do dominance decisions do in making decisions will not be supported under the low-involvement condition.

In sum, based on the different decision processing styles under high- and low-involvement conditions, we expect a significant moderating effect of involvement on the impact of the decision structure on a subsequent decision, as illustrated in Figure 3.4.2:

Proposition 3: The level of involvement will moderate the relationship between the decision structure of a previous choice and the tendency to repeat a previously chosen alternative. Specifically:

Proposition 3a: In a low-involvement situation, the tendency to retain a previously chosen alternative will be the same, both when the alternative is chosen from a dominance relationship, and when it is chosen from a trade-off relationship[28].

Proposition 3b: In a high-involvement situation, the tendency to retain a previously chosen alternative will be stronger when the alternative is chosen from a trade-off relationship than when it chosen from a dominance relationship (support for P1a).

[Figure 3.4.2 about Here]

[28] As explained in Figure 3.2.2, if the resource-based explanations are blocked by low involvement, non-resource-based explanations could influence the tendency to retain previously chosen alternatives. In such a case, we expect the pattern to be similar to that of Proposition 1b. However, low involvement can also affect non-resource-based explanations. For example, the tendency to justify a decision can also decrease under low involvement. Therefore, we expect no differences in the tendency to retain previously chosen alternatives.

Chapter IV. RESEARCH METHODOLOGY AND PRETESTS

In the previous chapter, we suggested several theoretical predictions on the impact of previous choice on subsequent choice. In this chapter, we will propose the methodology for testing previous predictions. The rest of this chapter is divided into six sections. First, we will argue for an experimental approach as the key empirical method. Second, we will suggest the empirical framework for our proposition. Third, we will provide the hypothesis or operational prediction based on the proposition. Fourth, we will describe the selection of participants and the target products. Fifth, we will report the pretest results and proposed pretests, which will be used for the main study. Finally, we will suggest the proposed studies in the last section.

4. 1 Selection of the empirical method: Experiment

We selected the experiment as the main research methodology, based on several reasons. First, Rosenthal and Rosnow (1991, pp. 10-11) suggest three important perspectives of empirical inquiry: (i) *descriptive research* (i.e., an investigatory focus that tends to have as its goals the careful mapping out of a situation or set of events in order to describe what is happening behaviorally); (ii) *relational research* (i.e., research focusing on the description of how what happens changes, along with some other set of observations); and (iii) *experimental research* (i.e., research focusing on the identification of causes, and what leads to what). Our research question (i.e., the impact of a previous decision on a subsequent one) basically belongs to the experimental realm. Therefore, the experimental method is the best way to conduct our research. Second, Kirk (1995, p. 6) also suggests that the experimental method has some characteristics that distinguish it from other research methods: (i) "manipulation by the research of one or more independent variables"; and (ii) "use of controls such as the random assignment of subjects to experimental conditions to minimize the effects of nuisance variables[29]." In our prediction, we are mainly interested in the impact of different types of initial decisions (e.g., trade-off vs. dominance) on subsequent decisions. The independent

[29] Nuisance variables are defined as "undesired sources of variation in an experiment that affect the dependent variable" (Kirk 1995, p. 5).

variable is the different type of initial decision, and the key dependent variable is the tendency to choose the same brand in the subsequent choice. We need the manipulation of an independent variable in order to investigate the causal relationship between the independent and dependent variables. In addition, the random assignment of the experimental condition is needed in order to accomplish our research goal. Third, the experimental method is good for providing strong internal validity, which can be defined as "the degree of validity of statements made about whether X causes Y" (Rosenthal and Rosnow 1991, p. 64). By using the experimental method, we can reduce some threats to interval validity, such as *history* (i.e., when nuisance variables enter the experimental process), *maturation* (i.e., changes in the dependent variable, based on the natural function of time), or *mortality* (i.e., contamination due to the changing composition of the participants in the research) (Cook and Campbell 1979; Kirk 1995).

In sum, the selection of the experiment as the main empirical method appears optimal.

4.2 Empirical framework

We can plot our framework for Proposition 1, as shown in Figure 4.2.1. Several things should be noticed within this framework. First, we have a theoretical prediction of the competing propositions regarding the relationship between the decision structure of an initial decision, and the tendency to retain a previous chosen alternative when faced with a subsequent decision. Second, as explained in the previous section, we will manipulate the decision structure as a "dominance vs. trade-off relationship." Third, we will measure the tendency to retain a previous chosen alternative by using the dependent variable, "the preference of a previous chosen option with an opportunity of switching to a new option." Finally, we have an empirical prediction about the relationship between a decision from the dominance vs. trade-off relationship and the preference of a previously chosen option with the opportunity to switch to a new option. Put differently, we can expect significant statistical results for the casual relationship between the independent and dependent variables.

In addition, we can plot our framework for Propositions 2 and 3, as shown in Figures 4.2.2 and 4.2.3. As can be seen here, the theoretical relationship between the initial decision and the subsequent one, and the manipulation of the independent variable and the measurement of the dependent variable are the same as that shown in Figure 4.1. However, there are several things that have been changed in this framework. First, the time interval and involvement influence the relationship between the initial decision and the subsequent one at a theoretical level. Second, we will manipulate the time interval by using shorter vs. longer time durations between two decisions as well as high vs. low involvement. Finally, at the empirical level, we expect a significant interaction between the independent variable and the moderator on the dependent variable.

[Figure 4.2.1 about Here]
[Figure 4.2.2 about Here]
[Figure 4.2.3 about Here]

4.3 Hypotheses and empirical design

In this section, we will provide the hypotheses or operational predictions, based on the propositions, as well as the empirical design to test the hypotheses.

4.3.1 Hypothesis 1

Based on: (1) effort-as-information: previous effort spending as a source of information for judgment; and (2) regulatory resource theory, we suggest that "*the tendency to retain a previously chosen alternative will be stronger when the alternative is chosen from a trade-off relationship than when it is chosen from a dominance relationship*" in Proposition 1a. In this dissertation, we will measure "the tendency to retain a previously chosen alternative" by using "the relative preference for a previously chosen alternative." To do so, we will provide participants with an opportunity to switch to another alternative after an initial decision. If the two mechanisms of: (1) effort-as-

information; and (2) regulatory resource theory works, we can expect that the participants in this study will show a higher preference for a previously chosen alternative over a new one. Therefore, we propose:

Hypothesis 1a: People will show a relatively high preference for a previously chosen alternative when the previous choice was from a choice set in which the alternatives represented a trade-off, compared to a condition when the previous choice was from a choice set in which one alternative dominated.

On the other hand, based on: (1) justification research; and (2) regret/negative emotional research, we suggest that "*the tendency to retain a previously chosen alternative will be stronger when the alternative is chosen from a dominance relationship than when it is chosen from a trade-off relationship*" in Proposition 1b. Thus:

Hypothesis 1b: People will show a relatively high preference for a previously chosen alternative when the previous choice was from a choice set in which one the alternative dominated, compared to a condition when the previous choice was from a choice set in which the alternatives represented a trade-off.

4.3.2 Hypothesis 2

In Proposition 2, we suggest that the time interval between two decisions will moderate the impact of an initial decision on a subsequent one. If the mechanism of regulatory resource theory is accurate, we can expect a significant interaction between the time interval and the decision structure of an initial decision. Based on this assumption, we suggest that Hypothesis 2 is based on Proposition 2[30]:

[30] If the mechanism of the effort-as-information: previous effort spending as a source of information for judgment is accurate, we do not expect a significant interaction between the time interval and the decision structure of an initial decision. In our Proposition 2 and Hypothesis 2, we merely assume that the mechanism of regulatory resource theory works. However, the empirical results will determine the true mechanism.

Hypothesis 2: There is an interaction between the time interval between the two decisions and the decision structure of a previous choice on the preference for a previously chosen alternative. Specifically:

Hypothesis 2a: When the time interval between two decisions is long, people will show relatively similar preferences for a previously chosen alternative when the previous choice was from a choice set in which the alternatives represented trade-off and when the previous choice was from a choice set in which one alternative dominated.

Hypothesis 2b: When the time interval between two decisions is short, people will show a relatively high preference for a previously chosen alternative when the previous choice was from a choice set in which the alternatives represented trade-off, compared to a condition when the previous choice was from a choice set in which one alternative dominated.

4.3.3 Hypothesis 3

In Proposition 3, we suggest that involvement will moderate the impact of an initial decision on a subsequent one. If the assumption of resource spending under trade-off and dominance is accurate, we expect a significant interaction between involvement and the decision structure of an initial decision. We suggest that Hypothesis 3 is based on Proposition 3:

Hypothesis 3: There is an interaction between involvement and the decision structure of a previous choice on the preference for a previously chosen alternative. Specifically:

Hypothesis 3a: When involvement is low, people will show relatively similar preferences for a previously chosen alternative when the previous choice was from a choice set in which the alternatives represented a trade-off, and when the previous choice was from a choice set in which one alternative dominated.

Hypothesis 3b: When involvement is high, people will show a relatively high preference for a previously chosen alternative when the previous choice was from a choice set in which the alternatives represented trade-off, compared to a condition when the previous choice was from a choice set in which one alternative dominated.

4.3.4 Hypotheses 4: Boundary condition for Proposition 1

In Proposition 1, we suggest that the tendency to retain a previously chosen alternative depends on the previous decision structure. In this section, we will suggest hypotheses that indicate the boundary condition for the previous proposition 1.

The moderator variable is accountability. The reason as to why we consider accountability is that it is strongly related to the prediction, based on the concept of justification. If the impact of an initial decision affects a subsequent decision through the "justification of an initial decision," the factors known to increase such a justification should increase the impact of the initial decision on the subsequent decision on account of the justification. In this dissertation, *accountability* can be defined as "the implicit or explicit expectations that one may be called on to justify one's beliefs, feelings, and actions to others" (Lerner and Tetlock 1999, p. 225).

Accountability is one of the variables that can influence justification for the initial choice (Lerner and Tetlock 1999; Simonson 1989), as previous literature has shown that there is a strong positive relationship between accountability and justification for making a decision. For example, under the high-accountability condition, the focus of decision-makers shifts from the choice of good options to the choice of a good justification (Shafir, Simonson, and Tversky 1993; Simonson 1992; Wilson and Schooler 1991).Therefore, we expect the moderating role of accountability (which influenced the initial decision) to affect a subsequent decision. In addition, we will focus on outcome accountability in this dissertation. Outcome accountability has

been shown to increase the self-justification bias for sunk costs (Simonson and Staw 1992) and has been shown to reduce decision quality (Siegel-Jacobs and Yates 1996)[31].

Under high-outcome accountability, when people make a decision in a dominance relationship, they can easily justify their decision, inasmuch as one alternative is obviously better than the other one. On the other hand, people cannot justify their decision so easily when they face trade-off alternatives because all alternatives have some strength in certain aspects or attributes, and because their decision process cannot suggest a single option. This prediction is supported by the empirical findings of Zhang and Mittal (2005). In addition, we can assume that people tend to retain a previously chosen alternative in a subsequent choice when they can easily justify their previous decision outcome. Therefore, we expect the moderating role of outcome accountability for Hypotheses 1a and 1b. Specifically, we expect that in the high-outcome-accountability condition, the tendency to retain a previous choice will be stronger in the dominance condition than in the trade-off condition:

Hypothesis 4: There is an interaction between outcome accountability and the decision structure of a previous choice on the preference for a previously chosen alternative. Specifically:

Hypothesis 4a: In the low-outcome-accountability condition, people will show a relatively high preference for a previously chosen alternative when the previous choice was from a choice set in which the alternatives represented a trade-off, compared to a condition when the previous choice was from a choice set in which one alternative dominated (support for Hypothesis 1a).

[31] We will focus on outcome accountability rather than on procedural accountability because under procedural accountability, it is difficult to predict the expected pattern for Hypotheses 1a and 1b. Generally, procedural accountability refers to "accountability for the procedures used to arrive at a decision," whereas outcome accountability refers to "accountability for the quality of the outcome of a decision" (Zhang and Mittal 2005, p. 465).

Hypothesis 4b: In the high- outcome-accountability condition, people will show a relatively high preference for a previously chosen alternative when the previous choice was from a choice set in which one alternative dominated, compared to a condition when the previous choice was from a choice set in which the alternatives represented a trade-off (support for Hypothesis 1b).

4.4 Section of participants and target products

We selected students as the main research participants, based on two reasons. First, even though this research is related to practical implications, this research mainly concerns theoretical development. Based on several researchers (Cook and Campbell 1979; Calder, Phillips, and Tybout 1981, 1983), using diverse sampling groups or enhancing external validity[32] is relatively less important when the goal of research is to test a theory. For example, Calder, Phillips, and Tybout (1981) suggested "a homogeneous sample" (p. 200) for theoretical research. Second, using homogenous students as the main participants is a cost/time-efficient method for our research question because if we used heterogeneous members of the population, we would need more sampling units (Rosenthal and Rosnow 1991, p. 64). Therefore, it appears that there are no significant problems for using only students as the main participants for our study.

For our empirical testing, we selected target products based on several criteria. First of all, our target group (i.e., students) should be familiar with or should have experience in buying or using a target product. Second, our target group should know a target product very well. Finally, the target product should have several key attributes and some variation in the attributes in order to manipulate the dominance and trade-off relationships.

4.5 Pretests and experimental material

[32] External validity can be defined as "the generalizability of a causal relationship beyond the circumstances under which it was studied or observed by the scientist" (Rosenthal and Rosnow 1991, p. 64).

The purpose of the pretest is to select the target product and to check the manipulation of the decision structure of an initial decision.

4.5.1 Pretest 1 for selection for target products

The first criterion for selecting a target product is that it has several key attributes. We first selected 9 products, including "a calculator, a digital camera, a golf club, a laptop computer, a memory stick, an MP3 player, a pen, a printer, and a TV." The second criterion for selecting a target product is that the target group (i.e., students) should: (i) be familiar with; (ii) have high usage experience; (iii) have high purchase experience; and (iv) have knowledge about the target product. Therefore, we created the survey material by asking students about their *familiarity*, *usage experience*, *purchase experience*, and *subjective knowledge*[33]. All scales are based on four intervals, from 1(*not at all familiar/ never/ never/ not at all knowledge*) to 4 (*Extremely familiar/ very often / very often/ extremely knowledgeable*). The participants of the pretest 1 were twenty undergraduate students at a large university (average age = 21.75; 50% of them were female).

As illustrated in Table 4.5.1, the mean values of a pen are significantly higher than the neutral value (2.5) for the four criteria of familiarity, usage experience, purchase experience, and subjective knowledge. The mean values of a calculator are also significantly higher than the neural value for three criteria. Therefore, we chose a pen and a calculator as the main target products

[Table 4.5.1 about Here]

4.5.2 Pretest for manipulation of the decision structure: Pens

Based on a search of existing pens' attributes from online websites, we generated 3 different pens, based on their real names. Two pens (e.g., Pens A and B) are equally attractive, while the other pen (e.g., Pen C) is inferior to the two other pens as illustrated

[33] In this dissertation, based on Alba and Hutchinson (1987) and Park and Lessig (1981), familiarity is defined as "the number of product-related experience" and subjective knowledge is defined as "the subjective perception of the ability to perform product-related tasks successfully.

in Table 4.5.2. We expect that the decision relationship between Pens A and B is a trade-off one, whereas the decision relationship between Pens A and C, as well as between Pens B and C, is a dominance one. In order to test this decision relationship, we conducted pretests 2.

In pretest 2, the participants were given information about the three pens and were asked to provide their perception of the overall attractiveness of each pen. Specifically, participants were asked to respond on a scale from 1 (*not at all attractive*) to 7 (*very attractive*). The participants of pretest 2a were sixteen undergraduate students at a large university (average age = 21.69; 44% of them were female). We expect that the evaluation of Pens A and B will be similar and that the evaluation of Pens A and B will be higher than that of Pen C. The results confirm this expectation. Specifically, participants evaluated Pen A (mean = 5.38) much more favorably than Pen C (mean = 2.69, t = 5.81, $p < .001$) and evaluated Pen B (mean = 5.50) much more favorable than Pen C (t = 7.65, $p < .001$). However, there was no difference in the evaluation between Pens A and B (t = .36, $p = .70$).

[Table 4.5.2 about Here]

4.5.3 Pretest for manipulation of the decision structure: Calculators

Based on a search of existing calculator's attributes from online websites, we generated 3 different calculators, based on their real manufacturer names. Two calculators (e.g., Calculators A and B) are equally attractive, while the other calculator (e.g., Calculator C) is inferior to the two other calculators as illustrated in Table 4.5.2. We expect that the decision relationship between Calculators A and B is a trade-off one, whereas the decision relationship between Calculators A and C, as well as between Calculators B and C, is a dominance one. In order to test this decision relationship, we conducted pretests 3a and 3b.

In pretest 3a, the participants were given information about the three calculators and were asked to provide their perception of the overall attractiveness of each calculator. Specifically, participants were asked to respond on a scale from 1 (*not at all*

attractive) to 7 (*very attractive*). The participants of pretest 3a were sixteen undergraduate students at a large university (average age = 21.87; 75% of them were female). We expect that the evaluation of Calculators A and B will be similar and that the evaluation of Calculators A and B will be higher than that of Calculator C. The results confirm this expectation. Specifically, participants evaluated Calculator A (mean = 5.50) much more favorably than Calculator C (mean = 2.50, t = 9.91, $p < .001$) and evaluated Calculator B (mean = 5.44) much more favorable than Calculator C (t = 9.95, $p < .001$). However, there was no difference in the evaluation between Calculators A and B (t = .19, $p = .85$).

In pretest 3b, the participants will be given a calculator-choice situation. The participants will be asked to choose one calculator from one of three different decisions (e.g., a choice between Calculators A & B, A & C, and B & C). They will be then asked to provide their perceptions of the decision difficulty, such as "Not at all difficult/effortful – Very difficult/effortful". We expect that decision difficulty will be higher in the choice between Calculators A and B than in the choice between Calculators A and C or Calculators B and C. The participants of pretest 3b were 37 undergraduate students at a large university (average age = 20.65; 57% of them were female).The results confirmed this expectation. Specifically, all participants in the dominance condition (i.e., choice between Calculators A and C or Calculators B and C) chose the superior alternatives (100% vs. 0%), whereas participants in the trade-off condition chose the two calculators equally (47.6% vs. 52.4%). In addition, decision difficulty was higher in the choice between Calculators A and B (mean = 3.69) than in the choice between Calculators A and C (mean = 1.75; F (1, 27) = 22.4, $p < .001$) or Calculators B and C (mean = 1.88; F (1, 27) = 15.6, $p = .001$). There was no difference in the decision difficulty fro two conditions (F < 1).

Chapter V. EMPIRICAL STUDIES

This chapter covers six main studies. Studies 1 and 2 tested our competing Hypotheses 1a and 1b. Specifically, we examined the impact of an initial decision on a subsequent one. We found results supporting Hypothesis 1a instead of Hypothesis 1b; that is, the preference for a previously chosen alternative was higher when a previous choice was from a choice set in which the alternatives represented a trade-off, compared to when a previous choice was from a choice set in which one alternative dominated. Studies 3, 4, and 5 supported the underlying mechanism for the results of Studies 1 and 2. We found that the results supported the "resource availability" mechanism rather than other mechanisms. Finally, the results of Study 6 suggested a moderating role of accountability for Hypotheses 1a and 1b.

5.1 Main Study 1

5.1.1 Overview of Study 1a

In Hypotheses 1a and 1b, we proposed competing hypotheses regarding the role of the initial decision on the subsequent decision. Specifically, when the resource-based explanation (i.e., effort as information and resource availability) is operative, participants ought to show a stronger tendency to retain a previous choice in the trade-off versus in the dominance condition. In contrast, when the resource-based explanation is not operative, subjects ought to show a stronger tendency to retain a previous choice in the dominance versus in trade-off the condition.

The main purpose of Study 1a was to empirically test the competing Hypotheses 1a and 1b. If our explanation (based on effort as information and resource availability) is operative, we will find that the preference for a previously chosen alternative is higher when a previous choice was from a choice set in which the alternatives represented a trade-off, compared to when a previous choice was from a choice set in which one alternative dominated (i.e., Hypothesis 1a). On the other hand, if an alternate theoretical explanation (based on justification and regret/negative emotion) is operative, we will find the reverse pattern, which would support Hypothesis 1b.

5.1.2 Experimental design Study 1a

As mentioned before, the main purpose of Study 1a was to empirically test Hypotheses 1a and 1b; that is, *peoples' different preference for a previously chosen alternative when the previous choice was from a choice set in which the alternatives represented a trade-off, compared to a condition when the previous choice was from a choice set in which one alternative dominated.* In order to achieve the main goal, a one-factor between-subjects experimental design was used. The independent variable was the decision structure of the first decision. The participants in this study were assigned to one of two conditions: a consideration set comprising a dominant alternative (hereafter known as the *dominance* condition) or a consideration set comprising alternatives that represent a trade-off (hereafter known as the *trade-off* condition).

In the dominance condition, we expect that the participants in this study will choose a dominating alternative over a dominated one. We used two versions for the dominance condition: the choice set of alternatives A and C as well as the choice set of alternative B and C[34]. We expect that participants will choose alternative A [B] from the choice set of alternatives A and C [B and C]. On the other hand, in the trade-off condition, we expect that the participants will choose two alternatives equally. For example, if the participants in the initial trade-off condition are exposed to alternatives A and B, they are expected to choose alternative A or B to the same degree.

The key dependent variable was the preference for a previously chosen alternative, with an opportunity to switch to a new option.

5.1.3 Procedures of Study 1a

One-hundred-and-three undergraduate students at a large university participated in the study as a course requirement. Fifty-three percent of them were female. All participants in this study went through a series of stages, as illustrated in Figure 5.1.1. At each stage, we gave the participants written instructions.

[34] Alternative C is clearly dominated by alternatives A and B.

[Figure 5.1.1 about Here]

First, the participants were exposed to the general instructions of this study. At this stage, we emphasized that this study consisted of several different tasks.

Second, the participants were exposed to the first-choice task. As explained in the previous section, they were assigned to one of two conditions: the *dominance* or *trade-off* condition. The participants were provided with information about two pens. Specifically, we provided attribute information and pictures of the pens in order to help the participants decide on one pen. Participants then were asked to choose one option. We also used the actual pen brand name instead of a fictitious one because we gave actual pens to the participants. For example, the participants in the trade-off condition were exposed to Pens A and B, and those in the dominance condition were exposed to either Pens A and C or Pens B and C. (See Figure 5.1.2 for the stimuli of the trade-off condition)[35]. Third, the participants were informed that they would actually be given a pen, based on their decision. After making their decision, they were given a pen. They then were asked not to use the pen because using the pen could affect the valuation of the pen later.

Fourth, the participants were given a short-term memory erasing task. They were asked to do an unrelated task within 1-2 minutes[36].

Fifth, the participants were exposed to another alternative and were asked to show their preference between a previously chosen alternative and a new one. Specifically, they were exposed to this message: "*Imagine that you have the chance to exchange your chosen pen for the pen pictured below.*" We provided information about the pen with a similar format to that of the first choice. The key dependent variable was based on a 7-point scale (See Figure 5.1.3 for details).

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[35] After choosing one pen, we also asked the participants to evaluate the attractiveness of the two pens with a scale (e.g., "1" (not at all attractive) to "7" (very attractive)) in order to do a manipulation check.

[36] The filler task was about a decision regarding participating sweepstakes. Specifically, we asked participants to imagine that they bought a specially marked "Road to Rewards" Welch's Fruit Spreads and then received a secret code on the packaging. They then were asked to show their willingness to participate in this sweepstakes using a 7-point scale. The task was not difficult to participants.

Sixth, the participants were asked to respond to other research-related variables (e.g., variables related to underlying mechanisms and a manipulation check) and demographic information. Specifically, we measured: (i) decision justifiability; (ii) regret; and (iii) resource spending in the initial task to check for manipulation. The decision justifiability scales were modified from previous research done by Inman and Zeelenberg (2002): (1) *how justifiable is the decision to choose the pen*[37]*?* (anchored by *weakly justifiable/strongly justifiable*); (2) *how easy to defend is the decision to choose the pen?* (anchored by *not easy to defend/easy to defend*); and (3) *how logical to defend is the decision to choose the pen?* (anchored by *very illogical/very logical*). Regret scales were taken from previous research done by Inman and Zeelenberg (2002): (1) *how much regret did you feel after you chose the pen?* (anchored by *no regret at all/regret very much*); and (2) *how much happier would you have been if you had made a different decision?* (anchored by *not much happier/much happier*). The manipulation check scales (i.e., resource spending in the initial decision) were modified from Chatterjee and Heath (1996) and Zhang and Mittal (2005): (1) *how much effort did it take in making your decision to choose one pen over the other?* (anchored by *very effortless/very effortful*); and (2) *how much difficulty did you feel in making your decision to choose one pen?* (anchored by not at all difficult/very difficult) (See Figure 5.1.4 for details)

Finally, the participants were thanked and debriefed.

[Figure 5.1.2 about Here]

[Figure 5.1.3 about Here]

[Figure 5.1.4 about Here]

5.1.4 Results of Study 1a

The data were analyzed as a one-way between-subjects design. The means for the results are presented in Table 5.1.1.

[Table 5.1.1 about Here]

[37] All scales of manipulation check were about the first task. Therefore, the pen on this scale was about the one in the first decision.

Manipulation Check: First of all, two scales of the manipulation check showed high reliability (Cronbach's Alpha = .82), and the average for the two scales was used in the main analysis. The manipulation was successful; specifically, we found that those who were in the trade-off condition (mean = 2.69) showed higher difficulty for their initial decision than did those who were in the dominance condition (mean = 1.83; F (1,101) = 16.29; p <.001). In addition, all participants in the dominance condition chose the superior alternatives (100% vs. 0%), whereas participants in the trade-off condition chose the two pens equally (44.2% vs. 55.8%). The choice result in the trade-off condition was not statistically different from 50% (z = .59; p > .10). Finally, the evaluation difference for the two alternatives was different across the two conditions. Specifically, those who were in the trade-off condition (mean = 1.42) showed a lower absolute difference for the two alternatives than did those who were in the dominance condition (mean = 2.65; F (1, 101) = 29.00; p < .001). In sum, the initial decision type manipulation was successful.

The preference for a previously chosen alternative: We expect that, if Hypothesis 1a is accurate, we will find that participants in the trade-off condition will show a relatively higher preference for a previously chosen alternative than those in the dominance condition. In contrast, if Hypothesis 1b is accurate, we will find the reverse pattern. The result supported Hypothesis 1a. Specifically, people in the trade-off condition (mean = 3.25) showed a higher intention to keep the previous chosen alternative than did those in the dominance condition (mean = 2.41; F (1,101) = 5.28; p < *.05)*

Decision Justifiability and Regret: We expect that the decision justifiability score in the dominance condition will be higher than that in the trade-off condition because the dominance structure can be a strong reason for decision-makers. On the other hand, the regret score will show an opposite pattern because the foregone alternative in the trade-off condition generates regret for decision-makers. For justifiability, our expectation was supported; specifically, we found that those who were in the dominance condition

(mean = 5.85) showed higher justifiability for their initial decision than did those who were in the trade-off condition (mean = 5.08; F (1,101) = 11.01; $p < .001$). However, there were no differences in regret across the dominance and trade-off conditions[38] (mean = 1.65 vs. 1. 75, F < 1). We found a significant difference in the justifiability scores across the two experimental conditions. In order to test the role of decision justifiability and regret in the key dependent variable, we ran a regression. Specifically, two independent variables of the regression analysis were decision justifiability and regret. The dependent variable was the tendency to keep the previous chosen alternative in the second decision. The results indicated that no variable was significant (all ts < 1, $p > .10$), suggesting that the underlying mechanisms (i.e., justifiability and regret) implicated in H1b were not related to the key dependent variable.

5.1.5 Discussion of Study 1a

Study 1a examined the impact of an initial decision on a subsequent one. Consistent with the prediction of H1a, we found empirical results indicating that the preference for a previously chosen alternative occurred when a previous choice was from a choice set in which the alternatives represented a trade-off, compared to when a previous choice was from a choice set in which one alternative dominated.

In addition, we found that the result was not explained by decision justifiability and regret. Specifically, the regret was not different across two experimental conditions. The regression analysis did not find any significant effect of decision justifiability and regret on the tendency to keep the previous chosen alternative in the second decision.

In sum, the results of Study 1a supported Hypothesis 1a.

5.1.6 Main Study 1b

In Study 1a, we found a significant effect of the initial decision on the subsequent one. Specifically, the preference for a previously chosen alternative in the subsequent decision was stronger when a previous choice was from a choice set in which the

[38] The insignificant result for regret suggested that there was no different in the level of regret based on the current stimuli. This result may reflect the possibility that a foregone pen may not induce regret. In a subsequent study employing calculators as the stimulus product, we observe differences in regret.

alternatives represented a trade-off, compared to when a previous choice was from a choice set in which one alternative dominated.

In Study 1b, we tried to control for the impact of the "ownership effect" during the experiment. Specifically, we gave pens to the participants after the initial decision in Study 1a, which could have affected the results of this study. We tried to replicate the previous findings by using a different type of dependent variable, and by providing another piece of evidence involving different resource spending from an initial decision. Therefore, the main purpose of Study 1b was to replicate Study 1a with some modifications. First, we did not give pens to the participants. We conjectured that the initial decision itself (vs. the decision outcome, that is, owning a pen) might have generated the outcome for the subsequent decision. Specifically, "how participants chose" rather than "what participants received" was the theoretical focus of this study. If we found results similar to study 1a in this study, they could be attributed to the impact of the initial decision itself, rather than to the impact of owning or receiving a pen. Second, we measured an additional dependent variable - willingness to accept (WTA). Specifically, we asked the participants to show their willingness to accept the price of the pen on a scale from 1 ($1.05) to 7 ($1.95). Third, in order to access resource depletion after the initial task, after conducting the main task, we asked the participants to solve as many difficult math problems as they could. The number of math problems was 25, and one example of the problems was "169 X 75 =." We expected that those who had depleted their resources in the initial task would solve fewer problems than those who did not.

Sixty-nine undergraduate students at a large university participated in the study as a course requirement. Sixty-three percent of them were female. The participants in this study were assigned to one of two conditions: a consideration set comprising a dominant alternative (hereafter known as the *dominance* condition) or a consideration set comprising alternatives representing a trade-off (hereafter known as the *trade-off* condition). In addition, the dependent variables were the preference for keeping the previously chosen alternative and WTA. All participants in this study went through

similar steps as those in Study 1a, except that Stage 3 was skipped and the math questions after Stage 6 were added (Figure 5.1.1).

5.1.7 Results of Study 1b

One participant in the dominance condition chose the inferior alternative. Therefore, we excluded this subject's data in the later analysis. The data were analyzed as a one-way between-subjects design. The means for the results are presented in Table 5.1.1.

[Table 5.1.1. about Here]

Manipulation Check: First of all, two scales of manipulation checks showed high reliability (Cronbach's Alpha = .81), and the average of the two scales was used in the main analysis. The manipulation was successful; specifically, we found that those who were in the trade-off condition (mean = 3.01) reported higher difficulty in making their initial decision than did those who were in the dominance condition (mean = 2.35; F (1, 67) = 4.76; p <.05). In addition, most participants in the dominance condition chose the superior alternatives, whereas participants in the trade-off condition chose the pens equally (42.9% vs. 57.1%). The choice result in the trade-off condition was not statistically different from 50% (z = 0.66; p > .10). The evaluation difference for the two alternatives was also different across the two conditions. Specifically, those who were in the trade-off condition (mean = 1.43) showed a lower absolute difference for the two alternatives than did those who were in the dominance condition (mean = 2.78; F (1, 67) = 24.76; p < .001). Regarding the math task, the results supported our expectations. Specifically, participants in the trade-off condition (mean = 12.86) solved fewer problems than those in the dominance condition (mean = 18.96; F (1, 67) = 11.69; p = .001). In sum, the initial decision type manipulation was successful.

The preference for a previously chosen alternative and WTA: We expect that, if Hypothesis 1a is accurate, we will find that participants in the trade-off condition will show a relatively higher preference for a previously chosen alternative than those in the

dominance condition. In contrast, if Hypothesis 1b is accurate, we will find the reverse pattern. The results of this study supported Hypothesis 1a.; specifically, people in the trade-off condition (mean = 4.24) showed a higher intention to keep the previously chosen alternative than those in the dominance condition (mean = 3.19; F (1, 67) = 5.464; $p < .05$). In addition, people in the trade-off condition (mean = 5.21) showed a higher WTA for the previously chosen alternative than did those in the dominance condition (mean = 4.07; F (1, 67) = 6.48; $p < .05$).

Decision Justifiability and Regret: For justifiability, our expectations were supported; specifically, we found that those who were in the dominance condition (mean =5.23) showed higher justifiability in making their initial decision than did those who were in the trade-off condition (mean = 4.40; F (1, 67) = 6.56; $p < .05$). However, there were no differences in regret across the dominance and trade-off conditions (mean = 1.69 vs. 1.88, F < 1). In order to test the role of decision justifiability and regret in the key dependent variable (i.e., preference), we ran a regression. The two independent variables were decision justifiability and regret. The results indicated that no variable was significant (all ts < 1, $p > .10$). The results of the regression analysis also supported H1a instead of H1b because the underlying mechanisms (i.e., justifiability and regret) implicated in H1b were not related to the key dependent variable.

5.1.8 Discussion of Study 1b

Study 1b examined the impact of an initial decision on a subsequent one without giving participants pens. Consistent with the results of Study 1a, we found that a preference for a previously chosen alternative occurred when a previous choice was from a choice set in which the alternatives represented a trade-off, compared to when a previous choice was from a choice set in which one alternative dominated. We also found a similar result for monetary judgments.

In Study 1b, we did not provide the participants with the pens in order to control for the impact of owning pens. However, we still found a significant effect of the initial decision on the subsequent one. Therefore, the results of Studies 1a and 1b jointly

suggest that the decision itself (vs. the decision outcome, that is, owning a pen) generated the outcome for the subsequent decision.

In addition, the results of this study also suggest additional evidence of different resource spending from trade-off and dominance decisions. Specifically, we found different numbers of math problems solved from the trade-off and dominance decisions. Finally, we could replicate the results of Study 1a with a monetary variable (i.e., WTA), which showed convergent evidence with the other preference measurement.

5.2 Main Study 2

The main purpose of Study 2 was to replicate Studies 1a and 1b with some modifications. First, we used another product category. In Studies 1a and 1b, we did not find any significant effort of "regret," which may have been due to using an inexpensive target product. Therefore, we used a more expensive product in this study. Second, we tried to provide direct evidence of a mediation role of resource spending for the impact of initial decision on the subsequent decision. Specifically, we measured the amount of resource spending with scales. Finally, we tried to measure the mood of the participants after the initial task in order to exclude the mood effect.

5.2.1 Procedures of Study 2

Eighty undergraduate students at a large university participated in the study as a course requirement. The average age was 23.33, and 51.3% were female.

The participants in this study were assigned to one of two conditions: the *dominance* or *trade-off* condition. All participants in this study went through a similar series of stages as those in Study 1a. At each stage, we gave the participants written instructions. The target product was a calculator.

First, the participants were exposed to the general instructions of this study. At this stage, we emphasized that this study consisted of several different tasks.

Second, the participants were exposed to the first-choice task. As explained in the previous section, they were assigned to one of two conditions: the *dominance* or

trade-off condition. The participants were provided with information about two calculators. For example, the participants in the trade-off condition were exposed to Calculators A (i.e., Sharp EL) and B (i.e., Casio DM), and those in the trade-off condition were exposed to either Calculators A and C (i.e., Ativa AT) or Calculators B and C (See Figure 5.2.1 for the stimuli of the trade-off and dominance conditions).

Third, the participants were asked to conduct a short-term memory erasing task. They were asked to do an unrelated task within 1-2 minutes[39].

Fourth, the participants were asked to respond to other research-related variables (e.g., variables related to underlying mechanisms and a manipulation check) and demographic information. Specifically, we measured: (i) decision difficulty; (ii) decision justifiability; (iii) regret; (iv) mood; and (iv) a manipulation check. The decision justifiability, regret, and manipulation check scales were the same as those in Study 1a with 9-point scales. The six decision difficulty scales were modified from Vohs et al. (2008). All scales were measured with 9-point scales (See Figure 5.2.2 for decision difficulty scales). The mood scale was based on 9-point scales (e.g., "1" (very sad) to "9" (very happy)).

Fifth[40], the participants were exposed to another alternative and were asked to show their preference between a previously chosen alternative and a new one, similar to that in Studies 1a and 1b. The dependent variable was measured with 9-point scales.

Finally, the participants were thanked and debriefed

[Figure 5.2.1 about Here]
[Figure 5.2.2 about Here]

5.2.3 Main Results of Study 2

Manipulation Check: First of all, the two scales of manipulation checks showed high reliability (Cronbach's Alpha = .79), and the average of the two scales was used in the

[39] The filler task was about decision regarding choosing one payment plans. Specifically, we asked participants to imagine that they you bought a digital camera and asked to choose one payment plan from two different payment schedules. The task was not difficult for participants.
[40] Half of the participants in this study responded to research-related variables first and then responded to the dependent variable, whereas the other half performed the reverse order. The order factor was not significant in all of the analyses. Thus, we merely reported the aggregated results.

main analysis. The manipulation was successful; specifically, we found that those who were in the trade-off condition (mean = 4.16) showed higher difficulty in making their initial decision than did those who were in the dominance condition (mean = 2.23; F (1, 78) = 33.86; p <.001). In addition, all participants in the dominance condition chose the superior alternatives[41]. Finally, the evaluation difference for the two alternatives was different across the two conditions. Specifically, those who were in the trade-off condition (mean = 1.70) showed a lower absolute difference for the two alternatives than did those who were in the dominance condition (mean = 4.03; F (1, 78) = 38.25; p <.001). In sum, the initial decision type manipulation was successful.

Decision Justifiability and Regret: We expect that the decision justifiability score in the dominance condition will be higher than in the trade-off dominance, whereas it will be the opposite pattern for the regret score. Our expectation was supported; specifically, for decision justifiability, we found that those who were in the dominance condition (mean =7.75) showed higher justifiability for their initial decision than did those who were in the trade-off condition (mean = 6.17; F (1, 78) = 16.93; p <.001). For regret, we found the opposite pattern (mean of dominance condition = 1.54 vs. mean of trade-off condition = 2.13; F (1, 77) = 4.54; p <.05). In Studies 1a and 1b, we did not find any significant result for regret; however, we did find a significant result in this study. We conjecture that the significant result of regret in this study could be attributed to the target product. Specifically, the foregone calculator in the trade-off condition could generate a feeling of regret for the participants, whereas the foregone pen could not generate such regret.

Decision difficulty: Six scales showed high reliability (Cronbach's Alpha = .882). In addition, in the factor analysis, six scales loaded on only one factor (Eigenvalue = 3.85, 64.12% of the total variance). Therefore, we could calculate the average of the six

[41] Participants in the trade-off condition chose one brand more frequently than the other brand (76.7% vs. 23.3%). The choice result in the trade-off condition was significantly different from 50% (z =2.57; p < .01). However, the choice of brand did not influence the key main dependent variables. In addition, based on the significant results of the other manipulation check variables, the manipulation of decision difficulty was generally successful.

scales for the main analysis. We expected that the decision difficulty in the trade-off condition would be higher than in the dominance condition. Our expectation was supported; specifically, we found that those who were in the trade-off condition (mean = 5.24) showed higher decision difficulty in making their initial decision than did those who were in the dominance condition (mean = 4.06; F (1, 78) = 11.09; p <.001).

The preference for a previously chosen alternative: We expect that if Hypothesis 1a is accurate, we will find that the participants in the trade-off condition will show a relatively higher preference for a previously chosen alternative than those in the dominance condition. In contrast, if Hypothesis 1b is accurate, we will find the reverse pattern. The results supported Hypothesis 1a; specifically, people in the trade-off condition (mean = 5.44) showed a higher intention to keep the previously chosen alternative than those in the dominance condition (mean = 4.24; F (1, 78) = 5.97; p <.05).

Furthermore, across the two experimental conditions, there was no significant difference in mood (mean = 5.91 vs. 6.08, F (1, 78) = .18; p >10). Therefore, the results of this study could not be explained by the mood effect.

Mediation test of decision difficulty: We expected that the perceived decision difficulty should mediate the relationship between the types of initial decision (i.e., dominance vs. trade-off) and the tendency to retain the previously chosen alternative. We tested for mediation, following procedures similar to those of Baron and Kenny (1986).

To prove mediation, we first regressed the mediator on the independent variable (link *a* in Figure 5.2.3), regressed the dependent variable on the independent variable (link *b* in Figure 5.2.3), and finally regressed the dependent variable on the independent variable and the mediator (links *b′*: and *c* in Figure 5.2.2). We found that links *a* and *b* were significant (β = 1.19, t = 3.33, p < .01 for link *a* and β = 1.20, t = 2.44, p < .05 for link *b*).When we regressed the dependent variable on the independent variable and the mediator, only the mediator was significant (β = 0.41, t = 2.75, p < .01). However, link *b′* became insignificant (β = .71, t = 1.47, p >. 05). Sobel's (1982) test of mediation

indicated that the reduction of perceived decision difficulty on the tendency to retain a previously chosen option was significant ($z = 2.12$, $p < .05$).

[Figure 5.2.3 about Here]

Additional analysis: In order to compare the relative impact of various mechanism variables on our key dependent variable, we conducted a regression analysis. The independent variables were decision justifiability, regret, and perceived decision difficulty. The dependent variable was the tendency to keep (vs. exchange) the previously chosen option in the second decision. The results confirmed our prediction. Only the perceived decision difficulty was significant ($\beta = .321$, $t = 2.57$, $p < .05$). On the other hand, both decision justifiability and regret were not significant ($t = 1.16$, $p > .10$ for justifiability; $t = 0.78$, $p > .10$ for regret). Therefore, the results of the regression analysis were similar to the other findings of Study 2.

5.2.4 Discussion of Study 2

In this Study 2, we replicated the previous Studies 1a and 1b with another product (i.e. calculators). Specifically, the participants in the trade-off condition showed a higher preference for a previously chosen calculator than did those in the dominance condition. In addition, we provided empirical evidence that the perceived decision difficulty mediated the above relationship. Therefore, the results of Study 2 supported Hypothesis 1a and provided the empirical evidence to support resource-based explanations. Finally, we could exclude the mood effect for the previous findings.

In sum, throughout Studies 1 and 2, we found the similar results supporting Hypothesis 1a.

5.3 Main Study 3

In Studies 1 and 2, we found that a different experience from a different initial task (i.e., a trade-off vs. a dominance structure) influenced the tendency to retain a previously chosen alternative. Specifically, we found the results supporting Hypothesis 1a instead

of Hypothesis 1b. However, even if we found a pattern supporting Hypothesis 1a, the results could be explained by two resource-based alternative explanations.

The main purpose of Study 3 is to empirically test the moderating role of the time interval between two decisions and to separate the underlying explanations (i.e., "resource availability" and "effort-as-information: previous effort spending as a source of information for judgment") of the previous study. In order to determine the specific mechanism for the previous findings, we manipulated the time interval between two decisions. The impact of resource spending on the initial choice on subsequent choice can decline if people have the time to replenish resources.

Time is one of the critical variables needed for decision-makers to replenish their resources (Muraven and Baumeister 2000; Schmeichel and Baumeister 2004), whereas time does not influence another mechanism (i.e., effort-as-information: previous effort spending as a source of information for judgment). The tendency to use previous effort spending as a source of information will not decrease as time passes. For example, Barsalou (1999) maintains that people can store previous effort spending information in the long-term memory.

Based on the above logic, we expect that if the resource availability mechanism is operative, we will find *an interaction between the time interval between the two decisions and the decision structure of a previous choice on the preference for a previously chosen alternative (i.e., Hypothesis 2).* This is because the time interval between two decisions could influence the resource availability in the second decision. On the one hand, after a long time interval, people can replenish their resource and will show the same tendency to keep a previously chosen alternative regardless of the type of the initial decision. On the other hand, after a short time interval, people can't replenish their resource from the initial trade-off decision. Therefore, Hypothesis 1a will be supported in a short time interval.

In contrast, if the other mechanism (i.e., "effort-as-information: previous effort spending as a source of information for judgment") is correct, we will find a non-

significant result of the interaction between two variables. This is because this mechanism will not change over time.

5.3.1 Procedures of Study 3

Seventy undergraduate students at a large university participated in the study. The average age was 21.5 and 57.1% were female. This study is a 2 (initial decision type: *dominance* vs. *trade-off*) by 2 (time interval between two choice: long vs. short) between-subjects design. Students from three different classes participated in this study. We randomly selected classes for assigning the time interval manipulations. Therefore, one class was randomly assigned as a *short*-time interval condition, whereas the other two classes were assigned as the *long*-time interval condition. Put differently, all students in each class received the same resource replenishing manipulations. However, we randomly assigned the initial decision types individually within each class.

Given that this study is an extension of previous studies, we used a similar experimental procedure, except for the time interval manipulation. In this study, we assumed that the time interval between two decision tasks could help the participants to replenish their resources.

Specifically, after conducting the first decision task, we asked the participants to do a different task, based on the experimental manipulations. In the *short* time interval condition, the participants were asked to do an unrelated task within 1-2 minutes break before the second decision. The time duration of 1-2 minutes was suitable because previous studies in self-regulatory resources have shown that a "1-2 minute short break" (i.e., Study 2 of Muraven, Tice, and Baumeister 1998; Study 1 of Tice, Baumeister, Shmueli, and Muraven 2007) or "conducting a short survey" (i.e., Study 3 of Muraven, Tice, and Baumeister 1998; Experiment 2 of Baumeister, Bratslavsky, Muraven, and Tice 1998) does not affect the replenishment of the depleted resources. Therefore, we expected that participants in the 1-2 minute short break would not have a chance to replenish their depleted resources.

On the other hand, in the *long* time interval condition, we asked the participants to do some other easy tasks in order to replenish their resource. Specifically, we used two different time manipulations. The first method was to take a one hour break between two decisions. The second method was to take a 2 day break between two decisions[42]. We assumed that participants in both methods took a rest and had an opportunity to replenish resources. All key measurements were similar as in the previous study.

5.3.2 Main Results of Study 3

We expect that the manipulation of the initial decision will be successfully replicated in this study. In addition, if the mechanism of "resource availability" is accurate, we expect a significant interaction between the time interval and the decision structure of an initial decision. However, if the mechanism of the "motivation to preserve a decision outcome associated with previous effort" is accurate, we do not expect the significant interaction between the two factors. The means for the results are presented in Table 5.3.1.

[Table 5.3.1. about Here]

Manipulation Check: Regarding the initial decision type manipulation (i.e., the *dominance* vs. *trade-off*), the results indicated that our manipulation was successful. First of all, all participants in the dominance condition chose the superior alternative, whereas participants in the trade-off condition did not choose one brand of calculator only (66.7% vs. 33.3%). The choice result in the trade-off condition was not statistically different from 50% ($z = 1.37$; $p > .10$). Second, the evaluation difference for the two alternatives was different across the two conditions. Specifically, those who were in the trade-off condition (mean = 1.27) showed a lower absolute difference for

[42] There were no differences in main dependent variables across the two long time interval condition. Therefore, we collapsed the two conditions in the main analysis. The size of two long time interval conditions was 17 each. In addition, due to the different class size, we have similar sample size cross short vs. long time interval condition in the main analysis.

the two alternatives than did those who were in the dominance condition (mean = 3.50; F (1, 67) = 58.67; p <.001). This manipulation check was not influenced by the time interval manipulation (F <1). Finally, the manipulation check was different across the two initial decision conditions. Specifically, we found that those who were in the trade-off condition (mean = 4.24) showed higher difficulty in making their initial decision than did those who were in the dominance condition (mean = 2.57; F (1, 68) = 22.09; p <.001). This manipulation check was not influenced by the time interval manipulation (F (1, 68) = 1.56, p > .10). In sum, the initial decision type manipulation was successful.

The preference for a previously chosen alternative: We expected a significant interaction effect for our dependent variable. In order to do an additional analysis, we analyzed a 2 (initial decision type: the *dominance* vs. *trade-off*) by 2 (time interval between two decisions: short vs. long) between subjects design. Participants' intentions to keep the previously chosen alternative were analyzed as a function of two factors.

First, participants in the trade-off condition (mean = 5.48) showed a higher intention to keep the previously chosen alternative than did those in the dominance condition (mean = 4.24; F (1, 66) = 4.43; p <.05) as hypothesized (H1a) and consistent with the results from the previous studies. In addition, not surprisingly, the participants in the short time interval condition (mean = 5.36) had higher intentions to keep the previously chosen alternative than did those in the long time interval condition (mean = 4.26; F (1, 66) = 4.10; p <.05). More importantly, however, this effect was qualified by a significant interaction of the two factors (F (1, 66) = 4.41; p <.05). As shown in Table 5.3.1 and consistent with Hypothesis 2, the participants in the short time interval condition showed higher intentions to keep the previously chosen alternative when their previous decision was based on a trade-off (mean = 6.50) than when it was based on dominance (mean = 4.22; contrast F (1, 66) = 9.17; p <.01), whereas the participants in the long time interval condition showed no differences in their intentions to keep the previously chosen alternative, based on trade-off (mean = 4.27) or dominance (mean = 4.26 contrast F(1, 66) = .000; p >.10). In fact, the interaction effect was due to higher intentions in the trade-off/no- resource-replenished combination (6.50), compared to the

other three conditions combined (4.25), whereas intentions in the latter three conditions were not different from one another. In sum, the results supported Hypothesis 2.

Furthermore, across the four experimental conditions, there was no significant difference in mood (all Fs < 1.5). Therefore, the results of this study could not be explained by the mood effect.

5.3.3 Discussion of Study 3

In this study, we manipulated the resource-replenishment opportunity with the time interval between two decisions. If the resource availability mechanism is correct, we should find a significant impact of the time interval. We found a significant interaction between resource replenishing and the decision structure of an initial decision. Specifically, in the short time interval condition, the participants showed higher intentions-to keep a previously chosen alternative when their previous decision was based on a trade-off versus dominance. On the other hand, in the long time interval condition, the participants showed lower intentions to keep the previously chosen alternative, regardless of whether their previous decision was based on a trade-off or dominance. We assume that this is because the participants in this condition have an opportunity to replenish their resource with time break. In sum, the results of this study supported the mechanism of "resource availability" rather than "effort as information" mechanism.

5.4 Main Study 4

Throughout this research, we assumed that *"decisions involving trade-offs require decision-makers to expend many more resources than those involving dominance*." Even though we provided some empirical evidence (i.e., different math problems solved across two decision-type conditions) supportive of this assumption in Study 2, we now attempt to show additional evidence to support this assumption.

The main purpose of Study 4 was to empirically test Hypothesis 3 and consequently, to confirm our key assumption.

We expected that the tendency to retain a previously chosen alternative would be stronger when the alternative is chosen from a trade-off relationship than when it is chosen from a dominance relationship in a *high*-involvement situation. This is because trade-off-related decisions require a greater amount of cognitive/emotional effort than do dominance decisions in making decisions. On the other hand, we expected that the tendency to retain a previously chosen alternative would be the same, both when the alternative is chosen from a dominance relationship, and when it is chosen from a trade-off relationship in a *low*-involvement situation. This is because people in the low-involvement condition would not fully expend their effort or resources, regardless of the trade-off or dominance conditions.

In order to accomplish this goal, we used a 2 (initial decision structure: trade-off vs. dominance) by 2 (involvement: high vs. low) between-subjects design.

One-hundred twenty-five undergraduate students at a large university participated in the study as a course requirement. They participated in this study as small group (i.e., 2-15 participants per group). The average age was 20.7 and 56.8 % were female.

[Figure 5.4.1 about Here]

We used a similar experimental procedure as in the previous Study 2, as illustrated in Figure 5.4.1.We tried to manipulate involvement in Stage 2 before conducting the initial task. In order to manipulate high vs. low involvement, we used the well-established methods by Petty, Cacioppo, and Schumann (1983) and by Escalas and Luce (2004) [43]. Specifically, we informed the participants that the main purpose of

[43] Petty, Cacioppo, and Schumann (1983) manipulated involvement as the following: "…*participants in both the high and low involvement groups were told that they would be evaluating advertisements for products, but subjects in the high involvement group were led to believe that the experimental advertised product would soon be available in their local area, and that after viewing a variety of advertisements they would be allowed to choose one brand from the experimental product category to take home as a gift. Low involvement participants were led to believe that the experimental advertised product would not be available in their local area in the near future, and that after viewing the ads they would be allowed to take home one brand from a category of products other than the experimental category"* (p. 137). In

the study was to evaluate new products. The participants in the high-involvement condition were told the message below:

The main purpose of this study is to evaluate new calculators.
On behalf of the manufacturer, we are surveying a very small sample of consumers in the Midwest (including Minneapolis) to gain insight about the new calculators to be launched in the Midwest soon (and later, in other parts of the US). Each and every person's opinion is, therefore, VERY important. Your opinions will weigh heavily in this decision.
The new calculators will soon be available in your local area. Therefore, please PAY ATTENTION to the new products as if you were actually thinking about choosing one model from these products.

In contrast, the participants in the low-involvement condition were told the message below:

The main purpose of this study is to evaluate new calculators.
On behalf of the manufacturer, we are surveying consumers in the US to gain insight about the new calculators to be launched in the US.
The new calculators will not be available in your local area in the near future.

We conducted the involvement manipulation check after the main responses with two scales (e.g., "1" (Not at all interested/Not at all involved) to "9" (very interested/very involved).

5.4.2 Main Results of Study 4

We expected to confirm our key assumption in this study. We expected a significant interaction between involvement and the decision structure of an initial decision. When involvement is high, we expected H1a to be supported. On the other hand, when involvement is low, the participants are expected to show relatively similar preferences for a previously chosen alternative between the dominance and trade-off conditions.

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addition, Escalas and Luce (2004) manipulated involvement as the following: "… *we told the high involvement participants to 'PAY ATTENTION to the ad as if you were actually thinking about a real ad.' Subjects were told that they would be eligible for one of five $50 prizes based on their performance in an (unspecified) later test to see if they had paid attention; they were also told repeatedly that the test questions would come after a set of opinion questions (i.e., our dependent measures). Thus, the 'test' phase of the experiment (related to the $50 prize) was clearly separated from the 'opinion' phase where dependent measures were collected. Prizes were randomly awarded from among students with perfect recall of product brand names. Participants in the control condition for the involvement manipulation were not presented with these instruction*s … "(p. 277).

The data were analyzed as a two by two between-subjects design. The means for the results are presented in Table 5.4.1.

[Table 5.4.1 about Here]

Manipulation Check: Regarding the initial decision type manipulation (i.e., *dominance* vs. *trade-off*), the results indicated that our manipulation was successful. First of all, all participants in the dominance condition chose the superior alternative[44]. whereas participants in the trade-off condition did not choose one brand of calculator only (78.7% vs. 21.3%) Second, the evaluation difference for the two alternatives was different across the two conditions. Specifically, those who were in the trade-off condition (mean = 1.69) showed a lower absolute difference for the two alternatives than did those who were in the dominance condition (mean = 3.48; F (1, 121) = 82.95; p <.001). Finally, the perceived difficulty for the initial decision was different. Specifically, we found that those who were in the trade-off condition (mean = 4.75) showed higher difficulty in making their initial decision than did those who were in the dominance condition (mean = 2.63; F (1, 123) = 68.77; $p < .001$). In addition, this manipulation check was not influenced by the other involvement manipulation (F < 1). In sum, the initial decision type manipulation was successful.

Regarding the involvement manipulation task, the results also supported our expectations. Specifically, participants in the high-involvement condition (mean = 5.44) showed higher involvement than did those in the low-involvement condition (mean = 4.86; F (1, 123) = 4.97; p <.05). In addition, this manipulation check was not influenced by the other initial decision manipulation (F < 1).

The preference for a previously chosen alternative: Participants' intentions to keep the previously chosen alternative were analyzed as a function of two factors. First, there

[44] Participants in the trade-off condition chose one brand more frequently than the other brand (78.7% vs. 21.3%). The choice result in the trade-off condition was significantly different from 50% (z =3.31; p < .01). However, the choice of brand did not influence the key main dependent variables. In addition, based on the significant results of the other manipulation check variables, the manipulation of decision difficulty was generally successful.

was no difference between high vs. low involvement in terms of the intentions to keep the previously chosen alternative ($F < 1$). However, we found a significant main effect of initial decision type. Participants in the trade-off condition (mean = 5.34) showed a higher intention to keep the previously chosen alternative than did those in the dominance condition (mean = 4.23; $F(1, 121) = 7.16$; $p < .01$) as hypothesized (H1a) and consistent with the results from the previous studies. More importantly, however, this effect was qualified by a significant interaction of two the factors ($F(1, 121) = 4.50$; $p < .05$). Further examination of this effect revealed that the participants in the low-involvement condition showed higher intentions to keep the previously chosen alternative when their previous decision was based on a trade-off (mean = 5.66) versus dominance (mean = 3.81, contrast $F(1, 121) = 12.59$; $p < .001$). On the other hand, the participants in the high- involvement condition showed similar intentions to keep their previously chosen alternative, regardless of whether their previous decision was based on a trade-off (mean = 5.00) or dominance (mean = 4.79, contrast $F(1, 121) = .142$; $p > .10$). In fact, the effect was due to lower intentions in the dominance /low-involvement combination (3.81), compared to the other three conditions combined (5.17), whereas intentions in the latter three conditions were not different from one another. In sum, even though we found the significant interaction effect, the pattern of each experimental condition was not consistent with the prediction based on H3.

Finally, regarding the mood variable, there was no significant main or interaction effect (all $Fs < 1$). Therefore, the above findings could not be attributed to the mood effect.

5.4.3 Discussion of Study 4

In this study, we manipulated involvement before the initial decision in order to empirically test our assumption of resource spending across trade-off and dominance conditions. Specifically, we expected to replicate the previous findings of Studies 1 and 2 in the high-involvement condition. On the other hand, we expected participants in the low-involvement condition to spend a great amount of resources for their initial decision, regardless of dominance or trade-off decisions. In addition, after spending a

great deal of resources in the initial decision, participants were expected to show higher intentions to keep their previously chosen alternative in the subsequent decision.

Empirically, we found a significant interaction between involvement and initial decision type. However, the pattern of results of this study was not the same as the prediction. Specifically, we could replicate the previous findings (i.e., the higher tendency to keep the previously chosen alternative in the trade-off vs. dominance condition) only in the low-involvement condition. On the other hand, in the high-involvement condition, the participants showed higher intentions to keep the previously chosen alternative, regardless of whether their previous decision was based on a trade-off or dominance.

We conjecture that, in the low-involvement condition, participants spent more effort or resources in the trade-off versus dominance condition. Therefore, the pattern of the tendency to keep the previously chosen alternative in the subsequent decision was similar to the previous findings. In contrast, participants in the high-involvement condition spent a great amount of resources or effort, regardless of the trade-off or dominance condition. Due to resource spending, they showed higher intentions to keep a previously chosen alternative in subsequent decisions[45].

In sum, we failed to find the results supporting our Hypothesis 3. However, the pattern of this study at least suggests different resource spending across trade-off and dominance decisions.

5.5 Main Study 5

In Study 3, we provided the empirical evidence supporting the "resource availability" mechanism rather than the "effort-as-information" mechanism. In this study, we try to provide additional evidence of the "resource availability" mechanism. We directly manipulated additional resource availability in the middle of the first and second tasks in order to accomplish this goal[46].

[45] This conjecture makes sense if we compare the manipulation of this Study 4 and other studies. This is because the manipulation of the other study was similar to the low-involvement condition. Therefore, the results of the low-involvement condition in this study are similar to those of the other studies.
[46] The design of Study 5 is based on Vohs and Kim (2006).

The logic behind this study was that if resource availability was at work in our previous findings, we should find a significant impact of additional resource availability manipulation on subsequent decision-making. Specifically, with no additional resource-depleting condition between the initial decision and the subsequent one, we expected to replicate the previous findings supporting H1a. On the other hand, with an additional resource-depleting condition between the initial decision and the subsequent one, we expected the participants to show higher intentions to keep their previously chosen alternative, regardless of whether their previous decision was based on a trade-off or dominance.

5.5.1 Procedures of Study 5

Seventy-one undergraduate students at a large university participated in the study as a course requirement. The average age was 21.7 and 70.4% were female. The design of this study was a 2 (initial decision type: *dominance* vs. *trade-off*) by 2 (resource depleting during two decision tasks: depleting vs. non-depleting) between-subjects design). The participants in this study were assigned to one of 4 experimental conditions. All participants in this study went through a series of stages similar to those in Study 2, with a resource-depleting manipulation to replace the third task (i.e., a short-term memory erasing task). Specifically, we manipulated resource availability by following previous methods of other researchers (i.e., Tice, Baumeister, Shmueli, & Muraven, 2007). All of the participants were provided with a 2/3-page length of text and were asked to cross out all instances of the letter "e" in the text. Half of the participants assigned to the resource-non-depleted condition were merely asked to cross out all of the "e's" in the text. On the other hand, the other half of the participants assigned to the resource-depleted condition were asked to cross out all of the "e's" in the text. However, they were also required *not* to cross out "e's" if the letter was followed by a vowel (a, e, i, o, u) or if a vowel came two letters before the "e." We only used native English speakers because the study manipulation involved crossing out "e's," which seemed to be a somewhat taxing exercise linguistically. Later, we added a

manipulation check for this task (e.g., "How difficult did you find the 'Cross Out the Letter 'e' Task ?" with scales of 1 (not at all difficult/effortful]) to 9 (very difficult/effortful)).

5.5.2 Main Results of Study 5

The data were analyzed as a two by two between-subjects design. The means for the results are presented in Table 5.5.1.

[Table 5.5.1 about Here]

Manipulation Check: The manipulation of the initial decision was successful. Specifically, all participants in the dominance condition chose the superior alternative. However, participants in the trade-off condition chose the two calculators equally (68% vs. 32%). The choice result in the trade-off condition was not statistically different from 50% ($z = 1.58$; $p > .10$). We also found that those who were in the trade-off condition (mean = 5.04) showed higher difficulty in making their initial decision than did those who were in the dominance condition (mean = 2.82; $F(1, 69) = 46.12$; $p < .001$). In addition, this manipulation check was not influenced by the other resource-depleting manipulation ($F < 1$).

Regarding the resource-depleting manipulation task, the results also supported our expectations. Specifically, participants in the resource-depleting condition (mean = 6.93) showed higher difficulty in finding the "e's" than those in the resource-non-depleting condition (mean = 4.02; $F(1, 69) = 54.42$; $p < .001$). In addition, this manipulation check was not influenced by the other initial decision manipulation ($F < 1$).

The preference for a previously chosen alternative: We expected a significant interaction effect for our dependent variable. The results of this study also supported our prediction. Specifically, no main effect was significant. However, the interaction effect was significant ($F(1, 67) = 4.91$; $p < .05$). A contrast analysis also confirmed our

expectations. When the middle task was easy, we expected that the resource availability for the participants would not change. In this situation, the resource availability was totally dependent on the initial decision. Therefore, we expected to replicate our previous findings from Studies 1 and 2. The results confirmed our expectations. Specifically, participants in the trade-off condition (mean = 5.56) showed higher intentions to keep a previously chosen alternative than those in the dominance condition (mean = 3.35, Contrast F (1, 67) = 6.74; $p < .05$). On the other hand, when the middle task was difficult, there were no differences across the two initial decision conditions (mean of trade-off condition = 4.63 vs. mean of dominance condition = 5.00; Contrast F (1, 67) < 1).

5.5.3 Discussion of Study 5

In this study, we manipulated the additional resource-depleting mechanism during two decisions. Put differently, if the resource-availability mechanism is the operative mechanism, additional manipulation of resource depletion should influence the impact of an initial decision on a subsequent one Empirically, we found a significant interaction between additional resource depleting and initial decision type. Specifically, we could replicate the previous findings only in the non-resource-depleting condition. On the other hand, in the resource-depleting condition, the participants showed higher intentions to keep their previously chosen alternative, regardless of whether their previous decision was based on a trade-off or dominance.

If the "effort-as-information" mechanism could explain the previous findings, additional resource depletion should not affect the tendency to keep their previously chosen alternative. This is because participants in this study had no reason to use the additional resource depletion task as an information source for the second decision. However, the results indicated that the additional resource depletion influenced the tendency to keep participants' previously chosen alternative, as explained by the "resource availability" mechanism. In other words, resource availability from the first task and the additional resource-depletion task together affected the second decision.

Therefore, the results of this study support the mechanism of "resource availability" rather than the mechanism of "effort-as-information."

This study further strengthens the previous findings by suggesting additional evidence of supporting the mechanism of "resource availability."

5.6 Main Study 6

5.6.1 Procedures of Study 6

In Study 6, we suggest a boundary condition for Hypotheses 1a and 1b. We proposed that accountability as the moderating variable for the role of initial decision type on the tendency to keep the previously chosen alternative in the subsequent decision. Specifically, we assumed that people, under high-outcome accountability, can easily justify their dominance decision based on the previous theory and finding by Zhang and Mittal (2005). However, people can't easily justify their trade-off decision under high-outcome accountability condition. In addition, we can assume that people tend to retain a previously chosen alternative in a subsequent choice when they can easily justify their previous decision outcome. Therefore, we expect that in the high-outcome-accountability condition, the tendency to retain a previous choice will be stronger in the dominance condition than in the trade-off condition.

The main purpose of Study 6 was to empirically test the moderating role of accountability and to test Hypothesis 4; that is, *there is an interaction between outcome accountability and the decision structure of a previous choice on the preference for a previously chosen alternative.*

In order to accomplish this goal, we used a 2 (initial decision type: *dominance* vs. *trade-off*) by 2 (accountability: *outcome* vs. *process*) between-subjects design. The participants in this study were assigned to one of 4 experimental conditions.
In order to manipulate outcome and process accountability, we used the well-established method of Zhang and Mittal (2005). Specifically, the participants in the outcome- accountability condition were told the following message before making their choice;

Before choosing, keep in mind that the outcome of your choice (what you choose) is most important for this decision. We hope to interview you to understand why you make your specific choice. In other words, you need to explain and justify the outcome of your choice. Please write down your name. I, _____, agree to participate in the interview on the outcome of my choice.

In contrast, the participants in process accountability condition were told the message below:

Before choosing, keep in mind that the process of your choice (how you choose) is most important for this decision. We hope to interview you to understand why you make your specific choice. In other words, you need to explain and justify the process of your choice. Please write down your name. I, _____, agree to participate in the interview on the process of my choice.

All other experimental procedures were similar as those in Study 1b, except for some changes (See Figure 5.6.1). First of all, we manipulated the outcome and process accountability condition. The target product was a pen, and all variables were measured with 7-point scales. In addition, we measured the accountability-manipulation check by asking participants 3 items in terms of justifying or explaining their decision outcome and process.

Seventy-eight undergraduate students at a large university participated in the study as a course requirement. The average age was 20.7 and 46.2% were female.

[Figure 5.6.1 about Here]

5.6.2 Main Results of Study 6

The data were analyzed as a two by two between-subjects design. The means for the results are presented in Table 5.6.1.

[Table 5.6.1 about Here]

Manipulation Check: Regarding the initial decision type manipulation (i.e., the *dominance* vs. *trade-off*), the results indicated that our manipulation was successful.

First of all, all participants in the dominance condition chose the superior alternative[47]. The choice result in the trade-off condition was significantly different from 50% (z =2.01; $p < .05$). Second, the evaluation difference for two alternatives was different across the two conditions. Specifically, those who were in the trade-off condition (mean = 1.60) showed a lower absolute difference for the two alternatives than did those who were in the dominance condition (mean = 2.91; F (1, 75) = 24.78; $p <.001$). Finally, the manipulation check was different across the different initial decisions. Specifically, we found that those who were in the trade-off condition (mean = 3.21) showed higher difficulty in making their initial decision than did those who were in the dominance condition (mean = 2.44; F (1, 76) = 8.36; $p= .005$). In addition, this manipulation check was not influenced by the other accountability manipulation (F (1, 76) = 1.68; p > .10).

Regarding the accountability manipulation task, the results also supported our expectations. Specifically, participants in the outcome-accountability condition (mean = 4.64) showed higher concerns to justify their *decision's outcome* than did those in the process accountability condition (mean = 4.11; F (1, 76) = 3.25; $p = .075$). On the other hand, participants in the process accountability condition (mean = 4.79) showed higher concerns to justify their *decision's process* than did those in the process accountability condition (mean = 4.13; F (1, 76) = 5.81; $p = .018$). In addition, these manipulation checks were not influenced by the other initial decision manipulation (Fs < 1).

The preference for a previously chosen alternative: We expected a significant interaction effect for our dependent variable. The results of this study supported our prediction. Specifically, no main effect was significant (Fs < 1). However, the interaction effect was significant (F (1, 74) = 4.77; $p = .032$). A contrast analysis also confirmed our expectations. In the outcome-accountability condition, participants in the dominance condition (mean = 4.61) showed a higher intention to keep the previously

[47] Participants in the trade-off condition chose one brand more frequently than the other brand (71.4% vs. 28.6%). The choice result in the trade-off condition was significantly different from 50% (z =2.01; $p <$ .05). However, the choice of brand did not influence the key main dependent variables. In addition, based on the significant results of the other manipulation check variables, the manipulation of decision difficulty was generally successful.

chosen alternative than those in the trade-off condition (mean = 3.38; Contrast F (1, 74) = 4.89; p = .030). This result supported Hypotheses 1b and 4a. On the other hand, in the process accountability condition, there were no differences across the two initial decision conditions (mean of dominance condition = 3.58 vs. mean of trade-off condition = 4.07; Contrast F (1, 67) < 1). However, the pattern of the results was similar to the previous findings, and was contrary to the outcome-accountability condition. Therefore, it appears that the pattern was similar to the low accountability condition[48].

5.6.3 Discussion of Study 6

Based on the different justifiability from trade-off and dominance decisions under high-outcome accountability, we expected a significant interaction between outcome versus process accountability and the decision structure of a previous choice on the preference for a previously chosen alternative. The results of Study 6 support Hypothesis 4. Specifically, in the outcome-accountability condition, we found a pattern supporting Hypothesis 1b (i.e., people showed a relatively high preference for a previously chosen alternative when the previous choice was from a choice set in which one alternative dominated, compared to a condition when the previous choice was from a choice set in which the alternatives represented a trade-off). In contrast, we found the opposite pattern for the process- accountability condition.

In sum, the results of this study suggest different types of accountability (i.e., outcome vs. process accountability) as the boundary condition for Hypotheses 1a and 1b. Specifically, we found the opposite result from Studies 1 and 2 in the high-outcome-accountability condition. That is, the tendency to retain a previous choice was stronger in the dominance versus the trade-off condition, which can be attributed to the idea that people cannot easily justify their trade-off decisions under high-outcome accountability conditions.

5.7. Chapter Summary

[48] It is important to note that we did not make any specific predictions for the high process accountability condition.

In this chapter, we empirically test the predictions from Chapter 4. The main finding of Studies 1-6 are as follows: 1) In general, participants tend to keep the previously chosen alternative when the previous choice was from a choice set in which one alternative dominated, compared to a condition when the previous choice was from a choice set in which the alternatives represented a trade-off; 2) such results are due to the resource availability mechanism rather than the effort-as-information mechanism; 3) the effect of an initial decision on a subsequent one is moderated by a different type of accountability.

The following chapter of this dissertation will briefly summarize the theoretical arguments, empirical findings, theoretical and managerial contributions, and limitations and suggestions for future research.

Chapter VI. CONCLUSIONS AND GENERAL DISCUSSION

6.1 Summary of Theoretical Arguments

The decisions we make are oftentimes made repeatedly. In these repeated-decision situations, consumers' prior knowledge and experiences based on consumption have been assumed to influence their current choice processes and outcomes (e.g., Alba and Hutchinson, 1987; Bettman and Park, 1980). However, the research literature is currently silent as to how the influence of prior decision processes or outcomes operates in making subsequent decisions. To address this gap, this dissertation investigates the impact of previous decisions on subsequent ones. We propose that the structure of an initial decision can differentially affect a subsequent one. Specifically, we compare the impact of trade-off- vs. dominance-related initial decisions.

Based on the different research streams, we suggest competing predictions regarding the role of the structure of previous decisions on subsequent choices. One stream of research from resource- or effort-based explanations (e.g., effort-as-information: previous effort spending as a source of information for judgment and resource availability) suggests that the tendency to retain a previous choice will be stronger when the initial decision is difficult (i.e., a trade-off decision) rather than when the initial one is easy (i.e., a dominance decision). This result occurs because people have depleted their resources after the difficult decisions. Subsequently, because the resources are depleted, people use simple decision heuristics in the subsequent decision (i.e., sticking with a previously chosen alternative). On the other hand, the other research stream from non-resource- or non-effort-based explanations (e.g., justification and regret/negative emotional research) suggests an opposite prediction (i.e., the tendency to retain a previous choice will be stronger when the initial decision is easy rather than difficult). This prediction occurs because people faced negative emotions or lacked justification after the difficult decisions. Subsequently, people repair negative emotions by switching to another option in the next decision.

We argue that decisions involving trade-off and dominance differ in terms of the resources or effort expended. Simply put, trade-off-related decisions require more effort

compared to dominance-related decisions. We propose that people with depleted resources in an initial decision (vs. those who have not depleted them) are more likely to stick to their previously chosen alternative when they have an opportunity to switch to another one. Consequently, we predict that in repeated-decision situations, initial decision structures systematically influence one's tendency to retain a previously chosen alternative.

In addition, we expect the above expectation to be mediated by one of two possible mechanisms. The first mechanism concerns "resource availability." We argue that after depleting their resources in initial decisions, people will use simple decision heuristics to make subsequent decisions. Therefore, we also expect that people who make a trade-off- vs. a dominance-related decision in an initial decision will tend to keep the previously chosen alternative in the subsequent decision. The other mechanism involves "effort-as-information: previous effort exerted as a source of information for judgment" in subsequent decisions. In other words, we argue that under repeated-decision situations, people have a tendency to make decisions by using previous effort spending as a source of information for subsequent decisions. Therefore, people who make a trade-off- vs. a dominance-related decision in an initial decision will not choose other alternatives. These two explanations have similar assumptions regarding the different resources spent from trade-off and dominance decisions. However, the manner of resource expending is unique in each case. In this paper, we propose that the time interval between two decisions will allow us to distinguish between these two mechanisms. This result occurs because the time interval between two decisions should influence the resource availability mechanism (i.e., people can replenish their depleted resources after taking a longer time break).

Furthermore, we suggest a study to test the assumption of resources. Specifically, we test whether decisions involving trade-offs require decision-makers to expend more resources than those involving dominance.

Finally, we propose boundary conditions for the competing predictions. Based on the difference in the justifiability of trade-off and dominance decisions under high outcome accountability, we suggest that people show a relatively high preference for a

previously chosen alternative when the previous choice was from a choice set in which one alternative dominated, compared to a condition when the previous choice was from a choice set in which the alternatives represented a trade-off.

6.2 Summary of Empirical Findings

In six studies, we found empirical evidence for the impact of previous decisions on subsequent ones. In Studies 1a and 1b, we basically showed that the preference for a previously chosen alternative in a subsequent decision is stronger when a previous choice was from a choice set in which the alternatives represented a trade-off, compared to when a previous choice was from a choice set in which one alternative dominated. Furthermore, we found a similar result for monetary judgments (i.e., willingness to accept [WTA]). In addition, the results occurred regardless of whether the decision involved owning a chosen option.

In Study 2, we replicated the previous Studies 1a and 1b with another product (i.e., calculators). In addition, we provided empirical evidence that perceived decision difficulty mediated the above relationship, which provided evidence to support resource-based explanations. Finally, we excluded the possibility that mood might account for previous findings.

The main purpose of Study 3 was to separate the underlying explanations (i.e., resource availability and effort-as-information: previous effort spending as a source of information for judgment) of the previous study. In order to determine the specific mechanism for the previous findings, we manipulated the time interval between the two decisions in order to change the opportunity to replenish resources. We assumed that people taking a break between the two decisions would replenish their resources. We found a significant interaction between resource replenishing and the decision structure of an initial decision. The pattern of the interaction supported the mechanism of "resource availability" rather than another mechanism. Specifically, in the short-time interval condition, the participants showed greater intentions to keep a previously chosen alternative when their previous decision was based on a trade-off vs. dominance. On the other hand, in the long-time interval condition, the participants showed lesser

intentions to keep a previously chosen alternative, regardless of whether their previous decision was based on a trade-off or dominance. The results of this study suggest evidence supporting the mechanism of "resource availability."

In Study 4, we manipulated involvement before the initial decision in order to empirically test our assumption of resource spending across trade-off and dominance conditions. We expected that involvement would influence the degree of resource spending for the initial decision. We found a significant interaction between involvement and the initial decision type, which suggests different resource spending across trade-off and dominance decisions.

Study 5 extended the findings from Studies 3 and 4, using the manipulation of additional resource availability in the middle of the first and second tasks. Results showed a significant interaction between additional resource depletion and initial decision type. Specifically, we replicated the previous findings only in the non-resource-depleting condition. Participants in the resource-depleting condition showed higher intentions to keep their previously chosen alternative, regardless of whether their previous decision was based on a trade-off or dominance. The results of this study further strengthen the previous findings by suggesting another piece of evidence supporting the mechanism of "resource availability."

Finally, Study 6 suggested the boundary conditions for the competing predictions. The results of this study suggest different types of accountability (i.e., outcome vs. process accountability) as the boundary conditions for previous findings. Specifically, we found results that were opposite to those found in Studies 1 and 2 in the high-outcome-accountability condition. That is, the tendency to retain a previous choice was stronger in the dominance vs. the trade-off condition.

6.3 Theoretical Implications

6.3.1 Theoretical discussion

We mainly found that the tendency to retain a previous choice was stronger when the initial decision is a trade-off rather than a dominance decision. This result has theoretical implications for the existing consumer decision-making literature.

First, the endowment effect[49] is the potential alternative explanation for our findings. However, upon closer examination of our results, we can exclude this explanation. In Study 1a, we examined the impact of an initial decision on a subsequent one by giving participants pens, whereas in Study 1b, we did not give participants pens. We found similar results from Studies 1a and 1b. Therefore, the endowment effect, in and of itself, cannot explain our results because the previous literature (i.e., Kahneman, Knetsch, and Thaler, 1990; Knetsch, 1989) suggests that the endowment effect is stronger when people actually own a product.

The results of this research can in fact contribute to extending the research of the endowment effect. Even though there are many studies regarding the effect itself (i.e., Kahneman, Knetsch, and Thaler, 1990; Knetsch, 1989) or the underlying mechanism of the endowment effect (i.e., Thaler, 1980; Van Boven, Dunning, and Loewenstein, 2000), the current literature has ignored *how* the endowed object was obtained. One exception is Loewenstein and Issacharoff (1994)'s research. They compared the magnitude of the endowment effect when people obtain an object by their own effort and when they obtain it by chance. However, the current research compares two different decisions involving the endowment effect. Specifically, it investigated the impact of difficulty for the initial decision on the tendency to keep a previously chosen alternative. We found that the endowment effect was greater when people obtain an endowed object via a difficult (vs. easy) decision. In sum, this study suggests a boundary condition for the endowment effect.

Second, in repeated decisions, we mainly focus on the tendency to retain a previously chosen alternative. This concept is directly related to brand loyalty and variety seeking. In the repeated decision-making situation, people can choose a similar

[49] For details of the endowment effect, please refer to Section 2.5.

alternative or brand (brand loyalty), or they can choose a completely different one (variety seeking) (Simonson, 1990; Simonson and Winer, 1992; Read and Loewenstein, 1995). The result of this study suggests that the tendency of brand loyalty vs. variety seeking depends on the initial decision. Specifically, the tendency toward brand loyalty increases when the initial decision is difficult. On the other hand, the tendency toward variety seeking increases when the initial decision is easy.

Third, we found that resource availability plays an important role in the impact of the initial decision on a subsequent one. Specifically, we argue that some types of decisions (i.e., trade-off decision) require great deal of resources. The resource spending then influences a tendency to keep a previously chosen option in the subsequent decision. This result has implications for the current literature on the role of decision-making (i.e., Dholakia, Gopinath, and Bagozzi 2005; Vohs et al., 2008). For example, Dholakia et al. (2005) have also provided empirical evidence demonstrating that resource depletion can increase impulsive choices. Vohs et al. (2008) argue that the choice itself requires some significant resources for decision-makers. However, to the best of our knowledge, our research is the first to demonstrate that resource depletion from an initial decision directly influences the subsequent decision. Therefore, this research comprises part of the streams showing the importance of decision-related resources for decision-making in repeated-choice situations.

Fourth, this study has some overlap with cognitive dissonance theory. Festinger (1957) suggested that people have a strong motivation to reduce cognitive dissonance after making a difficult choice, such that people try to increase their liking of a chosen object. Therefore, cognitive dissonance theory can explain the empirical findings of this research. For example, if people in the initial trade-off condition increase their evaluations of the chosen alternative, it may cause a greater tendency to retain the previously chosen alternative. If cognitive dissonance theory explains our empirical findings, we should find a systematic difference in terms of the evaluation of a chosen alternative from the trade-off and dominance decisions. Specifically, the evaluation of a

chosen alternative in the initial decision should be higher when the initial decision is trade-off vs. dominance based. However, in Studies 1a and 1b, we did not find any significant difference in the evaluation of the chosen alternative between the two conditions. (i.e., Study 1a: trade-off (5.48) vs. dominance (5. 37), F (1, 101) <1; Study 1b: trade-off (5.52) vs. dominance (5. 81), F (1, 67) = 1.45, p>.10). In Study 2, we found that the evaluation of a chosen alternative was higher when the initial decision was dominance (mean = 7.59) vs. trade-off (mean = 6.86, F (1, 78) = 6.53, p<.05) based, which is a pattern opposite to that which cognitive dissonance theory would predict. Therefore, we can exclude cognitive dissonance theory as a potential explanation for our results.

Fifth, different decision-making can influence memory for decision-makers. Specifically, people have a better memory for a chosen alternative from a trade-off decision (vs. a dominance decision) because the trade-off decision requires more time or effort to select one option. However, we can exclude the memory effect explanation based on two reasons. The first reason is that we found a similar result from different time intervals between the two decisions in Study 3. Specifically, there was no difference in terms of the tendency to retain a previously chosen alternative between a 1-hour and a 2-day interval. If memory had been a strong influence, we should have found a significant difference. The other reason is based on an unreported study. When the participants in this study were asked about a second decision, we manipulated the presence of the initial decision's material. The participants either (i) could or (ii) could not see the first-decision material. If memory had worked strongly, we should have found a significant difference between the two conditions. However, the result showed no such significant difference. Therefore, based on these empirical results, we can exclude the memory explanation.

6.3.2 Contributions and implications

This dissertation investigates the impact of previous choices on subsequent ones. This research is important from a theoretical perspective for several reasons.

First, even though we know how consumers make their decisions at one time, our understanding of repeated decisions is limited (i.e., Hastie, 2001). Put differently, the current literature on consumer decision-making is silent as to how initial decisions directly influence subsequent ones. This research has tried to provide a comprehensive perspective on how people make decisions, or how they choose one option in repeated-choice situations. Specifically, this research focuses on the impact of the structure of initial decisions on subsequent ones. Therefore, this research involves one of the streams investigating repeated decisions.

Second, we empirically found that the tendency to retain a previous choice was stronger when the initial decision was difficult vs. easy. The results of several studies suggest that "resource availability" is an important explanation for this pattern. This mediation is supported by multiple pieces of evidence. Strong evidence of this mediation can be found in the significant mediation analysis of Study 2. Specifically, we found that "perceived decision difficulty" mediated the impact of initial decisions on subsequent ones, which supports different resource spending from trade-off vs. dominance decisions. In addition, we found significant moderating effects of the "time interval between two decisions" in Study 3. In this research, we assume that only the "time interval" can influence the "resource availability" rather than "effort-as-information." Put differently, we assume that people can have a memory of the difficulty of an initial decision over time. This assumption has also been supported by recent research (Weick and Guinote, 2008; Barsalou, 1999). In sum, this research suggests the important role of "decision-related" resources in repeated decisions.

Third, considering that most consumer behavior research has focused on consumer satisfaction or dissatisfaction after making choices, this research may provide a new perspective concerning the role of decision-making in consumer behavior. Specifically, the current research on consumer behavior usually involves choice as a dependent variable and attempts to find significant independent variables or moderating

variables toward the choice variable (e.g., the dependent variable). If we investigate this choice variable as an independent variable in repeated-choice situations, we can further extend our understanding of decision-making in the consumer behavior literature.

Fourth, the current literature on consumer decision-making focuses on different preferences for different future times (i.e., near future vs. far future, Thaler, 1981; Loewenstein, Read, and Baumeister, 2003) or different preferences for different time perspectives (i.e., narrow vs. broad time, Read and Loewenstein, 1995; Read, Antonides, Ouden, and Trienekens, 2001; Kahn, Ratner, and Kahneman, 1997). However, by incorporating previous decisions, this research can extend the decision-making literature in terms of the time perspective. This extension of the time perspective is different from the existing research. Specifically, we found that time is an important variable for repeated choices and replenishment/resource depletion for consumers.

Finally, in Study 6, we found the boundary conditions for competing predictions. The results suggest that the tendency to retain a previous choice was stronger in the dominance vs. trade-off condition in the high-outcome-accountability condition. Therefore, this research can extend the current understanding of the role of accountability for consumer decision-making.

In sum, theoretically investigating the impact of previous choices on subsequent ones can enhance our understanding of decision-making. Along the same lines, Hastie (2001) suggests in a critical review of decision-making that it is useful to know how a previous choice influences a subsequent one. By knowing this information, we can develop a theory that provides us with an integrated account of one-shot decisions and sequences of linked decisions.

6.4 Managerial Implications

This research is also important from a managerial and practical standpoint.

First, most consumer behavior or decision-making is based on repeated decisions (Bagozzi, 1981; Betsch, Fiedler, and Brinkmann, 1998; Betsch, Haberstroh, Glockner, Haar, and Fiedler, 2001; Betsch and Haberstroh, 2005; Bentler and Speckart, 1979; Norman and Smith, 1995; Verplanken, Aarts, and Van Knippenberg, 1997). For example, consumers typically purchase both non-durable goods and durable ones repeatedly. In these repeated-buying situations, previous decisions can systematically influence later ones. In this situation, earlier difficult decisions can help marketing managers increase brand loyalty for previously chosen alternatives.

Second, the current decoy effect literature suggests that providing a dominance decision structure with a decoy alternative can be helpful for marketing managers to increase the market share of a dominating alternative (Huber, Payne, and Puto, 1982; Simonson, 1989; Park and Kim, 2005). However, the results of our current study suggest certain negative aspects of a dominance decision in repeated situations. Specifically, a dominance decision using the decoy effect can actually reduce brand loyalty for a chosen alternative in repeated decisions.

Third, this repeated-decision situation can also occur frequently in online shopping. Specifically, web users are frequently exposed to multiple alternatives while trying to buy products or services through web shopping malls. In addition, marketing managers of retailers can easily manipulate the display order of products, which is related to the difficulty of decision-making. For example, if retailers show a discounted item next to a regular one, it is an easy or dominance decision. However, if they show the discounted item next to another discounted one, it is a difficulty or trade-off decision[50]. Based on our findings, exposure to difficult vs. easy decisions can influence future decision patterns. Specifically, the tendency to keep a previously chosen alternative is expected to be higher when consumers face an initial difficult (vs. easy) decision.

[50] Please see Figure 6.1.

In sum, this research can provide managerial implications for marketing activities, including price management, product positioning, and product display. With various marketing mix tools, marketing managers can easily influence consumers' decision experiences, whether easy or difficult. These different experiences can then affect subsequent choices. Marketing mangers can strategically use decision experiences to maximize their profits based on this research.

6.5 Limitations and Future Research

This research has several limitations, which should be considered in carrying out future studies. First, this research has a limitation in generalizability in that students were used as the main participants; furthermore, the decision situations were of a hypothetical nature involving the use of a limited product category. However, the purpose of this study was to test a theory. Therefore, this limitation is not a critical one (Lynch 1982; Calder, Phillips, and Tybout, 1982). Future research needs to extend generalizability by using a different product type with actual choice problems.

Second, we focused on only trade-off vs. dominance decisions as the operationalization for the decision structure of an initial decision. This operationalization assumes that other types of decisions can also influence the tendency to keep or exchange a previously chosen alternative in a subsequent decision under a new alternative. For example, Luce (1998) suggests that the same trade-off decision could be different in terms of emotionally laden decisions, which are expected to require more decision-related resources than emotionally easy ones. Different resource spending could also have influenced our dependent variable. Therefore, we can expect that the tendency to keep a previously chosen alternative in a subsequent decision will be higher in *high* emotional-laden trade-off decisions rather than in *low* ones. Future research also needs to investigate this possibility.

Third, we mainly used "the tendency to keep or exchange a previously chosen alternative in the subsequent decision under a new alternative" as the dependent variable in this research. In future research, we need to extend the dependent variable. For example, we may want to use a different product category from the initial decision,

or a decoy or compromising alternative. This possibility could help us understand repeated decisions and could measure the strength of initial decisions.

Finally, this research focused on only two-stage repeated decisions. Future research needs to extend the current research by increasing the number of stages in repeated decisions. We can expect our pattern to interact with other variables. For example, Drolet (2002) provides empirical evidence that under repeated situations, people tend to change their decisions in third-choice situations. If this change of decision in the third choice is strong, we can expect different patterns of the tendency to keep a previously chosen alternative in third-repeated choices.

6.6 Conclusion

In sum, people have a tendency to keep a previously chosen alternative in a subsequent decision when a previous choice was from a choice set in which the alternatives represented a trade-off, compared to when a previous choice was from a choice set in which one alternative dominated. This result occurs because of "limited resource availability" after an effort-demanding trade-off decision. Specifically, people with depleted resources in an initial trade-off decision (vs. those who have not depleted resources in the dominance decision) are more likely to stick to their previously chosen alternative when they have an opportunity to switch to another one.

These findings contribute theoretically to the literature on repeated choice, and also provide managerial implications for marketing managers to know when different types of initial decisions can be useful.

TABLE 2.1.1

Overall Structure of This Proposal

Research Question	Section	Approach	Major Finding
RQ: What is the traditional model of decision-making?	Section 2.2	Review of the traditional economic model of individual decision-making	The limitations of the traditional economic model in repeated- choice situations
RQ: What is the status of the current research regarding repeated choice? **RQ:** What is framework of the impact of prior choices on subsequent ones?	Section 2.3	Review of the influences of various prior factors on subsequent choices	The limitation of the current literature not providing a rigorous theoretical explanation
	Section 2.4	Review of "choice processes" and "choice outcomes"	Suggestion of an overall framework
	Section 2.5	Review of previous ownership impact	Understanding the impact of previous ownership on subsequent choices
RQ: How do people solve decision-making problems? **RQ:** How does solving decision-making problems influence subsequent choices?	Section 2.6	Review of trade-offs and reactions to trade-offs	Understanding an individual's decision-making and providing a building block for predicting repeated decision-making
	Section 2.7	Review of attitudes toward decision-making	Understanding the role of decision attitudes in repeated-choice situations
	Section 2.8	Review of decision-related costs	Suggestion of three types of decision-related costs: (i) cognitive costs; (ii) emotional costs; and (iii) self-regulation costs

TABLE 2.2.1

Framework for Choice Study

# of Options \ Time Perspective		One-shot Decision	Repeated Decision
Single-option Decision	Assumption of EU theory	*Independence from irrelevant information or alternatives*	*Independence with time*
	Violation of EU theory	*Framing effect* *Context (Decoy) effect*	*Endowment effect* *Status quo effect*
Multiple-option Decision	Assumption of EU theory	*Independence with the number of choices option*	--
	Violation of EU theory	*Diversification bias*	--

TABLE 2.4.1

Good or Bad Decision Quality

Category	Good/bad	Description
Expected outcomes	Good	The decision is good because it yields good outcomes.
	Bad	The decision is bad because it yields bad outcomes.
Missed outcomes	Good	The decision is good because it prevents me from experiencing bad outcomes.
	Bad	The decision is bad because it results in me missing out on good outcomes.
Options	Good	The decision is good because of how it improve my options.
	Bad	The decision is bad because of its implications for my options, currently or in the future.
Process	Good	The decision is good because the process used to make it is good.
	Bad	The decision is bad because the process used to make it is bad.
Affect	Good	The decision is good because I felt good while/after making it.
	Bad	The decision is bad because I felt bad while/after making it.

TABLE 2.6.1

Example of Camera Decision

	Camera I (Reference)	Camera A	Camera B	Camera S (Reference)
Price ($)	390	331	299	240
Quality (5 = Best)	3.00	3.81	3.44	4.25

TABLE 2.6.2

Example of Automobile Choice

Automobile A	Automobile B	Automobile C
Rarely needs repair	**Good financing**	**Good financing**
Prestigious model	**Good acceleration**	**Good acceleration**
Hard-to-find service	*Hard-to-find service*	Many recalls
Poor warranty	*Poor warranty*	Hard to get parts

TABLE 2.8.1

EIPs Used in Decision Strategies

Componpents of EIPs	Description of EIPs
READ	Read an alternative's value on an attribute into short-term memory.
COMPARE	Compare two alternatives on an attribute.
DIFFERENCE	Calculate the size of the difference of two alternatives for an attribute.
ADD	Add the values of an attribute in short-term memory.
PRODUCT	Weight one value by another (Multiply).
ELIMINATE	Remove an alternative or attribute from consideration.
MOVE	Go to the next element of the external environment.
CHOOSE	Announce the preferred alternative and stop the process.

TABLE 4.5.1

The Results of Pretest 1

	Familiarity	*Usage experience*	*Purchase experience*	*Subjective knowledge*
Calculator:	**3.80 ***	**3.35 ***	2.10	**3.45 ***
Digital camera:	**3.50 ***	2.80	1.95	**2.95 ***
Golf club:	2.30	1.85	1.30	2.35
Laptop computer:	**3.65 ***	**3.30 ***	1.90	**3.40 ***
Memory stick:	**3.10 ***	2.80	2.00	2.65
MP3 player:	**3.40 ***	3.00	2.10	**3.15 ***
Pen:	**4.00 ***	**3.90 ***	**3.45 ***	**3.90 ***
Printer:	**3.85 ***	**3.65 ***	2.15	**3.35 ***
TV:	**3.95 ***	**3.85 ***	2.10	**3.65 ***

* indicates that the mean is significantly greater than the neutral vale (i.e., *2.5*), $p < .05$

TABLE 4.5.2

Description of Pens

Pen A	**Pen B**	**Pen C**
Pilot Neo-Gel Roller	Uni-ball Signo GelStick	Bic Round Stic Ballpoint
• Patented needle point for skip-free • Gel ink won't fade or smear • Ribbed finger grip for comfort • Translucent barrel • 0.7mm Fine Point • Ink is water-resistant • 2.0 miles of writing ink	• Gel ink technology for a smooth write • Vibrant, pigmented gel ink is acid-free • Ink is fadeproof and water-resistant • Grip for control • Contemporary barrel design • Medium-size 0.7mm • 2.0 miles of writing ink	• Cushion grip for comfort • Medium-size 0.7mm • Nonrefillable • 1.0 miles of writing ink

TABLE 5.1.1

Study 1a & 1b: Means for Evaluations and Other Measurements

	Study			
	Study 1a		Study 1b	
	Dominance Condition (n = 51)	Trade-Off Condition (n =52)	Dominance Condition (n = 26)	Trade-Off Condition (n = 42)
Manipulation Check	1.89	2.69	2.35	3.01
Evaluation difference	2.65	1.42	2.78	1.43
DV (exchange –Keep)	2.41	3.25	3.23	4.24
Justifiability	5.85	5.08	5.24	4.40
Regret	1.65	1.75	1.69	1.88
WTP ($)	--	--	$1.53	$1.69
# of Math Problem Solved	--	--	18.96	12.86

TABLE 5.3.1

Study 3: Means for Evaluations and Other Measurements

	Time interval between Two decisions			
	Short time interval		Long time interval	
	Dominance Condition (n = 18)	Trade-Off Condition (n =18)	Dominance Condition (n = 19)	Trade-Off Condition (n = 15)
Manipulation Check for initial decision	2.39	3.83	2.74	4.73
DV (exchange –Keep)	4.22	6.50	4.26	4.27
Mood	6.22	5.83	6.32	5.80

TABLE 5.4.1

Study 4: Means for Evaluations and Other Measurements

	Involvement			
	Low Involvement		High Involvement	
	Dominance Condition (n = 36)	Trade-Off Condition (n =32)	Dominance Condition (n = 28)	Trade-Off Condition (n = 29)
Manipulation Check for initial decision	2.64	5.55	2.63	4.97
Manipulation Check for Involvement	4.78	4.95	5.66	5.22
DV (exchange –Keep)	3.81	5.66	4.79	5.00
Mood	4.53	4.66	4.32	4.45

TABLE 5.5.1

Study 5: Means for Evaluations and Other Measurements

	Resource Depleting Task			
	Resource non-depleting		Resource depleting	
	Dominance Condition (n = 17)	Trade-Off Condition (n =16)	Dominance Condition (n = 19)	Trade-Off Condition (n = 19)
Manipulation Check for initial decision	2.79	5.66	2.84	4.53
Manipulation Check for resource depleting	3.74	4.31	6.97	6.89
DV (exchange –Keep)	3.35	5.56	5.00	4.63
Mood	4.35	4.69	5.16	4.47

TABLE 5.6.1

Study 6: Means for Evaluations and Other Measurements

	Accountability Manipulation			
	Outcome Accountability		Process Accountability	
	Dominance Condition (n = 18)	Trade-Off Condition (n =21)	Dominance Condition (n = 18)	Trade-Off Condition (n = 21)
Manipulation Check for initial decision	2.72	3.31	2.17	3.12
Manipulation Check for outcome accountability	4.87	4.44	4.20	4.03
Manipulation Check for process accountability	4.33	3.95	4.46	5.06
DV (exchange –Keep)	4.61	3.38	3.58	4.07

FIGURE 2.2.1

Utility curve by Bernoulli

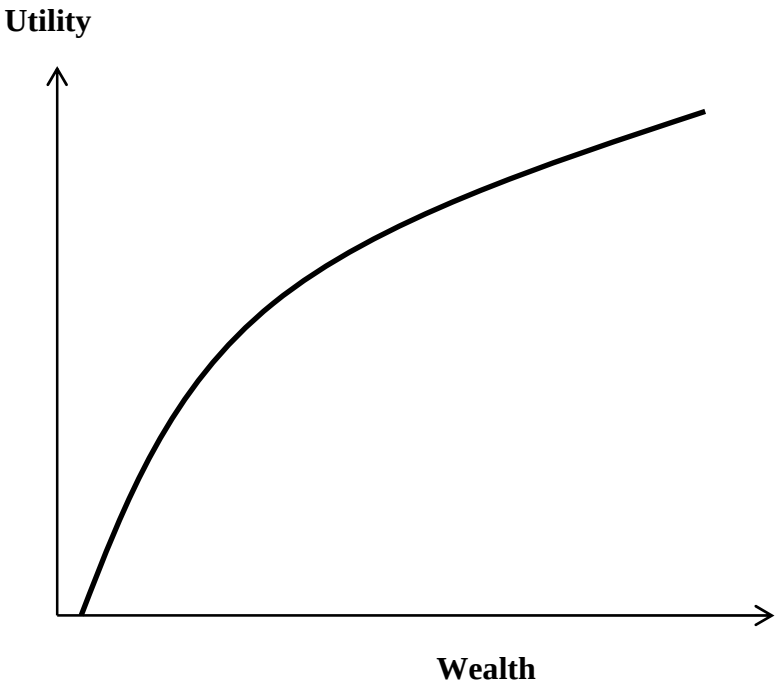
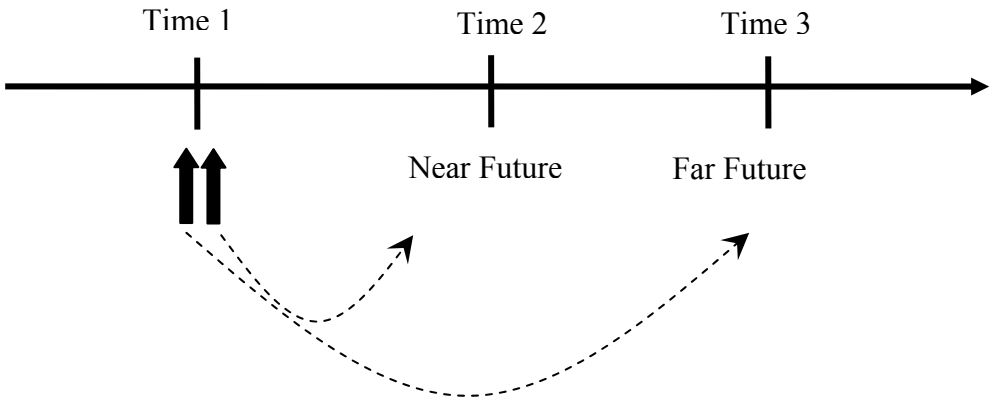


FIGURE 2.3.1

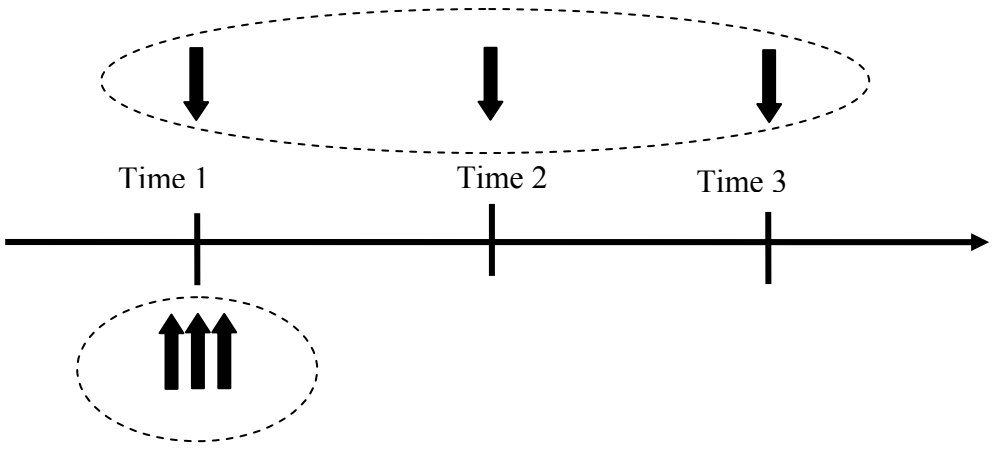
Different Frameworks



a) Choice over time perspectives:

This perspective investigates how people form preferences for future events. For example, it compares the current money value of $10 one month later and one year later.

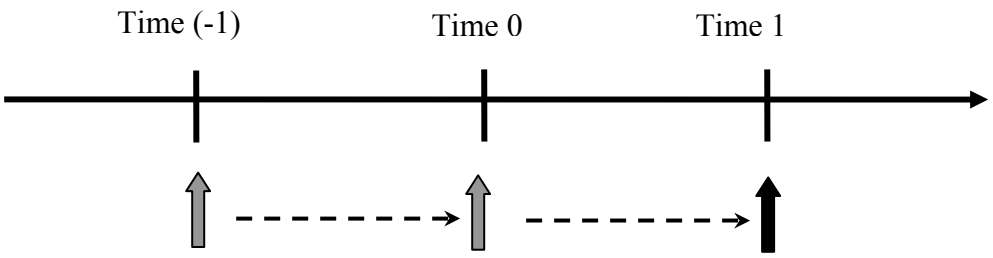
*** The symbol (⬆) represents "choice" behavior.*



b) Choice bracketing perspectives:

This perspective investigates how people form different choices resulting from different breadth-of-choice options. For example, it compares choice results between simultaneous choices and sequential choices.

FIGURE 2.3.1 (Continued)



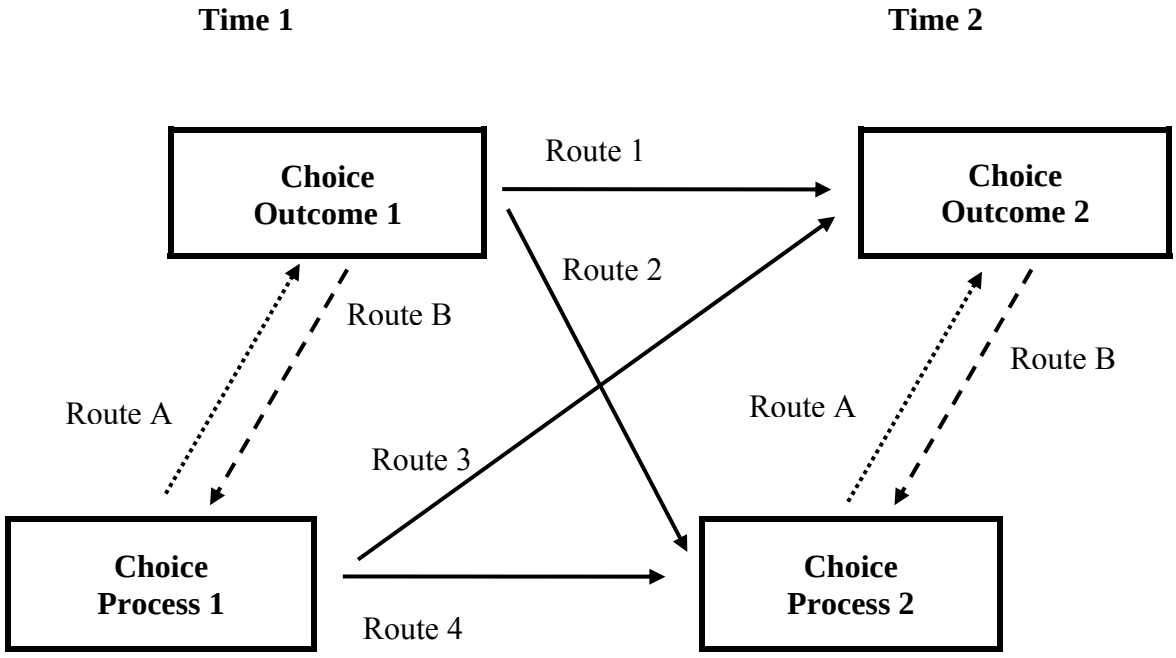
C) Repeated/Subsequent choice perspectives:

This perspective investigates how people's choices are influenced by previous choices. For example, it is interested in the impact of previous choices on subsequent ones.

*** The symbol (⬇⬆) represents "choice" behavior.*

FIGURE 2.4.1

Overall Framework regarding the Decision Process and Outcomes



Route A: The influence of the choice process on choice outcome at the same time.
Route B: The influence of the choice outcome on the choice process at the same time.
Route 1: The influence of the previous choice outcomes on the next choice outcome.
Route 2: The influence of the previous choice outcomes on the next choice process.
Route 3: The influence of the previous choice process on the next choice outcome.
Route 4: The influence of the previous choice process on the next choice process.

FIGURE 2.6.1

Example of the Decoy Effect and the Compromise Effect

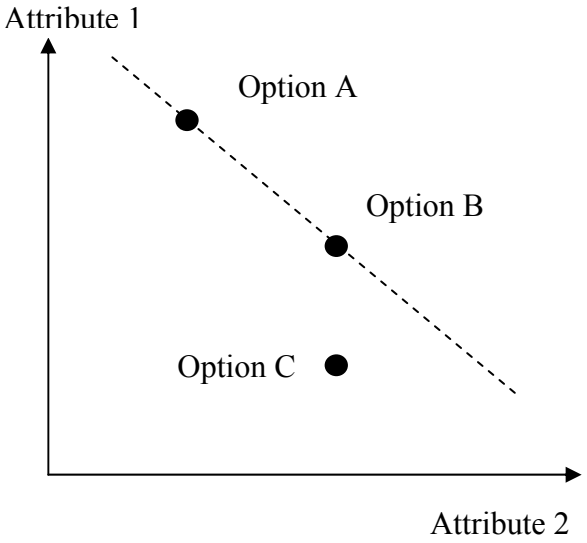


Figure a. Decoy effect

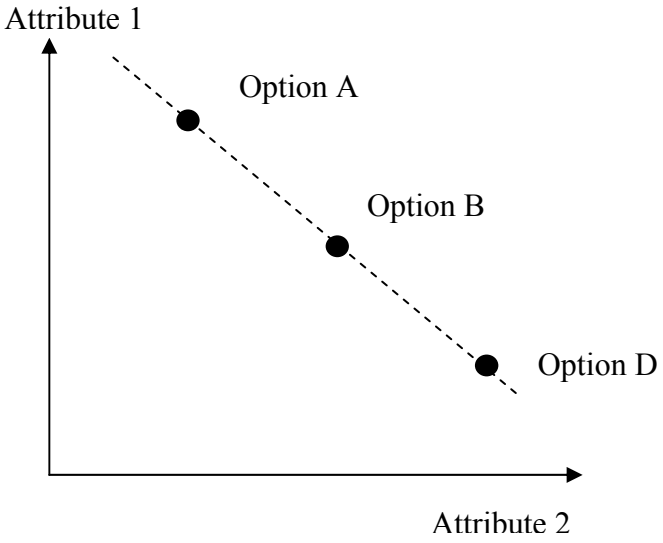


Figure b. Compromise effect

FIGURE 2.7.1

Relationship between Decision Quality and the Amount of Information

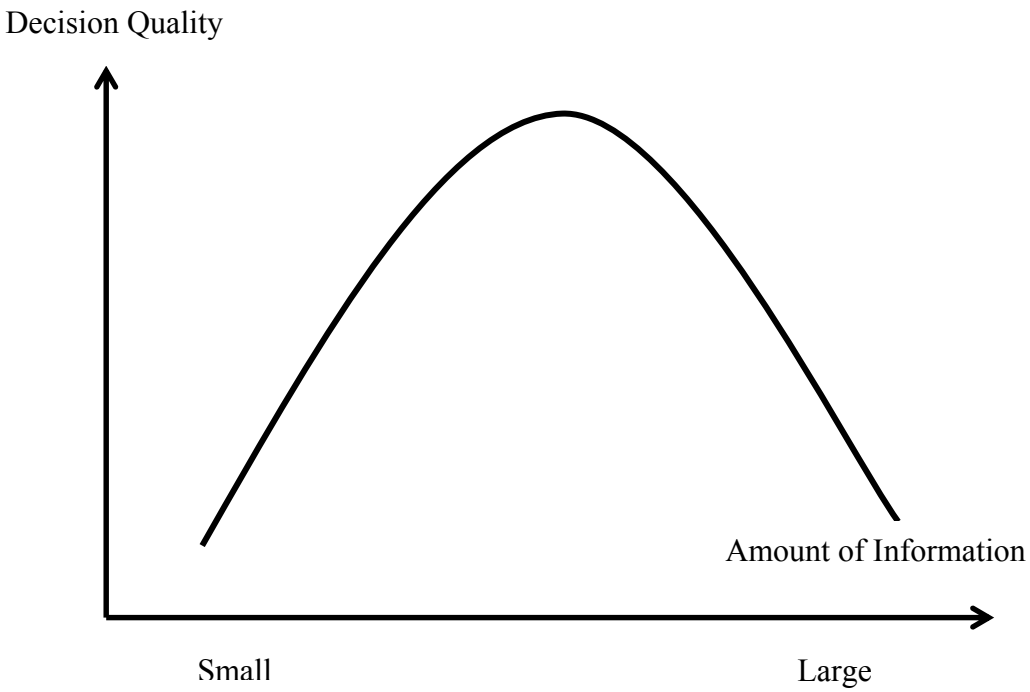


FIGURE 2.7.2

Summary of Decision Attitude

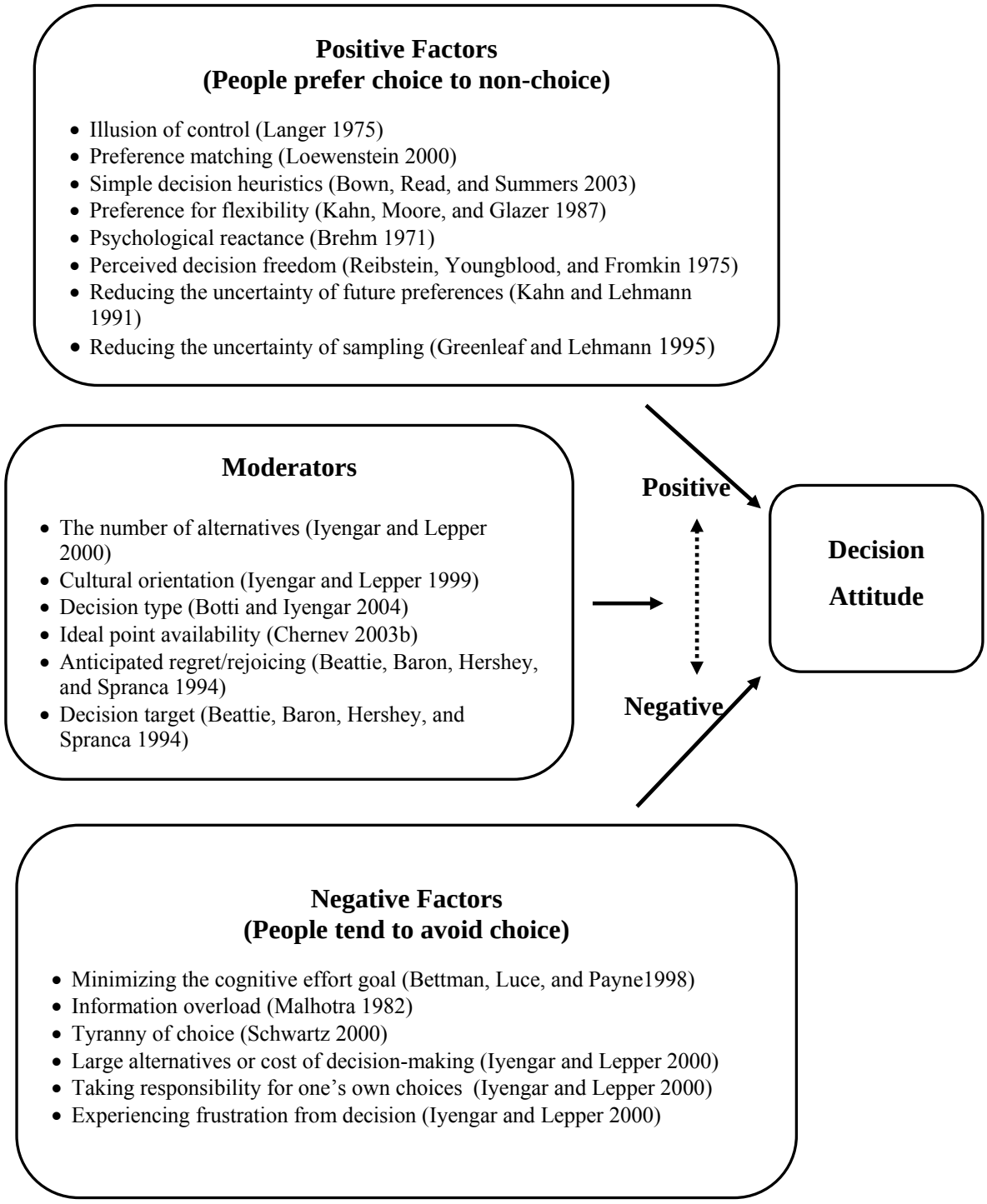


FIGURE 3.1.1

Example of the Trade-off and Dominance Relationship

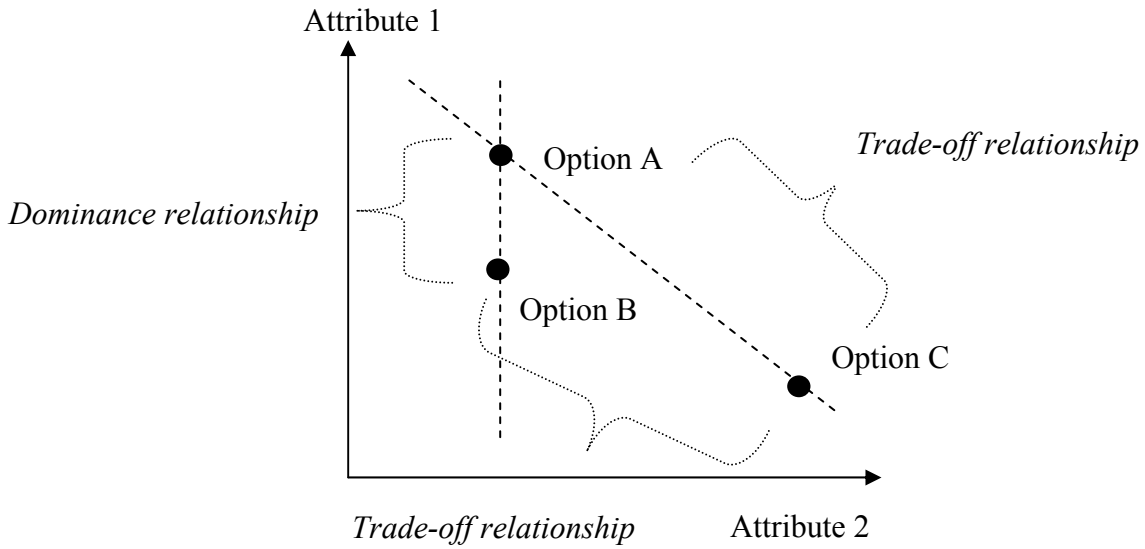


FIGURE 3.2.1

Example of the Trade-off vs. Dominance Relationship

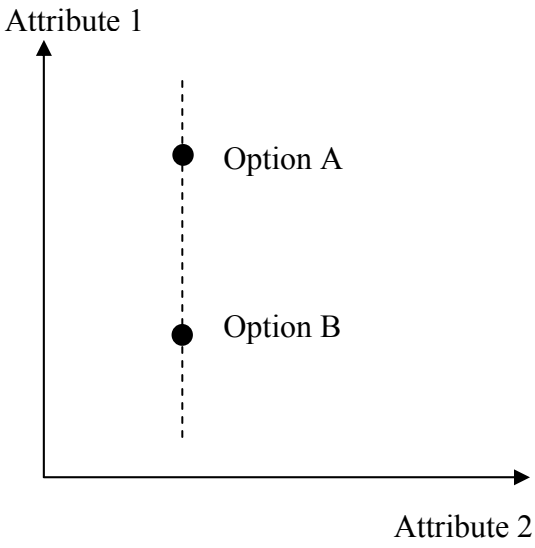


Figure a. Dominance

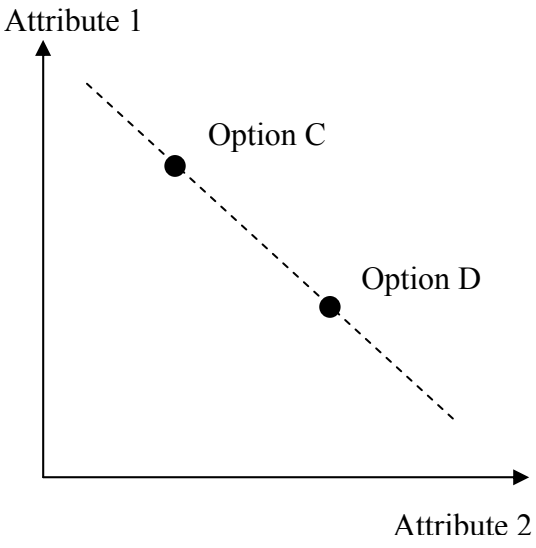


Figure b. Trade-off

FIGURE 3.2.2

Summary of Proposition 1

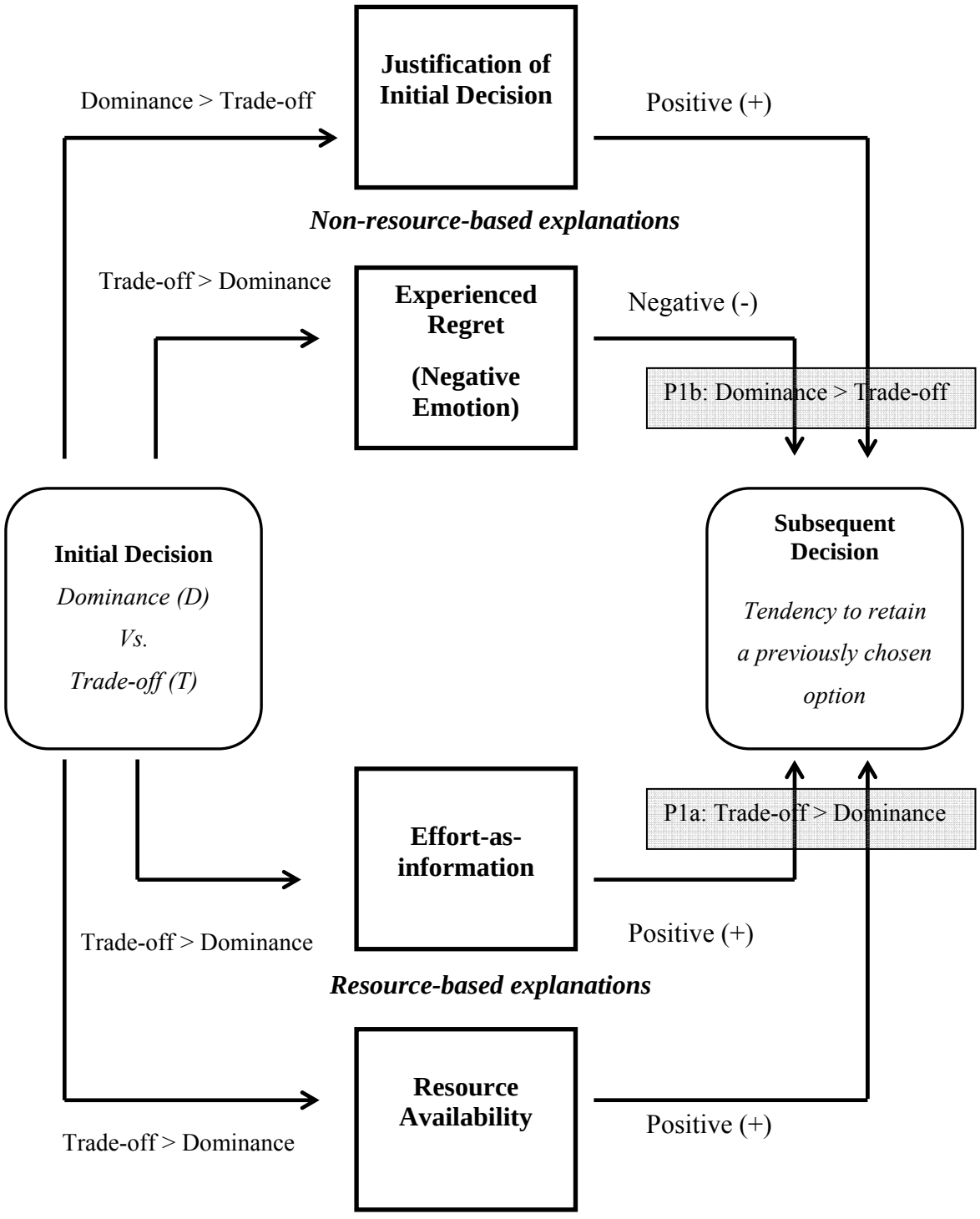


FIGURE 3.3.1

Discount Function: Hyperbolic and Exponential Functions

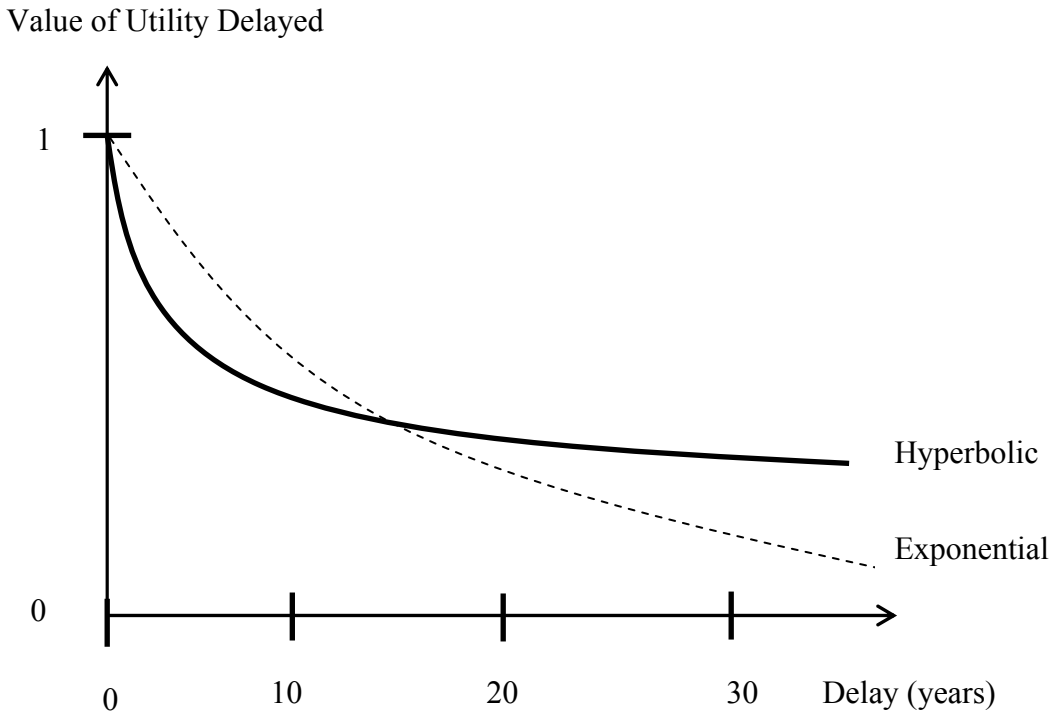


FIGURE 3.3.2

Prediction of Proposition 2

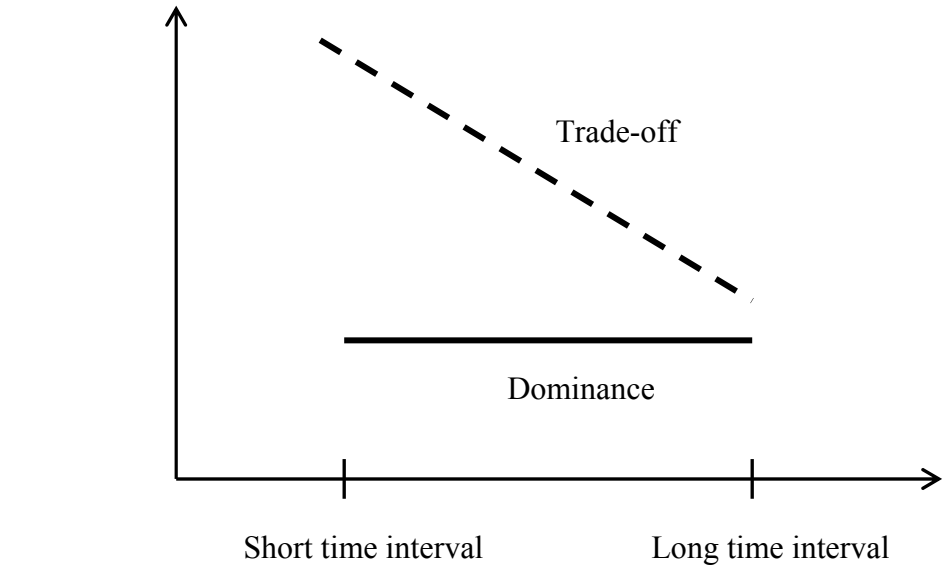


Figure 3.2.2a: Prediction I

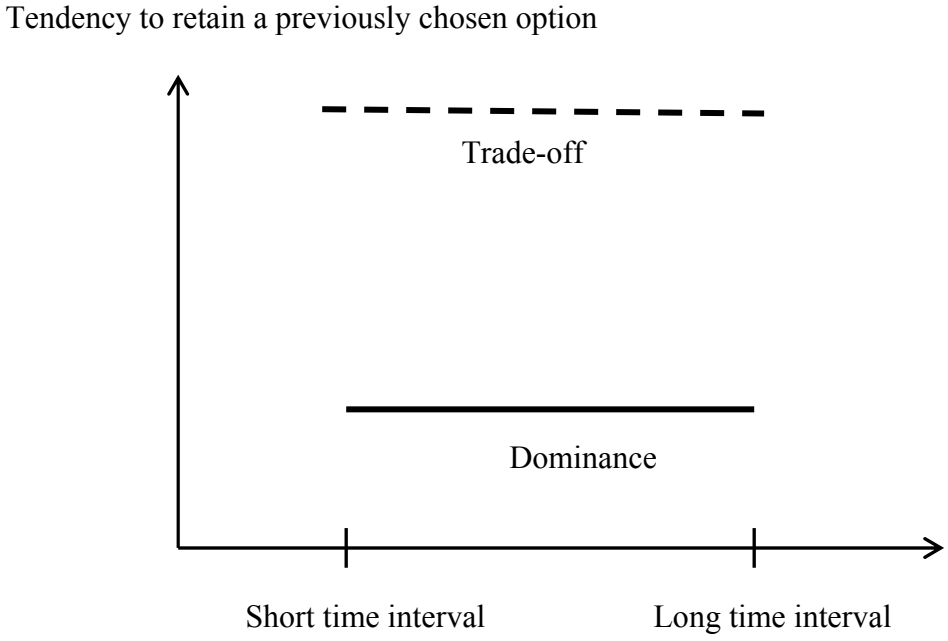


Figure 3.2.2b: Prediction II

FIGURE 3.4.1

The Theoretical Explanation for Proposition 1a

Figure 3.4.2 Alternative explanation for Proposition 1a

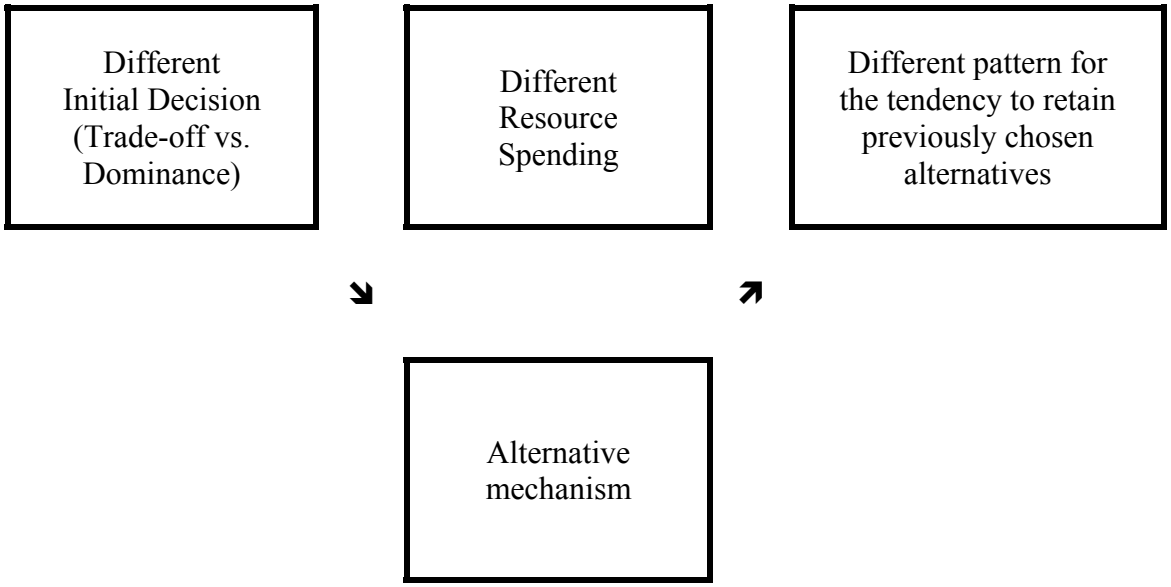


FIGURE 3.4.2

Prediction of Proposition 3

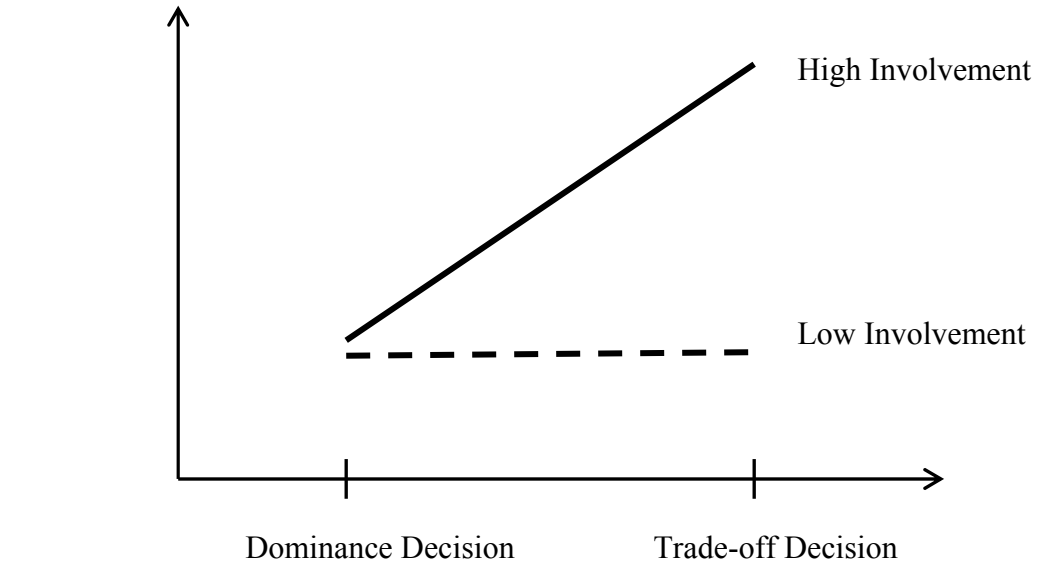


FIGURE 4.2.1

Framework of Prediction (Proposition 1)

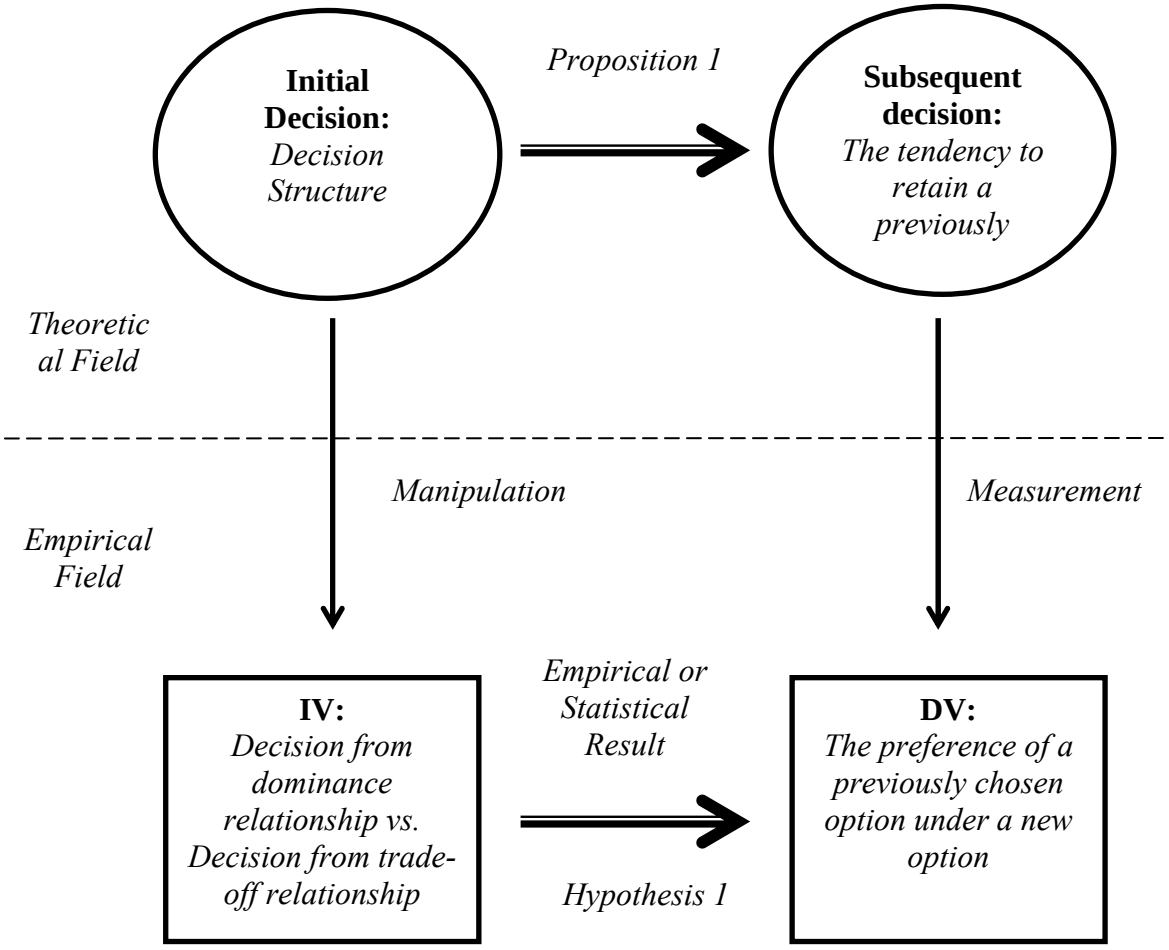


FIGURE 4.2.2

Framework of Prediction (Proposition 2)

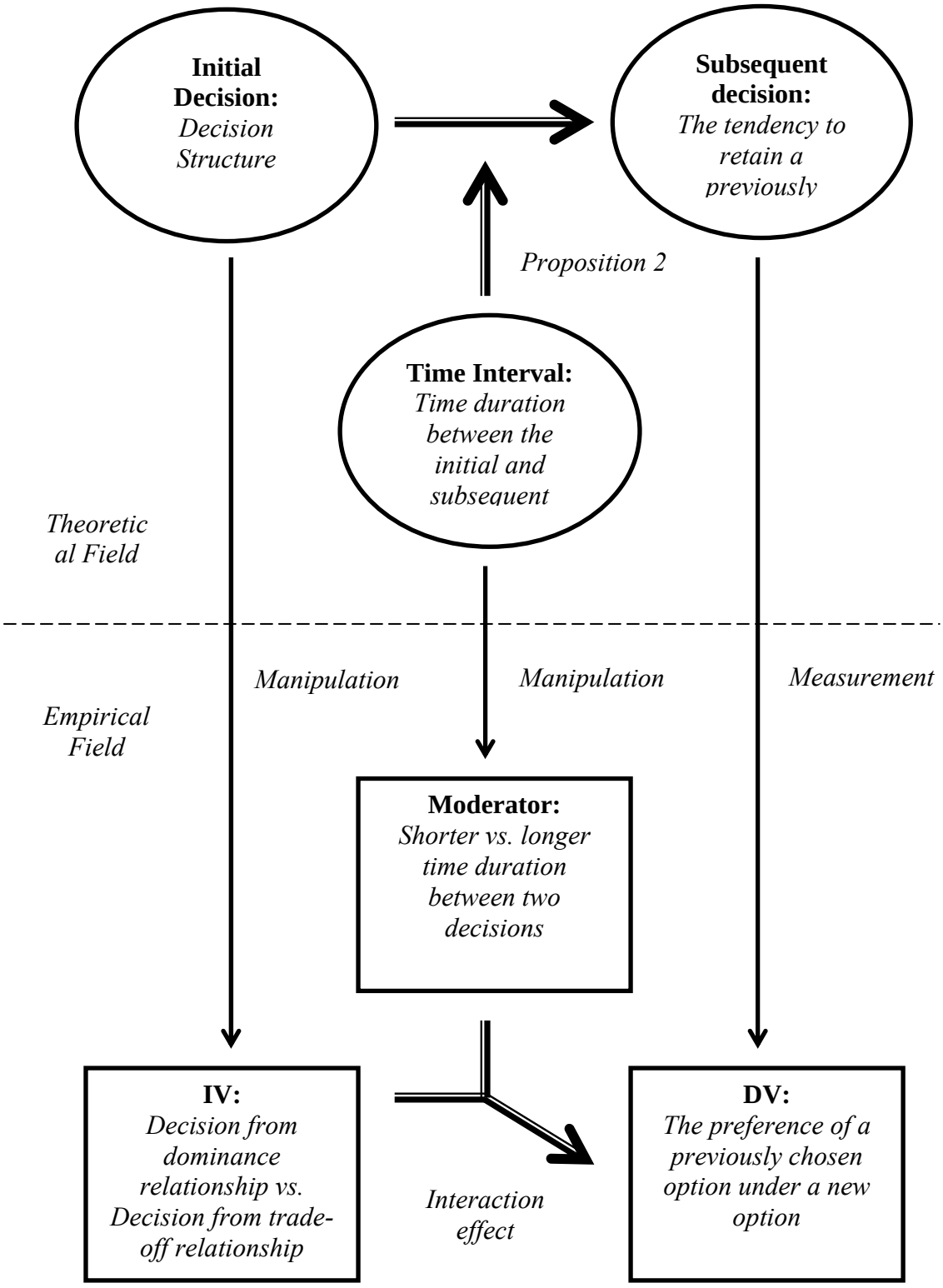


FIGURE 4.2.3

Framework of Prediction (Proposition 3)

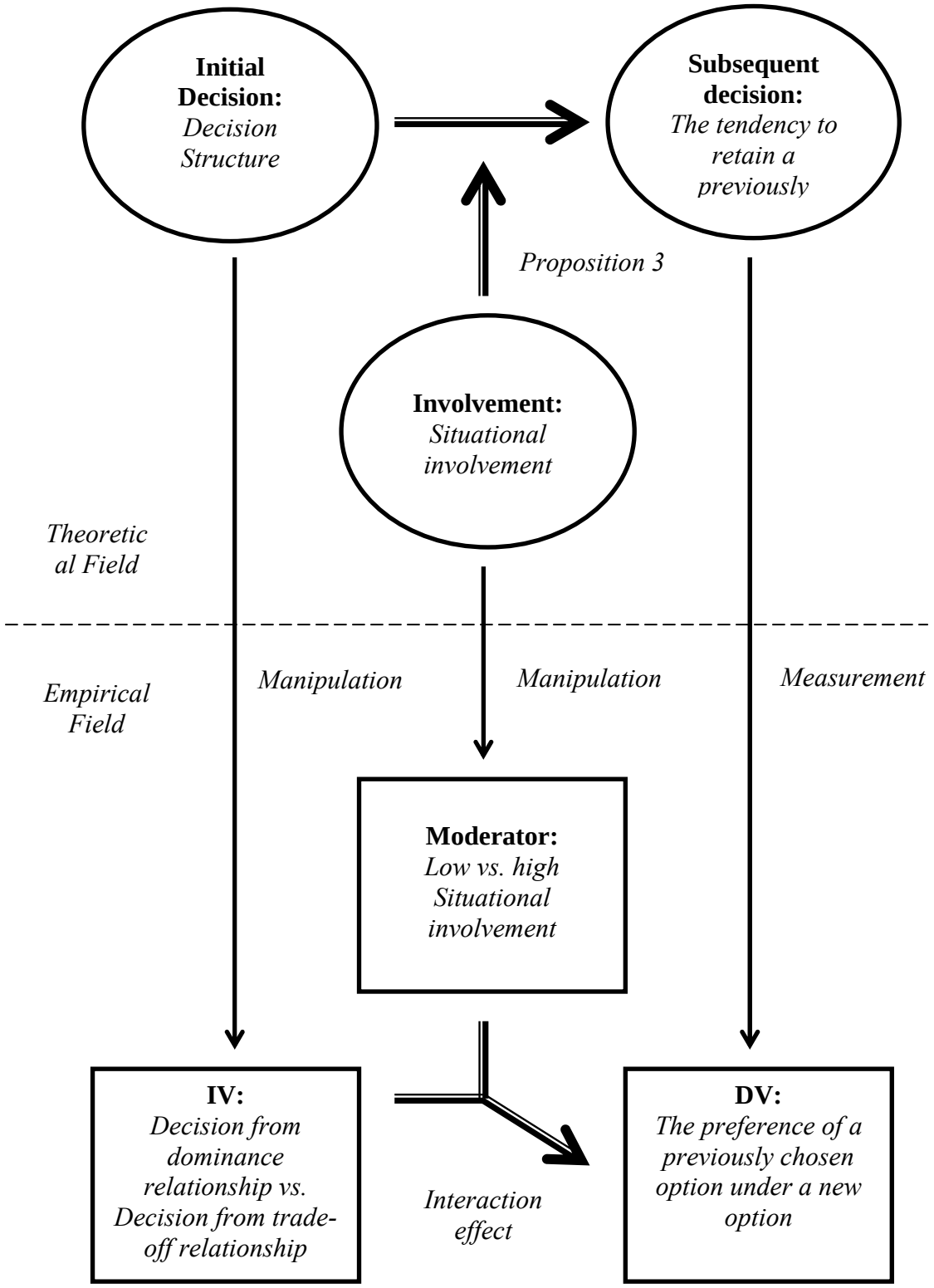


FIGURE 5.1.1

Study 1a: Experimental Procedure

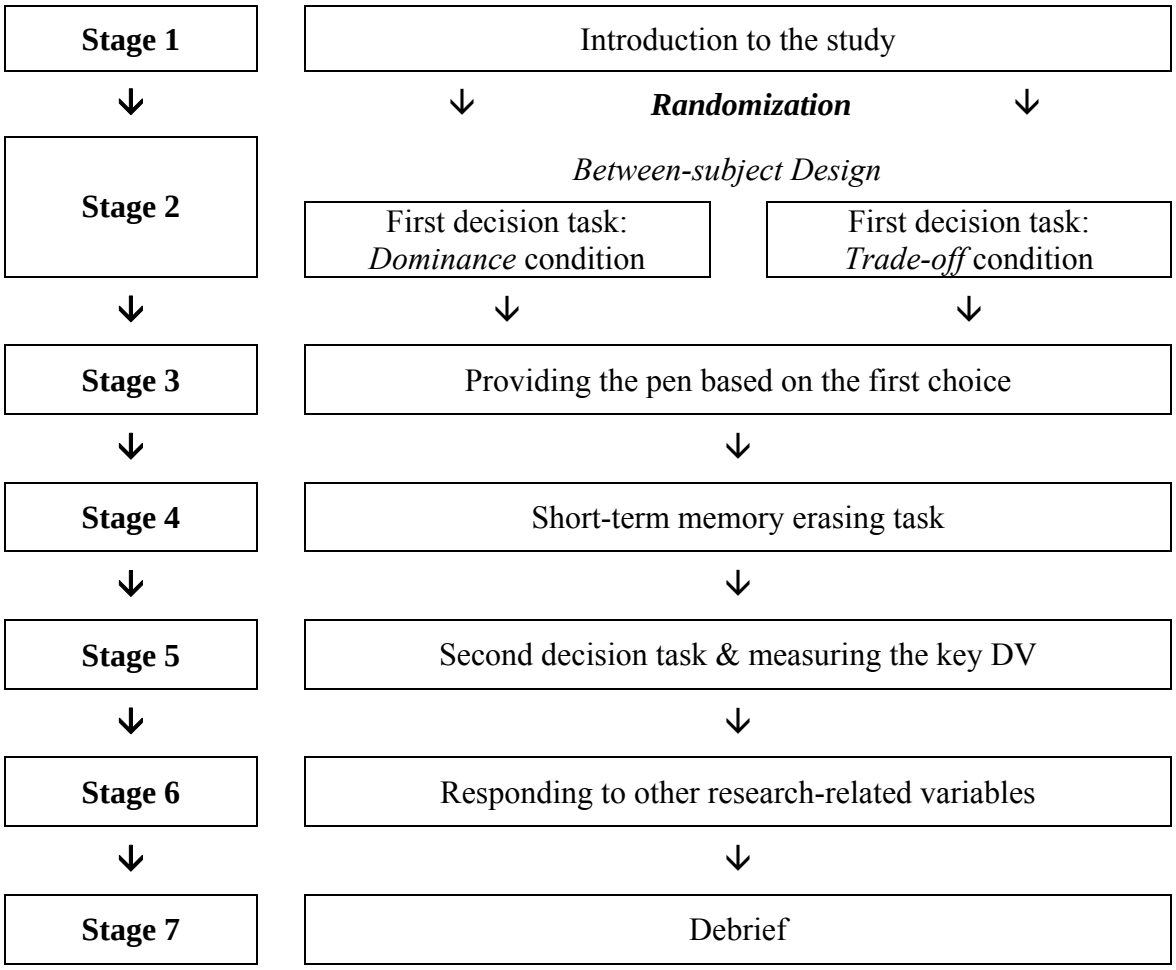


FIGURE 5.1.2

Study 1a: Stimuli for Study -Trade-off Condition

On the next page, you will see information and pictures of two pens. Please choose one pen carefully. **We are going to give you the pen that you choose.**

When you are given the pen, please don't respond to the survey with that pen.

---------- (Page separation) ----------

Information of Pens

Pen #A:

Pilot Neo-Gel Roller Pen

- Patented needle point for skip-free
- Gel ink won't fade or smear
- Ribbed finger grip for comfort
- Translucent barrel
- 0.7mm Fine Point
- Ink is water-resistant
- 2.0 miles of writing ink

Pen #B:

Uni-ball Signo GelStick Pen

- Gel ink technology for a smooth write
- Vibrant, pigmented gel ink is acid-free
- Ink is fadeproof and water-resistant
- Grip for control
- Contemporary barrel design
- Medium-size 0.7mm
- 2.0 miles of writing ink

1. Which pen would you like to choose?

Pen A: Pilot _____, Pen B: Uni-ball _____

FIGURE 5.1.3

Study 1a: Stimuli for Study - Dependent Variable

**** Imagine that you had the chance to exchange the pen for the pen pictured below.*

Pentel Hybrid DX Roller • Durable metal tip and generous ink supply • Large ergonomic barrel • Rubber comfort grip • Secure click cap and metal pocket clip • Waterproof and acid-free gel ink • Refillable.	

1. To what extent would you like to exchange this pen for the previously chosen pen?

I would definitely like to exchange my pen for the new one	1	2	3	4	5	6	7	I would definitely like to keep my current pen

FIGURE 5.1.4

Study 1a: Stimuli for Study -Other Variables

*** Please respond to the questions below based on the first survey. We are asking for your opinion when you first chose the pen.

(# Decision justifiability)

1. How justifiable is the decision to choose the pen?

Weakly justifiable	1 2 3 4 5 6 7	Strongly justifiable

2. How easy to defend is the decision to choose the pen?

Not easy to defend	1 2 3 4 5 6 7	Easy to defend

3. How logical to defend is the decision to choose the pen?

Very illogical	1 2 3 4 5 6 7	Very Logical

(#Regret)

1. How much regret did you feel after you chose the pen?

No regret at all	1 2 3 4 5 6 7	Regret very much

2. How much happier would you have been if you had made a different decision?

Not much happier	1 2 3 4 5 6 7	Much happier

(#Manipulation Check)

1. How much effort did it take in making your decision to choose one pen over the other?

Very effortless	1 2 3 4 5 6 7	Very effortful

2. How much difficulty did you feel in making your decision to choose one pen?

Not at all difficult	1 2 3 4 5 6 7	Very difficult

FIGURE 5.1.5

Study 1b: Experimental Procedure

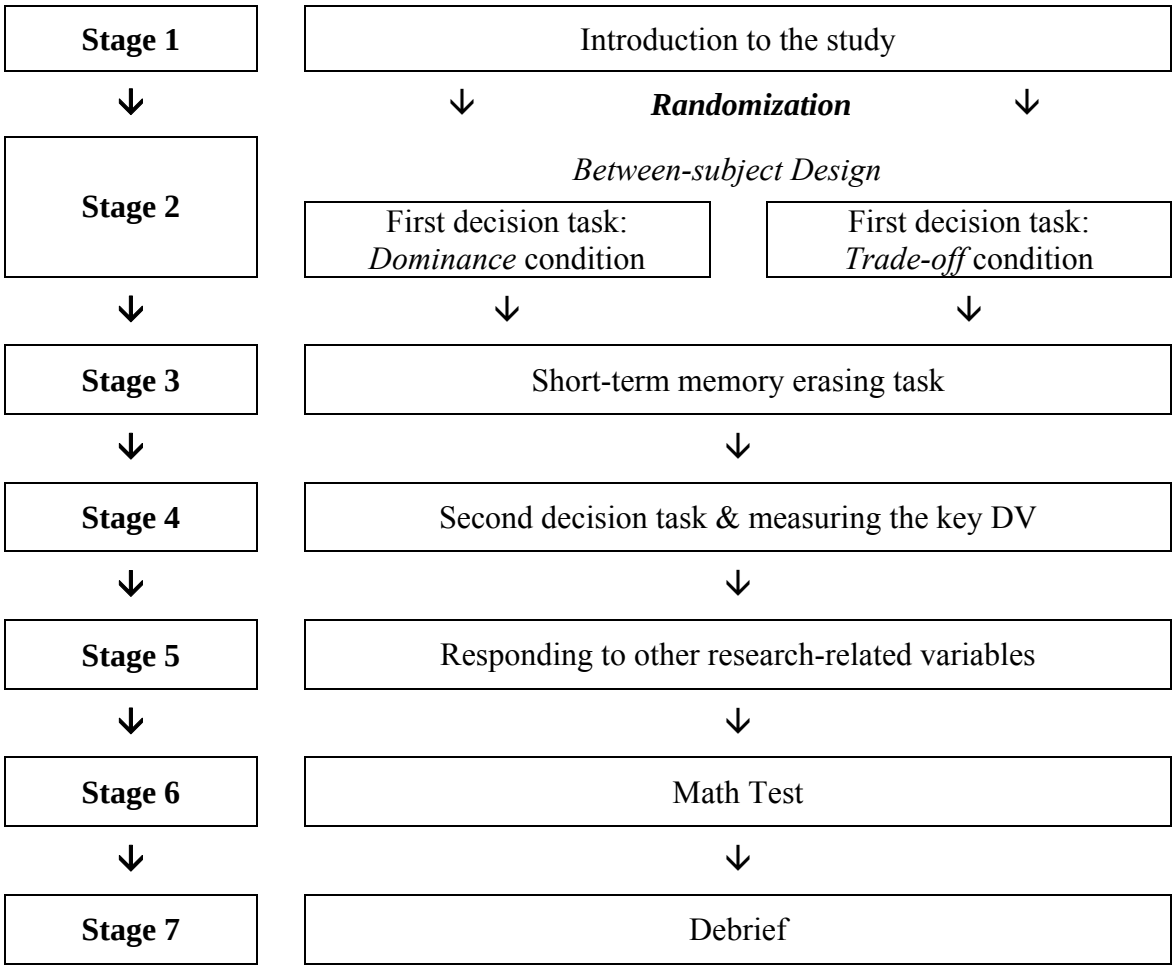


FIGURE 5.2.1

Study 2: Stimuli for Study

Trade-off condition: Calculator A (i.e., Sharp EL) vs. B (i.e., Casio DM)

Sharp EL	**Key Attributes**	**Casio DM**
Available	**Automatic shut-off**	Not available
Dual-powered (Battery & Solar)	**Battery**	Dual-powered (Battery & Solar)
10 characters on 1 line	**Number of characters per line**	12 characters on 1 line
10 functions	**Number of functions**	8 functions
Holds up to 3 numbers	**Numeric memory capacity**	Holds up to 5 numbers
No case included	**Protecting case**	Case included
2-year warranty	**Warranty**	1-year warranty

Dominance condition: Calculator A (i.e., Sharp EL) vs. C (i.e., Ativa AT)

Sharp EL	**Key Attributes**	**Ativa AT**
Available	**Automatic shut-off**	Not available
Dual-powered (Battery & Solar)	**Battery**	Single-powered (Battery only)
10 characters on 1 line	**Number of characters per line**	8 characters on 1 line
10 functions	**Number of functions**	4 functions
Holds up to 3 numbers	**Numeric memory capacity**	Holds up to 3 numbers
No case included	**Protecting case**	No case included
2-year warranty	**Warranty**	1-year warranty

FIGURE 5.2.2

Study 2: Stimuli for Study - Perceived Decision Difficulty

Please circle the number that best reflects how you were feeling when you chose the calculator.

1. How involved did you feel in the first choice task?

Not at all 1 2 3 4 5 6 7 8 9 Very Much So

2. How much careful consideration did you put into your responses for the first choice task?

Not at all 1 2 3 4 5 6 7 8 9 Very Much So

3. How much did you deliberate before making your choice during the first choice task?

Not at all 1 2 3 4 5 6 7 8 9 Very Much So

4. To what extent did you feel your responses to the first choice task were a reflection of your own choosing?

Not at all 1 2 3 4 5 6 7 8 9 Very Much So

5. How much did you think about your options prior to making your responses on the first choice task?

Not at all 1 2 3 4 5 6 7 8 9 Very Much So

6. How active did you feel making your responses during the first choice task?

Not at all 1 2 3 4 5 6 7 8 9 Very Much So

FIGURE 5.2.3

Study 2: Mediation Analysis

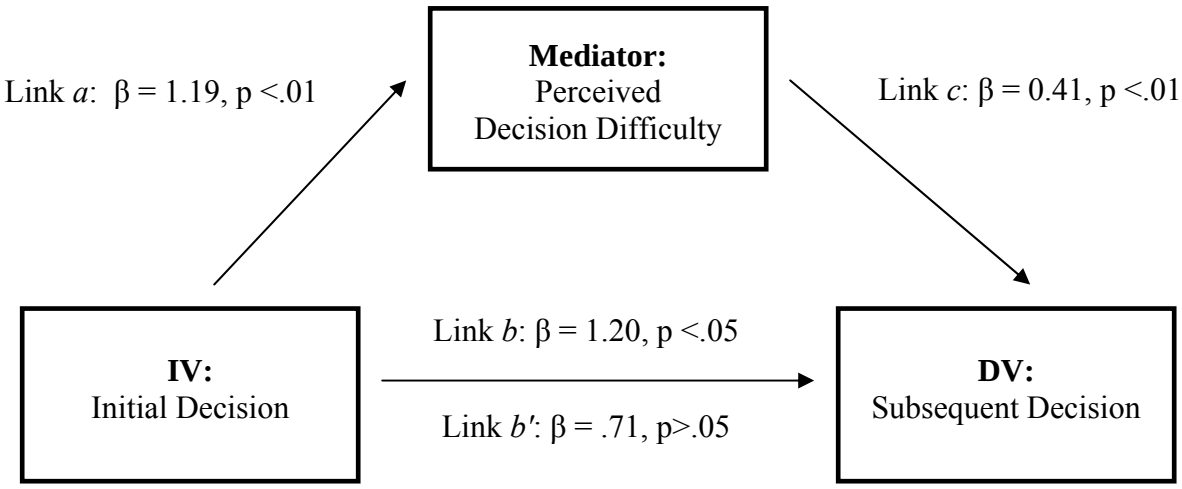


FIGURE 5.4.1

Study 4: Experimental Procedure

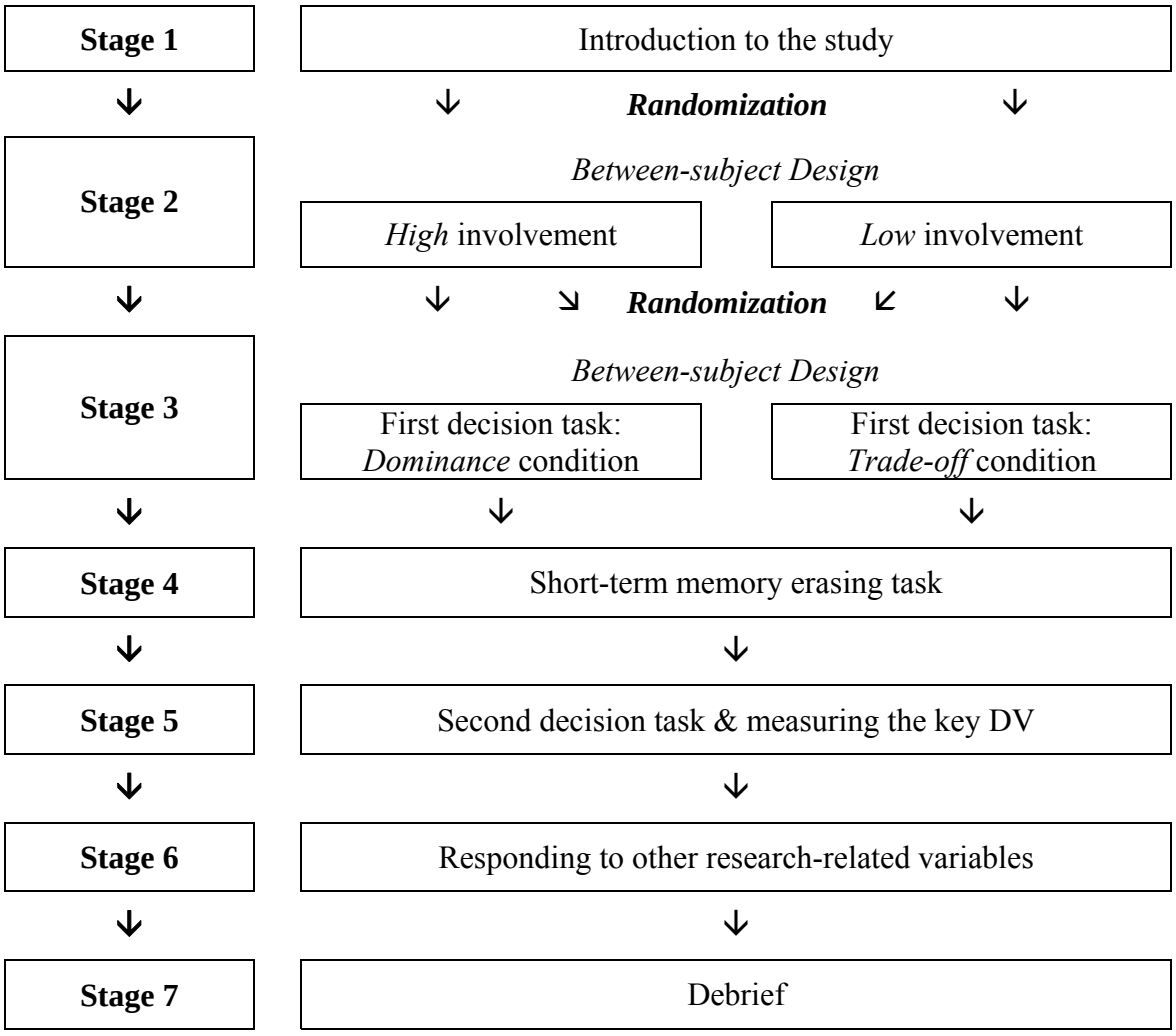
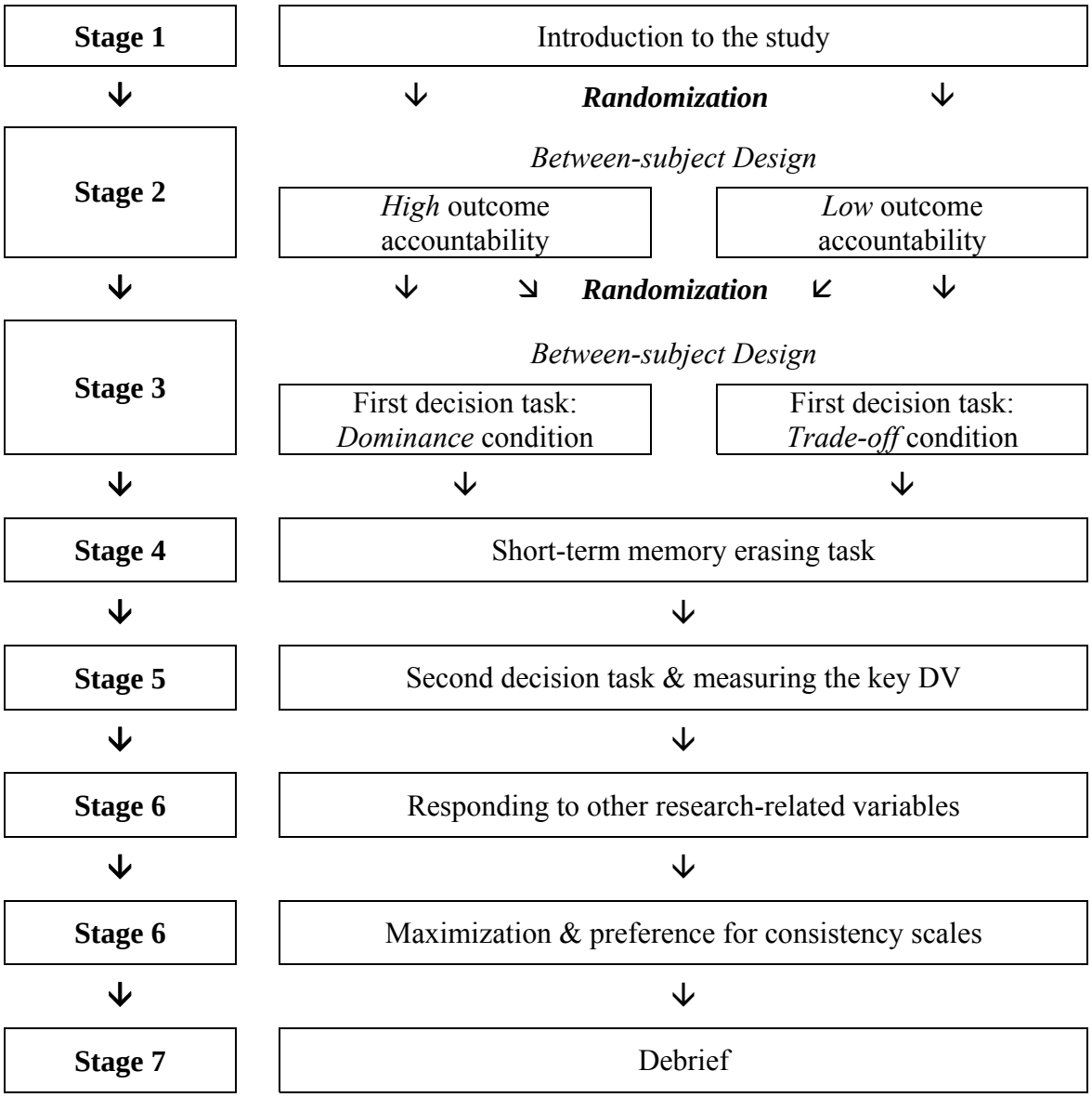


FIGURE 5.6.1

Study 6: Experimental Procedure



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APPENDIX

Appendix A. Different Decision Rules[51]

1. The weighted-additive rule (WADD):

The evaluation of each alternative is obtained by multiplying each importance or weight times the attribute rating and adding those products for all attributes. Then the alternative with the highest evaluation is selected.

2. The equal-weighted-additive rule (EQW):

The evaluation of each alternative is obtained by adding the ratings for all of the attributes, with the alternative with the highest evaluation selected. However, this rule ignores information about the relative importance or weight.

3. The lexicographic rule (LEX):

This rule requires people to first find the mort important attribute (the attribute with the largest weight) and then search the values on that attribute for the alternative with the highest value. That alternative is chosen, unless there are ties. In this case, those tied alternatives are examined on the second most important attribute. That process contiunes until a winner is found.

4. The eliminiation-by-aspects rule (EBA):

This rule begins by determining the most important attribute and examining that attribute's cutoff value. Next all alternatives with ratings below the cutoff for that attribute are eliminated. This process continues with the second most important attribute, and so on until one alternative remains.

5. The satisfying rule (SAT):

[51] This appendix is mainly based on Bettman, Johnson, and Payne (1990, p. 117) and Bettman, Luce, and Payne (1998, pp. 190-191).

This rule requires people to consider one alternative at a time, comparing each attribute to the cutoff value. If any attribute is below the cutoff value, that alternative is rejected. This first alternative with values that pass the cutoffs for all attributes is selected.

6. The majority-of-confirming-dimensions rule (MCD):

This rule processes pairs of alternatives. The values of the two alternatives are compared for each attribute, and a running score is kept: if the first alternative has a greater value on an attribute than the second, one is added to the score; if the second alternative is greater, one is subtracted; if the two alternatives are tied, the score is not changed. After all attributes have been examined, if the score is positive, the first alternative is retained; if the score is negative, the second alternative is retained; and if the score is zero, the alternative winning the comparison on the last attribute is retained. Generally, this rule retains the alternative that is better on most criteria. The alternative that is retained is then compared to the next alternative remaining among the set of alternatives. If no other alternative remains, the retained alternative is selected.

Please refer to Table A.1 for detailed properties of each rule.

Table A.1 General Properties of Decision Rules

Decision rules	Compensatory (C) vs. non-compensatory (N)	Amount of information processed	Attribute-based (AT) vs. alternative-based (AL)	Consistent (C) vs. selective (S)
1. WADD	C	Extensive	AT	C
2. EQW	C	Extensive	AL	C
3. LEX	N	Limited	AL	S
4. EBA	N	Variable	AT	S
5. SAT	N	Variable	AL	S
6. MCD	C	Extensive	AT	C