

**TOO MUCH INVESTED TO GO BACK: AN
INVESTIGATION OF SUNK COST
EFFECTS FOR MONETARY AND
NON-MONETARY RESOURCES**

By

VISHAL LALA

**Bachelor of Science (Chemistry)
University of Bombay
Bombay, India
1996**

**Master of Management Studies (Marketing)
University of Bombay
Bombay, India
1999**

**Master of Science (Management Information Systems)
Oklahoma State University
Stillwater, Oklahoma
2004**

**Submitted to the Faculty of the Graduate College of
Oklahoma State University towards partial fulfillment
of the requirements of the degree of
DOCTOR OF PHILOSOPHY
May, 2005**

**TOO MUCH INVESTED TO GO BACK: AN
INVESTIGATION OF SUNK COST
EFFECTS FOR MONETARY AND
NON-MONETARY RESOURCES**

Thesis Approved:

Dr. Goutam Chakraborty

Thesis Advisor
Dr. Joshua L. Wiener

Dr. Tracy A. Suter

Dr. Irwin P. Levin

Dr. A. Gordon Emslie

Dean of the Graduate College

Preface

Consumers and managers have been found to utilize information about previous investments in making decisions about subsequent investments. Relying on previous investments when they don't have any bearing on subsequent outcomes is irrational and this phenomenon is known as the sunk cost effect. The purpose of this dissertation is to investigate situations where either the initial or subsequent investment is non-monetary. Specifically, I investigate the role played by an initial monetary investment in the context of coupons and the effect of an initial investment of time and effort in a purchasing situation.

I am extremely grateful to my dissertation chair, Dr. Goutam Chakraborty for his valuable suggestions and guidance at every stage of this dissertation. I would like to thank my external committee member, Dr. Irwin Levin for his prompt and insightful comments on various versions of this dissertation. I am also thankful to my committee members, Dr. Josh Wiener and Dr. Tracy Suter for their guidance.

I would also like to thank my parents, Dr. Anil K. Lala and Dr. Krishna Lala, and my fiancé, Sharmila Rajendran for their support and encouragement through the process.

TABLE OF CONTENTS

Chapter		Page
1	Introduction	1
2	Literature Review: A Comprehensive Multi-Disciplinary Review of Sunk Cost Research	8
	Antecedents	10
	Moderators	43
	Consequences	43
	Contexts	45
	Theoretical Explanations	48
3	Self-Justification – Scale Development	60
	Context-Independent Scale	62
	Context-Dependent Scale	68
4	Desire to Reduce Waste – Scale Development	73
	Context-Independent Scale	74
	Context-Dependent Scale	79
5	Paying for Coupons	82
	Study 1	90
	Study 2	93
	Study 3	95
	Study 4	97
6	Impact of Consumers’ Effort Investments on Buying Decisions	103
	Study 1	107
	Pretest: Manipulation of Effort	113
	Study 2	127
	Pretest: Manipulation of Decisional Control	132
	Study 3	137
7	General Discussion	143
8	Implications and Future Research	145
	Bibliography	149
	Appendix	168

LIST OF TABLES

Table	Page
3.1 Content Validity and Exploratory Factor Analysis	63
3.2 Latent Structure	65
3.3 Dimensionality	66
3.4 Exploratory Factor Analysis	69
3.5 Latent Structure	70
3.6 Dimensionality	71
4.1 Content Validity and Exploratory Factor Analysis	75
4.2 Latent Structure	77
4.3 Exploratory Factor Analysis	80
4.4 Latent Structure	81
5.1 Coupon literature	84
5.2 Results of Coupon Studies	92
6.1 Pricing Information for Brands	126
6.2 Study Descriptions for Control Manipulation	137

LIST OF FIGURES

Figure	Page
1.1 Domain of Sunk Cost Research	4
2.1 Sunk Cost vs. Escalation of Commitment	9
2.2 Review of Sunk Cost Research – I	10
2.3 Review of Sunk Cost Research - II	13
5.1 Subsequent Monetary Investment	86
5.2 Subsequent Non-Monetary Investment	87
6.1 Subsequent Monetary Investment	105
6.2 Subsequent Non-Monetary Investment	106
6.4 Brand Evaluation Page in Web Instrument	118
6.5 Brand A Information Page in Web Instrument	119
6.6 Price Module for Web Instrument	125
6.7 Pricing Information for Brand A for Web Instrument	126
6.8 Effect of Effort-Control Interaction on Amount Paid	141

Chapter 1: Introduction

Consumers and managers are often faced with situations where they evaluate alternative courses of action and choose from among these options. Among these, there are a number of situations where decision makers are called upon to make additional investments. For instance, a manager who has sanctioned \$100 million for a new product may be faced with the decision of whether to invest another \$50 million or not. Similarly, a consumer with an old car may be faced with the decision of whether to invest another \$4,000 on repairs or to sell the car. It has generally been found that decision makers prefer to reinvest an additional amount rather than withdraw from the course of action. Furthermore, such decisions are guided by previous investments rather than consideration of future costs and future benefits. Such reliance on past investments when they do not reflect probability of achieving a goal is irrational. A number of labels have been used to identify this effect including, sunk cost effect (Arkes and Blumer 1985; Thaler 1980; Soman 2001; Whyte 1986), escalation of commitment (Bazerman et al 1984; Staw 1976; Staw and Fox 1977), entrapment (Brockner and Rubin 1985), and too much invested to quit (Teger 1980). Consider the following anecdotal evidence,

- An individual has spent three years working on an advanced degree in a field with minimal job prospects (e.g., in the humanities or social sciences). The individual chooses to invest more time and effort to finish the degree rather than switching to an entirely new field of study. Having obtained the degree, the individual is faced

with the options of unemployment, working under dissatisfying conditions such as part-time or temporary status, or starting anew in a completely unrelated field (Staw 1981).

- A family pays \$40 for tickets to a basketball game to be played 60 miles from their home. On the day of the game, there is a snowstorm. They decide to go anyway, but note in passing that had the tickets been given to them, they would have stayed home (Thaler 1980).
- A man joins a tennis club and pays a \$300 yearly membership fee. After two weeks of playing, he develops tennis elbow. He continues to play (in pain) saying, “I don’t want to waste the \$300” (Thaler 1980).
- An individual asks for a buffet at a Pizza restaurant. He is already full from a heavy breakfast, but that does not stop him from eating twice the amount of pizza he normally eats and winding up with a stomach upset (case taken from personal experience).
- An individual purchased a stock at \$50 a share, but the price has gone down to \$20. Still convinced about the merit of the stock, he buys more shares at this lower price. Soon the price declines further and the individual is again faced with the decision to buy more, hold what he already has or sell out entirely (Staw 1981).
- At an early stage of the U.S. involvement in the Vietnam War, George Ball, then Undersecretary of State, wrote the following in a memo to President Johnson: “The decision you face now is crucial. Once large numbers of U.S. troops are committed to direct combat, they will begin to take heavy casualties in a war they

are ill equipped to fight in a non-cooperative if not downright hostile countryside. Once we suffer large casualties, we will have started an irreversible process. Our involvement will be so great that we cannot – without national humiliation – stop short of achieving our complete objectives. Of the two possibilities, I think humiliation would be more likely than the achievement of our objectives – even after we have paid terrible costs.” (Sheehan and Kenworthy 1971, memo dated July 1, 1965).

A vast amount of empirical evidence exists in support of the sunk cost effect. Moreover, the evidence exists in both managerial (Boulding, Morgan, and Staelin 1997; Brockner, Shaw, and Rubin 1979; Schmidt and Calantone 2002; Staw 1976) and consumer domains (Arkes and Blumer 1985; Kahneman and Tversky 1979; Thaler 1980, 1999). Furthermore, a review by Staw and Ross (1987) identifies 26 underlying antecedents for this effect that they group into four categories, project factors, psychological determinants, social aspects, and structural aspects of the organization. Underlying these antecedents there exist a variety of different explanations of escalation behavior. These include self-justification (Staw 1976), information distortion (Boulding, Morgan, and Staelin 1997), prospect theory (Whyte 1986), decision dilemma theory (Bowen 1987; Heath 1995), goal substitution theory (Garland and Conlon 1997), and desire to reduce waste (Arkes and Blumer 1985).

Clearly, the domain of sunk costs is well researched. This brings the reader to the logical question: *how will this research contribute from either a (a) theoretical perspective or a (b) managerial perspective?* In the next paragraph, I address the theoretical contribution of this dissertation. In the paragraph following it, I address the

issue of managerial relevance. This is followed by an overview of the contents of this dissertation.

In general, a sunk cost situation involves investment of resources in at least two stages. In the first stage, an individual invests a resource which could be money, time, effort, emotion, etc. On receiving negative feedback regarding his initial decision, the individual makes the irrational decision of reinvesting the same or other resource. The bulk of research on sunk costs deals with situations where money is invested at every stage. This is represented by Cell A in Figure 1.1. There is little to no research investigating the sunk cost effect for situations where the resources are non-monetary. These situations are represented by Cell B, Cell C, and Cell D.

Figure 1.1: Domain of Sunk Cost Research

		Subsequent Investment	
		Monetary	Non-monetary
Primary Investment	Monetary	Cell A	Cell C
	Non-monetary	Cell B	<i>Cell D</i>

The theoretical contribution of this dissertation is in investigating the sunk cost phenomenon for Cell B and Cell C. In essence, my research is contributing by extending the extant knowledge on sunk cost effects to situations where the resources invested are non-monetary such as time or effort. In addition, I have also developed valid and reliable scales for self-justification and desire to reduce waste which are used to test the theoretical explanation for sunk cost effects.

To my knowledge, there exists no previous research in Cell B, i.e., sunk cost situations where the primary investment is non-monetary and subsequent investment is

monetary. With two exceptions (Heath 1995; Thaler 1980), there exists no research in Cell C, i.e., sunk cost situations where the primary investment is monetary and subsequent investment is non-monetary. Although only limited research exists in Cell D (Leclerc et al 1995; Soman 2001), i.e., sunk cost situations where both primary and subsequent investments are non-monetary, I am not going to explore such situations in this dissertation.

Thus, from a theoretical perspective, the contribution of this manuscript may be summarized as (i) an exhaustive review and organizing framework of the literature, (ii) development of scales for self-justification, (iii) development of scales for desire to reduce waste, (iv) investigation of the sunk cost effect when the primary investment is non-monetary and subsequent investment is monetary (Cell B), and (v) investigation of the sunk cost effect when the primary investment is monetary and subsequent investment is non-monetary (Cell C).

From a managerial perspective, this manuscript contributes through the development of scales for individual-level variables, an investigation of the effect of the effort spent by consumers in searching and evaluating products, and finally, an investigation of the impact of charging consumers for coupons (rather than offering them for free) on coupon redemption. In the next few paragraphs, I provide an overview of the following chapters of this dissertation.

Chapter 2 reviews the vast amount of sunk cost research dispersed over a range of disciplines including, marketing, management, psychology, sociology, and accounting. Based on this review, I construct an organizing framework of the antecedents, moderators, consequences, contexts, and theoretical explanations for sunk cost effects.

Such a framework (see Figures 2.1 and 2.2) would not only be beneficial for those interested in getting a grasp of the domain but also to those looking to further their understanding of this phenomenon.

In Chapter 3, I develop a context-independent and a context-dependent scale for self-justification. Self-justification, an individual-difference variable, has been proposed as an explanation for a number of phenomena including the attraction effect, compromise effect (Simonson 1989, 1992), and sunk cost effect (Brockner 1992; Staw 1981).

Through the development of a scale, I test the role of self-justification as one possible theoretical explanation. Chapter 4 is similar to chapter 3 in that it develops a context-independent and a context-dependent scale for desire to reduce waste, another individual difference variable. Here again, the purpose of developing a scale is to use it to test the role of desire to reduce waste as another possible theoretical explanation for the sunk cost effect.

Chapter 5 investigates the influence of charging consumers for a coupon booklet (rather than offering them for free) on coupon redemption behavior. Through a set of scenario based studies and a field study, I test the effect of the price of a coupon booklet on coupon redemption. I also test coupon expiration date as a contingency variable. Finally, I test self-justification and desire to reduce waste as theoretical explanations for the effect of price of coupon on redemptions.

Chapter 6 focuses on situations where consumers spend effort in searching for and evaluating products. In this chapter, I suggest that while marketers attempt to minimize the search and evaluation effort of consumers, making consumers invest large amounts of effort may not be all bad. Specifically, I suggest that consumers who spend a large

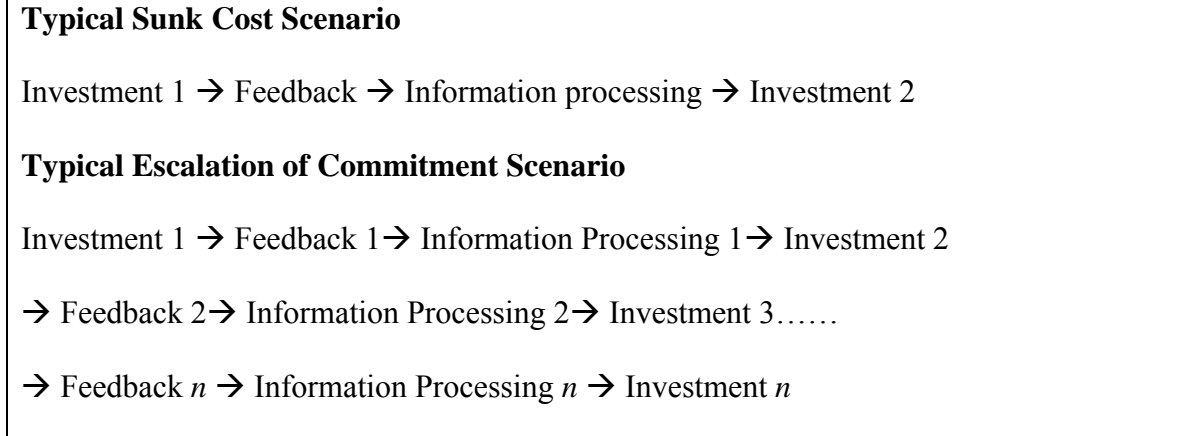
amount of effort in searching and evaluating products will actually pay more for the product they decide to buy than consumers who spend less effort. I test this proposition through a series of scenario based studies and a series of iterative studies using a web instrument. I also test the effect of search and evaluation effort on amount paid under different levels of decisional control. Finally, I test self-justification and desire to reduce waste as theoretical explanations for this effect.

Chapter 7 provides a general discussion summarizing the findings of this manuscript. Finally, in chapter 8, I discuss the managerial implications of these findings and future research.

Chapter 2: Literature Review - A Comprehensive Multi-Disciplinary Review of Sunk Cost Research

Research on the sunk cost phenomenon spans a number of disciplines including marketing, management, psychology, sociology, and accounting. Consequently, a number of different labels have been used to refer to this phenomenon and even the conceptualization has varied a little across disciplines. The two most commonly used labels used are sunk cost and escalation of commitment. Sunk cost is the label that has generally been used by consumer researchers (Arkes and Blumer 1980). On the other hand, in the management and strategy literature it is generally referred to as escalation of commitment. Conceptually, the two phenomena are very similar. The difference that exists is in the number of decision points involved. While sunk cost situations typically involve a single decision, escalation situations are characterized by a series of decisions. Sunk cost situations involve a single decision following a previous decision while in escalation situations this process repeats itself over a number of times (see Figure 2.0). Elsewhere, these two concepts have been distinguished as adoption or progression decisions (Garland 1990, Garland and Newport 1991).

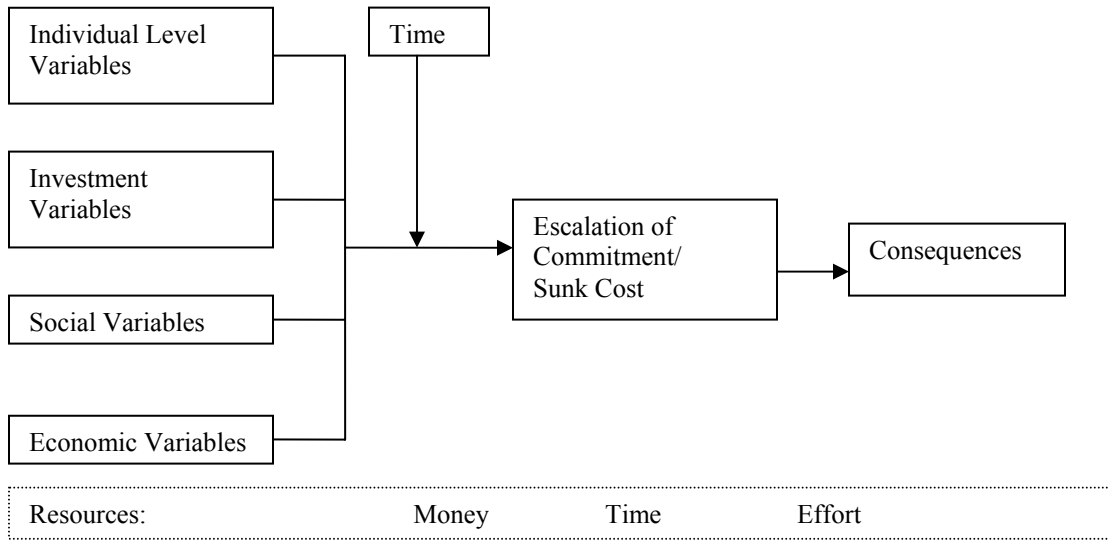
Figure 2.1: Sunk Cost vs. Escalation of Commitment



Given the conceptual similarity between the sunk cost effect and escalation of commitment, the review of the literature that follows encompasses both sets of research. Also, note that the extensive review of the literature on escalation of commitment presented is due to the vast amount of research conducted in the areas of management and strategy and is not intended to distract the reader from focus of this manuscript, the sunk cost phenomenon.

Since, the research on the sunk cost effect has investigated a number of difference facets and relationships; I have classified this research based on the category of the relationship investigated. The areas listed in order of the amount of research conducted are, (i) antecedents, (ii) theoretical explanations, (iii) moderators, (iv) consequences, and (v) other resources. These areas are pictorially depicted in Figure 2.1.

Figure 2.2: Review of Sunk Cost Research - I



Antecedents

Popular press and academic research (Drummond 1994, 1997, 1998; Staw and Hoang 1995; Staw and Ross 1987) have documented a number of escalating situations where managers continue to persist in a course of action in spite of receiving negative feedback. Attempts to remedy escalation biases have led a number of researchers in management and psychology to investigate the antecedents of escalation of commitment. As a consequence, the focus has been on isolating single determinants rather than on the influence of classes of variables. The primary objective of this review of antecedents is to condense the large number of antecedent variables into well-defined categories. Wherever possible, synonymous variables are combined under a single label. A snapshot of the organizing framework developed can be seen in Figure 2.2.

To my knowledge the only other literature that has attempted to classify antecedents for escalation of commitment is one by Staw and Ross (1987). Their

categorization classified causes of escalation into four macro variables: psychological, social, project, and structural. However, given the date of this publication it is quite apparent that the chapter does not incorporate any of the research that has been done in this area in the last sixteen years. In this section, I build on the framework developed by Staw and Ross rather than proposing an altogether new one. Thus, the categories used are similar although not identical. The categories of antecedents are, individual variables, social influences, investment variables, and economic variables.

Individual variables are the unique characteristics of individuals that affect their likelihood of succumbing to escalation errors. This category includes psychological determinants (Staw and Ross 1987) such as personal responsibility, choice, personality, and mood, in addition to demographic characteristics such as education and gender. The psychological determinants induce errors in decision making or commit individuals to courses of action due to self-justification and information processing limitations.

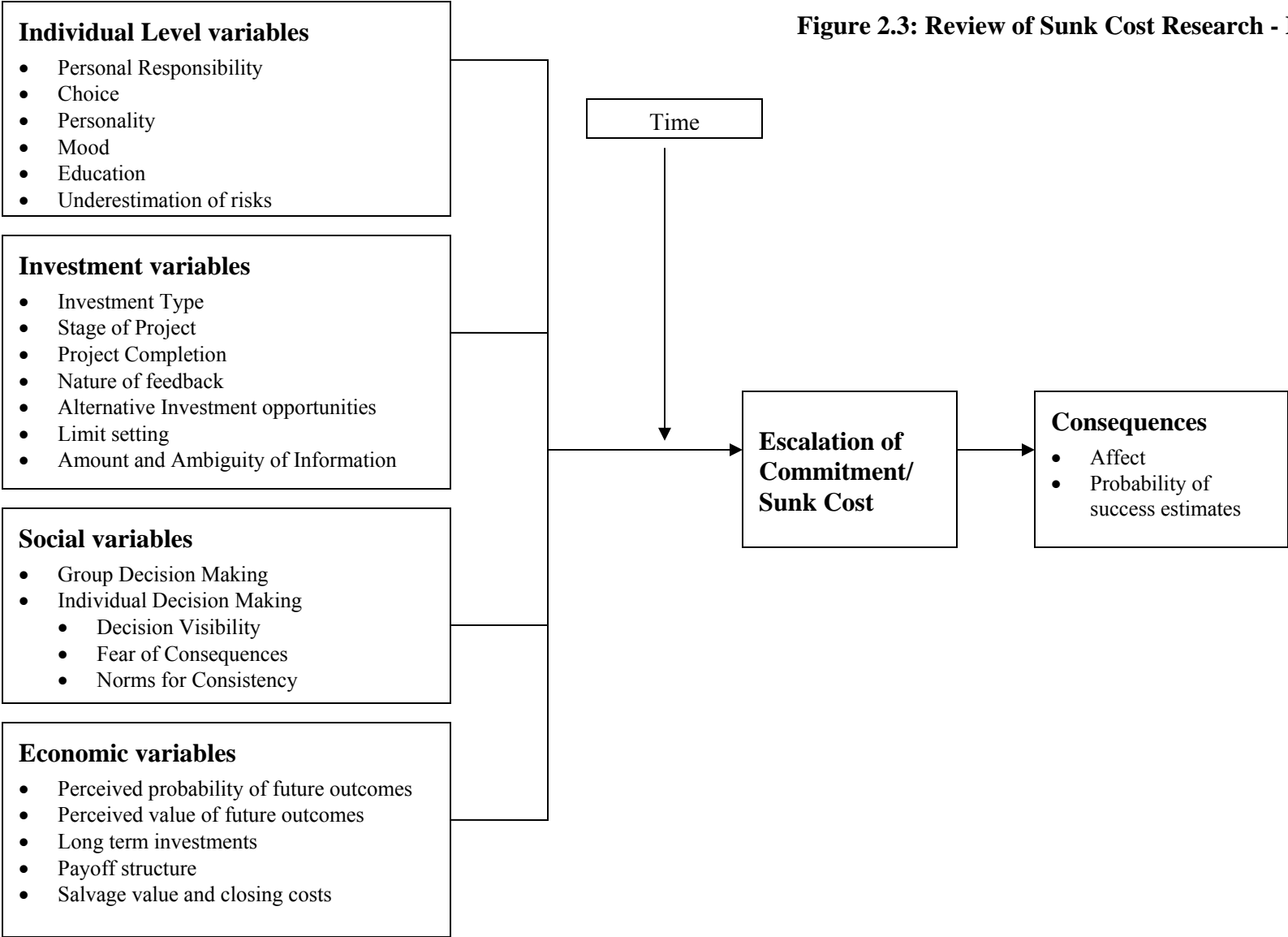
Investment variables are characteristics of the investment decision that induce errors in decision making. These include the specific characteristics of the investment (investment type, stage, alternative investment opportunities, riskiness of alternatives, and limit setting), stage of project (extent of completion), and specifics of decision situation (nature of feedback and ambiguity of information).

Social influences are the effect of other individuals in escalating commitment to a losing course of action. The influence of other individuals on a decision maker may take place either through direct participation in the decision making process as is the case in group decision making or indirectly as passive or active observers (such as superiors).

Finally, economic variables are the economic components of the project. This category includes variables such as market share, estimated sales volumes, profits, and financial performance measures (e.g., internal rate of return and return on investment). Also included in this category are structural determinants such as capital acquisition and its salvage value; compensation or reward systems; institutionalization of values, missions, and goals; and technical and economic side bets. The structural variables described by Staw and Ross (1987) are subsumed in this category.

In the following four sections, the variables included in each of these classes are discussed in greater detail.

Figure 2.3: Review of Sunk Cost Research - II



Resources: Money Time Effort

Individual variables

Individual variables are the unique characteristics of individuals that affect their likelihood of succumbing to escalation errors. These variables are discussed below.

Personal Responsibility

Personal responsibility for a decision is one of the earliest antecedents of escalation of commitment to be studied. To this date it is also one of the best researched. In most of the research reviewed here, high responsibility is operationalized by getting the decision maker to make the initial investment decision either actually in a real decision making situation (e.g., Brockner and Rubin 1985), or through a scenario (e.g., Arkes and Blumer 1985; Staw 1976). A low responsibility operationalization typically involves having someone else make the initial investment decision.

Staw (1976), in one of the earliest studies on escalation of commitment, found that subjects reinvested resources in a losing course of action only when they were personally responsible for the decision to make the initial investment. Staw and Fox (1977), in another study, found an escalation effect even for the low responsibility condition but the effect was found to be stronger for the high responsibility condition. Davis and Bobko (1986) manipulated responsibility, decision alternative, decision framing and affective responsibility but found an effect for only responsibility. Personal Responsibility was also found to play a role in a new product development study. Specifically, personal responsibility significantly influenced perceptions of the likelihood of failure, self-reported commitment, and funding propensity through the new product development process (Schmidt and Calantone 2002). Based on the findings of the effect

of responsibility, a number of researchers have recommended that different decision makers be used for each stage of investment decisions (Boulding, Morgan, and Staelin 1997; Simonson and Staw 1992). This would lower responsibility for past investments and thus lower escalation errors. This suggestion was validated in a new product development study where it was found that decision decoupling procedures (i.e., having multiple decision makers for different stages of investment) that ‘take out of play’ old information are most effective in lowering irrational escalation (Boulding, Morgan, and Staelin 1997).

In general, it has been found that respondents allocate the most amount of money in subsequent decisions when they are personally responsible for the initial decision to invest and when the outcome is negative (Staw 1976). This finding has been supported in a variety of experiments (Bazerman, Giulano, and Appelman 1984; Boulding et al 1997; Simonson and Staw 1992; Whyte 1991). Furthermore, the robustness of this effect is demonstrated by studies that have found an effect for responsibility under various conditions including presence of a lot of information about the decision (Schoorman et al 1994), existence of alternative investment opportunities of low risk (Schaubroeck and Davis 1994), and the absence of decision visibility (Kirby and Davis 1998).

Finally, the results of previous experiments described above notwithstanding, a number of researchers have noted that responsibility for the initial investment is a sufficient but not necessary condition for escalation (Biyalogorsky, Boulding, and Staelin 2003; Schoorman and Holahan 1996). Escalation effects have been found in a number of studies even when the initial decision was made by another person (Staw and Ross 1977), although the effects were weaker.

In explaining the effects of personal responsibility, Staw (1980) suggested that people have a strong need to be correct or accurate in decision making. As a result they are likely to feel compelled to justify their actions to prove to themselves and others that they are indeed competent and rational. When the decision maker receives negative feedback in response to a previous decision, he seeks to justify his actions by distorting the feedback (Boulding, Morgan, and Staelin 1997; Schmidt and Calantone 2002), over weighting positive information (Festinger 1957) and under weighting or ignoring negative information (Caldwell and O'Reilly 1982; Lord, Ross, and Lepper 1979). Continuing to invest in the same course of action, thereby escalating commitment, provides the ultimate justification for the initial decision. In general, personal responsibility for negative consequences leads to retrospective rationality wherein the decision maker experiences a need to demonstrate the rationality of previous decisions (Staw 1980). As a means to make earlier failing decisions pay off, the decision maker escalates commitment.

In summary, personal responsibility is an important antecedent for escalation effects; however, even in its absence, escalation effects may be observed. This effect is thought to occur through a self-justification mechanism.

Choice

Schoorman (1988), in a study on escalation bias in the context of a large public sector organization, noted that in the real world, the initial choices of decision makers are not always implemented. Thus, it is possible that a choice made by a decision maker is overruled so, although he made the initial choice, he does not have responsibility for the decision. Schoorman and Holahan (1988) investigated a similar scenario where choice

and responsibility were manipulated independently of each other. This digresses from most previous escalation studies, which investigate situations where choice and responsibility are confounded i.e., the decision maker making the choice is also responsible for it. Schoorman and Holahan (1988) test the effects of choice and responsibility independent of each other by investigating situations where the decision maker makes a choice, which is ultimately not implemented thus absolving him of responsibility for the decision. The results revealed that escalation effects were observed even when responsibility was low and when decision consequences were positive. On the other hand when decision consequences were negative, choice was a necessary condition for escalation effects. Thus, this series of studies showed that although previous research has highlighted the importance of personal responsibility and negative feedback, they are sufficient but not necessary conditions for escalation effects. On the other hand, choice is a necessary condition for escalation effects.

Personality

Although a number of antecedents of escalation of commitment have been investigated, surprisingly little research has explored the dispositional factors that promote this form of irrational behavior among decision makers. The few studies that have investigated the antecedent role of personality traits have assumed escalation of commitment to be driven by a need for self-justification (Brockner 1992). Therefore, these studies investigate personality characteristics that are more likely to dispose the individual to rationalization or justification, factors that are expected to lead to escalation of commitment.

Schaubroeck and Williams (1993) investigated two personality types, Type A and Type B. Type A individuals are characterized by over-attribution of negative task outcomes to internal, self-relevant factors (Strube 1985). These attributes lead to a greater feeling of perceived responsibility need to establish competence and success (Strube et al 1987), dissonance reduction attempts in stressful situations in the forms of denial and cognitive avoidance and persistence in goal directed behavior. Thus, people with a Type A personality are more prone to escalation errors than those with a Type B personality.

Moon (2001b) failed to find an effect of the elemental personality trait (Mowen 2000), conscientiousness, on escalation of commitment. Moon (2001b) attributed this finding to the nullifying effect of the two components of conscientiousness namely, duty and achievement striving. While achievement striving was found to be associated with an escalation of commitment, duty was associated with a de-escalation of commitment. Two components of achievement striving seem compatible with the type of individual who succumbs to the escalation of commitment bias. First, the individual is driven to succeed and works hard to achieve even difficult goals. Failure would create greater cognitive dissonance (Festinger 1957) and is therefore avoided (Brockner 1992). That is, achievement strivers do not like to fail or see themselves as failures. Second, an achievement striver values personal success more than that of others, the group, or the organization.

In summary, the limited research on personality traits has revealed that Type A personality types and achievement strivers are inclined to escalate commitment.

Mood

Research examining the influence of mood or affect on risk taking has demonstrated that positive affect can increase the propensity to take a risk if the risk is relatively low, whereas positive affect under conditions of high risk tends to reduce risk taking (Isen and Patrick 1983).

Most escalation situations lack information about the probabilities of outcomes. Thus, assessments of risk are left up to the decision maker. Previous research has demonstrated that positive affect can lead to improved expectations regarding probable outcomes when risk is not actually specified (Isen et al 1978). As such, decision makers experiencing a positive mood state may perceive the commitment of resources as less risky than their counterparts who are experiencing a negative (or neutral) mood states. It has been suggested that this occurs because positive affect can serve as a retrieval cue for positive material in memory, thus influencing the subsequent assessment of risk (Isen et al 1982). In turn, this reduction in perceived risk should lead to inflated allocations of resources.

Although the literature on affect might suggest that escalation effects be higher when the decision maker is experiencing positive affect, the only study testing this proposition failed to find an effect (Davis and Bobko 1986). However, it must be noted that the authors expressed surprise with the results and attributed their inability to find effects on the manipulation of mood. They recommended further attempts to test this hypothesis.

In summary, affective state of the decision maker is expected to affect escalation of commitment and this effect is contingent on the perceived risk. However, empirical support for this proposition is lacking.

Education

One reason that decision makers might exhibit sunk cost effects is that they have never been exposed to the normative principles prohibiting them. This issue was first investigated by Arkes and Blumer (1985) and they found that students who had received instruction in economics (with sunk cost being one of the topics covered) were no less susceptible to sunk cost effects than those who had not received instruction in economics. Tan and Yates (1995), on the other hand, found mixed results for the effect of education. When students were presented with scenarios that were similar to the ones discussed in class, then the sunk cost effects were considerably less. However, when the scenarios were incongruent with the situations discussed in class, sunk cost effects were observed to the same level in students who had received instruction on sunk costs as those who had not.

A recent study by Soman (2001) investigated whether education in economic approaches influenced sunk cost effects for time. It was found that education actually made the subjects pay attention to previous investments of time and resulted in a sunk cost effect. Those who did not participate in the classroom discussion on economic approaches to time did not succumb to the sunk cost effect.

In summary, education lowers but does not eliminate escalation tendencies. This effect is particularly pronounced when there is a close correspondence with the situations

discussed in class and those used in the experiment. However, in the *context of time*, education actually led subjects to pay attention to previous investments.

Underestimation of risks

In a broad ranging literature review, Taylor and Brown (1988) conclude that there is a pervasive optimism bias among people, along with an exaggerated sense of control over events. This general delusion of control of people has been brought out in a series of studies adopting gambling formats by Langer and her associates (Langer 1975; Langer and Roth 1975). They found that people often act as if they have control in situations that are actually determined by chance. When manipulations suggestive of skill, such as competition, choice, familiarity, and involvement, are introduced into chance situations, people behave as if the situations were determined by skill and, thus were ones over which they could exert some control (see also Goffman 1967). For example, people infer that they have greater control if they personally throw dice than if someone else does it for them (Fleming and Darley 1986; Langer 1975). Similarly a large literature on co-variation estimation indicates that people substantially overestimate their degree of control over heavily chance-determined events (see Crocker 1982, for a review).

Kahneman and Lovallo (1994) refer to this tendency among managers as delusions of control. Such beliefs in their ability to control their environment, often leads decision makers to underestimate risks and overestimate likelihood of achieving the goal. However, as noted in the review by Taylor and Brown (1988), delusions of control should be limited to only decision makers that actually make a decision. On the other hand, those not actively involved in the decision making process should not demonstrate the same level of optimism. This proposition was tested through a scenario-based

experiment where multiple decision makers were used. It was found that when a new decision maker was brought in, he did not demonstrate the same level of optimism as demonstrated by his predecessor (Boulding, Morgan, and Staelin 1997).

In summary, decision makers actively involved in a decision making process have delusions of control which leads them to underestimate risks. This underestimation of risks makes reinvestment seem as a rational decision.

Investment variables

Investment variables are characteristics of the investment decision that induce errors in decision making. These include the specific characteristics of the investment (investment type, stage, alternative investment opportunities, riskiness of alternatives, and limit setting), stage of project (extent of completion), and specifics of decision situation (nature of feedback and ambiguity of information).

Investment Type: Self-Sustaining vs. Self-Terminating Investments

In many entrapping conflicts (e.g., waiting situations), the process of resource allocation is 'passive' or self-sustaining. In self-sustaining escalating conflicts, investments increase continuously unless one deliberately decides to terminate involvement. For example, time continues to accrue at the bus stop until the commuter chooses to quit waiting.

In other escalating conflicts, however, the process of resource allocation is more 'active' or self-terminating. Unlike the investments in self-sustaining situations, continued investments in self-terminating conflicts do not accrue automatically. Rather, they are the result of an active decision to continue allocating one's resources. Stated another way, in self-terminating conflicts, unless the individual deliberately decides to

continue investing, his involvement in the conflict is automatically terminated. Unless the automobile owner chooses to continue sinking money into his car each and every time that it breaks down, he is no longer eligible for the goal of a functioning automobile. Thus, while in self-terminating situations, the decision maker needs to take a decision to invest in a course of action, in a self-sustaining situation, investments continue until a decision is taken to terminate the flow of investments. As an example, consider payment of bills for cell phone service. When payments are made on a monthly basis by writing a check, the consumer makes an explicit decision to reinvest resources. This would be analogous to a self-terminating situation. On the other hand, when payments are automatically made by the consumer's credit card, the consumer no longer makes a decision to pay. This would be a case of a self-sustaining situation.

Although the difference between self-sustaining and self-terminating forms of entrapping conflict may appear subtle, escalation has been found to be greater for self-sustaining rather than self-terminating situations (Brockner, Shaw, and Rubin 1979). This effect was explained by the authors as being caused by the greater cost salience in the self-terminating condition. By requiring subjects in the self-terminating condition to explicitly take a decision to invest, it is likely that the subjects were forced to consider information concerning costs. On the other hand, the subjects in the self-sustaining condition may have been less aware of the costs continuing to stay in the situation. Thus, the attention paid to costs might be a possible reason for an effect of investment type. This explanation is consistent with previous research that has found entrapment to be more likely to occur when information about costs is less salient (Rubin and Brockner 1975).

To summarize, escalation effects are stronger for self-sustaining situations rather than self-terminating situations.

Stage of Project

Much research on escalation of commitment has involved a simple dichotomous manipulation of investments (e.g., committing funds to begin a new project vs. committing funds to a project that has already involved a substantial investment). However, investment of funds, whether measured as a budget percentage or in raw dollars, forms a naturally continuous scale. Garland (1990) investigated the effects of the stage of investment on the strength of the sunk cost effect. It was found that the stage of investment was *linearly* related to the likelihood of reinvestment. Thus, those who had already invested \$9 million (out of a possible \$10 million) were more likely to invest an additional million dollars than those who had only invested \$5 million.

It is interesting to note that the relationship between the amount of investment and escalation effects was linear (i.e., the greater the amount of investment, the more the escalation of commitment). This is surprising given that the prediction made by the value function of prospect theory and by Garland (1990) was of an S-shaped rather than a linear relationship.

In summary, the greater the amount of investment in terms of absolute dollar or stage of project, the more the escalation effects.

Project Completion

Research about escalation of commitment has focused on previous investments. This line of research has been questioned by a number of researchers (Boehne and Paese 2000; Conlon and Garland 1993; Garland and Conlon 1998; Moon 2001) on the ground

that escalation may not necessarily be a result of only previous investments; rather extent of completion of the project may also have a role to play. In fact, a number of studies investigating sunk cost effects may have actually been measuring completion effects. For example, while an investment of \$1 million in a \$10 million project reveals information of the amount of money already invested, it also reveals that the project is 10% complete (Conlon and Garland 1993).

Furthermore, in a number of previous studies (Arkes and Blumer 1985; Garland 1990; Garland and Newport 1991) sunk costs are completely confounded with project completion. For example, in a study by Arkes and Blumer (1985), half the subjects were told that they had invested 9 out of 10 million dollars in a project that was 90% complete while the other half was told they had not invested anything in the project. Subjects were then asked their willingness to invest a million dollars. Since a project that had been completed to a greater extent also carried a larger sunk cost, this study confounded project completion with sunk cost. In later replications using the same scenario, Garland (1990) and Garland and Newport (1991) continued to confound sunk costs and project completion. Although there might be a strong positive correlation between sunk costs and project completion, they represent theoretically different concepts that may contribute separately to continuing investment behavior.

In order to investigate the effect of project completion independent of sunk costs, Conlon and Garland (1993) experimentally manipulated project completion and sunk costs and tested them independently. They found a project completion effect but not a sunk cost effect. Identical results were obtained by Garland and Conlon (1998) too. They proposed while sunk cost effects did not appear in their studies, they are quite likely to

appear when only a single decision is involved (also known as an adoption decision) rather than when successive decisions are involved (also known as a progression decision).

Further support for the effect of project completion is seen in a qualitative study by Drummond (1996). It was found that one of the major reasons for the decision to abandon the Taurus project, a £50 million IT venture, was the state of project incompleteness.

While the studies by Conlon and Garland (1993) and Garland and Conlon (1998) tested for project completion effects and sunk cost effects, economic concerns were not addressed. That is, information in order to make a rational decision was not provided. Boehne and Paese (2000) fill this gap in the literature by providing subjects with information that helps them assess anticipated profitability of the project (an economic concern). They tested three competing hypotheses in order to determine the driver of escalation effects. According to the sunk cost hypothesis, one's desire to complete a project will depend only on the amount of money or effort already invested in the project; the more money or effort already invested, the greater one's desire to complete the project. According to the project completion hypothesis, this desire will depend entirely on how far along the project is; the closer the project is to completion, the stronger the desire to complete the project. Finally, according to the profit motive hypothesis, this desire will depend exclusively on whether the anticipated sale price exceeds the marginal cost of completing the project; the more the sale price exceeds the marginal cost, the greater the desire to complete the project.

Consistent with previous findings, Boehne and Paese (2000) failed to find a sunk cost effect but found a significant project completion and profit motive hypothesis. Secondly they found a stronger effect for project completion than for profit motive hypothesis. This indicates that subjects were primarily driven by project completion and some also paid attention to profits. But a non-significant number were concerned about the amount of sunk cost. The authors caution the reader that these results may *only* apply to progression situations and sunk cost effects may still be observed in adoption situations.

Moon (2001a) investigated how completion and sunk cost effects may act both independently and in concert with a decision maker's propensity to escalate his or her commitment. Consistent with previous research, a boundary condition for this study is that it applies only to progression situations. Although previous research investigating completion effects could not find a sunk cost effect (Boehne and Paese 2000; Conlon and Garland 1993; Garland and Conlon 1998), Moon (2001a) managed to find both a sunk cost effect and a completion effect at the same time. Furthermore, these two effects interact to impact the level of commitment so that when sunk cost and completion are both high, commitment is the highest. Stated differently, for low levels of completion, an increase in sunk cost has no effect on commitment. But for high levels of completion, increase in sunk cost results in greater commitment.

The findings of a completion effect have been explained in terms of a goal substitution effect where the goals of the decision maker shift from profitability to completion of the task. Thus, a need for closure or completion could explain the increased likelihood to invest (Conlon and Garland 1993).

To summarize, the extent of project completion influences escalation of commitment and this effect is stronger than the effect of previous investments on escalation of commitment. This effect is observed even in the presence of information that would help take a rational decision.

Nature of Feedback (Negative or Positive)

In research studies on escalation (Conlon and Wolf 1980; Staw and Ross 1978), decision makers have often received negative information about project outcomes. While economic theory would predict escalation under such circumstances to be irrational, the opposite prediction would be made under situations of positive feedback. A study testing this effect found that when the feedback was positive, subjects were more likely to continue investing than when the feedback was negative (Conlon and Garland 1993).

In summary, positive feedback increases the likelihood of investing more than a self-justification driven reaction to negative information.

Alternative Investment Opportunities

While the conditions that perpetuate escalation effects have been researched in great detail, some researchers have drawn attention to the boundaries of this seemingly irrational renewal of resource investments (McCain 1986; Northcraft and Neale 1986; Schoorman and Davis 1994). It has been noted that there is a limit to the extent and number of escalation blunders that a manager may commit. Specifically, when provided with information about alternative investment opportunities or the opportunity costs of a decision, managers may be more likely to be rational.

Most escalation research has focused exclusively on the situation in which discontinuing further investment (i.e., withdrawing from the field *entirely*) is the only

available alternative to reinvestment. Such an 'escalate or withdraw' scenario may be less prevalent in business decisions, than are decision scenarios involving more than one means of recovering sunk costs. In a study that offered subjects the option of reinvesting in the same division or three other divisions it was found that subjects that were provided alternative investments invested smaller amounts and quit before those who were not provided alternative investments (McCain 1986). It was suggested that alternative investments might have made costs more salient or allowed comparisons of performance that helped to specify the causes of the initial investments setback.

Schaubroeck and Davis (1994) in an attempt to mimic real world situations offered subjects alternative investment opportunities. They found that as long as the two alternatives were equal in risk, personally responsible subjects reinvested, and thereby escalated commitment. On the other hand, when the alternatives differed in riskiness, subjects that were personally responsible invested in the alternative that was less risky, regardless of their initially chosen course of action. Thus, when subjects have accurate information on opportunity costs, escalation effects disappear.

In investigating the role of opportunity costs, Garland and Conlon (1998) found an interaction effect between project completion and opportunity costs. When the subjects were made aware of the existence of alternative investment opportunities, willingness to allocate funds dropped when project completion was low (10%) but not when it was high (90%). Thus, alternative investment information is more effective at reducing the escalation bias at the start of a project than toward the end of a project.

Although the above mentioned studies suggest an effect of opportunity costs on escalation of commitment, a new product development study found that providing the

future opportunity costs as a way of reducing escalation compares poorly to other strategies such as decision decoupling or precommitment to a predetermined decision rule (Boulding, Morgan, and Staelin 1997).

In summary, providing opportunity cost information can lower escalation of commitment, but this reduction may merely be statistically significant but not practically significant.

Limit setting

This stream of research joins other research such as investigation of alternative investment opportunities (McCain 1986, Schoorman and Davis 1994) and providing information on investment (Bowen 1987, Schmidt and Calantone 2002) which has investigated the boundaries of the escalation effect. It has been posited that escalation effects would be present only when a limit or budget does not exist. On the other hand, people will deescalate commitment when budgets are easy to set and investments are easy to track (Heath 1995). Evidence about the effect of setting a limit on escalation is presented below.

Teger (1979) found that those subjects who, beforehand, had spontaneously set a limit on the amount they were willing to invest usually kept to their limit and became less entrapped. Furthermore, a positive correlation was found between the limit subjects set before investing and the amount they actually spent. Some other evidence of de-escalation has been seen in studies by Brockner and Rubin (1985, p. 43-46).

Heath (1995) found that in the presence of an explicit budget or an internally generated mental budget, people escalate commitment until the budget is reached after which they irrationally deescalate commitment. In essence, Heath's findings are

consistent with previous literature to the extent that people pay attention to sunk costs but unlike previous literature he finds that when a budget exists, people deescalate commitment rather than escalate.

In order to explain findings of past research and his divergent findings, Heath proposed a mental budgeting model. According to this model, people escalate commitment only when they fail to set a budget. One such situation when subjects fail to set a budget is when information about benefits of the investment is not available at the outset. Another situation is when it is difficult to track investments. This may happen when investments involve multiple resources or investments are incurred in very different transactions.

While Heath (1995) and Brockner and Rubin (1985) were concerned with self generated budgets or stopping rules, most organizations rely on a more formal stopping rule in the form of a financial budget. A financial budget is typically one where the decision maker's superior has the final say in the budget setting process, even in instances where the decision maker negotiates or participates in creating the budget. A financial budget may be thought of as being similar to the "informed stopping rule" condition of Boulding, Morgan, and Staelin (1997). The mere presence of a budget has no effect on escalation as long as costs are within the budget (Tan and Yates 2002). This is consistent with the finding of Heath (1995) that escalation exists within the budget. When additional investments threaten to exceed the budget, escalation effects are much weaker and at times, decision makers may even irrationally deescalate commitment. Some other findings from this study include (i) the presence of a multi-stage budget

further lowers escalation without eliminating it and (ii) The introduction of expected sales information also has the ability to lower escalation.

Brockner, Shaw, and Rubin (1979) investigated the effect of the visibility of the limit (i.e., is there a difference between whether other people know about the limit or not?) They found a difference between whether the limit set by the subject was known only to him (private condition) or was known to others (public condition). Subjects demonstrated greater commitment to their limit when the limit set was known to others than when it was not known to others.

In their search for a means of lowering irrational escalation among new product managers, Boulding, Morgan, and Staelin (1997) investigated the effect of setting a limit. It was found that precommitment to self-specified decision rules were unsuccessful in lowering continued commitment to failing new products. This finding was attributed to the inability of managers to define an accurate stopping rule. However, getting managers to precommit to an informed stopping rule, determined by an external source, reduces distortion of the new information and lessens the tendency of commitment to a losing course of action.

Finally, investigation of escalation effects in the presence of budgets or expected benefit information may be justified in that it increases the external validity of the study. Moreover, experiments that omit information about benefits make it difficult to experimentally control the beliefs of subjects about the benefits of the future investment (Heath 1995).

In summary, escalation effects are robust as long as the budget is not exceeded or when one does not exist. Once the budget is exceeded, escalation effects are weaker or even reversed resulting in irrational de-escalation.

Ambiguity and Amount of Information

Most situations of escalating commitment investigated in previous literature are situations which either lack complete information or the information that exists is ambiguous. Bowen (1987) contends, when this happens the decision maker persists in a course of action because of his inability or difficulty in obtaining clear and reliable information to be able to exclude miscalculation from judgments about personnel or situations. Thus, persistence is a result of a lack of unequivocal feedback about the decision. After analyzing previously cited examples of escalation, Bowen concluded that the contextual equivocalities of the decisions for the situations described may have made the decision maker risk averse and led him to stick to the same course of action.

Staw and Ross (1978) found indirect support for the effect of ambiguity of information. They found when the causes of failure were ambiguous and unlikely to persist (called the exogenous cause condition) subjects invested more resources than when the cause of the setback was clear, unambiguous, and likely to persist (called the endogenous cause condition).

McCain (1986) found that the subjects escalated commitment in the early stages and then reduced their commitment toward the latter stages. He explained the results as a consequence of the reduction in ambiguity of information as the project progressed. He said when an investment first shows signs of failure, information vital to decisions for future investments are usually not available. Thus, the decision maker relies on the

available information to take a decision. The decision maker may also rely on subjective impressions. Over time, as some of the missing information becomes available, the decision maker is able to make a rational decision and thus escalation of commitment should cease as unambiguous diagnostic information becomes available.

Schmidt and Calantone (2002) found that the likelihood of escalating commitment in the development stages is higher than the likelihood of escalating commitment after commercialization. The authors explained their findings as follows. As the new product moves from development towards commercialization, information becomes more accurate because the market and technical uncertainties are reduced. The consequent lowering of ambiguity of information leads to greater effects for responsibility, product innovativeness and credibility of the information source on commitment to the selected course of action.

In a study by Schaubroeck and Davis (1994), subjects were provided unambiguous diagnostic information in the form of probability of success information (i.e., risk estimates) based on expert estimates. In general, it was found that in the presence of clear diagnostic information, the subjects invested in the course of action with the lower risk, regardless of the course of action that was originally selected (Schaubroeck and Davis 1994). In other words, unambiguous information did not result in escalation effects.

Schoorman et al (1994) in investigating a framing based explanation for escalation of commitment found that simply providing the subjects with more information through a case study eliminated frame based effects. This is consistent with the findings of Bettman and Sujan (1987) who found that in the presence of information,

either externally provided or internally present because of expertise, the effects of framing disappear. Thus, it seems that merely providing more information about the decision can lower escalation effects (when responsibility is low).

In general, escalation of commitment is more probable when the long-term implications of a decision are unclear (Bowen 1987) or ambiguous (Boulding, Morgan, and Staelin 1997). On the other hand, escalation of commitment is lowered when budgets are clear and decision makers are forced to confront their options (McCain 1986).

Conlon and Parks (1997) investigated the effect of making the subjects aware of the lack of information (rather than providing complete information). They sensitized subjects to the possibility of lack of information to take a decision. Subjects that were sensitized to the lack of information demonstrated weaker escalation effects. In their search for a means of lowering irrational escalation among new product managers, Boulding, Morgan, and Staelin (1997) investigated the effect of making the managers aware of the ambiguity of information (rather than providing clear information). They found that acknowledging the existence and magnitude of uncertainties and the associated probability of poor outcomes prior to making the initial decision to invest in a new product does not reduce the probability of future commitment to a new product failure (Boulding, Morgan, and Staelin 1997). It is interesting to note that these results are inconsistent with those of Conlon and Parks (1997).

In summary, escalation effects are more pronounced in ambiguous decision environments or situations lacking information poverty while these effects may be lower or non-existent where a large amount of non-equivocal information exists. Inconsistent

research evidence makes it hard to conclude whether priming subjects of ambiguity of the environment serves to reduce escalation effects.

Riskiness of alternative

Schaubroeck and Davis (1994) investigated the escalation effect when the choice was either between two alternatives that were high in risk or low in risk. While they failed to find a main effect for riskiness of alternatives, it was found that subjects in the high responsibility condition demonstrated greater escalation tendencies when both alternatives were high in risk rather than when they were low in risk.

In summary, high-risk situations may enhance escalation effects for decision makers with high responsibility.

Social Variables

Influences of other individuals on a decision maker either through direct participation in the decision making process as is the case in group decision making or indirectly as passive observers or active observers (such as superiors) constitute the social influences on escalation of commitment.

Group or social variables can cause one to persist with a course of action due to social pressures such as norms for consistency, face saving (i.e., external justification), and public identification with a project. This category is identical to the social determinants identified by Staw and Ross (1987).

Social Influences on Group Decision Making

Crucial decisions in an organization are, in most cases, made by a group rather than an individual (Bazerman et al 1984, Janis 1982). This makes the study of escalation in group situations particularly relevant. Of specific interest to managers and researchers

is whether the findings on escalation errors in the context of individual decision making carry over to groups. Alternatively, are these errors diminished or magnified by the group?

Self-justification based explanations assume that decision makers continue to invest in a losing course of action in order to justify their initial decision. But these effects may be mitigated in groups. This is because a group decision may allow the blame for the poor decision to be shared, so that group members each feel less responsible for the decision than if they had made the decision alone. Such diffusion of responsibility for the initial decision might inhibit the arousal of motives to justify previous behavior (Whyte 1991a). Another line of reasoning arising from prospect theory suggests that members of a group employ multiple frames thereby diluting the effect of any specific frame. Lower frame-based biases would in turn reduce the likelihood of escalation effects in group decision making (Whyte 1993). Consistent with this proposition, Whyte (1991a) found that subjects in the group responsibility condition were less likely to escalate commitment than those in the individual responsibility condition. Furthermore, consistent with their theoretical expectation, subjects in the group responsibility condition experienced fewer feelings of personal responsibility for the initial decision than did subjects in the individual responsibility condition.

In contrast to the above findings, a number of studies report that groups are not much more capable of decision making than individuals. In fact, groups may actually exacerbate individual level biases (Argote, Seabright, and Dyer 1986; Nagao et al 1985). Two well-established products of group interaction, uniformity pressures and group polarization, may undermine the ability of the group to take effective decisions.

Uniformity pressures occur when mutual influence among group members result in a tendency to move toward the majority position in the group, even when there is no requirement for uniformity and even when the position taken by the majority is wrong (Janis 1982). Group polarization effects occur when group members after group discussion intensify the strength of their beliefs. Consistent with this theoretical expectation, Whyte (1993) found that whatever the dominant individual tendency, the group magnified it. Thus, if individuals were inclined to escalate commitment, then groups were also likely to escalate commitment but with much greater amounts.

Finally, a study by Bazerman et al (1984) failed to find any differences between individuals and groups in the average amount of resources committed to a failing course of action.

Thus, Whyte (1991a) found that individual decision making led to greater escalation of commitment than did group decision making. However, in a later paper, Whyte (1993) found the exact opposite in that group decision making led to greater escalation of commitment than did individual decision making. Bazerman et al (1984) found no difference in escalation tendency. These apparently inconsistent findings deserve clarification. Bazerman (1986), in describing Bazerman et al's (1984) study, stated that groups exhibited considerably more variance in the amount of additional resources committed than did individuals. A much higher percentage of individuals escalated commitment than did groups (Whyte 1991a), but the groups that did escalate commitment tended to do so to a greater degree than did individuals (Whyte 1993). In general, groups are less likely to escalate commitment, but when they do they escalate commitment to a much greater extent than individuals. However, the opposing influences

of fewer groups escalating but with greater amounts, cancel out the effect of each other. Thus, on the average, groups and individuals do not differ in total amount committed due to escalation (Bazerman et al 1984).

In summary, groups are less likely to escalate commitment, but when they do, escalation biases are much greater for groups than for individuals.

Social Influences on Individual Decision Making

Decision visibility: Individuals have been observed to behave differently when they are aware that their actions are being noticed by others. The most common explanation offered for escalation is self-justification (Staw 1981). Given that individuals like to be perceived positively and do not like to be wrong, visibility of their decision to others might magnify their need to justify their actions. This might lead decision makers to further escalate commitment. On the other hand, decision visibility might make decision makers more conscious of possible decisional errors such as irrational escalation.

Brockner, Shaw, and Rubin (1979) found a difference between whether the spending limit set by the subject was known only to himself (private condition) or it was known to others (public condition). It was found that subjects demonstrated greater commitment to their limit when the limit set was known to others than when it wasn't. Similarly Conlon and Wolf (1980) found that high decision visibility intensifies the decision maker's adherence to a previously chosen allocation rationale.

It must be noted that even though the subjects in the study by Conlon and Wolf (1980) were made aware that their decisions were visible to others, these decisions weren't scrutinized by others. Kirby and Davis (1998) and Simonson and Staw (1992)

found that when the decisions of subjects were actively scrutinized by others, then escalation of commitment was lower than when decisions were not scrutinized. Kirby and Davis (1998) also found that non-monitored agents were more likely to invest in risky strategies than monitored agents.

Fear of Consequences: Fox and Staw (1979) posited that administrators who are vulnerable to job loss or who implement a policy they know will be unpopular would be especially motivated to protect themselves against failure. Such decision makers would persist with their decision in the hope of achieving success even when the signs of failure are obvious. The empirical evidence supported this proposition in that administrators who were both insecure in their jobs and who faced stiff policy resistance were most likely to escalate their commitment of resources and become locked into a losing course of action.

Norms for Consistency: Staw and Ross (1980) investigated perceptions of decision makers that were consistent and those that were inconsistent. The consistent decision maker stuck to a single course of action through a series of negative results while the inconsistent decision maker was one that switched from one course of action to a second when positive results did not occur and then on to the third alternative if positive results were still not observed. Results of the study revealed that administrators were rated higher when they followed a consistent course of action. It was also interesting to note that this “hero effect” perception of the consistent decision maker was strongest among practicing administrators, followed by business students, and weakest among psychology undergraduates.

In summary, visibility of the decision to others, and more particularly scrutiny by others, lowers escalation of commitment. On the other hand, fear of negative

consequences of a decision, such as job insecurity and the fact that consistent behavior is evaluated more positively, may lead decision makers to escalate commitment.

Economic Variables

Economic variables are the rational or economic components of the project including market share, estimated sales volumes and profits, and financial performance measures (e.g., internal rate of return and return on investment). These variables are identical to what are described as project determinants by Staw and Ross (1987).

According to rational economic theory, the decision maker must base decisions of future investments on marginal costs and benefits. Thus, economic variables include all the indicators of future benefits and future costs and their associated probabilities (described as prospective information by Staw [1981]), and also their determinants. The next few paragraphs discuss some factors that make persistence a rational decision even when marginal costs exceed marginal benefits.

Long-term investments

Consider the situation of waiting for a bus or for a customer service person to come on the phone. In both these cases, as the time invested increases, the probability of achieving the goal increases. Thus, to the extent that the person's persistence is determined entirely by the increasing probability of achieving the goal, it is rational. On the other hand, if the person waits longer than would be suggested by the increasing probability, the decision would be irrational. From a research perspective, studies investigating the sunk cost effect must exercise caution in classifying persistence as being irrational. As described above, waiting or persisting is rational to the extent that it is a function of the probability of achieving the goal.

Payoff Structure

For some projects, the rewards accrue much later in the project. Examples include R & D projects devoted to long-term product development, and construction projects in which no benefits are forthcoming until the entire venture is completed. In general, in such situations, only after investing resources successively for a number of periods without any payback are the benefits received (Northcraft and Wolf 1984). In such situations, it is perhaps rational to continue investing.

Salvage Value and Closing Costs

There are certain project characteristics that make it very costly to withdraw from a course of action. If a decision is taken to terminate a project, the company is faced with the prospect of receiving the salvage value, which might include money from sale of the leftover materials of the project and also faces closing costs, which may include rolling back the changes made. Consider a pharmaceutical company investing in developing a new drug. If the project is terminated before development of the drug, the company may not receive much in terms of salvage value because of the nature of the development process. On the other hand, closure would necessitate payments for terminated employees, penalties for breached contracts, as well as losses from ending leases and closing physical facilities.

In summary, considerations such as the nature of investments, the payoff structure, salvage value and closing costs might make it rational to persist even when the marginal costs exceed the benefits.

Moderators

The focus of most previous research on sunk costs has been almost entirely on antecedents. The only moderator that has been investigated in past research is time. Consequences studied include affective implications and probability of success estimates.

Time

Passage of time has been found to weaken the effect of sunk costs. Arkes and Blumer (1985) investigated the effect of the price of a season pass to a movie theater on the number of movies watched. For the first half of the season, consistent with the literature on sunk costs, consumers who paid more watched more movies. But this effect disappeared in the second half of the season. Thus, the strength of sunk cost effects is contingent on time. Similarly, the low redemption rates for mail-in rebates have been explained by the temporal delay between choice and redemption (Soman 1998). In a study across three time periods, Staw and Fox (1977) found that the commitment of subjects who were personally responsible for the decision declined over time. On the other hand, for subjects who were not personally responsible for the decision, commitment remained the same or increased slightly with time. The authors explained these findings as a result of attempts by subjects to learn from the system over time.

In summary, escalation effects tend to wear out with the passage of time, particularly among high responsibility subjects.

Consequences

Among the consequences of the sunk cost effect are probability of success estimates and affective implications.

Probability of success estimates

The self-justification paradigm suggests individuals reinvest in a course of action in order to justify their previous actions. One more way of justifying one's actions is to believe that the goal is more likely. Evidence for such distortion of information, as a consequence of the decision, was found by Arkes and Blumer (1985, experiment 4). They found that subjects that had taken an investment decision had an inflated estimate of the likelihood that the completed project will be a success. In a later study, Arkes and Hutzel (2000) found that the probability of success estimates given after the investment decision was higher than those before the decision.

However, Garland (1990) failed to find evidence for inflation of probability estimates. In this study, perceived probability of profit was measured at different stages of investments. The respondents estimates for perceived probability of profit were the same regardless of the amount of previous investment made.

Affective implications

Faced with negative feedback, a decision maker may escalate commitment by reinvesting or withdraw by discontinuing investments. A decision to reinvest is based on selectively focusing on the positive aspects while neglecting the negative aspects. Such selective information processing is likely to give the decision maker a feeling of happiness and satisfaction with oneself. Consistent with this line of reasoning, Cialdini (1984) found that people have positive feelings about products for which they paid higher prices. On the other hand, a decision to withdraw involves the admission of a bad initial decision. This is expected to be accompanied by feelings of negative affect.

Contexts

Although escalation of commitment has been extensively researched as evident from the literature reviewed above, almost all of this research has studied this effect in the context of money. In this section, I review the little research that has directly tested sunk cost effects in the context of other resources and also literature that provides indirect evidence for sunk cost in the context of time, effort, and emotions.

At least three pieces of literature indicate that the sunk cost effect may not be limited to just monetary resources. First, Kahneman and Tversky (1979, p.290), in discussing extensions of prospect theory said, "...the theory is readily applicable to choices involving other attributes, e.g., quality of life or the number of lives that could be lost or saved as a consequence of a policy decision. The main properties of the proposed value function should apply to other attributes as well." Clearly the proponents of prospect theory did not intend it to be limited to the domain of money. This is particularly relevant since many authors have explained the sunk cost effect as being a special case of prospect theory. Specifically, the value function in the loss domain quite accurately describes the sunk cost effect.

Second, Arkes and Blumer (1985, p.124) define the sunk cost effect as "a greater tendency to continue an endeavor once an investment in money, effort, or time has been made." Here again, the authors suggest that the effect may also hold for non-monetary investments. Third, Staw (1981, p.577) quoted the following as an example of escalation of commitment. "An individual has spent three years working on an advanced degree in a field with minimal job prospects (e.g., in the humanities or social sciences). The individual chooses to invest more *time and effort* to finish the degree rather than

switching to an entirely new field of study. Having obtained the degree, the individual is faced with the options of unemployment, working under dissatisfying conditions as part-time or temporary status, or starting anew in a completely unrelated field” [italics added]. In the next few paragraphs I explore sunk cost effects for the non-monetary resources, time, effort, and emotion.

Time

In the only direct test for the sunk cost effect of time that I am aware of, Soman (2001) failed to find any evidence for such an effect. The only way this effect was found was when the investments of time were directly related to their monetary value. Soman (2001) concluded that consumers are incapable of accounting for time in the same manner that they account for money. But providing them with a means to convert time investments into equivalent money allowed them to account for time in the same manner as they accounted for money. He proposed that the inability to account for time was caused by fundamental differences between time and money. Specifically, time cannot be inventoried or replaced, it is not easily aggregated and unlike accounting for money, accounting for time is not a routine activity.

The only other study that tested a similar effect investigated whether consumers treat time like money when taking decisions (Leclerc et al 1995). Specifically, they tested the value function of prospect theory in the context of time. Their results offered only partial support to the value function for time. Specifically, while consumers were risk averse in the gain domain as is the case for money, they were also risk averse in the loss domain, contrary to the findings for money.

Effort

To my knowledge, there exists no direct test of the sunk cost effect for effort. The study that comes closest to testing this effect is one by Kivetz (2003). Rather than directly testing the value function in the context of time, he proposed a model whereby the value function for money shifted to the right with effort investments. Effort was found to be non-linearly (inverted parabola) related to risk taking behavior. When a small amount of effort had been invested, subjects preferred the risky reward condition. However, when a larger amount of effort was invested, they wanted the sure reward (no risk condition). When very large amounts of effort had been invested, the risky reward condition was selected because it was felt that the sure reward would not be large enough to compensate them for their effort investments.

Emotions

Some literature in psychology has suggested that emotions may be another context where sunk cost effects might be observed. It has been observed that individuals continue in relationships, marital as well as non-marital, much after it has turned sour. This continuance in the relationship is because of concerns about the amount that has already been invested in the relationship. It must, however, be noted that much of this evidence is anecdotal and to my knowledge, there exists no direct test for the sunk cost effect for emotions.

In summary, sunk cost effects have either directly or indirectly been explored in contexts other than money. However, the amount of research is rather limited to generate any concrete conclusions.

Theoretical Explanations

A number of theories have been offered to explain escalation of commitment. These include, self-justification, prospect theory, attribution theory, desire to reduce waste, decision dilemma theory, and goal substitution theory.

It is possible that there is no one theory that completely explains escalation of commitment phenomena. Instead, these theories may all be interwoven (Brockner 1992; Staw and Hoang 1995).

Self-justification

Individuals have a need to be correct, especially when it is a decision taken by them (Staw 1976) or when the consequences of the decision are visible to others (Brockner, Shaw, and Ruben 1979; Conlon and Wolf 1980; Staw 1981). Thus, when the feedback obtained as a result of a decision is negative, decision makers may attempt to rationalize their initial decision. The process of rationalization may involve biased information processing and/or persistence in the initial course of action. While it has been suggested that biased information processing leads to persistence in the initial course of action, it is not a necessary condition for persistence. In the next few paragraphs, I trace the roots of self-justification and discuss the mechanism by which decision makers escalate commitment.

According to the theory of cognitive dissonance, whenever an individual is faced with dissonance between cognitions or between a behavior and a cognition, he experiences psychological discomfort. This might be manifested as a negative affective reaction or mood, which gives rise to pressures to reduce dissonance and thereby

minimize the psychological discomfort. This may be done by altering either one's cognition or behavior (Festinger 1957).

In some cases where the consumer is committed to maintain the existing behavior, attempts may be made to reduce dissonance by altering cognitions (Staw 1974; Weick 1964). This may be done by (i) altering the weights given to supporting and contradicting information and/or (ii) by bringing in new information to support the behavior. This may include searching for supporting information and ignoring contradicting new information.

The literature on cognitive consistency suggests that when a person's behavior leads to negative consequences, the individual cognitively distorts the negative consequences to more positively valenced outcomes (Abelson et al 1968; Aronson 1966; Weick 1966). In addition to the distortion of information, the consumer may selectively filter information (Caldwell and O'Reilly 1982; Lord, Ross, and Lepper 1979). The phenomenon underlying this biasing of behavioral outcomes is often said to be a self-justification process in which individuals seek to rationalize their previous behavior or psychologically defend themselves against adverse consequences (Aronson 1968, Festinger 1957). Over and above biasing of information, the individual may maintain cognitive consistency by also reinvesting resources in the same course of action.

Consumers and managers in their roles as decision makers are not immune to the temptation of information distortion (Taylor and Brown 1988). In fact, managers use a variety of heuristics and are susceptible to biases in simplifying the information environment to take decisions (Russo and Schoemaker 1989).

In a scenario-based experiment with managers, it was found that enriching or improving the information environment does not substantially reduce commitment to a

losing course of action. Instead, managers distort the provided information to justify continued commitment to the initial course of action (Boulding, Morgan, and Staelin 1997). Specifically, they found that participants who committed to failing products interpreted negative information positively in 152 out of 155 instances at the post-commercialization stage. Decision makers, in general, are highly adept at seeking out evidence to support their views while ignoring disconcerting information (Drummond 1997).

Other evidence for biased information processing comes from a study by Conlon and Parks (1987) where they found that decision makers who perceived that they were responsible for a failure tended to request information that was more useful for justification of past outcomes than for the prediction of future outcomes.

In general, studies investigating information distortion have found that decision makers process unsupporting feedback in a biased manner. Furthermore, the literature dealing with escalation of commitment suggests that when administrators are able to move beyond the mental distortion of reality in order to rationalize past mistakes, they will do so. This may often be accomplished by the increasing commitment of resources and the risking of additional errors. In an attempt to justify previous behavior and to establish the rationality of a course of action, administrators may become either trapped or committed to a failing or losing course of action.

Since the theory of self-justification predicts that decision makers act to justify their previous actions, it is reasonable to expect that the phenomenon of escalation of commitment will be limited to situations where the individual making the reinvestment decision is the same as the one who made the initial investment decision. When the same

individual makes successive investments, he is said to be 'personally responsible'. Thus, tests of the theory of self-justification involve testing the effect of personal responsibility on escalation of commitment. In summary, a crucial assumption of the self-justification explanation is that there is some personal responsibility for prior expenditures; without responsibility, sunk costs may not be a potent factor in decision making.

A number of studies that have demonstrated the effect of personal responsibility on escalation of commitment in a wide range of situations have contributed to our confidence in self-justification as a sound theoretical explanation for escalation effects (Boulding, Morgan, and Staelin 1997; Davis and Bobko 1986; Schaubroeck and Davis 1994; Schmidt and Calantone 2002; Simonson and Staw 1992; Staw 1976; Staw and Fox 1977). The effect of responsibility has also been found in group settings (Whyte 1991a). This effect has also been validated in real world studies (Staw, Barsade, and Koput 1997). In addition, theoretical reviews have suggested that although there may be more than one explanation for escalation of commitment, self-justification has the greatest explanatory power (Brockner 1992; Staw and Ross 1987).

Schoorman et al (1994) compared the effects of framing (prospect theory) and self-justification and found that while effects of responsibility were robust, the effects of framing were contingent on the amount of information provided to the subjects. When subjects were provided a lot of information, framing effects disappeared. Davis and Bobko (1986) obtained similar results when they compared self-justification effects and framing effects. They only found an effect of responsibility on resource allocation.

In spite of the evidence in favor of a self-justification explanation, there exist a few studies that failed to find an effect of responsibility. Specifically, Whyte (1993)

found that personal responsibility is a sufficient cause for escalation but not a necessary one. Furthermore, McCain (1986) found that low responsibility subjects persisted longer than high responsibility subjects, a finding opposed to that predicted by self-justification. Finally, in his theoretical exposition, Whyte (1986) suggested that framing was better explanation than self-justification.

In summary, there is a great amount of support for self-justification as a theoretical explanation and in spite of some non-supporting evidence, it remains one of the two dominant explanations for escalation of commitment.

Prospect theory

Prospect theory (Kahneman and Tversky 1984) forms a framework for the descriptive analysis of choice under risk. It describes the manner in which people evaluate risky outcomes. Two of the ways in which it differs from expected utility theory are particularly relevant to its application in explaining escalating commitment. First, prospect theory adopts the more limited but also more realistic perspective that people evaluate outcomes of decisions in terms of gains or losses relative to a neutral reference point such as the status quo or current asset position, rather than in terms of a change in total wealth or total asset position.

Furthermore, the sensitivity of individuals to either a gain or loss is dependent on their current asset position. The variation in an individual's perception of a gain or loss is described by the value function (Kahneman and Tversky 1979). The value function is concave above the reference point or in the gain domain and convex below the reference point or in the loss domain. The implication of this non-linear form of the value function is that the perceived value attached to a loss from \$50 to \$100 is perceived to be more

aversive than an identical loss from \$950 to \$1,000. Similarly the perceived value attached to a gain from \$50 to \$100 is more attractive than a gain from \$950 to \$1,000. Thus, losses early on are perceived to be more aversive than losses sustained later on while gains obtained early on are perceived to be more attractive than gains obtained later.

Escalating commitment might be seen as a case of investments in the loss domain (Whyte 1986). On receiving negative feedback in terms of initial losses, the decision would be framed as a choice between losses. Furthermore, the greater the investments already made the less aversive future losses would be. In other words, as the amount of resource invested increases, the decision maker will become more likely to be risk seeking and invest more resources in the hope of recouping previous losses.

Second, prospect theory relies upon the certainty effect. This is a psychological principle which holds that a given decrease in the probability of an event will have the greatest impact when the event is initially considered inevitable, rather than merely possible. The certainty effect promotes risk seeking in choices between losses by exaggerating the distastefulness of losses that are certain relative to those that are less sure. When choices are made between gains, the certainty effect leads to risk aversion, since the attractiveness of positive gambles is diminished relative to sure things. These two aspects of prospect theory predict individuals to be risk seeking in the loss domain, the extent of which being determined by the current asset position.

Prospect theory implies that when sunk costs are incurred in a losing course of action and these costs still possess economic value in their original use or have yet to be fully depreciated, subsequent decisions concerning whether to continue the initially

chosen course of action are likely to be framed as a choice between losses. Project abandonment is perceived as accepting a certain loss, whereas escalation is perceived as possibly increasing losses combined with a chance that losses may be avoided. The belief that sunk costs are relevant in decision making, an error to which even practicing managers are susceptible (Boulding, Morgan, and Staelin 1997), creates the perception of a choice between losses. Thus, escalating commitment is a natural consequence of negatively framing a decision.

One of the strengths of prospect theory as an explanation of escalation effects is its ability to predict escalation effects under both low and high responsibility conditions. Self-justification theory, on the other hand, is capable of predicting an effect for only the high responsibility condition. Since escalation effects have been observed under both high and low responsibility conditions (Garland 1990), some have touted prospect theory as being a better explanation for escalation of commitment (Whyte 1986). This theory has been used by a number of researchers to explain escalation effects for both individuals (Bazerman 1984; Garland and Conlon 1993; Schaubroeck and Davis 1994) as well as groups (Whyte 1993).

Despite its merits, prospect theory may not be a completely sufficient explanation. First, prospect theory fails to provide a comprehensive explanation of all the results of previous literature. For instance, Schoorman et al (1994) found that prospect theory explained escalation effects only when information available was low. In other words, subjects responded to framing effects only when they had no other information available. As the amount of information provided increased, the subjects were less likely to rely on

the type of frame. Second, prospect theory fails to explain the differential effect of low and high responsibility on the level of escalation.

In summary, prospect theory is one of the two dominant explanations of escalation effects and is capable of explaining these effects in a wide range of situations.

Decision Dilemma Theory

Decision dilemma theorists consider the main problem to be information poverty and/or absence of budgets or limits. Inability or difficulty in obtaining clear and reliable information makes it difficult for decisions makers to be able to exclude miscalculation from judgments about personnel or situations (Bowen 1987). Absence of budgets (Heath 1995) or limits (Teger 1980) prevents decision makers from setting up a cut-off point for when to stop investing. Thus, persistence is the most prudent alternative.

Analyzing previous research that has demonstrated escalation effects, Bowen (1987) argued that it is hard to call escalation decisions errors because there was clearly not enough information in experimental scenarios (e.g., Staw 1976) or anecdotes (e.g., Vietnam War) to assess whether the decisions at the time were in fact mistakes. A number of relevant issues neglected in experimental manipulations might play a role in the decision. Simply providing subjects with data showing declining sales and profits and disregarding other contextual equivocalities is not enough to convincingly demonstrate escalation to a failed course of action. Thus, based on prior research on escalation, it is difficult to determine whether the subjects reinvested in their experimental courses of action because of psychological manipulations or because they felt that they were making the economically prudent decision under equivocal circumstances. In general, decision dilemma theorists believe that escalation effects found in previous research were a result

of information poverty rather than the psychological, investment or social variables manipulated.

In a supporting experiment, McCain (1986) found escalation effects only in situations of information poverty. The results of the study indicated that subjects escalated commitment in the early stages and then reduced their commitment toward the latter stages. He explained his findings as follows: when an investment first shows signs of failure, information vital to decisions for future investments is usually not available. Thus, the decision maker relies on the available information to take a decision. The decision maker may also rely on subjective impressions. Over time, as some of the missing information becomes available, the decision maker is able to make a rational decision and thus escalation of commitment should cease as unambiguous diagnostic information becomes available.

The other reason proffered for escalation effects is the absence of internal or external budgets. According to the mental budgeting model, people escalate commitment only when they fail to set a budget. This may happen when information about benefits is not available on the outset. One such situation when subjects fail to set a budget is when information about benefits is not available at the outset. Another situation is when it is difficult to track investments. This may happen when investments involve multiple resources or investments are incurred in very different transactions (Heath 1995).

Decision dilemma theorists have attributed observed escalation of commitment effects to the vacuum like settings of most experiments. The external validity of manipulations for most escalation studies has been questioned, since it is not clear how many environments give people no diagnostic information. Moreover, experiments that

omit information about benefits make it difficult to experimentally control the beliefs of subjects about the benefits of the future investment (Bowen 1987; Heath 1995).

Although, decision dilemma theorists attribute escalation effects to information poverty, Boulding, Morgan, and Staelin (1997) found that acknowledging the existence and magnitude of uncertainties and providing opportunity costs does not greatly reduce the problem of prolonged commitment to new product failures. Schmidt and Calantone (2002) found that simply giving managers better information will not necessarily lead to better decisions. Other research on limit setting has revealed that decision makers escalate commitment even in the presence of budgets or limits, although the effect is weaker (Boulding, Morgan, and Staelin 1997; Simonson and Staw 1992).

In summary, decision dilemma theory explains escalation effects as being a result of insufficient information or lack of budgets.

Desire to reduce waste

Individuals in general don't like to waste. Societal norms too are consistent with this dislike for waste. Driven by this aversion to waste, individuals in their role as decision makers and consumers seek to minimize waste. Individuals may minimize waste by refraining from making expenditures that are not expected to provide an acceptable level of benefit. Thus, consumers refrain from buying products that are overpriced or products that they don't have a need for. Decision makers avoid investments that are not expected to yield sufficient returns.

While spending frugally is an obvious way of minimizing waste when investments haven't already been made, sunk cost situations are characterized by an investment that has already been made. Under such situations, individuals who have

already made an investment are faced with a decision to spend more or stop spending. Arkes and Blumer (1985) proposed that consumers who had already invested in a course of action would continue to invest in this course of action in order that their initial investment is not wasted. Specifically, if the consumer stopped investing, it would mean accepting the initial investment as a loss. In other words, the initial investment would have been wasted. As an illustration, consider the situation of a man who paid a membership fee at a tennis club and subsequently developed a tennis elbow. This person would continue to play tennis in spite of his elbow, because if he didn't that would imply accepting the membership fee as a loss or as wasted expenditure. (Thaler 1980).

In summary, desire to reduce waste explanation predicts that consumers decide to reinvest because if they didn't do so, their initial investment would be wasted.

Goal Substitution theory

As progress is made on a project, completion of the project itself takes increasing precedence over other goals (e.g., economic profit) that may have been more salient at the time the project was initiated (Garland and Conlon 1998). This phenomenon has been labeled as goal substitution.

In contrast to the sunk cost hypothesis, goal substitution is not driven by past expenditures of money and effort; rather, it is driven by the belief that project completion is close at hand. Garland and Conlon argue that individuals get caught up in the desire to complete what they have started, and as this completion draws nearer, information that might have been taken into consideration before choosing to undertake the project (e.g., cost-benefit ratios) become increasingly unimportant.

In general, the goal substitution effect is also consistent with the Brockner et al (1979) entrapment paradigm which argues that goals shift “from an economic motive at the outset to some other motive later.”

Incomplete tasks, in general, have been found to result in both frustration and perseverance (Zeigarnik 1927). This can be seen in the following statements extracted from interviews conducted with decision makers that were part of Project Taurus, a £500 million IT venture that collapsed.

“Let’s get it over with”,
“Let’s get the bloody thing and behind us.”
“We have already come so far, let’s finish it off now.” (Drummond 1998).

Conlon and Garland (1993) found that sunk costs and project completion have independent effects on likelihood of reinvestment and the effect of project completion was stronger than that of sunk cost. In a replication study, Garland and Conlon (1998) found evidence for only project completion. Boehne and Paese (2000) put the goal substitution explanation to test in the presence of economic motives. Consistent with the explanation, the quantitative results and qualitative responses suggested a shift in goals as the project progressed. Specifically, the goals shifted from profitability to completion as the project progressed.

In summary, goal substitution theory predicts that escalation occurs due to proximity to goal rather than due to previous investments.

Chapter 3: Scale for Self-Justification

Introduction

Driven by a need to appear to have taken a good decision (Staw 1976), individuals seek to justify their decisions to themselves and others (Brockner, Shaw, and Rubin 1979; Conlon and Wolf 1980; Staw 1981). Self-justification is the tendency to justify one's actions. This is particularly relevant to the sunk cost phenomenon since a number of researchers have proffered self-justification as an explanation for this phenomenon. It has been suggested that individuals who have made an investment, monetary or non-monetary, expect to make a good decision. But when things don't go as planned, individuals may distort negative feedback (Boulding, Morgan, and Staelin 1997; Conlon and Park 1987; Drummond 1997) and ultimately reinvest in the same course of action to justify their initial decision (Boulding, Morgan, and Staelin 1997).

If self-justification is in fact an explanation for the sunk cost phenomenon, then it could be a useful construct for identifying individuals susceptible to this bias. By determining the extent to which an individual engages in self-justification, it might be possible to assess how susceptible the individual is to sunk cost biases. Such information would be quite useful to organizational behaviorists and marketers. Toward this end, I develop a scale for self-justification in this section.

Dimensions of self-justification

Self-justification is a complex construct encompassing a number of dimensions. The motivation for self-justification might be internal, external or might involve distortion of information. Individuals may seek to justify their decisions to appear correct in their own eyes in which case the self-justification is internally driven. On the other hand, a number of researchers have found that individuals are quite concerned about what their peers, friends or superiors might think of their decision (Brockner, Shaw, and Rubin 1979; Conlon and Wolf 1980; Staw 1981). In this case, the need for justification is externally motivated. Finally, the process of self-justification may involve distortion of information (Boulding, Morgan, and Staelin 1997). Thus, I expect self-justification to have three dimensions: internal self-justification, external self-justification and information distortion.

Scale for Self-justification

A scale for self-justification may be seen as being tied to a specific context or independent of the context. The context-independent scale for self-justification could be useful in identifying individuals or categories of individuals susceptible to the sunk cost bias. On the other hand, a context-dependent scale for self-justification may be used to test the role of self-justification as an explanation for the sunk cost phenomenon. In this section, I develop both a context-independent as well as a context-dependent scale for self-justification.

Scale Development: Context-independent Scale

Item Development

An initial pool of 29 items was generated to reflect the three dimensions of self-justification. Item generation relied on conceptions of self-justification found in peer-reviewed and trade publications and examining qualitative data obtained in an exploratory investigation. These items were then subjected to a test of content validity in two stages (Bearden et al 1989). First, three judges were given the definition of each dimension, a related explanation, and an example item. The judges were then asked to assign the statements to one of the three dimensions or a “not applicable” category. After eliminating items that did not receive the appropriate categorization by at least two of the three judges, 25 items remained. Second, the same set of judges was given the definition of self-justification and was told about the dimensional structure of self-justification. They were then asked to rate each statement in terms of its applicability as an item for self-justification. The rating was done on a five-point scale with anchors very applicable (1) and not applicable (5) The items receiving a mean score higher than 3.5 were eliminated. Based on this criterion, none of the items were eliminated leaving me with 25 items. The dimension assignments and the appropriateness ratings of the final scale are show in Table 3.1.

Table 3.1: Content Validity and Exploratory Factor Analysis *

Item	Content validity		Dimensions (factor loadings)		
	Assigned Dimension	Appropriateness (1 – very applicable, 5 – not at all applicable)	Internal	Distortion	External
sj1	Internal	1.0	0.69	0.05	0.05
sj2	Internal	1.0	0.78	0.14	0.05
sj3	Internal	2.3	0.46	0.23	0.16
sj4	Internal	3.3	0.45	0.13	0.22
sj5	Internal	3.3	0.58	0.09	0.24
sj6	Distortion	1.3	0.29	0.47	0.18
sj7	Distortion	2.3	0.07	0.46	0.03
sj8	Distortion	3.0	0.03	0.80	0.09
sj9	Distortion	3.3	0.09	0.48	0.13
sj10	External	1.7	0.22	0.12	0.66
sj11	External	2.0	0.06	0.14	0.70
sj12	External	1.3	0.30	0.06	0.52
sj13	External	1.7	0.20	0.01	0.59
sj14	External	1.3	0.18	0.00	0.77
sj15	External	2.7	0.23	0.08	0.67

* The entries in the table are absolute values of factor-loadings. The exact description of each item is in Table 3.2.

Samples for Scale Development

The first sample consisted of 159 undergraduate management students at a large mid-western university. Of these students, 53% were female. These students received extra credit for participation in this study. The second sample consisted of undergraduate students taking a course in production and operations management at a large mid-western university. The sample consisted of 69 students of which 43% were female. As with the first sample, student subjects were offered extra credit as an incentive for participation.

Item Refinement

An index of Kaiser's measure of sampling adequacy (overall MSA = 0.797) and Bartlett's test of sphericity (chi square = 1748.79, $p = 0.00$) suggested the data in the sample was suitable for factor analysis. Since the dimensions are expected to be related to each other, an exploratory factor analysis with oblique rotation was run. Data from all 25 questions (tapping the three dimensions) were analyzed by a common factor analysis using Oblimin rotation. Since my interest was in determining items that correspond to one of the three dimensions of self-justification, I forced a three-factor solution. The resulting model captured 38% of total variance. The first factor captured less than half of the total variance indicating that method variance is an unlikely explanation of the factor solution. The results of the factor analysis were used to further refine the scale. Items that had communality estimates below 0.40, factor loadings under 0.30 or significant cross loadings were deleted. Based on these criteria, 10 items were deleted, leaving 15 items. Item descriptions and factor loadings of the refined scale are listed in Table 3.1.

Assessment of Latent structure

The refined scale obtained after conducting an exploratory factor analysis was subjected to a confirmatory factor analysis. Items were specified to load on the corresponding dimension of self-justification. The overall fit measures of the model were good. For both samples the CFI was above 0.95 and RMSEA was below 0.07. Factor loadings of items in this scale are presented in Table 3.2.

Table 3.2: Latent Structure

Dimension	Item	Standardized factor loading	
		Sample 1 (n=159)	Sample 2 (n=69)
Internal (Cronbach's alpha = 0.75, 0.78)			
	I feel a need to justify my actions to myself (sj1)	0.70	0.45
	It is important for me to appear rational to myself (sj2)	0.97	0.56
	I feel accountable to myself for my previous actions (sj3)	0.54	0.73
	I have a need to be correct (sj4)	0.44	0.71
	I find it hard to accept failure (sj5)	0.42	0.85
Distortion (Cronbach's alpha = 0.51, 0.64)			
	I look for information that supports my decisions (sj6)	0.63	0.93
	I tend to focus on the positive consequence of my decisions (sj7)	0.56	0.54
	I generally make good decisions (sj8)	0.69	0.79
	I am correct most of the times (sj9)	0.28	0.84
External (Cronbach's alpha = 0.83, 0.85)			
	I am concerned about what others would think if I change my decision (sj10)	0.80	0.50
	I find it hard to admit to others that I made a bad decision (sj11)	0.68	0.91
	I feel a need to justify my actions to others, especially when my actions are being monitored (sj12)	0.64	0.62
	I am concerned about what others think about the decisions I make (sj13)	0.60	0.59
	I tend to hide from others instances when I failed (sj14)	0.66	0.52
	I do my best to conceal the errors resulting from my decisions from others (sj15)	0.55	0.54
Overall Scale (Cronbach's alpha = 0.79, 0.85)			
	Chi Square	161.54, 78df	112.69, 77df
	RMSEA	0.079	0.063
	CFI	0.92	0.95

Since the dimensions were moderately correlated (phi coefficients ranged from 0.1 to 0.5), the chi square for a single factor model was compared to the three-dimension

model. The difference in chi-square was significant in both datasets indicating that the three dimension model is superior in fitting the data (Table 3.3).

Table 3.3: Dimensionality

Sample	Chi-square value		Chi-square difference	p-value
	1-factor model	3-factor model		
Sample 1 (n=159)	315.55, 81df	161.54, 78df	154.01, 3df	p<0.001
Sample 2 (n=69)	166.79, 80df	112.69, 77df	54.10, 3df	p<0.001

Reliability

Cronbach's alpha was calculated separately for the items comprising the three dimensions and then for the entire scale. The five internal self-justification items produced a cronbach's alpha of 0.75 in the first sample and 0.78 in the second sample. For the four distortion self-justification items, the cronbach's alpha was 0.51 in the first sample and 0.64 in the second sample. The six-item external self-justification dimension had a cronbach's alpha of 0.83 in sample 1 and 0.85 in sample 2. When combined into a single scale, alpha for the 15 items were 0.79 and 0.85 in samples 1 and 2 respectively.

Social Desirability

A tendency for self-justification in many contexts can lead to decisional errors such as the sunk cost phenomenon. It is possible that subjects aware of the negatives of over-justification offered socially desirable responses. Therefore, I decided to conduct a test of social desirability. Social desirability was measured in the first sample with 10 items from the Marlowe-Crowne scale (Crowne and Marlowe 1960). These items were chosen from the larger scale because they have been shown to possess greater sensitivity

than other items and are appropriately keyed for current standards of desirable behavior (Ballard, Crino, and Rubenfield 1988). Correlations with the social desirability measure were -0.15, 0.06, and -0.28 for the internal, distortion, and external dimensions respectively, and -0.23 for the combined scale. The low correlations suggest that social desirability bias is not a problem for these measures.

Discussion

The context-independent scale of self-justification developed has been found to be fairly robust. From the perspective of this dissertation, the goal of this scale is to test the role of self-justification as an explanation of the sunk cost effect. However, this scale may also be used for identifying specific categories of people in both organizational as well as marketing settings. In the following section, I develop a context-dependent version of this scale.

Scale Development: Context-dependent Scale

Item Development

The items for the context-dependent scale were selected from the context-independent scale. Nine items were selected so that each dimension was represented by three items. These items were appropriately modified so that they were tied to a situation or context. These items were selected based on the factor loadings of the items in the context independent scale and also based on the adaptability of these items to a context-dependent measure.

Research Instrument and Sample

Subjects were described a typical sunk cost scenario after which they were asked to make one of the two possible decisions. This was followed by a set of nine self-justification items that were framed as reasons for the decision. Next, subjects were asked questions on a number of other measures and demographics.

The first sample consisted of 23 undergraduate marketing students from a university in the mid-west and 60 undergraduate marketing students from a university in the west. In both sets, subjects were offered extra credit as an incentive for participation. Since the responses of the subjects across the two samples were similar, the two samples were merged to give a combined sample of 83 students. Of these 33% were female. The second sample consisted of undergraduate students taking a course in production and operations management at a large mid-western university. The sample consisted of 69 students of which 43% were female. As with the first sample, student subjects were offered extra credit as an incentive for participation.

Item Refinement

An index of Kaiser's measure of sampling adequacy (overall MSA = 0.726) and Bartlett's test of sphericity (chi square = 422.64, $p = 0.00$) suggested the data in the sample was suitable for factor analysis. Since the dimensions are expected to be related to each other, an exploratory factor analysis with oblique rotation was run. Data from all 9 questions (tapping the three dimensions) were analyzed by a common factor analysis using Oblimin rotation. Since my interest was in determining items that correspond to one of the three dimensions of self-justification, I forced a three-factor solution. The resulting model captured 68.6% of total variance. All the items had extracted communalities higher than 0.55 (with the exception of 'sj6' which had an extracted communality of 0.4). All but sj6 had factor loadings higher than 0.75. Since sj6 had poor fit indices (factor loading = 0.46), it was dropped from the scale. Item descriptions and factor loadings of the scale are listed in Table 3.4.

Table 3.4: Exploratory Factor Analysis *

Item	Dimensions (factor loadings)		
	Internal	Distortion	External
sj1	0.76	0.03	0.00
sj2	0.87	0.01	0.00
sj3	0.96	0.06	0.01
sj4	0.09	0.76	0.00
sj5	0.05	0.78	0.00
sj7	0.00	0.09	0.79
sj8	0.08	0.09	0.96
sj9	0.11	0.00	0.81

* The entries in the table are absolute values of factor-loadings. The exact description of each item is in Table 3.5.

Assessment of Latent structure

The refined scale obtained after conducting an exploratory factor analysis was subjected to a confirmatory factor analysis. Items were specified to load on the corresponding dimension of self-justification. The overall fit measures of the model were good (chi-square = 21.63 with 17df, $p=0.20$; CFI = 0.99; GFI = 0.94). Factor loadings of items in this scale are presented in Table 3.5.

Table 3.5: Latent Structure

Dimension	Item	Standardized factor loading	
		Sample 1 (n=83)	Sample 2 (n=69)
Internal (Cronbach's alpha = 0.90, 0.83)			
	I feel a need to justify the amount paid for the ticket (sj1)	0.74	0.78
	I have spent too much money on the ticket to not go to the game (sj2)	0.86	0.66
	After the amount of money spent, I feel pressured to go to the game n (sj3)	1.00	0.74
Distortion (Cronbach's alpha = 0.75, 0.95)			
	It is a good game (sj4)	0.93	0.89
	It is the kind of game I have been looking forward to (sj5)	0.65	1.00
External (Cronbach's alpha = 0.89, 0.93)			
	My friends won't think much of me if I miss the game (sj7)	0.79	0.91
	My friends will laugh at me if they find out that I didn't go to a game for which I bought a ticket (sj8)	0.93	0.88
	I wouldn't know what to say when my friends ask me how the game was (sj9)	0.84	0.91
Overall Scale (Cronbach's alpha = 0.63, 0.85)			
	Chi Square	21.63,	24.13.
		17df	16df
	RMSEA	0.053	0.077
	CFI	0.99	0.98

Since the dimensions were moderately correlated (phi coefficients ranged from 0.01 to 0.5), the chi square for a single factor model was compared to the three-dimension model. The difference in chi-square was significant in both datasets indicating that the three dimension model is superior in fitting the data (Table 3.6).

Table 3.6: Dimensionality

Sample	Chi-square value		Chi-square difference	p-value
	1-factor model	3-factor model		
Sample 1 (n=83)	186.62, 20df	21.63, 17df	164.99, 3df	p<0.001
Sample 2 (n=69)	115.43, 19df	22.37, 16df	93.06, 3df	p<0.001

Reliability

Cronbach's alpha was calculated separately for the items comprising the three dimensions and then for the entire scale. The three internal self-justification items produced a cronbach's alpha of 0.90 in the first sample and 0.83 in the second sample. For the two distortion self-justification items, the cronbach's alpha was 0.75 in the first sample and 0.95 in the second sample. The three-item external self-justification dimension had a cronbach's alpha of 0.89 in sample 1 and 0.93 in sample 2. When combined into a single scale, alpha for the eight items were 0.63 and 0.85 in samples 1 and 2 respectively.

Discussion

In the preceding section, I developed a context-dependent scale of self-justification scale which is in a number of ways similar to the context-independent version of this scale. However, the application of this scale is limited to testing self-justification as an explanation for the sunk cost effect.

Chapter 4: Scale for Desire to Reduce Waste

Introduction

Individuals have a desire to not appear wasteful. Wastage of resources such as money, time and effort result in negative feelings. Consequently, individuals try to minimize waste of resources. This desire to reduce waste has been offered as one of the explanations for the sunk cost phenomenon (Arkes and Blumer 1985). It has been suggested that individuals who have made an investment, monetary or non-monetary, refuse to stop investing because doing so would imply accepting that their initial investment was futile. Consider the following scenario

Imagine you *got a free ticket* [spent \$50 on a ticket] to a football game. On the day of the game, there is a snowstorm. Will you go to the game?

When the above scenario was presented to student subjects, it was found that those who had paid for the ticket were more likely to go to the game than those who had got a free ticket. One of the possible reasons for this is the subjects' desire to keep the amount paid for the ticket from being wasted.

If desire to reduce waste (DRW) is in fact an explanation for the sunk cost phenomenon then it could be a useful construct for identifying individuals susceptible to this bias. By determining an individual's tendency to reduce waste, it might be possible to assess how susceptible the individual is to sunk cost biases. Such information would be quite useful to organizational behaviorists and marketers. Toward this end, I develop a scale for desire to reduce waste.

Scale for DRW

A scale for DRW may be seen as being tied to a specific context or independent of the context. The context-independent scale for DRW could be useful in identifying individuals or categories of individuals susceptible to the sunk cost bias. On the other hand, a context-dependent scale for DRW may be used to test the role of DRW as an explanation for the sunk cost phenomenon. In this section, I develop both a context-independent as well as a context-dependent scale for DRW.

Scale Development: Context-independent Scale

Item Development

An initial pool of 27 items was generated to reflect the concept of DRW. Item generation relied on conceptions of DRW found in peer-reviewed and trade publications on topics such as saving, conservation, and wastefulness. Additionally, items were generated by examining qualitative data obtained in an exploratory investigation. These items were then subjected to a test of content validity. Three judges were given the definition of DRW and were asked to rate each statement in terms of its applicability as an item for DRW. The rating was done on a five-point scale with anchors very applicable (1) and not applicable (5). The items receiving a mean score higher than 3.5 were eliminated. Based on this criterion, none of the items were eliminated. The appropriateness ratings of the final scale are show in Table 4.1.

Table 4.1: Content Validity and Exploratory Factor Analysis *

Item	Content validity: Appropriateness measure (1 – very applicable, 5 – not at all applicable)	Factor loadings
drw1	1.0	0.56
drw2	1.0	0.63
drw3	1.0	0.71
drw4	2.3	0.51
drw5	2.0	0.79
drw6	1.3	0.78
drw7	2.7	0.72
drw8	3.0	0.78
drw9	2.0	0.63
drw10	1.0	0.72
drw11	2.0	0.69
drw12	2.0	0.62

* The entries in the table are absolute values of factor-loadings. The exact description of each item is in Table 4.2.

Samples for Scale Development

The first sample consisted of 159 undergraduate management students at a large mid-western university. Of these students, 53% were female. These students received extra credit for participation in this study. The second sample consisted of undergraduate students taking a course in production and operations management at a large mid-western university. The sample consisted of 69 students of which 43% were female. As with the first sample, student subjects were offered extra credit as an incentive for participation.

Item Refinement

In order to refine the scale for DRW, I ran an exploratory factor analysis. The index of Kaisers' measure of sampling adequacy (overall MSA = 0.88) and Bartlett's test

of sphericity (chi square = 1078.88, $p < 0.001$) suggested the data in the sample were suitable for factor analysis. Since I expected this scale to have only a single dimension, I forced a one-factor solution. Based on the results of the exploratory factor analysis, I refined the scale. Specifically, items that had communality estimates below 0.4 or factor loadings under 0.5 were eliminated. Based on these criteria, 15 items were deleted, leaving 12 items. The reduced scale with their factor loadings are listed in Table 4.1.

Assessment of Latent structure

The refined scale obtained after conducting an exploratory factor analysis was subjected to a confirmatory factor analysis. All items were made to load onto the underlying construct, DRW. The overall fit measures of the model were good. For both samples the CFI was above 0.95 and RMSEA was below 0.05. Factor loadings of items in this scale along with item descriptions are presented in Table 4.2.

To further assess internal consistency, cronbach's alpha was computed for the reduced scale. For both samples, alpha was greater than 0.90.

Table 4.2: Latent Structure

Dimension	Item	Standardized factor loading	
		Sample 1 (n=159)	Sample 2 (n=69)
drw1	I have a desire to reduce waste	0.57	0.65
drw2	I don't like wasting my money	0.57	0.80
drw3	Wastage of money makes me feel bad	0.68	0.78
drw4	I don't like wasting my time	0.55	0.71
drw5	I don't like wasting things	0.82	0.83
drw6	As far as possible I try not to waste	0.84	0.85
drw7	Waste is undesirable	0.81	0.77
drw8	I believe one mustn't waste even if one can afford it	0.82	0.81
drw9	I try to get the most out of the things I buy	0.56	0.66
drw10	I try to keep myself from wasting the things I buy	0.68	0.88
drw11	I try to reuse things as much as possible	0.62	0.76
drw12	I would rather find another use for a product I no longer need than throw it away	0.56	0.70
	Cronbach's alpha	0.91	0.94
	Chi Square	58.60, 44df	57.81, 42df
	RMSEA	0.047	0.049
	CFI	0.99	0.99

Social Desirability

With increasing concerns about wastage and awareness of recycling, it's quite possible that people have come to think of waste as a bad thing. This may have led respondents to offer socially desirable responses. Therefore, I decided to conduct a test of social desirability. Social desirability was measured in the first sample with 10 items from the Marlowe-Crowne scale (Crowne and Marlowe 1960). These items were chosen

from the larger scale because they have been shown to possess greater sensitivity than other items and are appropriately keyed for current standards of desirable behavior (Ballard, Crino, and Rubenfield 1988). Correlation with the social desirability measure was -0.053 which is not statistically different from zero. Given this low correlation, it seems likely that social desirability bias is not a problem for this measure.

Discussion

The context-independent scale of DRW developed has been found to be fairly robust. From the perspective of this dissertation, the goal of this scale is to test the role of DRW as an explanation of the sunk cost effect. However, this scale may also be used for identifying specific categories of people in both organizational as well as marketing settings. In the following section, I develop a context-dependent version of this scale.

Scale Development: Context-dependent Scale

Item Development

The items for the context-dependent scale were selected from the context-independent scale. Six items were selected and appropriately modified so that they were tied to a situation or context. These items were selected based on the factor loadings of the items in the context independent scale and also the adaptability of these items to a context-dependent measure.

Research Instrument and Sample

Subjects were described a typical sunk cost scenario after which they were asked to make one of two possible decisions. This was followed by a set of six DRW items that were framed as reasons for the decision. Next, subjects were asked questions on a number of other measures and demographics.

The first sample consisted of 23 undergraduate marketing students from a university in the mid-west and 60 undergraduate marketing students from a university in the west. In both sub-samples, subjects were offered extra credit as an incentive for participation. Since the responses of the subjects across the two sub-samples were similar, they were merged to give a combined sample of 83 students. Of these 33% were female. The second sample consisted of undergraduate students taking a course in production and operations management at a large mid-western university. The sample consisted of 69 students of which 43% were female. As with the first sample, student subjects were offered extra credit as an incentive for participation.

Item Refinement

An index of Kaiser's measure of sampling adequacy (overall MSA = 0.76) and Bartlett's test of sphericity (chi square = 277.15, $p < 0.001$) suggested that the data were suitable for factor analysis. As in the case of the context independent scale, I expected to find only a single dimension for desire to reduce waste. Accordingly, I forced a single factor solution. Next, I evaluated the items in the scale based on their extracted communality and factor loadings. Since all items had extracted communalities greater than 0.4 and factor loadings larger than 0.5, all items were retained. These items with their factor loadings are listed in Table 4.3.

Table 4.3: Exploratory Factor Analysis *

Item	Factor loadings
drw1	0.74
drw2	0.81
drw3	0.66
drw4	0.79
drw5	0.80
drw6	0.60

* The entries in the table are absolute values of factor-loadings. The exact description of each item is in Table 4.4.

Assessment of Latent structure

The refined scale obtained after conducting an exploratory factor analysis was subjected to a confirmatory factor analysis. All items were made to load onto the underlying construct, DRW. The overall fit measures of the model were very good. For both samples the CFI was 1.00 and RMSEA was 0.00. Factor loadings of items in this

scale are presented in Table 4.4. To further assess internal consistency, cronbach's alpha was computed for the reduced scale. For both samples, alpha was greater than 0.85.

Table 4.4: Latent Structure

Dimension	Item	Standardized factor loading	
		Sample 1 (n=83)	Sample 2 (n=69)
drw1	I don't feel like I wasted money on the ticket	0.69	0.79
drw2	I feel like I put my money to good use	1.00	0.88
drw3	The money I spent on the ticket was not in vain	0.67	0.89
drw4	I don't regret the money spent	0.78	0.95
drw5	I don't feel bad about the money spent	0.77	0.88
drw6	Buying the ticket was a good decision	0.59	0.83
	Cronbach's alpha	0.87	0.95
	Chi Square	4.16, 6df	5.28, 7df
	RMSEA	0.00	0.00
	CFI	1.00	1.00

Discussion

In the preceding section, I developed a context-dependent scale of self-justification scale which is in a number of ways similar to the context-independent version of this scale. However, the application of this scale is limited to testing self-justification as an explanation for the sunk cost effect.

Chapter 5: Paying for Coupons

Introduction

With about 250 billion coupons distributed in the United States every year, coupons continue to be among the more important promotional tools available to the marketer. However, of the large number of coupons distributed, only about 2% are redeemed. In fact, in 2000, only about 4.5 billion coupons were redeemed (Kerin et al 2002). Thus, from a managerial perspective, enhancing redemption rates is an important goal.

Previous research on coupon redemption has been directed at finding controllable variables such as face value of coupon (Bawa and Shoemaker 1987b) or determining suitable segmentation variables to identify those who redeem coupons (Bawa and Shoemaker 1987a). In this chapter, I draw on the literature about sunk costs to identify and test one such controllable variable. As an example of the sunk cost effect, consider the case of the man who develops a tennis elbow soon after paying the membership fee in a tennis club but continues to play in agony to avoid wasting his investment (Thaler 1980). In this example, the man's decision to keep playing is driven by his sunk cost, the membership fee. Similarly, it is plausible that if consumers paid for coupons, they would be more likely to put in the effort to redeem (or use) them. For example, instead of giving out free coupon booklets to consumers, if a company or a retailer were to charge \$2 for the coupon booklet, the consumer would be more likely to use (or redeem) the coupon. Thus, the payment for a coupon booklet would influence coupon usage (or redemption).

The primary goal of this chapter is to test the effect of payment for a coupon on coupon usage. Assuming this effect exists, I am also interested in investigating the theoretical mechanism that accounts for this. Finally, I am also interested in determining the conditions under which the price of the coupon(s) influences coupon usage.

Review of Prior Research on Coupons

The review of prior research is organized into two sections. The first section evaluates coupons as a promotional tool. The second section investigates one possible reason for low redemption rates for coupons. Specifically, the second section explores if redemption requires the investment of time and effort by the consumer.

Coupons as a promotional tool

Coupons have been used extensively by marketers to temporarily boost sales. Previous literature on coupons has indicated that coupon promotions increase sales (Bawa and Shoemaker 1987, 1989) although this increase is only temporary (Bawa and Shoemaker 1987). Furthermore, face value of the coupon, type of coupon or delivery vehicle (e.g., free standing insert or direct mail) and whether the coupon is for a preferred brand affect coupon attractiveness and consequently sales (Bawa and Shoemaker 1989; Bawa, Srinivasan and Srivastava 1997). One of the vexing problems related to coupons is poor redemption rates (i.e., usage). Over the years redemption rates have been dropping with only between 1 and 2% coupons being redeemed (Pressler 2004).

In their quest for ways to enhance redemption rates for coupons, marketers have investigated a number of variables that influence coupon usage. Broadly speaking these variables may be classified as (i) those that are within the control of the marketer such as face value of coupon, type of coupon or delivery, effort required to redeem the coupon

and (ii) those that are useful segmentation variables such as prior behavior and household characteristics (see table 5.1 for a summarization of this literature). My contribution to this literature is by introducing another such variable, price of coupon (PC), that is also within the control of the marketer. The theoretical basis for investigating this variable lies in the sunk cost effect literature. Specifically, I believe that consumers would treat the price paid for a coupon booklet as a sunk cost and would therefore put in the extra effort to use the coupon.

Table 5.1: Coupon literature

Controllable Variable	
Face value of coupon	Bawa and Shoemaker 1987a; Chakraborty and Cole 1991; Reibstein and Traver 1982; Shoemaker and Tibrewala 1985; Taylor 2001; Ward and Davis 1978
Type of coupon or delivery (e.g., free standing insert or direct mail)	Reibstein and Traver 1982; Ward and Davis 1978
Effort required to redeem the coupon	Chakraborty and Cole 1991
Segmentation variables	
Prior behavior	Bagozzi, Baumgartner, and Yi 1992; Bawa and Shoemaker 1987a
Whether the coupon is for a preferred brand	Bawa and Shoemaker 1987a; Shoemaker and Tibrewala 1985
Product category	Bawa and Shoemaker 1987b; Webster 1965
Household characteristics such as education, income, urban/rural, home-ownership	Bawa and Shoemaker 1987b; Bawa and Shoemaker 1989
Brand loyalty, store loyalty	Bawa and Shoemaker 1989; Chakraborty and Cole 1991
Coupon proneness	Bawa and Shoemaker 1989; Bawa, Srinivasan and Srivastava 1997
Deal proneness	Chakraborty and Cole 1991
Coupon attitudes	Mittal 1994

Costs of Coupons

While coupon usage may provide both monetary and non-monetary benefits (Chandon, Wansink and Laurent 2000), certain costs are also associated with coupon usage (Bawa and Schoemaker 1987). A fixed cost is incurred if one wishes to use any coupons at all and variable costs vary directly with the extent of coupon usage (Narasimhan 1984). Fixed costs are the same regardless of the person while variable costs vary from person to person.

The fixed cost is incurred when one scans through a magazine, newspaper, or envelope of pre-cut coupons to find a usable one. For example, if one receives an envelope containing 20 pre-cut coupons, one must look through the entire set of coupons even if only a few are to be collected. A similar cost is involved in reading a newspaper or magazine insert. That is, whether one wants to collect coupons for one product class or several, one must examine all the coupons and screen out the unusable ones. In addition to searching for coupons, the consumer must also clip, save and use the coupon in order to redeem it. Variable costs consist of the opportunity costs for the individual and the costs experienced because of having to purchase less preferred brands to realize the benefits of the coupon (Shimp and Kavas 1984).

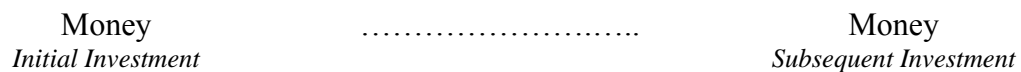
In general, using coupons involves a series of deliberative steps, including planning and implementation (i.e., coupons must be scanned and evaluated, organized and stored, and later selected and presented to a checkout person) and also time (Bagozzi, Baumgartner, and Yi 1992). This, at least in part, may explain consumer inertia towards redeeming coupons (see Dhar and Hoch 1996 for an exception).

One consequence of the effort requirements is lower redemption rates. This raises the question, are the low redemption rates because of the lower value attached to the coupon? Stated differently, if the customer attaches a greater value to the coupon, will he be more likely to go through the effort of redeeming the coupon? In the following section, I discuss the sunk cost phenomenon and how it relates to coupon redemption behavior.

Sunk cost effect

Sunk cost research has demonstrated that consumers irrationally invest resources into a course of action based on previous investments. The bulk of the research in this area has explored situations where the initial and subsequent investment(s) are monetary (see Figure 5.1). For instance, a manager who has invested \$1 million in development of a new product is inclined to invest another \$1 million in spite of knowing that a competitor will launch the product earlier (Schmidt and Calantone 2002). However, if the manager had not already invested a million dollars, he would be less likely to make this investment.

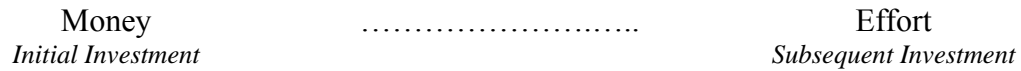
Figure 5.1: Subsequent Monetary Investment



While such situations have been extensively studied, there exists little peer-reviewed literature exploring situations where the initial investment is money and subsequent investment is effort (see Figure 5.2). On the other hand, a few prominent researchers in this domain have indicated that the effects similar to those found when both initial and subsequent investments are monetary (as in figure 5.1) will also be found

when the investments are non-monetary (as in figure 5.2) (Arkes and Blumer 1985; Kahneman and Tversky 1979, p. 290; Staw 1981, p. 577).

Figure 5.2: Subsequent Non-monetary Investment



Research in decision making suggests the sunk cost effect would be stronger when the subsequent investment is effort (Figure 5.2) than when it is money (Figure 5.1). In general this stream of research has found that subsequent to a monetary investment, consumers do not experience as much pain in investing effort as they do when investing money (Heath 1995). Part of the reason for this is the inability or reluctance of consumers to convert these investments into a common scale (Dreze and Nunes 2003; Raghurir and Srivastava 2002).

In summary, there exists some research that suggests a sunk cost effect would be found even when the subsequent investment is effort and there exists other research that suggests this effect would be more pronounced for effort rather than for money.

Creating a sunk cost

Coupons that require payment represent a sunk cost situation as represented by Cell B in Figure 1.1. Consumers invest money either directly (by payment for a coupon booklet) or indirectly (through purchase of a Sunday newspaper) in acquiring coupons. This is followed by a decision to invest effort in redemption. Based on what we know about the phenomenon of sunk costs, it would be expected that consumers who paid for

the coupon would be more likely to invest the additional effort to redeem it than those who did not pay for it.

In supporting this proposition, Porter (1993) said that when consumers are required to “earn” the offer, redemptions will be higher. He also cited a study where one group of customers was sent a coupon offer while a second group of customers was sent the same coupon offer and also a lengthy survey. It was found that the customers who were made to fill out the lengthy survey had much higher redemptions. This leads me to propose,

H₁: Consumers who pay for a coupon booklet will be more likely to redeem coupon(s) than those who don't pay for the coupon booklet.

Theoretical Explanations

There are a number of potential explanations for the sunk cost effect discussed in the literature review. Two of these explanations are particularly relevant to the present context, therefore they are discussed below.

Self-justification: According to this explanation, individuals have a need to be correct, especially when it is a decision taken by them (Staw 1976) or when the consequences of the decision are visible to others (Brockner, Shaw, and Rubin 1979). When a consumer invests in purchasing a coupon booklet, he believes he is going to use it. A decision to not use the coupon(s) is dissonant with the consumers' initial decision to pay for it. After all, if he didn't want to use the coupon(s), why did he pay for them in the first place? Driven by a need to justify his initial decision, the consumer would then invest the effort to use the coupon(s).

While a self-justification explanation suggests that consumers who pay for a coupon booklet will be driven to use the coupons in the booklet, it makes no prediction about the amount paid for the coupon booklet. Specifically, according to a self-justification explanation, a person who has spent \$1 on a coupon booklet is more likely to use the coupon(s) than someone who received the coupon booklet for free. However, according to a self-justification explanation, a person who spent \$2 on a coupon booklet is no more likely to use the coupon(s) than a person who spent only \$1 on the same coupon booklet.

Desire to reduce waste: Consumers are driven to minimize waste (Arkes and Blumer 1985). Thus, consumers avoid expenditures that don't yield commensurate benefit and look for bargains that save them money. In situations where expenditure has already been made, consumers have been known to put in the effort to fully utilize the product, so as to minimize feelings of wastefulness.

Consider the case of a consumer who has spent \$1 on purchasing a coupon booklet. If he fails to utilize any of the coupons in the booklet, he would feel like he has wasted \$1. On the other hand, if the coupon booklet had been obtained for free, he would be unlikely to experience feelings of wastefulness. Thus, a consumers' desire to reduce waste would make him more likely to redeem coupons that he paid for than coupons he received for free.

A desire to reduce waste explanation focuses on the amount of money spent on the coupon booklet and not just the act of paying or not paying. Since, wasting \$2 is more aversive than wasting \$1, a person who has spent \$2 on a coupon booklet will be more concerned about using the coupons than a person who spent \$1. Thus, a desire to reduce

waste explanation predicts that a \$2 coupon booklet will have a higher redemption rate than a \$1 coupon booklet which in turn will have higher redemptions than a coupon booklet that was free.

Study 1: Effect of Paying for a Coupon

The goal of this study was two-fold. First, I wanted to see if consumers who pay for a coupon booklet are any more likely to redeem coupon(s) than consumers who obtain the coupon booklet for free. Thus, I expected paying for a coupon (free or not free) to affect redemption. Second, I was interested in investigating the theoretical mechanism that accounts for the effect of charging for a coupon booklet on redemption behavior.

Subjects, Design, and Procedure

Sixty-nine students taking a course in management at Oklahoma State University were used as subjects for this study. The subjects received course credit for their participation. All subjects were presented the following scenario:

Imagine you [*got a free*] [*paid \$1 for a*] [*paid \$2 for a*] coupon booklet. You picked up the coupon booklet because it contained a \$10 discount on a pair of shoes you are interested in buying. The pair of shoes costs \$40. As you go through the fine print on the coupon you realize that the coupon is not valid at the neighborhood store. The nearest store where the coupon is valid is 20 miles out-of-town. Since you need to buy the shoes soon, you now need to decide whether you should

- (a) Buy the pair of shoes from the neighborhood store and forgo the discount, OR
- (b) Drive 20 miles to the out-of-town store to get a \$10 discount on the pair of shoes

The amount paid for the coupon booklet was manipulated in a between subjects design by varying the price of the coupon booklet as free, \$1, or \$2. Subjects were randomly assigned to the three conditions so that each condition had an equal number of subjects. All other aspects of the scenario were held constant across all conditions.

Subjects were then asked to make a choice between buying the shoes with the coupon or without the coupon.

Results and Discussion

Respondents in this scenario were faced with a choice between not using the coupon and using the coupon by investing effort (drive 20 miles). A rational consumer taking decisions based on marginal cost and marginal benefit would be expected to make a choice that is independent of the price of the coupon.

Since I hypothesized a difference between consumers who paid and those who didn't pay for the coupon booklet, I pooled the data on consumers who spent \$1 and \$2 on the coupon booklet. Next, I compared redemption rates of consumers who paid for the coupon booklet to those who didn't. The results revealed that consumers who paid for a coupon booklet were more likely to redeem the coupon than those who didn't pay for the coupon booklet (67% vs. 43%, $t_{64} = 1.91$, $p < 0.05$) (see Table 5.2).

Table 5.2: Results of Coupon Studies

Study and dependent measure used	Payment for coupon		Statistics
	Free	Paid	
Study 1: Redemption rate	43%	67%	$t_{64} = 1.91, p < 0.05$
Study 2: Likelihood of coupon usage	4.73	2.79	$t_{37} = 2.92, p < 0.01$
Study 2: Redemption rate	53%	88%	$t_{21} = 2.28, p < 0.05$
Study 3: Likelihood of coupon usage	2.61	2.82 (Sunday newspaper)	$t_{33} = 0.32, p > 0.1$ (n.s.)
Study 3: Redemption rate	11.8%	12.5% (Sunday newspaper)	$t_{31} = 0.06, p > 0.1$ (n.s.)
Study 4: Redemption rate	13.6%	24.2%	$t_{124} = 1.56, p < 0.1$
Study 4: No. of coupons redeemed	0.26	0.52	$t_{117} = 1.71, p < 0.05$

Redemption rate is measured as a percentage of those who used the coupon. The likelihood of coupon usage is measured on a 9-point scale with end anchors 1: Very likely, 9: Very unlikely.

Both, a self-justification and a desire to reduce waste explanation would predict that consumers who pay for a coupon booklet will be more likely to redeem the coupon(s). However, these explanations differ in their prediction of redemption behavior when consumers pay varying amounts for the coupon booklet. Specifically, a self-justification explanation would predict no difference in redemption rates between consumers who spend \$1 or \$2 for the coupon booklet. Since \$2 represents a larger expenditure than \$1, a desire to reduce waste explanation would predict that consumers who spend \$2 will have higher redemption rates than consumers who spend \$1. In order to determine the theoretical mechanism, I compared the redemption rates of subjects who spent \$1 to those who spent \$2 on the coupon booklet. The redemption rate for those who paid \$2 for the coupon booklet was 73% versus 62% for those who paid \$1 for the coupon booklet ($t_{41} = 0.74, p > 0.1$). The lack of significance of the difference in

redemption rates offers support for a self-justification based explanation over a desire to reduce waste explanation.

Study 2: Confirmatory Study on Effect of Paying for a Coupon

In general, Study 2 was quite similar to Study 1 except for two differences. First, while Study 1 relied on a single dichotomous measure of coupon usage, Study 2 made use of both a dichotomous and an interval scale measure for coupon usage. Second, post-study interviews conducted with a selected group of subjects from Study 1 revealed that the scenario used was somewhat hard to understand. Thus, it might be possible that the effects found were because the subjects misinterpreted the scenario rather than due to manipulation of the price of the coupon. So, in this study, I used a simplified version of the scenario used in Study 1.

Subjects, Design, and Procedure

Sixty-three subjects from marketing and management classes at Oklahoma State University participated in this study for course credit. Subjects were presented with the following scenario:

Imagine you [*got a free*] [*paid \$1 for a*] [*paid \$2 for a*] coupon booklet. You picked up the coupon booklet because it contained a \$10 discount on a pair of shoes you are interested in buying. As you go through the fine print on the coupon you realize that the coupon is only valid at a store 20 miles away.

Next, subjects responded to a manipulation check question asking them how much they paid for the coupon. Next, they were asked for their likelihood of coupon usage (nine-point scale) and actual coupon usage (binary choice). Likelihood of coupon usage was measured by asking subjects the question, “How likely are you to use the coupon?” Responses were scored on a nine-point scale with anchors very likely (1) and very unlikely (9). After this they were asked to respond to a set of items on self-

justification and desire to reduce waste as in study 1. Similar to study 1, the amount paid for the coupon booklet was manipulated at three levels: free, \$1, and \$2. Subjects were randomly assigned to these conditions.

Results and Discussion

Since two subjects provided incorrect responses to the manipulation check question, they were dropped from the analysis.

Similar to Study 1, I compared redemption rates for subjects who paid for the coupon booklet to those who obtained them for free. The data from subjects who had paid either \$1 or \$2 was pooled to create a group of subjects that had paid for the coupon booklet. I expected to find an effect for payment on the two dependent measures for coupon usage. Consistent with this expectation, I found that subjects who paid for a coupon booklet had a higher likelihood of using the coupon for a pair of shoes ($M_{\text{paid}} = 2.79$ vs. $M_{\text{free}} = 4.73$, $t_{37} = 2.92$, $p < 0.01$) and greater actual usage (88% vs. 53%, $t_{21} = 2.28$, $p < 0.05$) (see Table 5.2). These results support the effect of payment for a coupon booklet on redemption behavior.

The two theoretical explanations, self-justification and desire to reduce waste, make opposing predictions about the difference in redemption rates between subjects who paid \$1 or \$2 for the coupon booklet. Therefore, I tested the difference in redemption rate between subjects who paid \$1 and those who paid \$2 for the coupon booklet, and failed to find a difference in either likelihood of coupon usage ($M_{\$1} = 2.79$ vs. $M_{\$2} = 2.86$, $t_{44} = 0.13$, $p > 0.1$) or actual usage (88% vs. 86%, $t_{44} = 0.11$, $p > 0.1$). The absence of any difference in redemption rate between those who paid \$1 and those who paid \$2 for the coupon booklet in this study as well as the previous study, rules out desire

to reduce waste as a potential explanation for these effects. On the other hand, these results offer support for self-justification as a possible explanation.

Study 3: Mode of Payment

Studies 1 and 2 established the existence of an effect of payment for a coupon booklet. Furthermore, this effect was found to be attributable to self-justification concerns. One common thread between Studies 1 and 2 is that in both studies, the mode of payment for coupons was direct. Specifically, the amount paid for the coupon booklet was salient to the subjects. This raises the question of whether similar increases in redemption rates will also be found when the mode of payment is indirect. Consider the case of a consumer who buys the Sunday newspaper for \$1.50 only for a coupon. To the extent that the consumer believes he purchased the newspaper exclusively for the coupon, the redemption rate would be expected to be higher than if the coupon had been obtained for free. Thus, I propose,

H₂: Consumers who pay for a coupon indirectly (e.g., by purchasing a newspaper) will be more likely to redeem the coupon than consumers who obtain the coupon for free.

Subjects, Design, and Procedure

Thirty-five students from an introductory course in marketing at Oklahoma State University were offered extra credit for participation in this study. The scenario used for this study was similar to the one used in Study 1 except for the manipulation of the amount paid for the coupon. Approximately half of the subjects were told that they had spent \$1.50 for the Sunday newspaper which contained the coupon for a pair of shoes. They were also asked to imagine that they had bought the Sunday newspaper *specifically*

for the coupon. The remaining subjects were told that they had obtained a coupon booklet (containing the coupon for a pair of shoes) for free. The face value of the coupon was held constant at \$15.

After subjects had read the scenario, they were asked to respond to the manipulation check and dependent measures (i.e., likelihood of coupon usage and actual coupon usage) used in Study 2. Next, subjects were asked their perceived value (in dollars) of the coupon. Specifically, subjects were asked to respond to the open-ended question, “if you were to place a value on the coupon, what would it be?”

Results and Discussion

One subject provided an incorrect response to the manipulation check question, hence was dropped from further analysis.

In order to test H_2 , I compared redemption behavior of subjects who obtained the coupon for free to those who paid \$1.50 for the Sunday newspaper to get the same coupon. The results revealed that those who got the coupon from the Sunday newspaper and those who received it for free did not differ in either likelihood of coupon usage ($M_{\text{Newspaper}} = 2.82$ vs. $M_{\text{Free}} = 2.61$, $t_{33} = 0.32$, $p > 0.1$) or actual usage (12.5% vs. 11.8%, $t_{31} = 0.06$, $p > 0.1$). So, I failed to find support for H_2 .

An interesting finding was that, although subjects were no more likely to use the coupon from the Sunday newspaper than the free coupon, they attached greater value to the coupon from the Sunday newspaper more than the free coupon ($M_{\text{Newspaper}} = 14.91$ vs. $M_{\text{Free}} = 10.94$). Moreover, value attached to the coupon from the Sunday newspaper is much closer to the face value of the coupon (\$15). However, this difference, although visibly apparent, was not statistically significant ($t_{33} = 1.09$, $p > 0.1$).

I hypothesized an effect of payment even when the mode of payment was indirect so as to make the actual payment less salient. However, the data obtained from the scenario in this study failed to offer support for this hypothesis. Part of the reason for the non-significance of the results might be the small sample size used in this study.

Coupon Expiration Date

Research on coupon expiration dates has revealed that redemptions peak near the coupon expiration date (Inman and McAlester 1994). Thus, the later the coupon expiration date the more time consumers will take to redeem the coupons. This would imply that the further away the expiration date the more time the consumer would have to mentally depreciate the expenditure on the coupon booklet (Soman 2001). Since expiration dates far away in the future would give the consumer time to mentally depreciate their sunk cost, it is expected that the effect of paying for a coupon will be weaker or non-existent for later expiration dates.

H₃: When the coupon expiration date is near (rather than distant), consumers who pay for a coupon booklet will be more likely to redeem the coupon(s) than consumers who don't pay for the coupon booklet. On the other and, when the coupon expiration date is distant, consumers who pay for a coupon booklet will be no more likely to redeem the coupon(s) than consumers who don't pay for the coupon booklet.

Study 4: Field Study and Role of Coupon Expiration Date

Studies 1-3 utilized scenarios where subjects were asked to imagine paying for a coupon booklet and asked to state likelihood of using a coupon. The main purpose of study 4 was to test the effect of payment for a coupon on redemption in an experiment involving actual payment for the coupon booklet and use of a real coupon usage situation. In addition, I also sought to test the effect of payment for a coupon with different coupon

expiration dates. Finally, I was also interested in testing self-justification as a theoretical explanation for the effect of payment for a coupon on redemption behavior.

Subjects, Design, and Procedure

Students enrolled in three marketing classes at Oklahoma State University were invited to participate in this study. As an incentive for participation, subjects were promised course credit and a gift worth \$3. One hundred and thirty-two subjects participated in this study.

The experiment used a 2 (payment for coupon: free, \$2) X 2 (coupon expiration date: one week, two weeks) between subjects full factorial design. Here, expiration date refers to the date before which the coupons must be used. Expiration dates were marked on the coupons and these needed to be used within one week for half the subjects or within two weeks for the remaining subjects. A coupon booklet was used as the instrument for the study. The coupon booklet contained three coupons worth \$1 each and could be redeemed at either of the two on-campus convenience stores. Each coupon contained an identification number, its face value (\$1), name of the two convenience stores where they could be redeemed, and the expiration date. Actual coupon redemptions were tracked by the convenience stores.

Each subject arriving at the experimental facility was given \$2. The subjects were then told that they could use the \$2 given to them to enter a lucky draw where they could either get a coupon booklet worth \$3 plus the \$2 they invested or they could get just the coupon booklet worth \$3. Subjects were also given the option of leaving the experiment with the \$2 they just received. None of the subjects left. Based on the lucky draw, subjects were randomly assigned to one of the four experimental conditions. After this

subjects were excused. A month later subjects were re-contacted and asked to respond to manipulation checks, context-dependent measures of self-justification and desire to reduce waste (developed in Chapters 3 and 4), and other psychographic and demographic variables.

Results and Discussion

As part of the follow up study conducted a month later, subjects were asked to respond to a manipulation check question. Subjects were asked how many coupons were in the coupon booklet. The average response to this question was 3.01 which is not significantly different from the true value of 3 ($t_{85} = 0.70, p > 0.1$). Eighty-eight percent of the subjects correctly remembered the amount they had paid for the coupon booklet.

In order to test the effect of payment for coupon on redemption rate for different coupon expiration dates, I tested the interaction between payment for coupon and expiration date. Number of coupons redeemed was used as dependent measure. Since each coupon booklet contained three coupons, this variable could have values 0, 1, 2, or 3. The results revealed that the hypothesized interaction between payment for coupon and the expiration date, although in the expected direction, was not significant ($F(1, 128) = 0.427, p > 0.1$). Next, I ran an identical test with redemption rate as the dependent measure. Redemption rate is a dichotomous measure that was coded zero if the subject didn't redeem any coupons, and was coded one if the subject redeemed even one of the three coupons in the coupon booklet. However, the hypothesized interaction continued to be non-significant ($F(1, 128) = 0.37, p > 0.1$). Thus, I failed to support H_3 .

Next, I tested for the main effect of the payment for a coupon. I found that subjects who paid \$2 for the coupon booklet had a higher redemption rate (24.2% vs.

13.6%, $t_{124} = 1.56$, $p < 0.1$) and redeemed more coupons ($M_{\$2} = 0.52$ vs. $M_{Free} = 0.26$, $t_{117} = 1.71$, $p < 0.05$) than subjects who got the coupon booklet for free (see Table 2). This provides support for H_1 in a real setting.

The decision by subjects to redeem coupons that they had paid for may be explained either by a need to justify ones' decision to spend money on the coupon or by a desire to reduce waste of the money spent on the coupon. In order to test for these two explanations, I conducted tests of mediation by running regressions with and without each mediator (Baron and Kenny 1986). Using the measures collected for context dependent self-justification and desire to reduce waste, two different summated indexes were generated. These were then entered as independent variables in a regression of payment for coupon on the dependent measures. In the test of self-justification as a mediator, it was found that entering self-justification as an independent variable weakened the coefficient of payment for coupon when it was regressed against the number of coupons redeemed ($\beta = 0.148$, $p = 0.044$ to $\beta = 0.058$, $p = 0.502$). In the test of desire to reduce waste as a mediator, it was found that the coefficient of effort was unaffected by the introduction of desire to reduce waste into the regression ($\beta = 0.148$, $p = 0.044$ to $\beta = 0.279$, $p = 0.007$). The results of mediational analysis along with the findings of Studies 1 and 2 support a self-justification based explanation for the effect of payment for coupons on redemption rate. On the other, the data from studies 1, 2, and 4 failed to support desire to reduce waste as an explanation.

Conclusions

I conducted four studies to test the influence of payment for a coupon on redemption. I also investigated the theoretical mechanism of this effect and some

boundary conditions. In general, I found that consumers who pay for a coupon booklet are more likely to use the coupon(s) than consumers who don't pay for the coupon booklet. This finding was supported across two scenario-based studies (Studies 1 and 2) and one field study (study 4) (see Table 5.2 for a summary of results). Study 3 revealed that this effect is limited to situations where the payment for the coupon is direct. For example, the amount paid for the coupon influences usage of that coupon only when a consumer directly pays for the coupon booklet. This effect is not found for other forms of payment such as buying a Sunday newspaper specifically for a coupon. Study 4, revealed that contrary to my expectations the effect of payment for a coupon on coupon usage is not moderated by the expiration date of the coupon(s). Finally, an investigation of the theoretical mechanism revealed that consumers who pay for a coupon booklet put in the effort to use it because they have a need to justify their decision to buy the coupon booklet in the first place.

The above results notwithstanding, this study has a few limitations. First, from a managerial perspective, the idea of putting a price on a coupon booklet is susceptible to the self-selection bias. Specifically, it is plausible that only those likely to use the coupons will buy them. Second, I was unable to find an interaction of payment for a coupon with expiration date even though the same would be expected based on what we know about the sunk cost effect. It is possible that the time difference of one week between the two expiration dates was too short for consumers to mentally depreciate the price paid for the coupon. Alternatively, there might be a different theoretical explanation for this null effect. This is worthy of further investigation. Third, I only tested one form of indirect payment. It would be interesting to test the effect of price of coupon for other

forms of indirect payment such as paying for it as part of the weekly grocery bill at the department store and paying by credit card.

Chapter 6: Impact of Consumers' Effort Investments on Buying Decisions

Introduction

In most cases, acquisition of products and services require both monetary and non-monetary investments on the part of the consumer. Monetary investments, the focus of much of the pricing literature, primarily includes the purchase price, but may also include costs such as shipping and handling, taxes, surcharges, and tips. Non-monetary investments may include the time spent waiting for a service, cognitive effort (and time) in evaluating various brands available, in searching for information in magazines, newspapers, direct mail, in-store, on the web, or physical effort (and time) in commuting to a store. Time and effort (physical and cognitive), the non-monetary investments made by consumers, tend to be ecologically confounded (Soman 2001), hence in this section, I use the term effort to refer to investments of both time and effort.

It is generally agreed upon that consumers seek to minimize the amount of effort expended in searching for and evaluating products (Osselaer and Alba 2000; Swait and Adamowicz 2001). Thus, consumers prefer to shop at stores that are nearby and prefer information formats that make it easy to evaluate brands. Retailers have responded by locating stores near their target market and merchandising their products so that they are easy to find. Similarly, websites provide convenient information formats such as side-by-side comparisons and have made their check out procedures simpler. Recently, Staples went so far as to launch an advertising campaign highlighting the ease in finding products in-store and submitting mail-in-rebate forms.

Although consumers generally select alternatives that demand less effort, situations exist where consumers may commit to a more effortful alternative. Specifically, consumers might invest effort either because of an incentive such as a Thanksgiving sale or because the amount of effort required is not obvious at the outset, as in the case of buying from a website. In such situations, I propose that consumers will be more likely to buy and will spend more money than if they had spent less effort.

In the next few sections, I present my conceptualization of effort. Next, I discuss the relationship between the sunk cost phenomenon and situations where consumers invest effort in purchasing. This is followed by a discussion of justification and desire to reduce waste as potential explanations. Next, I present three studies that test the role of effort invested through a set of scenarios and a web-based study. Finally, I draw conclusions and discuss some managerial implications.

Effort

In purchasing a product, consumers expend both money as well as effort. For the purposes of this chapter, any non-monetary investment by the consumer towards the purchase of a product is treated as an investment of effort. Thus, this conceptualization of effort includes the value of time spent.

Based on type, effort has been categorized as being either cognitive, physical or emotional (Mohr and Bitner 1995). Given their immediate relevance to consumer buying situations, I focus on cognitive and physical effort only. Cognitive effort refers to any consumption related expenditure of mental resources. Thus, examples include information search and selection from a set of alternatives (Bettman et al 1990; Garbarino and Edell 1997), evaluating brands in the consideration set, searching for products on the

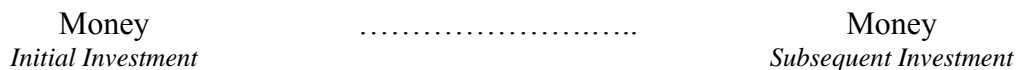
web, tailoring (or personalizing) a web site to one’s preferences, and looking for products on an auction site such as eBay. Physical effort involves consumption related expenditure of bodily resources. Examples include traveling to the store, searching for the product within a brick and mortar store (see service convenience in Berry, Seiders and Grewal 2002), accumulating loyalty points, and accumulating frequent flyer miles (Dreze and Nunes 2003; Kivetz 2003)

Having described the conceptualization of effort used here, in the next section I review research that makes predictions about the influence of effort invested on purchasing behavior.

Sunk Cost

Sunk cost research has demonstrated that consumers irrationally invest resources into a course of action based on previous investments. The bulk of the research in this area has explored situations where the initial and subsequent investment(s) are monetary (see Figure 6.1). For instance, a manager who has invested \$1 million in development of a new product is inclined to invest another \$1 million in spite of knowing that a competitor will launch the product earlier (Schmidt and Calantone 2002). However, if the manager had not already invested a million dollars, he would be less likely to make this investment.

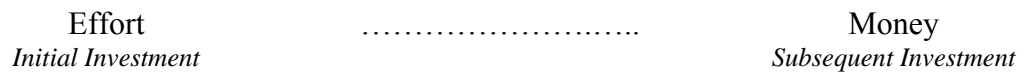
Figure 6.1: Subsequent Monetary Investment



While such situations have been extensively studied, I was unable to find any peer-reviewed literature exploring situations where the initial investment is effort and

subsequent investment is money (see figure 6.2). On the other hand, a few prominent researchers in this domain have indicated that the effects similar to those found when both initial and subsequent investments are monetary (as in Figure 6.1) will also be found when the investments are non-monetary (as in Figure 6.2) (Arkes and Blumer 1985; Kahneman and Tversky 1979, p. 290; Staw 1981, p. 577).

Figure 6.2: Subsequent Non-monetary Investment



Thus, based on the sunk cost literature, it would be expected that consumers investing effort in searching or evaluating a product would be willing to pay more for the product.

H₁: The purchase price paid by consumers who spend more effort towards a purchase (which includes searching and evaluating the product) will be greater than the purchase price paid by consumers who spend less effort towards the purchase.

Theoretical Explanations

A number of theoretical explanations have been proposed to explain the sunk cost effect. These explanations have been discussed in detail in the Literature Review section. Two of those explanations are particularly relevant to the present context and therefore are discussed below.

Self-Justification: According to this explanation, individuals have a need to be correct, especially when the decision is taken by them (Staw 1976). Driven by this need to make good decisions, individuals justify their decisions to themselves and others (Brockner, Shaw, and Ruben 1979; Conlon and Wolf 1980; Staw 1981). Similarly, consumers in

purchasing situations like to make good decisions. If they invest a large amount of effort in picking a brand, then they are driven to purchase it. For instance, consider a person who drove 100 miles (in his friend's car) to take advantage of a Thanksgiving sale. Having traveled so far, the person is quite likely to buy product(s) he would normally not buy. This behavior may be explained by the person's need to be consistent with his initial decision to drive down there. After all, he wouldn't want to appear to have made a bad decision to drive a 100 miles! Thus, self-justification concerns might explain a consumer's likelihood to buy and willingness to pay more.

Desire to Reduce Waste: Individuals have a desire to not appear wasteful. Consumers who incur a sunk cost tend to follow it up with a subsequent investment because of fear that the initial investment would be wasted (Arkes and Blumer 1985). Consumers who invest effort in searching and evaluating products may be more inclined to buy it because if they did not buy it, it would seem like their effort was wasted. Thus, desire to reduce waste might explain consumer's likelihood to buy and willingness to pay more.

Method

Study 1: Scenario Based Studies

Since sunk cost effects for effort and time have not been documented before, I conducted a series of scenario based studies to obtain some preliminary evidence of the existence of this effect. Toward this end, I conducted four scenario based studies. The first two studies (Studies 1a and 1b) were tested on a set of 52 subjects from two different introductory marketing classes at Oklahoma State University while the next two studies

(Studies 1c and 1d) used 31 subjects from another introductory marketing class at Oklahoma State University. Subjects received course credit for participation in these studies.

The procedure for the two data collection efforts was identical. Subjects were described a scenario in which they had expended effort in purchasing a product. Next, they were asked to respond to a manipulation check question. For example, subjects in Study 1a were asked, “How far did you drive for the watch?” After this they were asked about their intention to buy. Specifically, subjects were asked, “What is the likelihood that you will buy the watch (in Study 1a)/home theater system (in Study 1b)/memory card (in Study 1c)/other CD (in Study 1d)?” Responses were collected on a 9-point scale with anchors of very likely (1) and very unlikely (9). Next, subjects were asked to respond to a dichotomous question asking them whether they would buy or not. For example, in Study 1a the choices were (i) buy the watch and (ii) not buy the watch. Finally, subjects were asked to explain their choice/decision.

Study 1a: Physical effort

The purpose of this study was to see if the physical effort invested influenced the subjects’ decision to buy a product that was more expensive than initially expected. Fifty-two subjects from two different introductory marketing classes at Oklahoma State University participated in this study for extra credit. Physical effort was manipulated at two levels, “drive 20 miles” (low effort) or “drive 70 miles” (high effort). Thus one half of the subjects were asked to imagine they drove 20 miles while the other half was asked to imagine they drove 70 miles. In order to control for the effect of money invested on

gas, subjects were told to imagine they were using their parents' gasoline card. Subjects read the following scenario

Imagine you are interested in purchasing a watch. Since it is a specialty watch, it's not available in the stores nearby. So, you drive 20 [70] miles in order to find this watch. Since you pay for gas using your parents' 'gasoline card,' your commute doesn't cost you any additional money. On reaching the store, you find that they do carry the watch you are looking for but it is priced at \$100. This is more than the \$60 you budgeted for the watch.

The manipulation check was successful with all those in the low effort condition saying they drove either 20 or 40 miles while all those in the high effort condition said they drove either 70 or 140 miles. Please note that subjects in the low effort condition who said they drove 40 miles were thinking in terms of the distance for a round trip while those who stated 20 miles were thinking of the one-way distance. Similarly, those in the high effort condition stated 70 or 140 miles based on whether they were thinking of a one-way trip or a round trip respectively. I found that those who drove 70 miles had a higher intention to buy the watch ($M_{20} = 5.43$ vs. $M_{70} = 4.31$, $t_{50} = 1.78$, $p < 0.05$), and a greater proportion decided to pick up the watch (69% vs. 43.5%, $t_{50} = 1.87$, $p < 0.05$). Both results are in the expected direction and statistically significant. The reasons given by the subjects offer some evidence of the existence of a sunk cost effect for effort. Subjects selecting to buy the watch gave reasons such as "I wasted all of the time to drive to the store..." and "Since I wanted the watch and had driven 70 miles for it, it only makes sense for me to buy it." Thus, the results lend support to H_1 and the reasons given by the subjects suggest that the amount of effort already invested influenced their decision to buy the watch.

Study 1b: Information search on the web (Cognitive effort)

Fifty-two subjects from two different introductory marketing classes at Oklahoma State University participated in this study for extra credit. In this study, cognitive effort rather than physical effort was manipulated. The purpose of this study was to see if subjects who spent longer (50 minutes vs. 10 minutes) surfing the web looking for a home theater system were any more likely to buy a home theater. Effort was manipulated between subjects with half the subjects being told that they had spent 50 minutes and the other half were told that they had spent 10 minutes looking for home theater systems. Subjects read the following scenario:

Imagine you are looking for a home theater system. You decide to go to a price comparison website to get the best deal. This website lists the price of the home theater system you are interested in buying at many different websites. The lowest of these prices is \$199 for Website A and the price closest to this is \$209, for Website B. You decide to go to Website A.

On arriving at Website A, you are asked to register with the website. In order to do so, you fill out three pages of personal information and select a username and password for the website. On submitting this information, the website informs you that the shipping and handling cost for this product is \$49. You think this is a very high price for shipping and handling and it's quite likely that website B will do shipping and handling for less. At the same time, you are thinking about the fact that you have already spent *10 [50]* minutes looking for home theater systems.

The manipulation check was successful with those in the low effort condition saying they spent 10 minutes while those in the high effort condition said they spent 50 minutes. I found that those who spent 50 minutes had a higher intention to buy from Website A ($M_{10}=6.87$, $M_{50}=6.31$, $t_{50} = 0.93$, $p > 0.1$) and a greater proportion decided to buy from Website A (31% vs. 17.4%, $t_{50} = 1.12$, $p>0.1$). However, neither result was statistically significant.

In general, I found that surfing the web looking for deals was considered to be an exciting activity. So, the fun aspect of the process may have overshadowed the effect of effort. For example, one subject said, "I like to find the best price and also like to look at

all kinds of systems.” There were others who were influenced by the sunk cost effect. For example, one subject said, “I don’t want to start over and waste more time.” In conclusion, in this scenario, all the results were in the expected direction but failed to reach acceptable levels of statistical significance.

Other studies (Studies 1c and 1d)

In addition to the scenarios discussed in studies 1a and 1b, I conducted tested two other scenarios (studies 1c and 1d). In studies 1a and 1b, subjects who had invested varying levels of effort were asked if they were interested in consummating the transaction. On other hand, in studies 1c and 1d, the subjects were told that the product they had invested effort in searching for, was not available. They were then asked about their interest in purchasing a related product. For example, in Study 1d, subjects who had spent either 10 minutes or 45 minutes looking for a CD were told that the CD they were looking for was not available. They were then asked about their likelihood of buying another CD that they also liked. Similarly in Study 1c, subjects who had spent either 10 or 45 minutes looking for a digital camera were told the camera was not available. They were then asked about their likelihood of buying a memory card.

Based on the literature on sunk costs, a prediction cannot be made for purchasing behavior of products that were not the goal of the initial investment as is the case with studies 1c and 1d. Hence, studies 1c and 1d are not discussed here.

Conclusion

Studies 1a and 1b have demonstrated the effect of effort invested through two different scenarios. However, this effect was not found to be significant for either of these scenarios. There are three possible explanations for the non-significance of these results. One, there is no effect of effort invested. However, the consistency of the direction of the findings of Study 1 added together with the open-ended responses suggests that the effect does exist. Second, there is not enough statistical power to capture these effects. It is possible that these effects would appear with larger samples. After all, the choice variable was marginally significant across all three scenarios. Third, the manipulation of effort was not strong enough. The scenarios asked subjects to imagine an investment of effort. It is possible that the subjects had difficulty imagining such an investment which led to a weak manipulation. Thus, although subjects did remember whether the scenario read ‘driving 10 miles’ or ‘driving 50 miles’, they had difficulty in utilizing this information. There exists some previous research suggesting that consumers are not used to thinking about expenditure of effort the same way they are used to thinking about money (Soman 2001). This would, in part, explain why such scenarios have been successfully used for monetary resources but haven’t been as successful for non-monetary resources. In the studies that follow, I manipulate effort by making subjects actually invest effort rather than asking them to imagine such an investment.

Pretests: Manipulation of Effort

A series of pretests were conducted using a web-based instrument. The purpose of these pretests was to develop a suitable manipulation for the effort invested by consumers in searching and evaluation for products. The web-based instrument used involved exposure to a website followed by a web-based survey. These pretests were not pre-planned but rather driven by a need to refine the research instrument. Thus, one could think of these pretests as being progressive. In the following paragraphs, I describe the general characteristics of these pretests

Subjects

In all of these pretests, data was collected from student subjects who were offered course credit for participation. Approximately 600 subjects taking undergraduate business classes at Oklahoma State University (in Stillwater), Oklahoma State University (in Tulsa) and University of Wisconsin – Green Bay participated in these studies.

Design

The purpose of this series of pretests was to develop a suitable manipulation of effort and obtain preliminary evidence of the effect of effort invested on amount consumers are willing to pay. Toward this end, a between subjects design with two levels of effort was used in each one of these studies. Effort was manipulated as being either high or low. The computer randomly assigned subjects to one of these two conditions.

Procedure

Subjects were first asked to respond to a set of context-independent measures of self-justification and desire to reduce waste using the scales described in Chapters 3 and 4 respectively. After this they responded to a set of unrelated questions. They were then

told about a second unrelated study in a computer lab. They were told that they were required to participate in both studies to get the extra credit. Once in the computer lab, subjects were given an instruction sheet which told them how to access the web-based instrument. The subjects then viewed the website and responded to the web-based instrument. Finally, subjects were asked to respond to an open ended question on what they thought was the purpose of the study.

Research Instrument

The research instrument utilized here was designed on the lines of the MouseLab instrument which has been used extensively in studies involving effort manipulations (Garbarino and Edell 1997; Payne et al 1988). The first few pages introduced subjects to the task. Next, effort was manipulated by varying the level of difficulty of the task. Finally, subjects were asked to respond to a set of process measures and dependent measures. Details about these sections follow.

Introduction section: The first few pages told subjects that they were going to be provided information on four competing brands of desktop computers. Based on this information, they were going to evaluate the four brands and then pick their top preference.

Main task: The task involved searching for information and evaluating a set of four competing brands of desktop computers. Effort required of subjects was manipulated at this stage. Subjects in the high effort condition were faced with greater difficulty in searching for information and evaluating the brands than those in the low effort condition.

Measures: After performing the main task, subjects were asked to respond to a set of measures. They first responded to a set of dependent measures including an item measuring consideration, willingness to buy and the amount they would pay. Consideration was measured by the item, “What is the likelihood that you would consider the Brand you chose if you were shopping for a desktop computer?” Willingness to buy was measured by the item, “What is the likelihood that you would actually buy the Brand you chose if you were shopping for a desktop computer?” Both items were scored on a nine-point scale with anchors very unlikely (1) and very likely (9). Amount subjects were willing to pay was measured by the following open-ended question, “A typical desktop computer is priced between \$600 and \$1200. How much would you be willing to pay for the Brand you chose?” Next, subjects responded to a set of context-dependent measures for self-justification and desire to reduce waste using the scales developed in Chapters 3 and 4. Subjects then responded to a four-item semantic differential scale for affect which included the items, no enjoyment/a lot of enjoyment, no irritation/a lot of irritation, no pleasure/a lot of pleasure, and very annoying/not at all annoying. The items were scored on a seven-point scale. Next, subjects responded to a three-item scale for perceive effort. The items used were, “evaluating the brands was easy (reverse scored),” “evaluating the brands was difficult,” and “evaluating the brands took a lot of effort.” All items were scored on a seven-point scale with anchors, strongly disagree and strongly agree. This measure served as the manipulation check for effort. In addition, a number of response latency measures were automatically collected by the website.

Pretest 1.1

A total of 193 subjects from marketing and management classes were used as subjects for this pretest. Effort invested by subjects was manipulated at two levels, low effort and high effort in a between subjects design. Subjects were randomly assigned to the two conditions so that the two conditions had equal number of subjects.

Effort Manipulation

The task assigned to the subjects was to evaluate a set of four brands and pick the best brand. In order to evaluate the brands, subjects were given the attribute scores for each of the four brands on four different attributes. In order to evaluate the brand, subjects had to add the attribute scores. The brand with the highest sum would be the best brand. For example, subjects were given the attribute scores of Brand A as being 4 for Value, 3 for Performance, 3 for Multimedia and 2 for Technical Support. The overall evaluation score for Brand A would then be 12.

Effort was manipulated by varying the difficulty of this brand evaluation task. Subjects in the low effort condition were given attribute scores that were numbers without decimals ranging from 1 to 7. On the other hand, subjects in the high effort condition were given attribute scores that had decimals. The set of attribute scores were generated such that the ratio of the sums was constant across the four brands. This manipulation of effort is consistent with previous literature where subjects were asked to add numbers without decimals or with decimals (Garbarino and Edell 1997).

Results

One of the dependent measures used asked the subjects to state how much they would pay for the computer described. They were also told that a typical desktop

computer of the type described would cost between \$600 and \$1200. Hence, subjects were expected to offer to pay amounts within this range. Accordingly, two subjects that offered to pay amounts greater than \$1500 were eliminated.

Subjects in the high effort condition considered the task to be more effortful than those in the low effort condition ($M_{\text{low}} = 3.71$ vs. $M_{\text{high}} = 3.89$, $t_{187} = 0.48$, $p > 0.1$), but this difference was not significant. This was surprising as well as disappointing since the instrument had performed well in a pre-test conducted a few weeks earlier. Moreover, this is similar to the MouseLab instrument (Payne et al 1988).

Pretest 1.2

Since the manipulation check in Pretest 1.1 had failed, the goal of this pretest was to increase the manipulation strength. A total of 25 subjects from an introductory marketing class were used as subjects for this pretest. Effort invested by subjects was manipulated at two levels, low effort and high effort in a between subjects design. Subjects were randomly assigned to the two conditions with nine in the high effort condition and the remaining in the low effort condition.

Effort Manipulation

Since the primary goal for this pretest was to enhance the manipulation strength, I decided to add an information search task to the simple evaluation task that student subjects were asked to do in the previous pretest.

As in the previous pretest, subjects went through a brand evaluation tutorial. After this they saw a page with boxes for the attribute scores for each brand. In addition, they also saw a button for each brand. Figure 6.4 is a screenshot of this page. Clicking on the button for a brand took them to a page which showed them expert reviews on the brand

(see Figure 6.5 for expert reviews on Brand A). Subjects had to go through the reviews and based on that enter a score for each of the four attributes for the brand. (Since each reviewer provided a numeric rating of each attribute, I expected subjects to anchor on those numeric ratings or use the exact same ratings.) They had to do this for each of the four brands. Although subjects could enter scores into the boxes without going through the expert reviews, I observed the subjects during administration of the experiment and noticed that all the subjects looked at the expert reviews for each of the four brands.

Figure 6.4: Brand Evaluation Page in Web Instrument

Evaluating Desktop Computers

The buttons given below contain expert reviews of 4 brands of desktop computers. Clicking on them will display reviews. Go through each one of these reviews. Based on the reviews, evaluate each brand of computer. Now, based on the evaluations pick the best one.

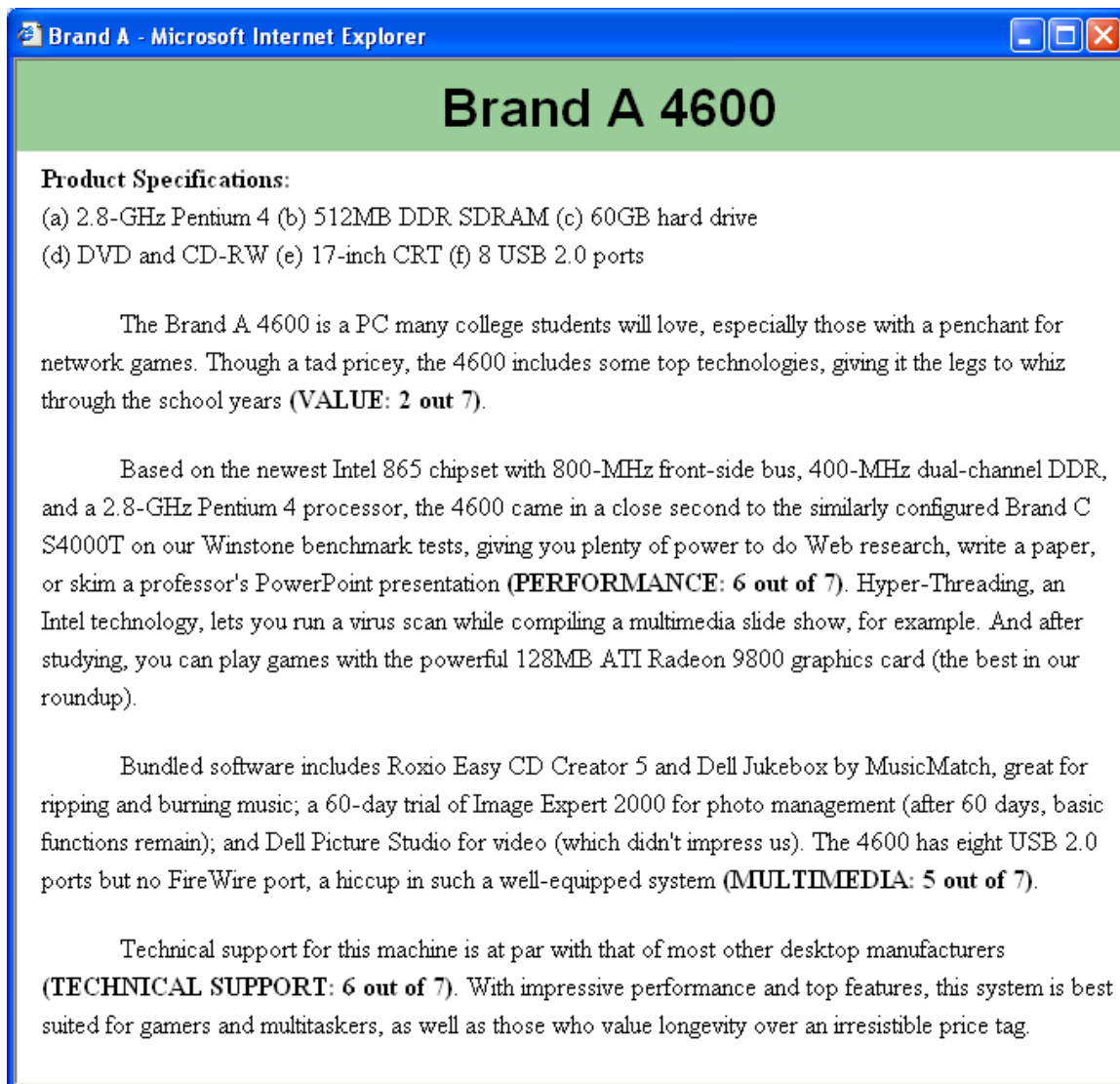
Brand A Brand B Brand C Brand D

Evaluation of Desktop Computer Brands

	Brand A	Brand B	Brand C	Brand D
Value	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Performance	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Multimedia	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Technical Support	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Overall Evaluation	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

The best brand is

Figure 6.5: Brand A Information Page in Web Instrument



Effort was manipulated at two levels, information search and evaluation. In both conditions, subjects had to click on a button to read the expert reviews. In the low effort condition expert reviews opened in a pop-up window which made going back and forth between windows to enter attribute scores easier. In the high effort condition, the expert reviews opened in the same window which meant subjects had to use the back button to go to the brand evaluation window. In addition, the information in the high effort condition was more difficult to read because of a smaller font that contrasted poorly with

the background. I expected this to make reading through the information more difficult. Another point of difference was that in the low effort conditions, the reviewer's numeric ratings were in bold face while in the high effort condition, the reviewer's numeric ratings were in the same font as the rest of the text making them hard to find. Lastly, in the high effort condition, the reviewer's ratings were decimals as opposed to the low effort condition where the reviewer's ratings were not in decimals. Thus, like in the previous pretest, subjects in the high effort condition added decimals.

Results

The manipulation check for perceived effort continued to be non-significant ($p > 0.10$). In case the scales for effort were not capturing the manipulation in this pretest, I also utilized a response latency measure. Such measures have been used as manipulation checks in studies where MouseLab was used as instrument. I found that subjects in the high effort condition took longer to complete the brand evaluation task than subjects in the low effort condition ($M_{low}=8.5$ minutes vs. $M_{high}=10.5$ minutes, $t_{23} = 1.07$, $p > 0.1$) but this difference too was non-significant. It must be noted that the times stated above are for only the brand evaluation task not the entire task. The entire task on average took about 25 minutes.

Pretest 1.3

A total of 43 subjects from a sports marketing class were used as subjects for this pretest. Effort invested by subjects was manipulated at two levels, low effort and high effort in a between subjects design. Subjects were randomly assigned to the two conditions with 24 in the high effort condition and the remaining in the low effort condition.

Effort Manipulation

In order to strengthen the manipulation of effort, I created a page-load delay in the web instrument. Subjects in the low effort condition saw the expert reviews instantaneously but the subjects in the high effort condition did not see it until 5 seconds later. Since subjects had to go back and forth between the expert reviews and brand evaluation pages, this resulted in huge delays in completing the task.

Also, I had noticed that subjects weren't adding numbers correctly since there were no controls for this. So, in this pretest, there was a validation check to ensure that subjects were adding the numbers correctly. If they made an error, the web page prompted them to make corrections and would not allow them to go past that page.

Results

Subjects in the high effort condition took much longer to complete the brand evaluation task than those in the low effort condition ($M_{low} = 12.5$ minutes vs. $M_{high} = 5.3$ minutes, $t_{41} = 4.36$, $p < 0.01$). However, subjects did not perceive the effort to be different ($M_{low} = 3.33$ vs. $M_{high} = 2.87$, $t_{41} = 0.96$, $p > 0.1$). Since at least the response latency measure manipulation check was successful, I decided to analyze the data.

I failed to find support for the effect of effort on either willingness to buy or amount paid. Subjects who spent more effort were willing to pay \$859 while those who spent less effort were willing to pay \$875 ($t_{41} = 0.28$, $p > 0.1$, wrong direction). Subjects who spent more effort were also less willing to buy the desktop computer than those who spent less effort ($M_{low} = 5$ vs. $M_{high} = 4.43$, $t_{41} = 1.09$, $p > 0.1$, wrong direction). Although these results are non-significant, it must be noted that they are in the wrong direction.

To investigate the reason for these disappointing results, I analyzed responses to a four-item semantic differential scale for affect. The four items used to measure affect no enjoyment/a lot of enjoyment (reverse scored), no irritation/a lot of irritation, no pleasure/a lot of pleasure (reverse scored), and very annoying/not at all annoying (reverse scored). Scores on these items were averaged and used as a measure for affect with high scores indicating negative affect. I found that subjects who invested more effort experienced more negative affect than those who invested less effort ($M_{low} = 4.26$ vs. $M_{high} = 4.90$, $t_{41} = 1.86$, $p < 0.1$). To take this analysis a step further, I tested for the effect of effort on amount paid with affect as a covariate. Although the effect of effort remained non-significant, the direction was reversed so that the results were now in the expected direction ($M_{low} = \$863$ vs. $M_{high} = \$869$, $F(1, 40) = 0.01$, $p > 0.1$). This is an interesting result because it mirrors the findings of a similar study by Garbarino and Edell (1997) where the authors found that subjects who had to invest effort experienced negative affect and, therefore, had a poorer evaluation of the products.

Pretest 1.4

Since negative affect might have been driving the results in the previous pretest, the goal in this pretest was to strengthen the effort manipulation without annoying the subjects.

A total of 35 subjects from an introductory marketing class were used as subjects for this pretest. As before, a between subjects design was used with 19 subjects were randomly assigned to the high effort condition and the remaining assigned to the low effort condition. I made a couple of changes to the instrument in the previous pretest. The page load delay of 5 seconds was reduced to 2 seconds. Furthermore, the validation script

in the computer program was eliminated. So, even if subjects added the numbers incorrectly, they could proceed to the next stage. Finally, the low effort condition was made easier by not requiring subjects to enter the attribute scores from the expert reviews. They simply had to read through the expert reviews. It was hoped that this would make the information search aspect of the task a lot easier.

Results

Subjects in the high effort condition took much longer to complete the brand evaluation task than those in the low effort condition ($M_{low} = 3$ minutes vs. $M_{high} = 11.8$ minutes, $t_{33} = 7.13$, $p < 0.01$). However, subjects did not perceive the effort to be different ($M_{low} = 3.21$ vs. $M_{high} = 3.35$, $t_{33} = 0.3$, $p > 0.1$). Since at least the response latency measure manipulation check was successful, I decided to analyze the data.

After the previous pretest, I also checked to see if those in the high effort had been annoyed excessively. The scores for negative affect were indistinguishable across the two groups ($M_{low} = 3.90$ vs. $M_{high} = 3.79$, $t_{33} = 0.28$, $p > 0.1$).

The effect of effort on amount paid was in the expected direction and marginally significant. Subjects who invested more effort were willing to pay \$944 while those who invested less effort were willing to pay only \$875. This difference was marginally significant ($t_{33} = 1.62$, $p < 0.1$). However, the groups did not differ in their intention to buy the computer ($M_{low} = 5.12$ vs. $M_{high} = 4.92$, $t_{33} = 0.50$, $p > 0.1$).

Pretest 1.5

Since the findings of the previous pretest suggested marginal significance, I tried to replicate those findings in another pretest. A total of 40 subjects from a consumer behavior class were used as subjects for this pretest. Seventeen of were assigned to the

high effort condition and the remainder to the low effort condition. The manipulation check for both time ($M_{low} = 4.42$ minutes vs. $M_{high} = 5.31$ minutes, $t_{38} = 1.07$, $p > 0.1$) and perceive effort ($M_{low} = 3.65$ vs. $M_{high} = 3.83$, $t_{38} = 0.4$, $p > 0.1$) were non-significant. Furthermore, I failed to replicate the effect of effort on amount paid ($M_{low} = \$886$ vs. $M_{high} = \$818$, $t_{38} = 0.73$, $p > 0.1$) or willingness to buy ($M_{low} = 4.52$ vs. $M_{high} = 4.56$, $t_{38} = 0.1$, $p > 0.1$).

Pretest 1.6

A total of 84 subjects from a production and operations management class and two introductory marketing classes were used as subjects for this pretest. Subjects were randomly assigned to the high and low effort conditions so that there were an equal number of subjects in the two conditions.

Effort Manipulation

In order to make the brand selection task more realistic and at the same time strengthen the effect of effort, I added a price module to the instrument. The instrument in the previous pretest was modified so that subjects also had to calculate the price of the four brands of desktop computers.

Once the subjects had evaluated the four brands, they were taken to the next page where they had to enter the total price of each desktop computer. Figure 6.6 is a screenshot of this page. In order to calculate the price of each of the brands, the subjects needed information on the retail price, sales tax, rebates, and shipping and handling costs. They could see this information by clicking on the button for the corresponding brand. Figure 6.7 is a screenshot of what the subjects saw. Subjects were expected to utilize this information to calculate the price to be paid for each of the four desktop computers.

Effort was manipulated by varying the difficulty in computing the final price. Those in the high effort condition were given numbers that were hard to compute while those in the low effort condition were given numbers that were easy to compute. Table 6.1 lists the numbers that subjects used to compute the final price for each brand.

Figure 6.6: Price Module for Web Instrument

Evaluating Desktop Computers

On the previous page, you evaluated 4 brands of desktop computers and picked the best one. The following table contains your evaluations of those computers.

Evaluation of Desktop Computer Brands

	Brand A	Brand B	Brand C	Brand D
Value	5	5	3	1
Performance	4	7	3	3
Multimedia	4	1	3	2
Technical Support	7	1	5	4
<i>Overall Evaluation</i>	20	14	14	10

The brand you picked was Brand A

Now, please consider price information on the same 4 brands. Clicking on the buttons below will display the pricing information for a brand. This includes the retail price, shipping and handling expense (S&H), sales tax (if applicable) and rebates if any. You need to calculate the price of each these computers and enter them in the textboxes that follow. In order to calculate the price, add the retail value, S&H costs, sales tax (if applicable) at 8.5% of retail value and subtract any rebates that may be available. Based on your evaluations of the brands and the prices calculated which would you consider to be the best brand.

Please consider the information carefully. If your selection of the best brand matches with ours, you will be eligible for a \$10 lucky draw.

Total Price (in \$)

Based on this new information, the best brand is

Figure 6.7: Pricing Information for Brand A for Web Instrument

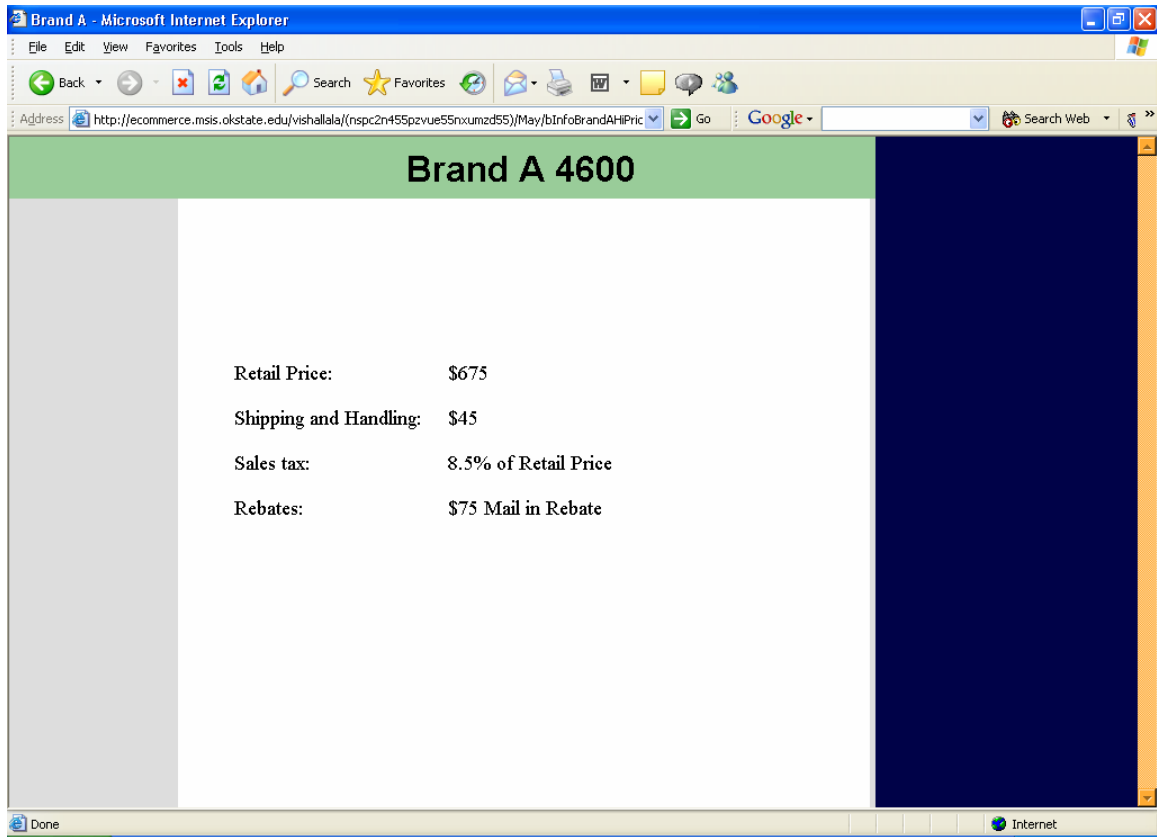


Table 6.1: Pricing Information for Brands

	High Effort				Low Effort			
	Brand A	Brand B	Brand C	Brand D	Brand A	Brand B	Brand C	Brand D
Retail Price	\$675	\$735	\$615	\$885	\$700	\$800	\$600	\$900
Shipping and Handling	\$45	\$85	\$35	\$65	Free	Free	\$100	Free
Sales tax	8.5% of retail price	8.5% of retail price	8.5% of retail price	8.5% of retail price	No sales tax	No sales tax	No sales tax	No sales tax
Rebates	\$75 mail-in rebate	\$45 mail-in rebate	None	\$25 mail-in rebate	\$100 mail-in rebate	None	None	None

Results

A successful manipulation check was indicated by both the perceived effort measure and the response latency measure. Subjects in the high effort condition took much longer to complete the brand evaluation task than those in the low effort condition ($M_{\text{low}} = 4.6$ minutes vs. $M_{\text{high}} = 6.3$ minutes, $t_{81} = 3.11$, $p < 0.01$). In addition, subjects in the high effort condition perceived the task to be more effortful than subjects in the low effort condition ($M_{\text{low}} = 2.71$ vs. $M_{\text{high}} = 3.97$, $t_{81} = 4.26$, $p < 0.01$). Having successfully manipulated the amount of effort spent in searching and evaluating brands, I used this manipulation to test for the effect of effort spent on amount paid for a desktop computer (H_1).

Study 2

Subjects and Design

A total of 84 subjects from a production and operations management class and two introductory marketing classes were used as subjects for this study. Subjects were randomly assigned to the high and low effort conditions so that there were an equal number of subjects in the two conditions.

Effort Manipulation

The manipulation for effort developed in pretest 1.6 was used to manipulate effort in this study.

Results

A successful manipulation check was indicated by both the perceived effort measure and the response latency measure. Subjects in the high effort condition took much longer to complete the brand evaluation task than those in the low effort condition ($M_{low} = 4.6$ minutes vs. $M_{high} = 6.3$ minutes, $t_{81} = 3.11$, $p < 0.01$). In addition, subjects in the high effort condition perceived the task to be more effortful than subjects in the low effort condition ($M_{low} = 2.71$ vs. $M_{high} = 3.97$, $t_{81} = 4.26$, $p < 0.01$).

The main hypothesis of this study is that subjects who spend more effort in searching for information and evaluation of the brands of desktop computers will be willing to pay more for it. The results revealed that subjects who invested more effort were willing to pay significantly more than those who invested less effort ($M_{low} = \$777$ vs. $M_{high} = \$853$, $t_{81} = 2.19$, $p < 0.05$). Also, subjects investing more effort were more likely to buy the computer than those who spent less effort, but the difference was only marginally significant ($M_{low} = 5.21$ vs. $M_{high} = 5.57$, $t_{81} = 1.45$, $p > 0.1$).

The above results notwithstanding, it might be argued that the manipulation of effort used here may have manipulated more than just effort. In fact, in another study investigating the role of effort, it was found that subjects who were assigned difficult computations were more likely to experience negative affect than those who were assigned easy computations (Garbarino and Edell 1997). Other research on waiting time has revealed that those who waited longer got angrier (Hui and Tse 1996; Hui, Thakor, and Gill 1998). Now, if subjects did in fact experience negative affect, based on the findings of Garbarino and Edell (1997), subjects should be less likely to engage in purchasing behavior. Thus, an affect-driven behavior makes a prediction counter to what

I have hypothesized. Put differently, the presence of affect would, if anything, weaken the results obtained here.

To assess the role of affect, I compared the low and high effort groups in terms of affect and found that those in the high effort condition did in fact experience more negative affect than those in the low effort condition ($M_{\text{low}} = 3.70$ vs. $M_{\text{high}} = 4.55$, $t_{81} = 3.75$, $p < 0.01$). So, I ran the above analysis with affect as a covariate and found that the effect of effort on the amount subjects would pay for a desktop computer was magnified as would be expected ($F(1,81) = 4.78$, $p < 0.05$ to $F(1, 81) = 6.38$, $p < 0.05$).

In general, it is difficult to manipulate effort without also manipulating affect. However, it is comforting to know that the accidental manipulation of affect (although only marginal), actually works towards weakening the results of this study. Thus, the significance of the effect of effort in spite of the existence of some affect speaks for the strength of these results. On the other hand, taking out the effect of affect analytically offers even stronger results.

The influence of effort on purchasing behavior may be explained by a desire to justify one's decision to spend effort or as a desire to reduce the effort already wasted. In order to test for these two explanations, I conducted tests of mediation by running regressions with and without each mediator (Baron and Kenny 1986). Using the measures collected for self-justification and desire to reduce waste, two different summated indexes were generated. These were then entered as independent variables in a regression of effort on the dependent measures. In the test of self-justification as a mediator, it was found that entering self-justification as an independent variable weakened the coefficient of effort when it was regressed against the amount subjects were willing to pay ($\beta = 0.24$,

$p=0.03$ to $\beta =0.21$, $p=0.06$). Since willingness to buy had turned out to be non-significant in analysis described earlier, it was not used as a dependent measure for a test of mediation. In the test of desire to reduce waste as a mediator, it was found that the coefficient of effort was unaffected by the introduction of desire to reduce waste into the regression ($\beta=0.24$, $p=0.03$ to $\beta =0.26$, $p=0.02$). Thus, the test for self-justification as an explanation was supported but the same was not supported for desire to reduce waste.

Discussion

Using a web-based instrument, I manipulated the effort in searching and evaluating desktop computers. The findings were consistent with H_1 . Specifically, subjects who invested more effort were likely to spend more on a computer and this effect was strengthened when affect was used as a covariate (H_1). The decision to spend more on a computer was driven by the subjects' desire to justify their decision to invest effort in searching and evaluating. The role of desire to reduce waste as an explanation was not supported. Although not hypothesized, it was surprising that willingness to buy failed as a dependent measure.

Decisional Control

Although the results of Study 2 support the influence of effort, it is not clear if these results would pan out the same way in a natural setting. One major difference between Study 2, a laboratory experiment, and a person who decides to go to a website to buy a desktop computer is that in the former situation the task was not determined by the subject. Instead those who had agreed to participate in Study 2 were instructed to go to a certain website, evaluate four desktop computers and pick the best one. Thus, subjects in Study 2 lacked control over the decision to shop.

Control is defined as the active belief that one has a choice among responses that are differentially effective in achieving the desired outcome (Langer 1983). Researchers investigating control have investigated various aspects such as behavioral, decisional, and cognitive control (Averill 1973). Behavioral control is the direct action taken on the environment to influence a threatening event; cognitive control relates to the interpretation of threatening events; and, finally, decisional control is the opportunity to choose among various possible actions. Most previous research on control has employed one of these forms of control in testing the role of control. Among these different forms of control, it is the role of decisional control that is most relevant to the question raised in the previous paragraph.

Previous research investigating the role of decisional control (Schoorman and Holahan 1996) has found that when subjects felt they didn't have control over their decision to spend money they were less likely to commit sunk cost errors. Drawing a parallel to the role of effort, it may be said that if subjects don't perceive having control over the task characteristics of the study, their purchasing behavior would be less likely to be influenced by the amount of effort invested. Conversely, if subjects did experience decisional control, then the effect of effort on purchasing behavior would be expected to be stronger. This might be formally stated as,

H₂: Under conditions of high decisional control, the purchase price paid by consumers who spend more effort towards a purchase will be greater than the purchase price paid by consumers who spend less effort towards the purchase. Under conditions of low decisional control, there will be no difference in the purchase price paid by consumers who spend more effort towards a purchase and those who spend less effort.

Pretests: Manipulation of Decisional Control

In order to develop a suitable manipulation of decisional control, I conducted a series of pretests. Descriptions of each of these pretests follow.

Pretest 2.1

The purpose of this pretest was to determine a suitable manipulation for decisional control. A total of 72 subjects from two e-commerce classes were used as subjects for this study. Thirty-four subjects were randomly assigned to the high control condition and the rest were assigned to the low control condition.

Decisional Control manipulation

The manipulation of decisional control was operationalized as choice as has been done in previous literature (Burger 1987; Langer and Rodin 1976). In this vein, I manipulated control by offering subjects in the high control condition, a choice between the present study or a different study that was going to be conducted on Friday evening. Thus, subjects opting for the latter study would have to leave the lab and go to a different building on a Friday evening to participate in a different study. This choice was offered on the first page of the web instrument. Subjects were required to make their selection by clicking a button on the web page. Those in the low control condition were not given this choice. In fact, they were told that they were required to do the present study and did not have an option.

Results

Since control was operationalized as choice, the manipulation check questions assessed whether subjects felt like they had a choice. Specifically, subjects were asked to

respond to the following two items, “I was able to choose the brand evaluation study to participate in,” and “I was able to choose the decision rule to use.” Items were scored on a nine-point scale with anchors strongly disagree and strongly agree.

Subjects in the high control condition did not perceive any more control than those in the low control condition ($M_{low} = 1.24$ vs. $M_{high} = 1.17$, $t_{45} = 0.68$, $p > 0.1$). Interviews with subjects who completed the study revealed that subjects did not perceive a choice. They felt that since one option was clearly dominant, there wasn't a real choice.

Pretest 2.2

The purpose of this pretest was to develop choices that are comparable or competitive as compared to the choices developed in the previous pretest. One hundred ninety-three students from management and marketing classes participated in this pretest. One hundred two subjects were randomly assigned to the high control condition and the rest were assigned to the low control condition.

Decisional Control manipulation

In this pretest, I made an attempt to give the subjects an illusion of control. Subjects made choices at two stages. The first choice was made at the beginning of the pretest where subjects were asked to choose between two studies, ‘Study A’ and ‘Study B.’ Those in the high control condition could click on either one of these buttons and it would take them to the next page which was the same regardless of the study selected. When subjects in the low control condition clicked on either button, a message popped up telling the subjects that they could not select that study and they must select the other study. For example, if the subject clicked the button for ‘Study A,’ he would see a message that told him that a large number of students had already selected study A

because of which the quota study A had been reached. Therefore, they must select study B.

The second choice was between two methods of evaluating brands, Method A and Method B. Regardless of the method selected, subjects in the high control conditions saw the same information. As with the first choice, subjects in the low control condition were not allowed to use the first method they selected. When they selected the first method, they were told that they were not allowed to use this method and had to use the other method.

Results

Perceived control was measured using the same set of two items used in the previous pretest (pretest 4.1). The results obtained were similar to the previous pretest with subjects in the high control condition experiencing no more control than those in the low control condition ($M_{\text{low}} = 2.23$ vs. $M_{\text{high}} = 2.36$, $t_{186} = 0.61$, $p > 0.1$). Post-study interviews with subjects revealed that the subjects did not feel like they had enough information to make a choice. Although they chose between two studies, they had no way of knowing which one to choose, since no information was given to them. The only information available to the subjects were the labels on the buttons. Similarly, when choosing a method, the subjects were given no information on how the methods were different. Therefore, since subjects did not know enough to choose between the two options, they did not perceive a sense of control.

Pretest 2.3

The purpose of this pretest was to provide subjects with real choices. I felt that doing so would give them a feeling of control. Twenty-four subjects taking an introductory course in management were used as subjects for this pretest.

Procedure and Design

A review of the literature on perceived control led me to believe that a choice exerted by a mere clicking of a button would not be a strong enough manipulation for control. The goal was therefore to provide subjects with real choices. Thus in this pretest, I tried to create a choice that would provide subjects with not only the labels for their choices (i.e., Research Study A and Research Study B) but also descriptions about them. At the same time, an equally important goal was to ensure that the studies were completely equivalent.

In order to find a pair of equivalent descriptions, I tested eight pairs of research study descriptions for equivalence. Each of the research studies in these pairs differed in terms of a set of variables. Some of these variables are, the sponsor of the research study (marketing, business, or education department), where the research study was conducted (a lab 2 minutes away or at a lab 10 minutes away), duration of the research study (30 minutes, 35 minutes or 40 minutes), and previous participation in the research study (no student participated before, more than 20 students participated before, or more than 100 students participated before).

Each subject was given four pairs of descriptions. They were asked to evaluate each research study, state their preference, evaluate similarity between the research studies and finally were asked if the choice gave them a feeling of control. The evaluation

question for each study consisted of a single item measured on a nine-point scale with anchors very bad (1) and very good (9). The item used was, “if you were to participate in Research Study A, how would you rate it?” Preference was measured using a dichotomous question that asked subjects, “which of these two research studies would you prefer to participate in?” Similarity was measured by a single item on a nine-point scale with anchors very similar (1) and very different (9). The item used was, “Research Study A and Research Study B are...” Finally, perceived control was measured by the following item, “being allowed to select between Research Study A and Research Study B would give me a feeling of...” This item was measured on a nine-point scale with anchors no choice (1) and complete choice (9).

Results

Of the research study pairs considered, research studies 3 and 8 were the most equivalent. When subjects were given a choice between the two research studies 64% selected research Research Study 3. The average difference between the evaluation of Research Study 3 and Research Study 8 was 1.09 which is the second lowest from among all the pairs. In terms of similarity, research studies 3 and 8 were rated the most similar ($M = 5.45$). Finally when subjects were asked whether a choice between research studies 3 and 8 would give them a sense of control, the average score was 7.27 which is the second highest amongst the pairs considered. The two research study descriptions (Research Studies 3 and 8) are given in Table 6.2.

Table 6.2: Research Study Descriptions for Control Manipulation

Research Study A

This research study is being conducted by the Education Department and it involves mathematical calculations. This study is the last of a series of 5 studies. More than 100 students have participated in previous versions of this research. This study will be conducted in the Instructional Services computer lab which is on the first floor of Instructional Services, a 5 minute walk from here. Once you arrive at the computer lab, the study will take approximately 30 minutes. As an incentive for participation in this study you will not only receive class credit but will also be entered into a lucky draw for \$15.

Research Study B

This research study is being conducted by the Business Department and it involves desktop computers. This study is the first of a series of 5 studies. You are the first set of students to participate in such a study. This study will be conducted in the Wood Hall computer lab which is on the second floor of this building, a 1 minute walk from here. Once you arrive at the computer lab, the study will take approximately 20 minutes. As an incentive for participation in this study you will not only receive class credit but will also be entered into a lucky draw for \$5.

Study 3

The main purpose of this study is to test for the role of decisional control in influencing the relationship between the amount of effort invested by a consumer and the amount paid. The second objective is to test the role of self-justification and desire to reduce waste as theoretical explanations.

Subjects and Design

A total of 95 subjects from an introductory business class were used as subjects for this study. This experiment used a 2 (Effort: high, low) X 2 (Decisional control: high, low) between subjects full factorial design. The manipulation of effort is

the same as that used in Study 2. Those in the high effort condition had to put in more effort to search for information and to evaluate a set of four brands based on that information. On the other hand, those in the low effort condition had to invest much less effort in searching and evaluating brands. The manipulation of decisional control is the same as described in pretest 2.3. Subjects in the high control condition were given two equivalent study descriptions and asked to choose one of them. On the other hand, subjects in the low control condition were shown the two equivalent study descriptions and then assigned to one of the two studies. Here, it is important to note that all the subjects performed the exact same task. Thus, subjects were given an illusion of control rather than any real sense of control.

Procedure

The experiment was conducted in four sessions with approximately an equal number of subjects in each session. Two of these sessions were high control sessions and the other two were low control.

Subjects arriving at the study location were told that we were conducting two studies and we would tell them more about these studies after they answered some general questions. They were then asked to respond to context independent measures for self-justification and desire to reduce waste. When all of them had completed responding to the questions, we reminded them that we were conducting two studies. We then told them to turn to the next page where the two studies (Research Study A and Research Study B) being conducted were being described. For the high control session, we told the subjects that they could choose the study (Research Study A or Research Study B) they would like to participate in. In order to exercise their choice, they had to write the name

of the study they wished to participate in on the last page of the questionnaire. For the low control session, subjects were told that they could not choose a study to participate in. Half the subjects were randomly assigned to each study. Subjects were then told to write the name of the study they were participating in on the last page of the questionnaire.

To be consistent with the study descriptions, subjects who selected the two studies were taken to different computer labs where they responded to a set of manipulation checks for decisional control. After this, they all responded to the same web instrument. Each session lasted approximately 50 minutes.

Results

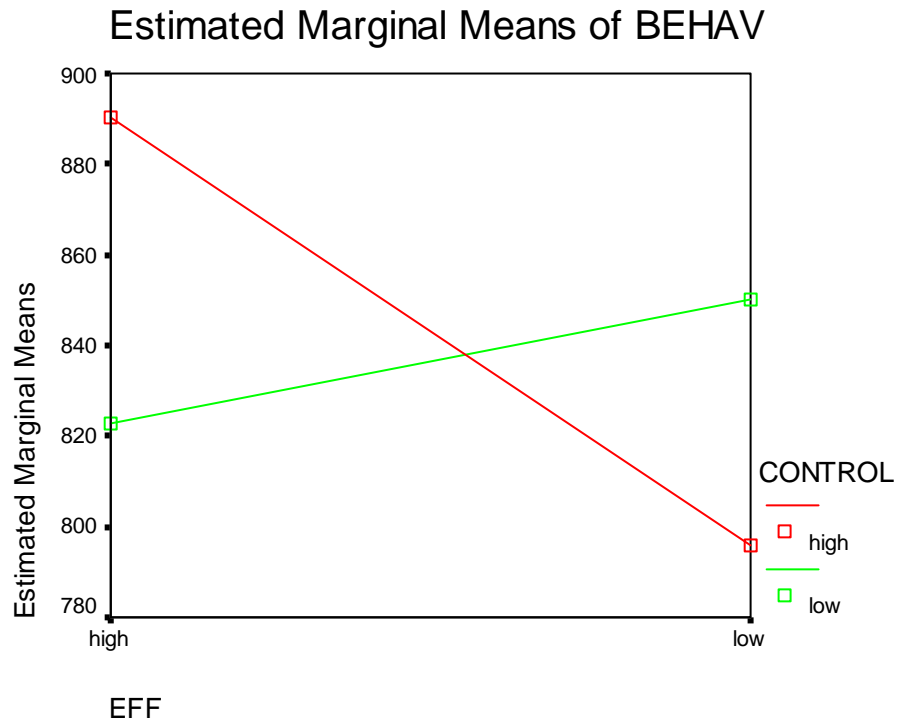
Effort had been successfully manipulated across the high effort and low effort conditions. Those in the high effort condition took significantly longer to complete the study as compared to those in the low effort condition ($M_{\text{low}} = 21.3$ minutes vs. $M_{\text{high}} = 14$ minutes, $t_{93} = 7.28$, $p < 0.001$). There was also a significant difference in perceived effort, with subjects in low effort condition finding the task significantly easier than those in the high effort condition ($M_{\text{low}} = 2.51$ vs. $M_{\text{high}} = 3.60$, $t_{93} = 4.13$, $p < 0.001$). The control manipulation also worked out as expected. Those in the high control condition experienced a significantly greater sense of control than those in the low control condition ($M_{\text{low}} = 1.30$ vs. $M_{\text{high}} = 6.36$, $t_{93} = 15.78$, $p < 0.001$).

Although the manipulations were effective, I was concerned about some sort of a bias created by the two studies used to manipulate control. Specifically, I was concerned that the results of this study may be driven by a perceived difference between Research Study A and Research Study B. In order to test for this, I compared Research Study A

and Research Study B on a number of variables. I found no difference across the two studies. Specifically, subjects participating in either study were equally capable of performing the task ($M_A = 5.12$ vs. $M_B = 4.87$, $t_{93} = 0.62$, $p > 0.1$), took the same amount of time to complete the study ($M_A = 17.85$ minutes vs. $M_B = 17.75$ minutes, $t_{93} = 0.99$, $p > 0.1$), were equally willing to buy the desktop computer ($M_A = 4.95$ vs. $M_B = 5.06$, $t_{93} = 0.35$, $p > 0.1$), were willing to pay similar amounts ($M_A = \$837$ vs. $M_B = \$842$, $t_{93} = 0.14$, $p > 0.1$), were also similar in terms of their scores for self-justification ($M_A = 3.63$ vs. $M_B = 3.75$, $t_{93} = 0.51$, $p > 0.1$) and desire to reduce waste ($M_A = 5.12$ vs. $M_B = 5.26$, $t_{93} = 0.5$, $p > 0.1$).

Next, I tested for the proposed interaction between effort and decisional control as predicted in H_2 . The interaction between effort and control was significant for the amount paid ($F(1,91) = 4.045$, $p < 0.05$) (see Figure 6.8). Subjects who spent more effort and had control were willing to pay \$890 while those who had control but invested lesser effort were willing to pay only \$795. On the other hand, for subjects who had low control, the corresponding numbers for high and low effort were \$822 and \$850, respectively. Thus, the proposed interaction hypothesized in H_2 is supported. As in Study 2, entering affect as a covariate increased the size of the interaction effect ($F(1,91) = 4.04$, $p = 0.047$ to $F(1,90) = 4.35$, $p = 0.040$). Although not hypothesized, I tested for the interaction between effort and control using willingness to buy as a dependent variable. This interaction was not significant ($F(1,91) = 2.11$, $p = 0.15$).

Figure 6.8: Effect of Effort-Control Interaction on Amount Paid



Discussion

This study provided support for the hypothesized interaction between effort and decisional control. Specifically, I found that when subjects had an illusion of decisional control, the effect of the amount of effort invested on purchasing behavior was strengthened.

Conclusion

Marketers have focused on reducing the effort required of consumers in acquiring products. In this chapter, I demonstrate that situations where consumers have to expend a large amount of effort are not all bad. In fact, when consumers invest effort in acquiring products, they are likely to spend more. Consider the case of a person who drives 50 miles to take advantage of a sale on home furniture or spends hours shopping for home

furniture. Based on this study, I predict that this person will buy more expensive furniture.

Data from Study 3 reveals that the effect of effort on purchasing behavior is stronger when the decision to invest effort is taken by the consumer himself rather than someone else. Consider a situation where a husband complies with his wife's request to go to a home furniture store 50 miles away or complies with his wife's request to spend hours shopping for home furniture. Based on the findings of this chapter, since the decision to shop was not that of the husband, I would predict that the husband would still spend more money than if he had not spent as much time and effort; however, had the decision to shop been his own, he would have spent even more money on furniture. Here, I assume that the decision to buy furniture rests entirely with the husband.

The motivation for consumers' investing a large amount of effort to spend more is explained by a desire to justify their decision to expend so much effort. Thus, a consumer who had spent six hours shopping for home furniture would seek to justify his decision to spend so much time and effort by buying some furniture.

Chapter 7: General Discussion

The purpose of this dissertation was to investigate sunk cost effects when the resources involved are non-monetary, such as time and effort. In Chapter 2, I presented an extensive review of peer-reviewed literature on sunk costs. This review spanned the literature in multiple disciplines including management, marketing, organizational behavior, psychology, sociology, and accounting. While investigating sunk cost effects was an important goal for this dissertation, equally important was determining the reasons for these effects. Toward this end, I investigated theoretical explanations that have been previously proposed for the sunk cost effect. Of these and other consumer behavior theories, the theoretical explanations that seemed to best fit the context of non-monetary resources were self justification and desire to reduce waste. Accordingly, I set out to develop process measures (context dependent scale) and a general scale (context independent scale) for both self-justification and desire to reduce waste. In Chapters 3 and 4, I developed scales for self-justification and desire to reduce waste. These scales were rigorously tested for validity and reliability and were cross-validated across multiple samples.

In Chapter 5, I investigated the sunk cost effect where the initial investment was monetary and the subsequent investment was non-monetary. This study was done in the context of coupons. Here, I tested a novel idea of putting a price on coupons. I found that subjects who paid for a coupon booklet were more likely to take the effort to use it rather than those who did not pay for it. The explanation for this effect lies in consumer's desire

to justify their decision to pay for the coupon. This has interesting implications for companies that want to encourage consumers to use coupons and thereby generate sales. It also has implications for retailers who might want to discourage redemption as is the case with mail-in rebates (Soman 2001).

In Chapter 6, I investigated the sunk cost effect for effort. Here the initial investment was effort (confounded with time) and subsequent investment was monetary. Here, I tried explore if consumers would react to sunk effort in the same manner they react to sunk money. I found evidence that suggested the existence of a sunk cost effect for effort. However, this effect was weak. Moreover, the effect existed only when the decision to invest effort was voluntary. This effect was explained by the subjects' need for self-justification.

Chapter 8: Implications and Future Research

Theoretical Implications

In Chapter 2, I described the findings from an extensive multi-disciplinary literature review on sunk cost effects. To my knowledge, the only other review of this kind was conducted about two decades ago by Staw and Ross (1987). This literature review summarizes and organizes more than 25 years of literature on sunk cost biases. In doing so, I have provided future researchers with a good starting point for beginning their investigations. More importantly, this review has found a number of inconsistent findings. Specifically, I found that the findings for the following antecedent variables are inconsistent across the literature: education, affect, alternative investment opportunities, ambiguity of information, and social influences on group decision making. Rationalizing these inconsistencies is a worthy avenue for future research. Another area where there is a lack of consensus is with regard to the theoretical mechanism for sunk cost effects. More than a half a dozen theories have been proposed, yet no single theory has been accepted as a suitable explanation.

Finally, this literature review has contributed by exposing some of the gaps in our understanding of the sunk cost phenomenon. The bulk of the research has focused on variables that lead individuals to commit sunk cost errors. Much less literature has looked at moderators and consequences. It would be theoretically interesting to explore conditions, such as passage of time, which might alleviate sunk cost biases. Similarly, research investigating consequences of a decision to reinvest have been neglected. For

instance, no research has looked at how the individual feels subsequent to committing a sunk cost error. Specifically, does he feel happy, satisfied, or less dissonant? Another gap in the literature is with respect to the nature of the resource invested. Almost all the literature on sunk costs has focused on monetary resources. This is yet another interesting avenue for future research.

In Chapter 3, I developed a scale for self-justification. Although the concept of self-justification has existed for more than four decades and was first proposed as an explanation of the sunk cost phenomenon about thirty years ago, there existed no measure for this construct. The development of a valid and reliable scale should lead to more research in this area. Another contribution of this scale is the recognition that self-justification has three dimensions - internal, external and distortion. In Chapter 4, I developed a scale for desire to reduce waste. This construct too has been offered as an explanation for the sunk cost effect but lacked a scale for measurement. Development of this scale should help further research in the area of sunk costs. Finally, the development of these scales will allow for further testing of self-justification and desire to reduce waste as theoretical mechanisms for the sunk cost phenomenon.

In Chapters 5 and 6, I tested for the sunk cost effect when the resources are non-monetary. While there exists a large amount of sunk cost literature involving money as a resource, there exists very little research on non-monetary resources such as time and effort. In Chapter 5, I demonstrated that the sunk cost effect was found even when the subsequent investment involved expenditure of effort. This is noteworthy because the bulk of the previous literature focuses on situations where the subsequent investment is money. In Chapter 6, I found a sunk cost effect even when the initial investment was in

the form of time and effort. Again, this finding is noteworthy because this is the only study that I am aware of where the sunk cost effect was demonstrated for a non-monetary investment. Finally, it must be noted that although I did find sunk cost effects across resources, these effects appear to be weak.

Managerial Implications

Coupons have been widely used as a promotional tool to stimulate sales. One of the challenges faced by coupon promotions is the low redemption rates. In Chapter 5, I demonstrated that if consumers are made to pay for a coupon booklet, they would be more likely to put in the effort to redeem these coupons. This is a particularly useful finding because it is dissonant with marketers attempts to make coupons easily available. In fact with the exception of a few non-profit organizations and entertainment booklets, coupons are generally available for free. Furthermore, this effect does not wear out with time.

Another managerially relevant finding of this dissertation is the role of the effort invested by consumers. There exist numerous marketing settings where consumers invest effort such as traveling to a store, reading product related literature, filling out forms online, and accumulating loyalty points. While marketers have traditionally tried to minimize effort expenditures, I have shown that not doing so might actually have some positive consequences for the marketers. In fact consumers who invest more effort will pay more for the product in order to consummate the transaction.

Future Research

The multi-disciplinary literature review conducted has demonstrated a number of inconsistent findings in the literature and has also uncovered a couple of gaps in our understanding of sunk cost effects. These gaps may be useful avenues for future research

The scales for self-justification and desire to reduce waste have been rigorously tested for validity and reliability. However, the reliance on student samples raises questions about the external validity of these scales. Although, there is no reason to expect students to differ from the general population in either their tendency to justify their past decisions or their desire to reduce waste, testing these scales on real people will help allay any concerns about the generalizability of these scales.

In Chapter 5, I tested the effect of the payment for coupons on redemption rates. While this study used coupon redemption as a context, based on what we know about the sunk cost phenomenon, I would expect to find an effect with other contexts too. Other contexts which require upfront payment and investment of effort later are worthy of future investigation. In Chapter 6, I demonstrated the existence of a sunk cost effect for effort. It would be interesting to test this finding in real marketing contexts. Finally, while I have demonstrated the existence of a sunk cost effect across resources, there remains a gap in the literature with respect to situations where both the initial and subsequent investments are non-monetary.

In conclusion, I hope that the findings of this dissertation will help us understand the behavior of consumers a little better and lead to further research in the area.

Bibliography

Abelson, R. P., E. Aronson, W. J. McGuire, T. M. Newcombe, M. J. Rosenberg, and P.

H. Tannenbaum (1968), *Theories of Cognitive Consistency*. Chicago: Rand McNally.

Argote, Linda, Mark A. Seabright, and Linda Dyer (1986), "Individual Versus Group Use of Base-Rate and Individuating Information," *Organizational Behavior and Human Decision Processes*, 38 (1), 65-75.

Arkes Hal R., and Laura Hutzler (2000), "The Role of Probability of Success Estimates in the Sunk Cost Effect," *Journal of Behavioral Decision Making*, 13, 295-306.

Arkes, Hal R. and Catherine Blumer (1985), "The Psychology of Sunk Cost," *Organizational Behavior and Human Decision Processes*, 35 (1), 124-140.

Aronson, E. (1966), "The Psychology of Insufficient Justification: An Analysis of Some Conflicting Data," In S. Feldman (ed.), *Cognitive Consistency*, New York: Academic Press.

Aronson, E. (1968), "Dissonance Theory: Progress and Problems," R. P. Abelson, E. Aronson, W. J. McGuire, T. M. Newcombe, M. J. Rosenberg, and P. H. Tannenbaum (Eds.), *Theories of Cognitive Consistency*. Chicago: Rand McNally.

Bagozzi, Richard P., Hans Baumgartner and Youjae Yi (1992), "State versus Action Orientation and the Theory of Reasoned Action: An Application to Coupon Usage," *Journal of Consumer Research*, 18 (March), 505-518.

- Ballard, Rebecca, Michael D. Crino, and Stephen Rubenfeld (1988), "Social Desirability Response Bias and the Marlowe-Crowne Social Desirability Scale," *Psychological Reports*, 63 (August), 227-237.
- Baron, Jonathan and Ilana Ritov (1994), "Reference Points and Omission Bias," *Organizational Behavior and Human Decision Processes*, 59 (3), 475-498.
- Bawa, Kapil and Robert W. Shoemaker (1987a), "The Effects of a Direct Mail Coupon on Brand Choice Behavior," *Journal of Marketing Research*, 24 (March), 370-376.
- Bawa, Kapil and Robert W. Shoemaker (1987b), "The Coupon-Prone Consumer: Some Findings Based on Purchase Behavior Across Product Classes," *Journal of Marketing*, 51 (4), 99-110.
- Bawa, Kapil and Robert W. Shoemaker (1989), "Analyzing Incremental Sales from a Direct Mail Coupon Promotion," *Journal of Marketing*, 53 (July), 66-78.
- Bawa, Kapil, Srinivivasan, and Rajendra Srivastava (1997), "Coupon Attractiveness and Coupon Proneness: A Framework for Modeling Coupon Redemption," *Journal of Marketing Research*, 34 (4), 517-525.
- Bazerman, M (1984), "The Relevance of Kahneman and Tversky's Concept of Framing to Organizational Behavior," *Journal of Management*, 10, 333-343.
- Bazerman, M. T. Guiliano, and A. Appelman (1984), "Escalation of Commitment in Individual and Group Decision Making," *Organizational Behavior and Human Decision Processes*, 33, 141-152.
- Bazerman, Max H. (1986), "Why Negotiations Go Wrong?," *Psychology Today*, 20 (6), 54.

- Bazerman, Max M. (1994), *Judgement in Managerial Decision Making*, 3rd ed. New York: John Wiley.
- Beach, L. R. and T. R. Mitchell (1990), "Image Theory: A Behavioral Theory of Decisions in Organizations. In B. M. Staw and L. L. Cummings (Eds.), *Research in Organizational Behavior*, 12, 1-41, Greenwich, CT, JAI Press.
- Bearden, William O., Richard G. Netemeyer, and Jesse E. Teel (1989), "Measurement of Consumer Susceptibility to Interpersonal Influence," *Journal of Consumer Research*, 15 (March), 473-481
- Berry, Leonard L., Kathleen Seiders, and Dhruv Grewal (2002), "Understanding Service Convenience," *Journal of Marketing*, 66 (3), 1-17.
- Bettman, James M. and Mita Sujon (1987), "Effects of Framing on Evaluation of Comparable and Non-Comparable Alternatives by Expert and Novice Consumers," *Journal of Consumer Research*, 14 (2), 141-154.
- Biyalogorsky, Eyal, William Boulding and Richard Staelin (2003), "Stuck in the Past: Why Managers Exhibit Escalation Bias," Working Paper, Duke University. .
- Blattberg, Robert C. and John Deighton (1996), "Manage Marketing by the Customer Equity Test," *Harvard Business Review*, 74 (4), 136-144.
- Boehne, Donna M. and Paul W. Paese (2000), "Deciding Whether to Complete or Terminate an Unfinished Project: A Strong Test of the Project Completion Hypothesis," *Organizational Behavior and Human Decision Processes*, 81 (2), 178-194.

- Bolton, Ruth N., P. K. Kannan, and Matthew D. Bramlett (2000), "Implications of Loyalty Program Membership and Service Experiences for Customer Retention and Value," *Journal of the Academy of Marketing Science*, 28 (1), 95-106.
- Boulding, William, Ruskin Morgan, and Richard Staelin (1997), "Pulling the Plug to Stop New Product Drain," *Journal of Marketing Research*, 34 (1), 164-176.
- Bowen, Michael G. (1987), "The Escalation Phenomenon Reconsidered: Decision Dilemmas or Decision Errors," *Academy of Management Review*, 12 (1), 52-66.
- Brockner Joel and J. Z. Rubin (1985), *Entrapment in Escalating Conflicts*, New York: Springer-Verlag.
- Brockner, J., Shaw, M. C., & Rubin, J. Z. (1979). Factors Affecting Withdrawal from an Escalating Conflict: Quitting Before its too Late. *Journal of Experimental Social Psychology*, 15, 492-503.
- Brockner, Joel (1992), "The Escalation of Commitment to a Failing Course of Action: Toward Theoretical Progress," *Academy of Management Review*, 17 (1), 39-61.
- Brockner, Joel, J. Z. Rubin and E. Lang (1981), "Face Saving and Entrapment," *Journal of Experimental Social Psychology*, 17, 68-79.
- Brockner, Joel, M. C. Shaw, and J. Z. Rubin (1979), "Factors Affecting Withdrawal from an Escalating Conflict: Quitting Before its too Late," *Journal of Experimental Social Psychology*, 15, 492-503.
- Caldwell, D. F. and C. A. O'Reilly (1982), "Responses to Failure – The Effects of Choice and Responsibility on Impression Management," *Academy of Management Journal*, 25, 121-136.

- Chakraborty, Goutam and Catherine Cole. (1991), "Coupon Characteristics and Brand Choice," *Psychology and Marketing*, 8(3), 145-159.
- Chandon, Pierre, Brian Wansink, and Gilles Laurent 2000, "A Benefit Congruency Framework of Sales Promotion Effectiveness," *Journal of Marketing*, 64 (4), 65-81.
- Conlon, D. E. and H. Garland (1993), "The Role of Project Completion Information in Maintaining Commitment," *Academy of Management Journal*, 36, 402-413.
- Conlon, E. and G. Wolf (1980), "The Moderating Effects of Strategy, Visibility, and Involvement on Allocation Behavior: An Extension of Staw's Escalation Paradigm," *Organizational Behavior and Human Performance*, 26, 172-192.
- Conlon, E. J. and J. M. Parks (1987), "Information Requests in the Context Escalation," *Journal of Applied Psychology*, 72, 344-350.
- Crowne, Douglas P. and David Marlowe (1960), "A New Scale of Social Desirability Independent of Psychopathology," *Journal of Consulting Psychology*, 24 (August), 349-354.
- Davis, K. and E. E. Jones (1960), "Changes in Interpersonal Perception as a Means of Reducing Cognitive Dissonance," *Journal of Abnormal Social Psychology*, 61, 402-410.
- Davis, Mark A. and Philip Bobko (1986), "Contextual Effects on Escalation Processes in Public Sector Decision-Making," *Organizational Behavior and Human Decision Processes*, 37 (February), 121-138.
- Dhar, Ravi and Stephan M. Nowlis (1999), "The Effect of Time Pressure On Consumer Choice Deferral," *Journal of Consumer Research*, 25 (4), 369-384.

- Dhar, Sanjay K. and Stephen J. Hoch (1996), "Price Discrimination Using In-Store Merchandising," *Journal of Marketing*, 60 (1), 17-30.
- Dodds, William B., Kent B. Monroe, and Dhruv Grewal (1991), "Effects of Price, Brand, and Store Information on Buyers Product Evaluations," *Journal of Marketing Research*, 28 (August), 307-319.
- Dowling, Grahame R. and Mark Uncles (1997), "Do Customer Loyalty Programs Really Work," *Sloan Management Review*, 38 (4) 71-82.
- Dreze, Xavier and Joseph C. Nunes (2003), "\$189 or \$39 plus 16000 Frequent Flyer Miles? Pricing in Combination of Currencies to Lower Consumers' Perceived Cost," *Unpublished*, University of Southern California.
- Drummond, Helga (1994), "Too Little Too Late: A Case Study of Escalation in Decision Making," *Organization Studies*, 15 (4), 591-607.
- Drummond, Helga (1996), "Between a Rock and a Hard Place: A Case Study of Escalation," *Management Decision*, 34 (3), 29-34.
- Drummond, Helga (1997), "Give it a Week and Then Another Week: A Case of Escalation in Decision Making," *Personnel Review*, 26 (1/2), 99-113.
- Drummond, Helga (1998), "Is Escalation Always Irrational," *Organization Studies*, 19 (6), 911-930.
- Feldman, Laurence P. and Jacob Hornik (1981), "The Use of Time: An Integrated Conceptual Model," *Journal of Consumer Research*, 7 (4), 407-419.
- Festinger, L. (1957), *A Theory of Cognitive Dissonance*, Stanford: Stanford University Press.

- Fischer, Ilan and David V. Budescu (1995), "Desirability and Hindsight Biases in Predicting Results of a Multi-Party Election," In Contributions to Decision Making I, Jean-Paul Caverni, M. Bar-Hillel, F. H. Barron, and H. Jungermann, eds. Amsterdam, NY: Elsevier Science, 193-211.
- Fox, Craig R. and Amos Tversky (1998), "A Belief Based Account of Decision Under Uncertainty," *Management Science*, 44 (7), 879-885.
- Fox, F. V. and B. M. Staw (1979), "The Trapped Administrator: Effects of Job Insecurity and Policy Resistance upon Commitment to a Course of Action," *Administrative Science Quarterly*, 24, 449-471.
- Garland H. and D. E. Conlon (1998), "Too Close To Quit: The Role of Project Completion in Maintaining Commitment," *Journal of Applied Social Psychology*, 28, 2025-2048.
- Garland H. and S. Newport (1991), "Effects of Absolute and Relative Sunk Costs on the Decision to Persist With a Course of Action," *Organizational Behavior and Human Decision Processes*, 48, 55-69.
- Garland, H. (1990), "Throwing Good Money After Bad: The Effect of Sunk Costs on the Decision to Escalate Commitment to an Ongoing Project," *Journal of Applied Psychology*, 75, 728-731.
- Garland, H., Craig A. Sandefur, and Anne C. Rogers (1990), "De-escalation of Commitment in Oil Exploration: When Sunk Costs and Negative Feedback Coincide," *Journal of Applied Psychology*, 75 (December), 721-727.

- Gross, Barbara L. and Jagdish N. Sheth (1989), "Time-Oriented Advertising: A Content Analysis of United States Advertising, 1890 – 1988," *Journal of Marketing*, 53 (October), 76-83.
- Heath, Chip (1995), "Escalation and De-Escalation in Response to Sunk Costs: The Role of Budgeting in Mental Accounting," *Organizational Behavior and Human Decision Processes*, 62, 38-54.
- Houston, Mark B., Lance A. Bettencourt, and Sutha Wenger (1998), "The Relationship Between Waiting in a Service Queue and Evaluations of Service Quality: A Field Theory Perspective," *Psychology and Marketing*, 15 (8), 735-53.
- Hui, Michael K. and David K. Tse (1996), "What to Tell Consumers in Waits of Different Lengths: An Integrative Model of Service Evaluation," *Journal of Marketing*, 60 (April), 81-90.
- Inman, J. J., & McAlister, L. (1994). Do Coupon Expiration Dates Affect Consumer Behavior? *Journal of Marketing Research*, 31(3), 423.
- Isen, A. M. and R. Patrick (1983), The Effect of Positive Feelings on Risk Taking: When the Chips are Down, *Organizational Behavior and Human Decision Processes*, 31, 194-202.
- Isen, A. M., B. Means, R. Patrick, and G. Nowicki (1982), Some Factors Influencing Decision Making Strategy and Risk Taking. In M. S. Clark and S. T. Fiske (Eds.), *Affect and Cognition*. Hillsdale, NJ: Erlbaum.
- Isen, A. M., T. E. Shalcker, M. S. Clark, and L. Karp (1978), "Affect, Accessibility of Material in Memory, and Behavior: A Cognitive Loop?" *Journal of Personality and Social Psychology*, 36, 1-12.

- Janis, I. (1982), *Groupthink*, Boston: Houghton Mifflin
- Kahn, Barbara E. and Alice M. Isen (1993), "The Influence of Positive Affect on Variety Seeking Among Safe, Enjoyable Products," *Journal of Consumer Research*, 20 (2), 257-270.
- Kahneman, Daniel and Amos Tversky (1979), "Prospect Theory: An Analysis of Decisions Under Risk," *Econometrica*, 47 (2), 263-291.
- Kahneman, Daniel and Dan Lovallo (1993), "Timid Choices and Bold Forecasts: A Cognitive Perspective on Risk Taking," *Management Science*, 39 (1), 17-31.
- Katz, Karen L., Blaire M. Larson, and Richard C. Larson (1991), "Prescription for the Waiting-in-Line Blues: Entertain, Enlighten and Engage," *Sloan Management Review*, 32 (2), 44-53.
- Kaufman, Carole Felker, Paul M. Lane and Jay D. Lindquist (1991), "Exploring More than 24 Hours a Day: A Preliminary Investigation of Polychronic Use of Time," *Journal of Consumer Research*, 18 (3), 392-401.
- Keil, M (1995), "Escalation of Commitment in Information Systems Development: A Comparison of Three Theories," *Academy of Management Journal*, 38, 348-352.
- Kerin, R. A., Berkowitz, E. N., Hartley, S. W., & Rudelius, W. (2002). *Marketing* (7th ed.): McGraw-Hill/Irwin.
- Kirby, Susan L. and Mark A. Davis (1998), "A Study of Escalating Commitment in Principal-Agent Relationships : Effects of Monitoring and Personal Responsibility," *Journal of Applied Psychology*, 83 (2), 206-217.
- Kivetz, Ran (2003), "The Effects of Effort and Intrinsic Motivation on Risky Choice," *Under Review at Marketing Science*.

- Kivetz, Ran and Itamar Simonson (2002), "Self Control for the Righteous: Toward a Theory of Precommitment to indulgence," *Journal of Consumer Research*, 29 (2), 199-217.
- Kivetz, Ran and Itamar Simonson (2003a), "Earning the Right to Indulge: Effort as a Determinant of Customer Preferences Toward Frequency Program Rewards," *Journal of Marketing Research*, 39 (2), 155-170.
- Kivetz, Ran and Itamar Simonson (2003b), "The Role of Effort Advantage in Consumer Response to Loyalty Programs: The Idiosyncratic Fit Heuristic," *Forthcoming, Journal of Marketing Research*.
- LaPointe, Patrick (2002), "Loyalty Marketing's Newest Challenges: Trends that Boost drag on Loyalty Programs," *Marketing News*, Oct 14, 2002.
- Leclerc, France, Bernd H. Schmitt, and Laurette Dube (1995), "Waiting Time and Decision Making: Is Time like Money," *Journal of Consumer Research*, 22 (June), 110-19.
- Lichtenstein, Donald R., Nancy M. Ridgway and Richard G. Netemeyer (1993), "Price Perceptions and Consumer Shopping Behavior: A Field Study," *Journal of Marketing Research*, 30 (May), 234-245.
- Lipshitz, R. (1995), "The Road to Desert Storm," *Organization Studies*, 16, 242-264.
- Lord, C. G., L. Ross, and M. R. Lepper (1979), "Biased Assimilation and Attitude Polarization: The Effects of Prior Theories on Subsequently Considered Evidence," *Journal of Personality and Social Psychology*, 37, 2098-2109.
- Luce, Mary Frances (1998), "Choosing to Avoid: Coping With Negatively Emotion Laden Consumer Decisions," *Journal of Consumer Research*, 24 (4), 409-433.

- McCain, Bruce E. (1986), "Continuing Investment Under Conditions of Failure: A Laboratory Study of the Limits of Escalation," *Journal of Applied Psychology*, 71 (2), 280-284.
- McQuarrie, Edward F. and David Glen Mick (1992), "On Resonance: A Critical Pluralistic Inquiry into Advertising Rhetoric," *Journal of Consumer Research*, 19 (September), 180-197.
- Meloy, Margaret G. (2000), "Mood-Driven Distortion of Product Information," *Journal of Consumer Research*, 27 (December), 345-359.
- Menon, Satya and Barbara E. Kahn (1995), "The Impact of Context on Variety Seeking in Product Choices," *Journal of Consumer Research*, 22 (3), 285-295.
- Mittal, Banwari (1994) "An Integrated Framework for Relating Diverse Consumer Characteristics to Supermarket Coupon Redemption," *Journal of Marketing Research*, 31(4), 533.
- Mittal, Vikas, William T. Ross Jr., and Michael Tsiros (2002), "The Role of Issue Valence and Issue Compatibility in Determining Effort Investment," *Journal of Marketing Research*, 39 (4), 455-468.
- Moon, Henry (2001a), "Looking Forward and Looking Back: Integrating Completion and Sunk Cost Effects Within an Escalation of Commitment Progress Decision," *Journal of Applied Psychology*, 86, 104-113.
- Moon, Henry (2001b), "The Two Faces of Conscientiousness: Duty and Achievement Striving in Escalation of Commitment Dilemmas," *Journal of Applied Psychology*, 86 (3), 533-540.

- Mowen, John C. (2000), *The 3M Model of Motivation and Personality: Theory and Empirical Applications to Consumer Behavior*, Kluwer Academic Press, Boston MA.
- Northcraft, G. B. and G. Wolf (1984), "Dollars, Sense and Sunk Costs: A Life Cycle Model of Resource Allocation Decision," *Academy of Management Review*, 9 (April), 225-234.
- Northcraft, G. B. and M. A. Neale (1986), "Opportunity Costs and the Framing of Resource Allocation Decision," *Organizational Behavior and Human Decision Processes*, 37 (June), 348-356.
- Nowlis, Stephen M., Barbara E. Kahn, and Ravi Dhar (2002), "Coping with Ambivalence: The Effect of Removing a Neutral Option on Consumer Attitude and Preference Judgments," *Journal of Consumer Research*, 29 (December), 319-334.
- Payne, John W., James R. Bettman, and Eric J. Johnson (1988), "Adaptive Strategy Selection in Decision Making," *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 14 (July), 534-552.
- Pressler, Margaret Webb (2004), "Use of Coupons Cuts Both Ways," *The Washington Post*, September 12, 2004, F.01.
- Quittner, Jeremy (2003), "Loyalty Programs' Use – and Expectations – Rising," *American Banker*, New York, N.Y. May 6, 2003.
- Raghubir, Priya (1998), "Coupon Value: A Signal for Price," *Journal of Marketing Research*, 35 (3), 316-324.

- Raghubir, Priya and Joydeep Srivastava (2002), "Effect of Face Value on Product Valuation in Foreign Currencies," *Journal of Consumer Research*, 29 (3), 335-347.
- Ratner, Rebecca K., Barbara E. Kahn, and Daniel Kahneman (1999), "Choosing Less Preferred Experiences for the Sake of Variety," *Journal of Consumer Research*, 26 (1), 1-15.
- Reibstein, D. J. and Traver, P. A. (1982). Factors Affecting Coupon Redemption Rates. *Journal of Marketing*, 46 (Fall), 102-113.
- Roehm, Michelle L., Ellen Bolman Pullins, and Harper A Roehm Jr. (2002), "Designing Loyalty-Building Programs for Packaged Goods Brands," *Journal of Marketing Research*, 39 (2), 202-213.
- Ross, J. and B. M. Staw (1986), "Expo 86: An Escalation Prototype," *Administrative Science Quarterly*, 31, 274-297.
- Rubin, Jeffrey Z. and Joel Brockner (1975), "Factors Affecting Entrapment in Waiting Situations: The Rosencrantz and Guildenstern Effect," *Journal of Personality and Social Psychology*, 31, 1054-1063.
- Russo, J. E., M. G. Meloy and V. H. Medvec (1996), "The Distortion of Information During Decisions," *Organizational Behavior and Human Decision Processes*, 66 (1), 102-110.
- Russo, J. E., M. G. Meloy and V. H. Medvec (1998), "Predecisional Distortion of Product Information," *Journal of Marketing Research*, 35, 438-452.
- Russo, J. Edward and Paul J. H. Schoemaker (1989), *Decision Traps*, New York: Doubleday/Currency.

- Samuleson, W. and R. Zeckhauser (1988), "Status Quo Bias in Decision Making," *Journal of Risk and Uncertainty*, 1, 7-59.
- Schaubroeck, John and Elaine Davis (1994), "Prospect Theory Predictions When Escalation is Not the Only Chance to Recover Sunk Costs," *Organizational Behavior and Human Decision Processes*, 57, 59-82.
- Schaubroeck, John and Steve Williams (1993), "Type A Behavior Pattern and Escalating Commitment," *Journal of Applied Psychology*, 78 (5), 862-867.
- Schaubroeck, John and Steve Williams (1993), Type A Behavior Pattern and Escalating Commitment, *Journal of Applied Psychology*, 78 (5), 862-867. Schmidt and Calantone 2002;
- Schmidt, Jeffrey B. and Roger J. Calantone (2002), "Escalation of Commitment During New Product Development," *Journal of the Academy of Marketing Science*, 30 (2), 103-118.
- Schoorman, David F. (1988), "Escalation Bias in Performance Appraisals," *Journal of Applied Psychology*, 73 (1), 58-62.
- Schoorman, David F. and Patricia J. Holahan (1996), "Psychological Antecedents of Escalation Behavior: Effects of Choicem, Responsibility and Decision Consequences," *Journal of Applied Psychology*, 81 (6), 786-794.
- Sheehan, N. and E. W. Kenworthy (1971), *Pentagon Papers*, New York: Bantam Books.
- Shermach, Kelly (2003), "Tapping Into Trends," *Incentive*, New York, Feb 2003.
- Shimp, Terence A. and Aican Kavas (1984), "The Theory of Reasoned Action Applied to Coupon Usage," *Journal of Consumer Research*, 11 (December), 795-809.

- Shoemaker, R. W., & Tibrewala, V. (1985). Relating Coupon Redemption Rates to Past Purchasing of the Brand. *Journal of Advertising Research*, 25(October/November), 40-47.
- Simonson, Itamar and Barry M. Staw (1992), "Deescalation Strategies: A Comparison of Techniques for Reducing Commitment to Losing Courses of Action," *Journal of Applied Psychology*, 77 (4), 419-426.
- Soman, D. (2001). Effects of Payment Mechanism on Spending Behavior: The Role of Rehearsal and Immediacy of Payments. *Journal of Consumer Research*, 27(4), 460-474.
- Soman, Dilip (1998), "The Illusion of Delayed Incentives: Evaluating Future Money-Effort Transactions," *Journal of Marketing Research*, 35 (4), 427-437.
- Soman, Dilip (2001), "The Mental Accounting of Sunk Time Costs: Why Time is not Like Money," *Journal of Behavioral Decision Making*, 14, 169-185.
- Spranca, Mark, Elisa Minsk, and Jonathan Baron (1991), "Omission and Commission in Judgment and Choice," *Journal of Experimental Social Psychology*, 27(1), 76-105.
- Staw, Barry M. (1976), "Knee-Deep in the Big Muddy - A Study of Escalating Commitment to a Chosen Course of Action," *Organizational Behavior and Human Performance*, 27.
- Staw, Barry M. (1974) Attitudinal and Behavioral Consequences of Changing a Major Organizational Reward: A Natural Field Experiment, *Journal of Personality and Social Psychology*, 6, 742-751.

- Staw, Barry M. (1981), "The Escalation of Commitment to a Course of Action," *Academy of Management Review*, 6 (October), 577-587.
- Staw, Barry M. and F. V. Fox (1977), "Escalation: The Determinants of Commitment to a Chosen Course of Action," *Human Relations*, 30 (May), 431-450.
- Staw, Barry M. and H. Hoang (1995), "Sunk Costs in the NBA: Why Draft Order Affects Playing Time and Survival in Professional Basketball," *Administrative Science Quarterly*, 40, 474-494.
- Staw, Barry M. and Jerry Ross (1987), "Knowing When to Pull the Plug," *Harvard Business Review*, 65 (March/April), 68-74.
- Staw, Barry M., S. G. Barsade, and K. W. Koput (1997), "Escalation at the Credit Window: A Longitudinal Study of Bank Executives' Recognition and Write-off of problem loans," *Journal of Applied Psychology*, 82, 130-142.
- Staw, Barry. M. and J. Ross (1978), "Commitment to a Policy Decision: A Multi-Theoretical Perspective," *Administrative Science Quarterly*, 23, 40-64.
- Staw, Barry. M. and J. Ross (1987), "Behavior in Escalation Situations: Antecedents, Prototypes, and Solutions. In B. M. Staw (Ed.), *Research in Organizational Behavior*, 9, 39-78, Greenwich, CT: JAI Press.
- Strube, M. J. (1985), "Attributional Style and the Type A Coronary-prone Behavior Pattern," *Journal of Personality and Social Psychology*, 49, 500-509.
- Strube, M. J., S. M. Boland, P. A. Manfreda and A. Al-Falaj (1987), "Type A Behavior Pattern and the Self Evaluation of abilities: Empirical Tests of the Self Appraisal Model," *Journal of Personality and Social Psychology*, 52, 956-974.

- Tan, Hun-Tong and J. Frank Yates (1995), "Sunk Cost Effects: The Influences of Instruction and Future Return Estimates," *Organizational Behavior and Human Decision Processes*, 63 (3), 311-319.
- Tan, Hun-Tong and J. Frank Yates (2002), "Financial Budgets and Escalation Effects," *Organizational Behavior and Human Decision Processes*, 87 (2), 300-322.
- Taylor, G. A. (2001). Coupon Response in Services. *Journal of Retailing*, 77(1), 139-151.
- Taylor, Shelley E. and Jonathon D. Brown (1988), "Illusion and Well-Being: A Social Psychological Perspective on Mental Health," *Psychological Bulletin*, 103 (2), 193-210.
- Taylor, Shirley (1994), "Waiting for Service: The Relationship between Delays and Evaluations of Service," *Journal of Marketing*, 58 (April), 56-69.
- Taylor, Shirley (1995), "The Effects of Filled Waiting Time and Service Provider Control over the Delay on Evaluations of Service," *Journal of Academy of Marketing Sciences*, 23 (1), 38-48.
- Teger, A. (1980), *Too Much Invested to Quit*. New York: Pergamon Press.
- Thaler, Richard (1980), "Toward a Positive Theory of Consumer Choice," *Journal of Economic Behavior and Organization*, 1, 39-60.
- Thaler, Richard (1999), "Mental Accounting Matters," *Journal of Behavioral Decision Making*, 12, 183-206.
- Tversky, Amos and Daniel Kahneman (1974), "Judgment Under Uncertainty: Heuristics and Biases," *Science*, 185, 1124-1131.

- Ward, R. W., & Davis, J. E. (1978). A Pooled Cross-Section Time Series Model of Coupon Promotions. *American Journal of Agricultural Economics*, 60(August), 393-401.
- Webster, F. E. (1965). The 'Deal-Prone' Consumer. *Journal of Marketing Research*, 2(May), 186-189.
- Weick, K. (1964), "Reduction of Cognitive Dissonance Through Task Enhancement and Effort Expenditure," *Journal of Abnormal and Social Psychology*, 56, 152-155.
- Weinberg, Bruce D. (2000), "Don't keep your Internet Customers Waiting too long at the (virtual) Front Door," *Journal of Interactive Marketing*, 14 (1), 30-39.
- Whyte Glen (1993), "Escalating Commitment in Individual and Group Decision Making: A Prospect Theory Approach," *Organizational Behavior and Human Decision Processes*, 54, 430-455.
- Whyte, Glen (1986), "Escalating Commitment to a Course of Action: A Reinterpretation," *Academy of Management Review*, 11 (2), 311-321.
- Whyte, Glen (1991a), "Diffusion of Responsibility: Effects on Escalation Tendency," *Journal of Applied Psychology* 76 (June), 408-415.
- Whyte, Glen (1991b), "Decision Failures: Why They Occur and How to Prevent Them," *Academy of Management Executive*, 11 (2) 311-321.
- Yadav, Manjit (1994), "How Buyers Evaluate Product Bundles: A Model of Anchoring and Adjustment," *Journal of Consumer Research*, 21 (2), 342-353.
- Yadav, Manjit and Kent B. Monroe (1993), "How Buyers Perceive Savings in a Bundle Price: An Examination of a Bundle's Transaction Value," *Journal of Marketing Research*, 30 (3), 350-358.

Zeigarnik, B. (1927), "On Finished and Unfinished Tasks," *Psychological Forces*, 9, 1-85.

Appendix

Appendix A: Context-Independent Scales for Self-justification and Desire to Reduce Waste, Oklahoma State University

Oklahoma State University
Institutional Review Board

Protocol Expires: 1/20/2005

Date: Wednesday, January 21, 2004

IRB Application No BU0415

Proposal Title: Development of Global Scales for Self-Justification and Desire to Reduce Waste

Principal Investigator(s):

Vishal Lala
312A Business
Stillwater, OK 74078

Goutam Chakraborty
419A Business
Stillwater, OK 74078

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

Dear PI :

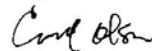
Your IRB application referenced above has been approved for one calendar year. Please make note of the expiration date indicated above. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved projects are subject to monitoring by the IRB. If you have questions about the IRB procedures or need any assistance from the Board, please contact me in 415 Whitehurst (phone: 405-744-5700, colson@okstate.edu).

Sincerely,



Carol Olson, Chair
Institutional Review Board

Appendix B: Context-dependent scales for Self-justification and Desire to Reduce Waste, Oklahoma State University

Oklahoma State University Institutional Review Board

Protocol Expires: 1/4/2005

Date: Monday, January 05, 2004

IRB Application No BU0413

Proposal Title: Development of Scales for Self-Justification and Desire to Reduce Waste

Principal Investigator(s):

Vishal Lala
312A Business
Stillwater, OK 74078

Goutam Chakraborty
419A Business
Stillwater, OK 74078

Reviewed and
Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

Dear PI:

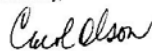
Your IRB application referenced above has been approved for one calendar year. Please make note of the expiration date indicated above. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved projects are subject to monitoring by the IRB. If you have questions about the IRB procedures or need any assistance from the Board, please contact me in 415 Whitehurst (phone: 405-744-5700, colson@okstate.edu).

Sincerely,



Carol Olson, Chair
Institutional Review Board

Appendix C: Paying for Coupons, Oklahoma State University

**Oklahoma State University
Institutional Review Board**

Protocol Expires: 2/2/2005

Date: Tuesday, February 03, 2004

IRB Application No BU0417

Proposal Title: Discount Coupons for a Price

Principal Investigator(s):

✓
Vishal Lala
312A Business
Stillwater, OK 74078

Goutam Chakraborty
419A Business
Stillwater, OK 74078

Reviewed and
Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

Dear PI :

Your IRB application referenced above has been approved for one calendar year. Please make note of the expiration date indicated above. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved projects are subject to monitoring by the IRB. If you have questions about the IRB procedures or need any assistance from the Board, please contact me in 415 Whitehurst (phone: 405-744-5700, colson@okstate.edu).

Sincerely,



Carol Olson, Chair
Institutional Review Board

Appendix D: Impact of Consumers' Effort Investments on Buying Decisions, Oklahoma State University

Oklahoma State University Institutional Review Board

Protocol Expires: 11/19/2004

Date: Thursday, November 20, 2003

IRB Application No BU046

Proposal Title: Impact of Consumers Effort Investments on Buying Decisions

Principal
Investigator(s):

Vishal Lala
312A Business
Stillwater, OK 74078

Goutam Chakraborty
419A Business
Stillwater, OK 74078

Reviewed and
Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

Dear PI :

Your IRB application referenced above has been approved for one calendar year. Please make note of the expiration date indicated above. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved projects are subject to monitoring by the IRB. If you have questions about the IRB procedures or need any assistance from the Board, please contact me in 415 Whitehurst (phone: 405-744-5700, colson@okstate.edu).

Sincerely,



Carol Olson, Chair
Institutional Review Board

**Appendix E: Impact of Consumers' Effort Investments on Buying Decisions,
University of Wisconsin – Green Bay**

**UNIVERSITY of WISCONSIN
GREEN BAY**

September 14, 2004

To: Vishal Lala, Business Administration

From: Steven Muzatko, Chair UW–Green Bay Institutional Review Board

Subject: IRB approval of research protocol: *Impact of Consumers Effort Investments on Buying Decisions*

IRB tracking number (Please use this number in future correspondence with the IRB): **F 04 01**

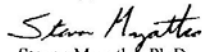
After reviewing the materials associated with the proposed study, it has been determined that appropriate measures will be taken to protect the respondents during the course of your research. The UW-Green Bay IRB therefore grants approval of your human subjects protocol for a one-year period from the date of this memorandum.

At the end of the one-year period, you must submit an Annual Progress Report Form to indicate the status of your study and request renewal if it is your intention to continue.

If any modifications of your protocol become necessary prior to the expiration date, it is your responsibility as principle investigator to seek IRB review of the modified protocol before changes are implemented.

Questions concerning any issues related to the review of your protocol should be directed to me at (920) 465-2578 or by email at muzatkos@uwgb.edu.

Sincerely,



Steven Muzatko, Ph.D.
Chair, UW–Green Bay Institutional Review Board

Professional Programs in Business
L.G. Wood Hall, Suite 460, 2420 Nicolet Drive, Green Bay, Wisconsin 54311-7001
Phone (920) 465-2051 • FAX (920) 465-2660

VITA

Vishal Lala

Candidate for the Degree of

Doctor of Philosophy

Dissertation: TOO MUCH INVESTED TO GO BACK: AN INVESTIGATION OF SUNK COST EFFECTS FOR MONETARY AND NON-MONETARY RESOURCES

Major Field: Business Administration

Biographical:

Education: Graduated from Kendriya Vidyalaya, Bombay, India in June 1996; received Bachelor of Science degree in Chemistry from St. Xaviers College, Bombay, India in May 1996; received Master of Management Studies degree in Marketing from University of Bombay, Bombay, India in June 1999; received Masters of Science degree in Management Information Systems/Accounting Information Systems from Oklahoma State University, Stillwater, Oklahoma in July 2004. Completed the requirements for the Doctor of Philosophy degree in Business Administration at Oklahoma State University in May 2005.

Experience: Worked as a Junior Researcher for Shoppers Stop in Bombay, India, 1997-1998; worked as Corporate Executive for Elbee Services Limited in Bombay, India, 1998-1999; worked as a Teaching Associate for Department of Marketing, Oklahoma State University, 1999-2004; employed as an Assistant Professor by University of Wisconsin in Green Bay, Wisconsin, 2004-present.

Professional Memberships: American Marketing Association, Association for Consumer Research, Society for Consumer Psychology, Society for Judgment and Decision Making, Direct Marketing Association.