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The Sunk Cost Fallacy and Individual Differences in Health Decisions

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THE SUNK COST FALLACY AND INDIVIDUAL DIFFERENCES
IN HEALTH DECISIONS

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DEDICATION

I would like to dedicate the efforts made on this dissertation to my family and those who have treated me like a sister or a daughter throughout my life. They constantly remind me that they believe in me.

THE SUNK COST FALLACY AND INDIVIDUAL DIFFERENCES
IN HEALTH DECISIONS

by

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DISSERTATION

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ABSTRACT

The Sunk Cost fallacy is a biased committed when individuals base their decisions to stop or continue a course of action solely on past irrecoverable invested costs (i.e., monetary or time-related). Individuals' susceptibility to the Sunk Cost fallacy has been justified as the need to try to avoid appearing wasteful, to avoid appearing inconsistent, to learn a lesson from and to punish self for a poorly made decision. A study by Bornstein and Chapman (1995) evaluated these justifications along with a normative response and found statistical differences among all justifications. However, the study of the Sunk Cost fallacy and these justifications in health-related scenarios is scarce. The purpose of the present study was to replicate Bornstein and Chapman's study, develop and test new health-related scenarios, and evaluate the relationship between the Sunk Cost fallacy and individual differences in terms of decision making styles and fatalism. The replication study yielded similar findings as the original study. Results across experiments confirmed the presence of the Sunk Cost fallacy among a predominantly Mexican American sample in both non-health related and health-related scenarios. There were statistically significant associations between the Sunk Cost fallacy and decision making styles and fatalism. In addition, there were statistical differences based on age and sex.

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INTRODUCTION

“When you have to make a choice and you don’t make it, that itself is a choice”

William James

Making choices is part of our human nature: how long to stay in bed, what to eat for breakfast, which job to choose. Yet, other living beings also make choices: where to burrow, what food to gather, who to mate with. Furthermore, as in the above quote, even not making a choice is in itself making a choice. Thus, it would be in our best interest to try to select the best option or course of action, even if the selected course of action is not to act.

Selecting a course of action, however, is not as simple as it may seem (Cheng, Li, & Yu, 2005). Influential factors that can be explicit or implicit should be taken into account when making a decision. For instance, explicit factors (i.e., salary) and implicit factors (i.e., effort) are important considerations in staying at a job. It is of great importance to identify the factors that have the greatest influence on the majority of people when making decisions so that they make more informed decisions. Nonetheless, identifying these factors can be complicated because there is variability in which factors are considered important. In addition, there is variability in the way people use these factors, which can be thought of as a variation of heuristic usage (Kahneman, Slovic, & Tversky, 1983; Nisbett & Wilson, 1977).

Variation of heuristic usage may become apparent in some cases. For example, two decision makers face the same question, use completely different decision making

styles, and yet, they both arrive at the same choice. Although these individual and personal decision making styles may lead to good decisions, they can also lead to poor decisions (Gibson, 2001; Riquelme, 2001).

The following scenario illustrates the way in which an individual may make a poor decision. Imagine for a moment that a patient, who is obese and at risk of death, has suffered from severe type II diabetes for the past two years. In addition, he knows that in order to lower the risk of a heart attack, he has to control his diet and lose at least 30 pounds. However, he invested \$500.00 dollars on a new wardrobe for work and he feels that losing weight equates to losing the money he already invested. Thus, he continues his unhealthy lifestyle and disregards his health problems. In this case, money seems to be the explicit influencing factor behind his choice. Although there may be other implicit influencing factors such as feeling too helpless about his poor health to care, the influence of all these factors combined (i.e., money and helplessness) may cost this patient his life.

If one was to assume that all factors in the previous scenario were carefully considered, it would seem rational to choose life over \$500.00 dollars. However, this patient's decision seems to be biased because he is only focusing on an irrecoverable past investments instead of the future costs. The bias influencing the patient in this case is known as the Sunk Cost fallacy (SCF, Arkes & Blumer, 1985). The SCF affects the way individuals evaluate health and other decisions, eliciting in many cases negative and damaging outcomes. Unfortunately, the case of this patient with type II diabetes is not an improbable scenario. Even after careful planned responses to situations, humans tend to change their behavior and how they view this situations when circumstances change but

they do not necessarily change their course of action (Bornstein & Chapman, 1995).

The influence of the SCF in decision makers' choices is of great interest and it is among a series of biases that have been extensively studied (Arkes & Blumer, 1985; Arkes & Hutzler, 1999; Bornstein & Chapman, 1995; Garland, 1990; Garland & Newport, 1991; Tan & Yates, 1995; Thaler 1980; Schiltz, 2004). However, prior research does not offer much insight into the impact of the SCF on scenarios related to health issues and the effects of individual decision making styles on the SCF.

The objective of this dissertation was threefold. First, a replication of Bornstein and Chapman (1995) study was conducted to examine the presence of the SCF in the present population. Second, scenarios related to health issues were developed, and the effects of the SCF on these scenarios were examined. Third, individual differences in the presence of the SCF were evaluated. For all studies indicators such as age, ethnicity, and sex were investigated. Significant findings may shed some light on how individual differences and the SCF in health scenarios may affect the decision making process in some people. These findings would be of help in suggesting further studies.

CHAPTER 1

BACKGROUND

1.1 The Sunk Cost Fallacy

1.1.1 Overview

In the hypothetical example presented in the introduction concerning the reluctance to lose weight, the type II diabetes patient seemed to focus on past events rather than on potential future benefits. He apparently focused on the amount of money spent on his wardrobe, which is irrecoverable, instead of focusing on the immediate and long term positive health benefits of losing weight when making this decision. This patient's behavior exemplifies the SCF. The SCF is a bias committed when a decision is made to continue a project or choice based only on the past irrecoverable amount of time, money, and/or effort (TME) already invested (Arkes & Blumer, 1985).

In other words, the TME invested are sunk and no longer variable; thus, they should not influence future decisions. Based on classical economic theories, rational decision makers should cut their losses when a course of action has no further benefit and change their course of action in order to maximize the value of their future decisions regardless of the extent of their losses (Moyer, 2004). Furthermore, the rational decision maker should base choices on future benefits and incremental costs (Navarro, 2007). Arkes and Blumer (1985, p.126) presented the following scenario to a group of college students:

Assume that you have spent \$100 on a ticket for a weekend ski trip to Michigan. Several weeks later you buy a \$50 ticket for a weekend ski trip to Wisconsin. You think you will enjoy the Wisconsin ski trip more than the

Michigan ski trip. As you are putting your just-purchased Wisconsin ski trip ticket in your wallet, you notice that the Michigan ski trip and the Wisconsin ski trip are for the same weekend! It's too late to sell either ticket, and you cannot return either one. You must use one ticket and not the other. Which ski trip will you go on?

When invested TME has been used and is irrecoverable, regardless of a decision's future failure or success, TME should not influence someone to continue. In the ski trips example, the amount of money spent cannot be recovered in any way; thus, now becoming a sunk cost. Hence, the money spent for the ski trip should not affect any future decisions, which in this case is the selection of the trip site. This means that all participants in this experiment should have chosen the Wisconsin trip over the Michigan trip (i.e., 100%). However, some decision makers (54.1%) chose the Michigan ski trip instead because that ticket was more expensive than the one for the Wisconsin ski trip (45.9%, 99% CI 30-62%).

The decision makers in the above example are focusing on past irrecoverable costs in spite of the negative outcomes (i.e., going on a less enjoyable trip). However, any future decisions should be based on incremental cost and future outcomes only (Bazerman, Beekun, & Schoorman, 1982; Bowen, 1987). Thus, the rational decision maker should choose the ski trip he enjoys (i.e., Wisconsin) because it would yield the largest reward for what appears to be the most influential future factor. In other words, the individual's choices are: a) waste money or b) waste money and time (assuming that spending time on an unpleasant activity is equivalent to time wasted). Theoretically, the first choice should be more efficient¹.

¹ Most efficient and smaller waste: Waste Money < Largest waste: Waste Money + Waste Time

Further, let us consider the following example presented by Staw and Ross (1987, p.68):

Last year you authorized the expenditure of \$500,000 for what you thought was a promising new project for the company. So far, the results have been disappointing. The people running the project say that with an additional \$300,000 they can turn things around. Without extra funding, they cry, there is little hope. Do you spend the extra money and risk further losses, or do you cut off the project and accept the half-million-dollar write-off?

In the ski trip example, the decision maker has the choice to go on one of two trips. He only needs to decide which one. He would show vulnerability to the SCF if he chooses the trip solely based on cost. In Staw and Ross' example, the decision maker has two choices regarding the project: a) continue with the project or b) terminate the project. In comparison to the ski trip, this new example consists of only one project (e.g., no two projects), thus all decisions are about this project. Staw and Ross' example is a variation of a situation that is vulnerable to the SCF, in which the rational choice, according to some economists and psychologists (Arkes & Blumer, 1985; Carpenter, Matthews, & Brown, 2005; Garland, 1990), is to terminate the project as it is a waste of more money. The loss of wasting money alone compared to wasting money and wasting workers' efforts² could help a decision maker if he wanted to quantify losses instead of sunk costs. Therefore the logical decision should be to terminate something that seems to have no future. However, selecting the rational choice in cases like this is difficult for most decision makers because sunk costs occur before witnessing a final product (Ware,

² Here we would have to assume that in Staw and Ross' (1987) example the work invested by workers on the project is representative of sunken effort. However, this may also be considered as sunken time. Either way coupled with sunken money remains the worse choice.

1984). By not choosing the rational choice, the decision maker not only easily falls prey to the SCF but also the commitment to a failing project or choice escalates³.

Researchers have speculated that this escalation may occur because individuals heavily focus on sunk cost to the point they tend to forget why and how they generally evaluate decisions (MacGregor & Lichtenstein, 1991).

The SCF can be a serious problem for decision makers, and ideally should be eliminated because it may cause irrecoverable future losses. There are many complex situations in the governmental, military, and business arenas in the United States in which individuals might fall prey to the SCF as a consequence (Arkes & Blumer, 1985; Whyte, 1990). Arkes and Blumer (1985) described an example of a political decision affected by the SCF: the Tennessee-Tombigbee Waterway Project. Large sums of money had been invested in this project but outcomes were not promising. In 1970, the original estimate for the project was \$323 million. In 1975, the estimate increased to \$815 million. By 1976 the estimate increased to \$1.36 billion. Even at that point, its proponents argued that discontinuing this project after spending large sums of money on it would be wasting taxpayers' money, a decision that reflected the SCF.

Another example of the SCF on a larger scale was the investment by France and England's governments in developing a supersonic jet named the Concorde (See Arkes & Ayton, 1999). Even though there were not many interested buyers, both countries continued to invest large amounts of TME. Nonetheless, the planes were not as efficient

³ The SCOFF is also known as the escalation of commitment fallacy (Beeler & Hunton, 1997; Brockner, 1992; DeNicolis & Hantula, 1996; Staw, 1976, 1981; Whyte, 1986, 1990). However, the escalation of commitment fallacy studies and the SCF have different methodologies. Generally, in escalation research different factors are tested maintaining sunk costs invariable (Navarro, 2007), the current choice does not meet expectation or is failing (Moon, 2001) and negative information induces an escalation to commitment (Garland, 1990).

as they had planned, their manufacture was very costly, and the price of usage was very high. The project came to a halt when one Concord airplane crashed in 2000⁴.

An interesting study of the SCF operating in the area of business was conducted by Staw and Ha Hoang (1995). In this archival study, basketball teams were granted more playing time and retained players for longer time on their roster based on their salary and draft status (e.g., sunk money), rather than on the players' court performance. For every increment in the draft number there was a decrease in playing time of 23 minutes in the second year ($\beta_1 = -22.77, p < .01$). Furthermore, if a player was chosen in the second round instead of the first round of the draft, there was a decrease of 552 minutes of playing time during the player's second year in the NBA, regardless of their performance on the court. The more irrecoverable costs were sunk into a player the more those players played.

Former President George W. Bush was heavily criticized for continuing to send American troops to the war in Iraq based on the time, money, and effort invested. He appeared to continue with this action regardless of the present outcomes (e.g., no weapons of mass destruction had been found, the enemy had not surrendered) and advice to terminate this project. He publicly stated that his reasoning was that large sums of money had been spent and many soldiers had perished—a great example of the SCF if based solely on this reasoning. It seems evident that the SCF could permeate all kinds of decisions; and in spite of extensive research, the SCF continues to influence the decisions of individuals. Thus, it is important to further study this bias. In order to do so,

⁴ Interestingly, this failure gave birth to the coined phrase Concorde fallacy, synonymous of the SCF, although this term is more commonly used when lower animals are the ones who commit the SCF (Arkes & Ayton, 1999).

several factors previously studied should be considered prior to proposing new and possible influencing factors on the SCF, including existing modes of sunk costs, past seminal experiments, theories of its existence, and prescriptions for controlling it.

1.1.2 Three Sunk Cost Dimensions

1.1.2.1 Time

One dimension or type of sunk costs is time. However, there are few studies formally exploring time as a sunk cost (Klaczynski & Cottrell, 2004). Navarro (2007) conducted eight experiments examining the effects of time as a type of sunk cost. Navarro (2007) found that the difference in the amount of time spent (e.g., short vs. long amount of time) influences the extent of the SCF. In addition, Navarro (2007) also found that the quality of time (e.g., tedious task vs. fun task) did not have a significant effect on the SCF, which replicated earlier work (Soman, 2001).

1.1.2.2 Money

Most of the SCF research has concentrated on the importance of money as dimension of sunk cost. Arkes (1996) presented participants with a hypothetical scenario in which they were given two choices related to an obsolete income tax software program: a) completely buying new software or b) renewing their previously bought software. Only a small amount (11%) of the participants decided to purchase the new program, even though the upgrade and the new program were the same price. Participants indicated that they did not want to change programs because they had already invested in one, ignoring the benefits of the new program. The difference between buying a new program or keeping with the old one was statistically significant,

$\chi^2(1) = 5.03, p < .05$. Participants indicated they wanted to keep the software since they had spent money on it. In another study, participants were asked to choose between stopping or continuing building an airplane that was almost (90%) completed and money had already been invested (Arkes & Hutzler, 1999). Even after being informed of the low success rate of completion for the airplane, a statistically significant number of participants chose to continue the course of action because of the amount of time that had been already invested, $t(144) = 1.97, p < .05$. Overall, money seems to be the most plausible sunk cost dimension to measure because its value remains constant across participants (Carpenter et al., 1990; Staw & Ha Hoang, 1995).

1.1.2.3 Effort

Another sunk cost dimension is effort. Klaczynski and Cottrell (2004) presented children aged 7 to 14 years old with scenarios dealing with effort as a dimension of sunk cost. More children decided to continue (i.e., the SCF) than stop or switch with the present course of action. In a more recent study, Navarro (2007), showed undergraduate students scenarios that presented a leader of a copper-mining group in which the sunk cost dimension of effort combined with time was defined as “zero-time” (i.e., mining project would barely start), “time-easy” (i.e., mining ground has been easy to dig and have spent 60 days working), and “time-hard” (i.e., mining ground has presented several difficulties and have spent 60 days working). Scenarios specified that there would be little reward in continuing with the present course of action. There was a statistical difference among groups in terms of time, showing that both “time-easy” and “time-hard” were selected above “zero-time”. However, there were no statistical differences in terms of effort, though effort seemed to generate a change increasing the number of individuals

who decided to continue with the project when workers had put more effort in the mine (47% “time-easy” and 75% “time-hard”).

Research on effort⁵ is more difficult to conduct because both are abstract, thus making it harder to keep track of and measure these SCF dimensions (Staw & Fox, 1977; Staw & Ross, 1987). However, some studies found that the larger the amount of either time, money or effort the more the vulnerability to the SCF was evident (Arkes & Blumer, 1985; Bornstein & Chapman, 1995; Garland, 1990; Garland & Newport, 1991). In light of the methodological issues in including effort as a dimension in the SCF research, more studies on the time and money comparisons could be conducted. It is important to mention that other influencing factors in addition to from the sunk cost modes (i.e., TME) need to be considered when examining the SCF.

1.1.3 Influencing Factors

Past research on the SCF is immense. Researchers have been searching for explanations as to why the SCF occurs. In addition, they have explored possible factors that influence the SCF. The following factors are of particular relevance to the present dissertation: level of responsibility, manner in which the decision is made, and amount of investment.

1.1.3.1 Level of Responsibility

The effect of level of responsibility of decision makers on their choices has been unclear because their responsibility has been defined in different ways. Some

⁵ Conceptually, amount of effort invested at work, for instance, may vary depending on individual differences. Two people may produce the same amount of work, but they may rate their effort lower or higher than the other individual. Effort as a dimension was not used in the present dissertation because of the issues in measuring it independently from extraneous variables.

researchers have evaluated levels of responsibility by making decision makers responsible for their own choices, while others have compared decision makers acting alone or in a group. For instance, Whyte (1993) found that when decision makers were made to believe that it was their responsibility if a project was failing, the decision makers elicited more of the SCF. Similarly, other researchers have found that when participants were held accountable for any negative consequences of their choices, decision makers were more vulnerable to the SCF (Garland & Newport, 1991; Kanodia, Bushman, & Dickhaut, 1989; Simonson & Nye, 1992; Staw 1976, 1981; Tetlock & Boettger, 1989). However, some researchers have not found consistent significant differences in comparisons between decisions made by an individual or decisions made by a group of individuals (Arkes & Blumer, 1985; Bazerman, Giuliano & Appelman, 1984). In those studies, the group as a whole was held accountable instead of each individual group member.

1.1.3.2 Decisions Care

Bornstein and Chapman (1995) argued that the degree to which a decision is based on careful consideration or careless consideration (i.e., decision care) influenced the SCF. They believed decision care was influential especially in situations in which the decision maker is being observed or feels the need to learn a lesson from the current course of action. Bornstein and Chapman also believed that when decisions are not made carefully, decision makers feel that since resources have been invested the situation should be used to learn a lesson so that the same mistake is not made in the future. This becomes a SCF situation when the individual reaps no benefits by remaining in the current course of action since learning a future lesson could be debatable.

Bornstein and Chapman (1995) found that participants indeed felt strongly about remaining in situations in which decisions were made carelessly, in particular when large amounts of investments had been made.

1.1.3.3 Amount of Investment

Generally, the larger the sunk costs the more the SCF is elicited (Bornstein & Chapman, 1995; Staw, 1981). In other words, the larger the investment amount, the more likely an individual will continue with a course of action even if the odds are against benefits. This positive linear relationship between the increase or decrease of money or time as dimensions of sunk cost and the amount of the SCF elicited has been found across scenarios. Bornstein and Chapman (1995) found that there were statistically significant differences between scenarios in which large sums of money were invested vs. small amounts, when an individual was trying to avoid appearing wasteful. In another study, Navarro (2007) found that scenarios in which longer amounts of time were invested produced a statistical higher preference than the scenarios in which shorter amounts of time were invested.

Further scrutiny is needed of the array of statistically and non significant factors influencing the SCF. For instance, level of responsibility, manner in which the decision is made, and amount of investment should be further investigated. Aside from the SCF modes (e.g., TME) and influencing factors, previous theories present some evidence that may justify why the SCF occurs and should be considered.

1.1.4 Justifications for the Sunk Cost Fallacy

In addition to studying influencing factors, researchers have studied possible

justifications or reasons for decision makers to commit the SCF. Past research has shown that there are various possible causes for decision makers to commit the SCF: fear of appearing inconsistent (Brockner, 1992; Staw, 1981; Staw & Ross, 1987), fear of appearing wasteful (Arkes & Blumer, 1985), feeling personally responsible for lack of success (Staw, 1976; Staw & Fox, 1977; Whyte, 1986), risk-seeking behavior after considering losses (Kahneman & Tversky, 1979; Arkes & Hutzler, 1999; Garland & Newport, 1991; Knox & Inkster, 1986; Thaler, 1980; Whyte, 1986; Whyte et al., 1997), the need to learn a lesson or experience the decision as a punishment (Bornstein & Chapman, 1995) and the perception of how scenarios and options are framed (Bornstein & Chapman, 1995; Navarro 2007). Experiments conducted for this dissertation concentrated on a) fear of appearing wasteful, b) fear of appearing inconsistent, c) feeling the need to use the opportunity to learn a lesson, and d) the feeling of deserving a punishment for current situation. A more detailed description of these explanations is provided next.

1.1.4.1 Avoid Appearing Wasteful

Arkes and Blumer (1985) and other researchers argue that decision makers fall prey to the SCF because they do not want to appear wasteful. Researchers feel that decision makers have been constantly taught not to waste anything. For instance, some parents nag their children to eat all of their food because there are others who do not have food. Thus, researchers feel that such ideology in the decision maker's mind is stronger than being able to see future benefits (Prelec & Loewenstein, 1998). The problem is not to avoid appearing wasteful but generalizing this rule to situations in which the decision maker focuses on already sunk resources and the continuation of sinking

further resources that could be used more efficiently elsewhere (See Bornstein & Chapman, 1995). The following is an example of continuing a course of action to try to avoid appearing wasteful (Arkes & Blumer, 1985):

On your way home you buy a TV dinner on sale for \$3 at the local grocery store. A few hours later you decide it is time for dinner, so you get ready to put the TV dinner in the oven. Then you get an idea. You call up your friend to ask if he would like to come over for a quick TV dinner and then watch a good movie on TV. Your friend says "Sure." So you go out to buy a second TV dinner. However, all the on-sale TV dinners are gone. You therefore have to spend \$5 (the regular price) for the TV dinner identical to the one you just bought for \$3. You go home and put both dinners in the oven. When the two dinners are fully cooked, you get a phone call. Your friend is ill and cannot come. You are not hungry enough to eat both dinners. You cannot freeze one. You must eat one and discard the other.

In this example, Arkes and Blumer (1985) expected all participants not to be influenced by the SCF in terms of cost (i.e., \$3 or \$5 meal), since it is the exact same product. However, results indicated that some (31.8 %) of the participants chose to eat the \$5 meal based on the fact of money invested. Although the majority chose the "no preference response" (75.7%, 99% CI 64, 88%), the expectation was for all of the participants (100%) to select the "no preference" choice. This choice seemed to be influenced by the irrecoverable costs that were invested. In other words, participants feared appearing wasteful.

1.1.4.2 Avoid Appearing Inconsistent

Some decision makers seem to fear appearing inconsistent (Brockner, 1992; Staw, 1981; Staw & Ross, 1987). In other words, some decision makers feel that changing courses of action or discontinuing a current project would represent accepting

“failure.” Because decision makers seem to keep track of their failures rather than prior successes, not continuing the course of action may imply that the decision maker is not reliable because he is not consistent with his positive results. In addition, changing a course of action may indicate an admission of having made a mistake (Bornstein & Chapman, 1995).

This phenomenon seems to be stronger among cultures in which “saving face” is prominent (Petrova, Cialdini, & Sills, 2007; Staw, 1981; Whyte, 1993). In addition, there is a similar effect among leaders in positions of high power and among workers in which their boss is constantly scrutinizing their work (Tan & Yates, 1995). Thus, avoiding inconsistency seems to be influenced by the level of responsibility (Bornstein & Chapman, 1995; Garland & Newport, 1991; Kanodia et al., 1989; Staw, 1976, 1981; Simonson & Nye, 1992). The following is an example of continuing a course of action to try to avoid appearing inconsistent regarding successes (Staw, 1981):

A company overestimates its capability to build an airplane brake that will meet certain technical specifications at a given cost. Because it wins the government contract, the company is forced to invest greater and greater effort into meeting the contract terms. As a result of increasing pressure to meet specifications and deadlines, records and tests of the brake are misrepresented to government officials. Corporate careers and company credibility are increasingly staked to the airbrake contract, although many in the firm know the brake will not work effectively. At the conclusion of the construction period, the government test pilot flies the plane; it skids off the runway and narrowly misses injuring the pilot.

In this example, the irrecoverable efforts, time and money consumed, seem to play a key role in continuing with the project. Furthermore, decision makers feel that if they continue the project, they may recover invested costs so they do not appear as

inconsistent with their results (Staw, 1981). Adversely, decision makers continue to invest more knowingly that they will not recover any of those costs. Some researchers have suggested this is due to a cognitive dissonance.

1.1.4.3 Learn-a-lesson and Punishment

Bornstein and Chapman (1995) suggested two other possibilities for the presence of the SCF: need to learn a lesson and punishment. Based on past research, Bornstein and Chapman felt that individuals have different selves. In other words, individuals may have a “judgmental self” that is overly critical of what they do. They may have also a “teacher self” that tries to use all situations as teaching opportunities; or they may have a “student self” that is constantly trying to learn.

Bornstein and Chapman (1995) presented different scenarios in which either an adult alone or a parent and a child were together making a decision. Participants viewed the decision made by the individual portrayed as a parent as an opportunity to teach a lesson because although irrecoverable investments had been made, the parent could take advantage of the situation. However, this becomes a SCF situation because costs cannot be recovered even when the decision maker wants to learn a lesson from the current situation. This is especially interesting when continuing with a course of action regardless of level of enjoyment. Presumably, in terms of the SCF some decision makers with a prominent “teacher self” would continue an unfruitful project to use the opportunity to teach themselves not to replicate similar projects and decisions. Furthermore, Bornstein and Chapman (1995) speculated that some decision makers might feel that they should continue with the course of action as a punishment for not thinking carefully before initiating similar projects or decisions. After presenting participants with various

scenarios, Bornstein and Chapman (1995) found that in fact some situations caused some decision makers to have a-need-for-punishment view, when making poor decisions.

When studying the effects of the SCF on decisions, it is important to conduct more research studies that compare different justifications to evaluate which ones have stronger effects. Furthermore, it would be important to evaluate these justifications in different scenarios such as scenarios that deal with health-related issues. Understanding the justifications when making irrational decisions would help provide decision makers with better messages to make more beneficial health-related decisions.

1.2 Health-related Decisions and the SCF

Beyond the fact that humans use different heuristics to make decisions on a daily basis, the fact that there are different types of decisions is noteworthy. Thus, some decisions may be more important and have a greater impact on the decision maker. This would be true with decisions dealing at some extent with the decision maker's health. Furthermore, research has found that some of the same biases found in non-health related decisions are found in health-related decisions (Arkes, Wortmann, Saville, & Harkness, 1981; Bornstein, Emler, & Chapman, 1999; Chamot, Charvet, & Perneger, 2005). The SCF is not the exception.

It has been speculated that certain health behaviors are examples of the SCF. For example, Arkes and Blumer (1985) found that participants consumed a food item based on the price paid (i.e., amount of investment) and not merely for its contents. This example alone may explore the reasons why individuals continue to consume large amounts of products that are not beneficial (e.g., pizza, doughnuts, coke) for their future

health. One possible reason for this damaging behavior could be that individuals are consuming large amounts of products only based on their irrecoverable amount of monetary value. However, no recovery would be made and instead, this biased thinking may lead to an increase in existing health problems like diabetes and high cholesterol.

Notably, some researchers have argued that decision makers are more likely to be susceptible to the SCF if a situation is framed in such a manner that continuing a course of action, regardless of lacking future benefits, would seem the natural choice (Bornstein & Chapman, 1995; Navarro 2007; Tan & Yates, 1995). Tan and Yates (1995) suggested that the SCF could be reduced if decision makers are presented with scenarios containing future benefits and outcomes. However, health-related decisions may have more influencing variables than non-health related decisions (Bornstein et al., 1999). Thus, prescribed solutions for the reduction of the SCF may not be as successful in health-related decisions (Bornstein & Chapman, 1995). It would seem that when non-health related decisions are in fact deemed unimportant, they would be less prone to the SCF. However, health-related decisions may contain influential factors that may or may not be evident. This will make difficult the evaluation of decision importance since this may vary from individual to individual. For instance, Mckirnan, Ostrow, and Hope (1996) found that HIV positive patients deemed their situation as trivial, thus changing the framing of all their decisions.

O'Connor et al., (2003) noted that when dealing with health-related decisions, it is difficult for individuals to differentiate complex health-related decisions and complex health experiences. In complex health-related decisions, individuals tend to forget they have a choice. Furthermore, health-related decisions vary in their complexity depending

on an array of factors. In an example of a few of those factors, O'Connor et al., (2003) found that decisions regarding institutionalization were harder, more confusing, and had the highest decision delayed rate than health-related decisions associated with surgical procedures.

There may be a relationship between the presence of the SCF and certain factors. For instance, Whyte (1993) found that if participants felt truly responsible for a project's decisions, they were more vulnerable to the SCF. Similarly, Bornstein et al., (1999) found that medical residents were more susceptible to the SCF only when they made a decision as compared to when another person made the decision. However, these participants did not fall prey to the SCF when the scenarios did not have to do with medical situations. Nonetheless, the literature on the relationship between the SCF and levels of responsibility is not definite and further research is needed. Another possible effect of the SCF on health-related decisions would be in trying to avoid appearing wasteful, thus deciding the continuation of an unhealthy behavior (Arkes & Blumer 1985).

On the other hand, the SCF could prove helpful (Bornstein & Chapman, 1995) in maintaining healthy behaviors. Walton (2002) suggested that individuals might be more committed to exercise if they made large investments (e.g., purchase of a treadmill). There are not many studies that have explored the SCF influence in health scenarios, although it seems noteworthy (Bornstein & Chapman, 1995; Bornstein et al., 1999; Chapman & Sonnenberg, 2000). Bornstein et al., (1999) had medical residents make decisions about health procedures on hypothetical patients (i.e., medical scenarios) by manipulating amount of investment (i.e., high or low) and level of responsibility (i.e.,

residents were making the decision or the residents were making the decision for a hypothetical individual). Furthermore, medical residents made decisions dealing with non-medical scenarios. Medical residents were more susceptible to the SCF when they evaluated day-to-day decisions for a hypothetical individual than when the decision maker was themselves. When evaluating medical decisions, medical residents were not susceptible to the SCF either when they were making the decision or for some hypothetical decision maker. The study also included non-medical residents (i.e., undergraduates) who did fall prey to the SCF more when they had to make the decisions. It should be noted that Bornstein et al., (1999) only used the normative (i.e., stop or switch course of action) and two SCF (i.e., continue with a course of action) responses with the medical residents. The normative response is one that represents the logical response expected by expert economists and judgment decision making researchers.

A way to improve individuals' decisions would be to increase control over their health-related decisions and this improvement could lead to desirable and attainable health outcomes (Makoul, Arntson, & Schofield, 1995). If the SCF has an effect on health-related decisions, it would be beneficial to evaluate this effect in an effort to possibly reduce the SCF. However, there is a scarce amount of research that has investigated the SCF in terms of health-related decisions (Chapman & Sonnenberg, 2000). One of the few studies conducted by Bornstein et al., (1999) compared medical and non-medical scenarios among medical residents. However, only participants who were medical residents dealt with medical scenarios. Thus, there are no other studies that have evaluated the SCF in health scenarios formally among the general population.

1.3 Individual Differences

The effects of individual differences on the SCF have been studied. Past research has evaluated the relationship of the SCF and individual differences extensively in terms of: Level of knowledge (Arkes & Blumer, 1985; Carpenter et al., 2005), level of responsibility (Kanodia et al., 1989; Staw, 1976, 1981), level of expertise (Simonson & Nye, 1992; Tan & Yates, 1995) and age differences (Klaczynski, 2001; Strough, Mehta, McFall, & Schullier, 2008). Other individual difference variables that may be related to the SCF include one's decision making styles and the perceived control people feel they have over their decisions. These individual differences merit the attention of researchers to further understand possible hidden underlying factors in the SCF effect (Klaczynski & Cottrell, 2004). The present studies focused on individual differences in terms of: a) decision making styles, and b) perceived control over decisions.

1.3.1 Decision Making Styles

Payne, Bettman, and Johnson (1993) observed that individuals use many decision making strategies, especially when decisions are complex. Furthermore, researchers have noted that cognitive individual styles affect decisions' outcome more than previously considered (Hunt, Krzystofiak, Meindl, & Yousry, 1989; Messick, 1984; Scott & Bruce, 1995; Spicer & Sadler-Smith, 2005). Some researchers have divided cognitive styles into analytical and intuitive decision making styles (Allinson & Hayes, 1996; Andersson & Engelberg, 2006; Epstein, Pacini, Denes-Raj, & Heier, 1996; Hunt, Krzystofiak, Meindl, & Yousry, 1989; Kopfstein, 1973; Nygren, 2000; Nygren & White, 2002; Riding, 1997; Sadler-Smith, 1999). Individuals with an analytical cognitive style make decisions through careful and methodical assessment of options, while those with

an intuitive cognitive style tend to follow their “gut feeling” (Morera et al., 2006). Other researchers have argued that cognitive styles may reflect regret-based styles, in which individuals make decisions based on past experiences and feeling emotional regret (Nygren & White, 2002). This dissertation is interested particularly in analytical, intuitive, and regret-based decision making styles in relationship to the SCF.

1.3.1.1 Analytical and Intuitive Decision Making Styles

Past research has shown that decompositional decision making styles, in which decision makers break down into pieces their decisions, tend to have a greater temporal stability than intuitive decision making styles (Dawes, 1986; Fernandez, 2006; Meehl, 1954; Stillwell, Barron & Edwards, 1983). In other words, a course of action taken at one point in time would be the same or at least similar at another point in time (i.e., temporally stable) made with a decompositional or analytical decision making style. Furthermore, several studies have shown that the convergent validity between intuitive or holistic and analytical strategies is higher when the decision problem is not complex (Fernandez, 2006; Morera & Budescu, 1998; Ravinder, 1992; Von Winterfeldt & Edwards, 1986). As the decision problem becomes more complex, the convergent validity of analytical and intuitive judgments deteriorates, making these styles differ greatly from each other. Butler and Harvey (1988) hypothesize that the intuitive decision making strategy may not be as accurate because without a systematic decision style there is an overload of information. Thus, the human mind may be unable to process that much information.

In past research, both decision making styles (i.e., analytical and intuitive) seem to influence differently how people make decisions (Andersson & Engelberg, 2006). Cheng, Li, and Yu, (2005) stated that individuals make decisions considering multiple

criteria. Ideally, decision makers should consider and prefer the same criteria (e.g., if quality is important, then the criteria of quality will be used in all decisions) but that is not the case (Arkes, Schiltz, Kung, Bailey, & Gonzalez-Vallejo, 2000; Fernandez, 2006). Arkes (2003) hypothesized that individuals use attributes in their decisions that are not relevant (e.g., the color of a car instead of the price). Dawes (1986) believed that decision makers prefer intuitive evaluations because of “illusory reasons” (e.g., personal preference, overconfidence). Some researchers have observed that individuals with high intuitive decision style scores were more likely to be impulsive (Andersson & Engelberg, 2006; Morera et al., 2006; Nygren, 2000).

Based on Prospect Theory (Kahneman & Tversky, 1979), intuitive decision making styles may be related to risk-seeking styles, while analytical styles may be related to risk adverse styles. For instance, Parker, Bruine de Bruin, and Fischhoff (2007) found that self-reported maximizers (i.e., seekers of the highest possible gains), tend to have high scores as spontaneous decision makers (i.e., intuitive decision making style). Therefore, when a decision maker seeks to be a maximizer, he may insist on a current project because he has the false belief that a big gain is coming after large losses (i.e., sunk costs). However, researchers found that maximizers were inferior decision makers and tended to obtain negative outcomes (Thaler & Johnson, 1990). Therefore, if intuitive decision making styles are related to higher SCF effects, decision makers may be encouraged not to use such style.

On the other hand, it has been suggested that an intuitive decision maker may be more flexible and adaptive to change (Nygren, 2000). Nygren (2000) conducted a study in which participants were evaluated and rewarded according to their performance tasks,

which were similar to the ones pilots complete in flights. Interestingly, the performance of individuals with high analytical scores became relatively inferior across time, even after additional practice. Furthermore, their performance in other tasks was never as effective as the individuals with high intuitive scores by committing more mistakes. Seemingly, when dealing with multiple tasks, analytical decision making styles may not be as useful. Perhaps using an analytical decision style in a high attention-demand situation may be detrimental to performance because decision makers have a sort of “tunneling kind of effect” that interferes with maintaining a “global assessment” (Nygren & White, 2002). This reasoning may explain why Carpenter et al., (2005) found a positive correlation between committing the SCF and high mathematics SAT scores.

Although unlikely, Nygren (2000) adds that there is a difference between thinking and decision style, which explains his results: analytical styles were predictive of inferior performance. In other words, it may seem as if a decision maker can be an analytical thinker that displays an intuitive decision making style. Intuitive decision making styles may be beneficial when workload increases because they are more flexible to changes. The flexible decision maker, who can adapt and switch from analytical to intuitive or vice versa, is the one that has an advantage (Payne et al., 1993; Andersson & Engelberg, 2006; Nygren & White, 2002).

1.3.1.2 Regret-based Decision Making Style

Wong and Kwong (2007) noted that even when just thinking or imagining situations that induce great commitment, individuals are flooded with an array of emotions. These participants describe influencing emotions from past experiences and emotions they expect to feel in the future after the decision has been made. Furthermore,

those individuals who expect to feel more regret seem to gravitate toward greater escalation in their commitments. On the other hand, Ku (2008) found that regret did not predict escalation of commitment. Rather, participants over-predicted the amount of regret over escalation of commitment. Furthermore, Ku (2008) found that participants who escalated their commitment had little regret ($d = .90$). However, regret may focus the decision maker on the past more than the future, giving more value to sunk costs and increasing the susceptibility to the SCF.

1.3.1.3 Summary of Decision Styles

Differences in results of the presence and amount of the SCF may be due to individual differences in decision styles when coupled with varied interpretations of diverse situations. Furthermore, it is possible that the benefit of having a more adaptive decision style is advantageous; perhaps such advantage would reduce some biases. Thus, researchers would benefit from further understanding decision making processes and biases to help individuals make decisions, taking into consideration individual differences like decision making styles. However, past research has not offered decisive insight into the relationship between individual decision making styles and the SCF.

1.3.2 Control over Decisions

In addition to the possible relationship between decision making styles and the SCF, it is also important to consider individual differences in terms of how much control individuals feel they have over their decisions and outcomes. In other words, individuals may not change the course of their present fruitless situation because they may feel guided by fate, luck, or divine powers (Benavides, Bonazzo, & Torres, 2006; Esparza &

Wiebe, 2008; Mckirnan et al., 1996). For example:

Mr. Smith bought a house a year ago. But the neighborhood where the house is located has become extremely dangerous because the crime rate quadrupled within the past month. There are at least 3 to 4 burglaries per night. However, Mr. Smith believes that he has no choice but to stay because since he was meant to live there probably nothing will happen to him and he has already spent money on the house.

As the previous example illustrates, Mr. Smith's decision is guided by the amount of resources (i.e., money) he has invested in the house and by some higher power (e.g., fate, destiny). Researchers have defined fatalism as the feelings an individual has regarding lack of control over decisions (Esparza & Wiebe, 2005; Futa, Hsu, & Hansen, 2001; Ross, Mirowsky & Cockerham, 1983). Fatalism can be interpreted as the belief that events are fixed in advance, that situations are helpless, that situations are controlled externally, by luck or some divine power (Esparza & Wiebe 2005). Research has shown that fatalism levels varied among individuals. For instance, Mckirnan et al., (1996) found that individuals with high fatalistic scores and were HIV positive experience a similar effect to cognitive dissonance and a belief that their situation is due to destiny. In the example, Mr. Smith has a fatalistic view in that he has no control over future choices.

High levels of fatalism in terms of helplessness also correlate with low self-efficacy and high levels of responsibility. Whyte et al., (1997) stated that decision makers who had positive self-efficacy perceptions persisted for a longer time on their present decision and spent greater amounts of effort on that decision. In addition, when decision makers feel more personally responsible for decisions, they tend to stand by

them even when these decisions are failing (Whyte, 1993). Presumably, higher fatalism scores coupled with low levels of responsibility should yield high effects of the SCF.

Esparza and Wiebe (2008) found that depression and pessimism are positively correlated with helplessness $r(421) = .40, p < .01$. Interestingly, Wong, Yik, and Kwong (2006) found that negative affect (i.e., depression) produced a stronger commitment to a present course of action. Similarly, Moon, Hollenbeck, Humphrey, and Maue (2003) found that escalation of commitment was positively correlated to depression and anxiety. On the other hand, Juliusson (2006) found that escalation of commitment was positively correlated to optimism and negatively correlated to pessimism. In relationship to the SCF, Ku (2008) found that participants' predictions of feeling less entrapped tended to escalate more in their commitments, $r = -.61, p = .01$. Presently there is no research that examines fatalism and the SCF.

CHAPTER 2

AIM OF DISSERTATION

According to experts in the area of decision making, an individual should not be affected by irrecoverable sunk costs when deciding whether or not to continue with a course of action that has no positive outcomes. Thus, the individual should change or stop a course of action when a situation will not yield any type of future benefit (Arkes & Blumer, 1985). However, a review of the Sunk Cost fallacy (SCF) literature suggests that level of responsibility (i.e., decision made for oneself or hypothetical decision maker), amount of sunk cost (i.e., a high vs. low investment), and manner in which a decision is made (i.e., careful vs. carelessly) influence whether or not a decision maker would fall prey to the SCF. Furthermore, research has shown that there may be different justifications or reasons why an individual is susceptible to the SCF such as fear of appearing wasteful (Arkes & Blumer, 1985), wanting to learn a lesson from a situation (Bornstein & Chapman, 1995), wanting to punish oneself for making a bad decision (Bornstein & Chapman, 1995), or wanting to appear consistent across time (Staw, 1981). However, published research has not investigated decision problems that are health-related. Moreover, previous research has not studied the effects of individuals' decision making styles and individuals' view of control over their decisions on the SCF.

2.1 Objective

Accordingly, the objective of this dissertation was threefold. First, a replication of the study by Bornstein and Chapman (1995) was conducted to examine the presence of the SCF in the present population. Second, scenarios related to health issues were

developed, and the effects of the SCF on these scenarios were examined. Third, the relationship of the SCF and individual differences was evaluated. For all studies indicators such as age, ethnicity, and sex were investigated.

2.1.1 Replication Study

Replication studies have been suggested as a starting point for new research to explore the generalizability of previous studies (Johnson, 2001; Reese, 1999). It is believed that a replication of Bornstein and Chapman (1995) would provide support for the role the effects of the SCF play on decisions on the basis of four reasons or justifications: 1) Fear of appearing wasteful, 2) Need to learn a lesson, 3) Feel deserving of punishment, and 4) Need to appear consistent. In addition, these four justifications would be compared to the rational choice (i.e., normative).

Researchers have asked participants whether they would or would not follow a course of action, by having them select one of two choices: a) stopping or switching the course of action or b) continuing with the present course of action. According to economists, stopping or switching a course of action in a situation with no future benefits is the ideal rational choice (i.e., a normative response). Bornstein and Chapman (1995) measured the SCF in a unique manner by using a 10-point Likert-like scale, which made the analyses parametric. In this scale “1” represented “a very bad response, should definitely not follow” and “10” represented “a very good response, should definitely follow.” Participants were shown these verbal anchors only for the numbers “1” and “10.” The rest of the numbers did not have any verbal anchors. Bornstein and Chapman (1995) asked people to rate responses on this 10-point scale. Four different responses or justifications represented how likely it would be that they would continue (i.e., the

SCF) with a hypothetical course of action. One response or justification represented how likely it would be that they would stop or switch a course of action. This would be the response expected by expert economists.

Based on past theory, Bornstein and Chapman (1995) categorized justifications for committing the SCF (i.e., continue with a failing course of action) into four responses: 1) Fear of appearing wasteful, 2) Need to learn a lesson, 3) Feel deserving of punishment, and 4) Need to appear consistent. Furthermore, Bornstein and Chapman added a fifth response that measures the lack of the SCF (i.e., normative response). The normative response would represent the rational choice expected by expert economists. They developed this list of justifications based on past experiments and literature reviews. Bornstein and Chapman, then, tested the responses. Each scenario contained an irrecoverable investment, a need to make a choice to continue or stop or switch the course of action, and no seemingly future benefits. The following is an example from Bornstein and Chapman (1995):

SCENARIO: Becky decides to take cello lessons. After Becky buys a cello and pays \$1200 for lessons for 3 months, Becky finds she is no longer interested and wants to quit.

A. Becky should stop attending cello lessons because it would be a waste of time and money to attend more lessons she won't enjoy. (*Normative response*).

B. Becky should continue with the cello lessons because otherwise she will have wasted the time and money she has already spent. (*Wasteful response*).

C. Becky should continue with the cello lessons to teach herself that next time she should be more careful about what hobbies she selects for herself. (*Learn-a-lesson response*).

D. Becky should continue with the cello lessons because if she was foolish enough to select a hobby that she doesn't enjoy, she deserves to suffer by continuing with the cello lessons. (*Punishment response*).

E. Becky should continue with the cello lessons because if she stops that would mean she made a bad decision in deciding to take cello lessons. If it was the right decision then, it is still the right decision. (*Consistency response*).

Each participant rated all five responses (i.e., A, B, C, D, and E) on the 10 point scale. Higher ratings on the response to the first question (i.e., A-normative response) indicated a more rational or normative response to the scenario in which the decision maker would stop or switch the course of action. Higher ratings on the next four responses (i.e., B-wasteful, C-learn-a-lesson, D-punishment, and E-consistency) indicated higher amounts of the SCF, in which the decision maker would continue with the course of action. These last four responses give the researcher an opportunity to further understand some possible underlying reasons for committing the SCF. Each participant evaluated 8 scenarios (See APPENDIX A). Bornstein and Chapman (1995) found that there was a statistical difference between the normative (i.e., stopping or switching course of action) and the four SCF responses (i.e., continuing with the course of action), indicating that the SCF was present (See Table 1). All responses were statistically different from 1 and from each other. The normative response was not reverse-coded. The normative response represents the expected answer by expert economists. Although a little over 60% chose to stop a course of action, close to 40% were susceptible to the SCF (i.e., wasteful, learn-a-lesson, consistency, and punishment responses). Furthermore, from the SCF responses, the most common justification was

the need to avoid appearing wasteful. As expected, the normative response was negatively correlated to the other four responses representative of the SCF.

Table 1. Mean Ratings with Standard Deviations for Each Response (Adapted from Bornstein & Chapman, 1995, p. 256).

Response	<i>M</i>	<i>SD</i>
Normative	6.88**	3.14
Wasteful	4.76**	3.03
Learn-a-lesson	3.79**	2.84
Consistency	3.37**	2.57
Punishment	2.28**	2.06

Note. Ratings were made on a 10-point scale (“1” = “a very bad response, should definitely not follow” and “10” = “a very good response, should definitely follow.”). Higher mean ratings indicate a higher agreement with the response. Means with ** differ at $p < .01$.

In addition to exploring the five responses, Bornstein and Chapman (1995) studied the effects of amount of investment, manner in which decision is made, and type of decision maker on the SCF by manipulating them in each scenario. Amount of investment was defined as utilizing a large or small (i.e., high, low) amount of resources (i.e., time, money). The manner in which a decision was made consisted of the individual in the scenario making a careful (“after careful consideration”) or a careless (“on the spur of the moment”) decision. The decision maker was portrayed either as an adult-alone or a parent and their child making a decision together.

The amount of investment explored the hypothesis that larger investments create larger commitments to a course of action, regardless of its benefits. The variable manner

in which a decision making evaluates the hypothesis that decisions made in a careless manner will produce larger commitments to a course of action for the learn-a-lesson response. The type of decision maker manipulated the levels of responsibility and tested the hypothesis that the more responsible an individual feels, the larger the commitment to a course of action. This manipulation and test occurs particularly in the learn-a-lesson response.

Bornstein and Chapman (1995) found a main effect for amount of resources invested, indicating that high amount of resources had the highest ratings. Moreover,

Table 2. Mean Response Ratings with Standard Deviations (Adapted from Bornstein & Chapman, 1995, p. 257).

Variable	Response									
	Normative		Wasteful		Learn-a-lesson		Consistency		Punishment	
	M	SD	M	SD	M	SD	M	SD	M	SD
Invested resources										
High	6.50	3.24	5.12**	3.05	4.05**	2.92	3.55**	2.63	2.49**	2.28
Low	7.27**	2.98	4.39	2.96	3.52	2.73	3.20	2.51	2.07	1.79
Decision maker										
Parent & child	6.28	3.25	4.86	3.09	4.56**	3.02	3.57**	2.73	2.61**	2.33
Adult alone	7.49**	2.89	4.66	2.96	3.01	2.40	3.16	2.39	1.94	1.68
Decision care										
Carefully	6.92	3.13	4.66	2.86	3.62	2.78	3.33	2.54	2.25	2.06
Carelessly	6.84	3.14	4.86	3.18	3.96*	2.89	3.40	2.61	2.31	2.06

Note. Ratings were made on a 10-point scale (“1” = “a very bad response, should definitely not follow” and “10” = “a very good response, should definitely follow.”). Higher mean ratings indicate a higher agreement with the response. Means with ** $p < .05$ or * $p < .07$ significantly differ within each condition.

when the amount of resources invested was high, the wasteful response was selected as more suitable to what the participant would have done. In addition, when decisions were made by both parent and child, the learn-a-lesson response was rated highest than when an adult alone made the decision. In the majority of instances, the punishment response was rated the least. On Table 2, only the larger of the two variables compared is being flagged (i.e., “*” or “**”) representing a statistical difference between those variables (e.g., high and low for the normative response).

2.2 General Hypotheses

The overall goal of this dissertation was to examine the impact of individual differences on the tendency to fall prey to the SCF especially when responding questions to health-related scenarios. The individual differences that were studied regarding the SCF are decision making styles and fatalism. The relationship between the SCF and the individual differences as defined here has not been explored before.

The following are the general hypotheses for the present dissertation:

- (1) While the normative response will receive higher mean ratings than SCF responses on average, a statistically significant number of participants will endorse the SCF responses.
- (2) The normative response will be negatively correlated with the SCF responses.
- (3) Health-related scenarios (study 2) will yield higher SCF effects than non-health related scenarios (study 1).

CHAPTER 3

STUDY 1

Based on Bornstein and Chapman (1995), a replication experiment was conducted with Introduction to Psychology students at the University of Texas at El Paso. A replication study was conducted in order to examine the effects of a normative response (i.e., stopping or switching a course of action) and four SCF responses (i.e., continuing with a course of action) on varied scenarios. These scenarios were based on three variables: Whether (a) the decision maker was portrayed as a parent deciding with a child or an adult acting alone, (b) the decision was made in a careful or carelessly manner, and (c) the investments were large or small. In addition, individual differences were defined as having three decision making styles (i.e., analytical, intuitive and regret-based) and levels of fatalism (i.e., ineluctable destiny, helplessness, internality, luck and divine control).

3.1 Hypotheses

The hypotheses for this study were:

- (1) SCF responses will be positively correlated with each other.
- (2) Scenarios in which there are large investments will have higher SCF ratings for the wasteful, learn-a-lesson, punishment, and consistency responses.
- (3) Scenarios in which the decision maker is portrayed as a parent will have higher SCF ratings for the learn-a-lesson, punishment, and consistency responses.
- (4) Scenarios in which the decision is made in careful manner will have lower SCF ratings for the learn-a-lesson and punishment responses.

- (5) The regret-based decision making style will be negatively correlated with the SCF responses.
- (6) The analytical decision making style will positively correlate with the normative response.
- (7) Fatalism will be positively correlated with the SCF responses.

3.2 Power Analyses

Prior to conducting this study, a power analysis was performed to determine adequate sample size, assuming 64 conditions (8 sets X 8 scenarios). Using heuristic values associated with “small,” “medium,” and “large” effect size estimates (See Cohen, 1988), it was conservatively assumed that the size of the effects of (a) the type of decision maker (i.e., a parent deciding with a child or an adult acting alone), (b) manner in which the decision was made (i.e., careful or carelessly), and (c) the amount of investment (i.e., large or small) in the current study would be small. Using the G*POWER program, (Faul, Erdfelder, Lang, & Buchner, 2007), a power analysis of a repeated measures within factors analysis of variance (ANOVA) was performed. The analyses indicated that a sample size of no larger than 128 participants would yield a small effect size ($f = .10$), with an estimated power of .95 at the customary .05 level of statistical significance.

3.3 Method

3.3.1 Participants

There were a total of 128 participants who, after completing a 1-hour session, received 1 credit towards their Introduction to Psychology class requirement. Of the

sample, over half (62.5%) were women, over half (61.3%) were freshman, and the mean age was 19.93 ($SD = 3.02$). A little less than half (47.7%) of the participants spoke English as their first language and the majority (83.8%) considered themselves Mexican American. Table 3 shows the sample characteristics based on subjective questions that relate to the Sunk Cost fallacy.

Table 3. *Characteristics based on subjective questions for Study 1*

Characteristic	<i>N</i>	<i>(%)</i>
Understand scenario conditions	97	(75.8)
Has been in a similar situation	97	(75.7)
Has watched an entire movie they dislike	109	(85.2)
Has continued a project they dislike	92	(71.9)
Has attended an event they dislike	119	(92.9)
Has belonged to a club/membership they do not use	121	(94.9)
Makes decisions based on who is watching	31	(24.2)
Makes decisions to teach others a lesson	85	(66.4)
Makes decisions based solely on past experiences	122	(95.3)
Makes decisions based on how much was invested	111	(86.7)

3.3.2 Measures

Prior to evaluating scenarios, all participants completed a questionnaire with demographic questions. Participants also completed the Decision Making Styles Inventory (DMI, Nygren, 2000), the Multidimensional Fatalism Measure (MFM, Esparza & Wiebe, 2008), and the Marin Short Acculturation Scale (MSAS, Marin, Sabogal, Marin, Otero-Sabogal, & Perez-Stable, 1987). After evaluating the scenarios, participants identified whether they have participated in similar scenarios and what factors influenced

them when making decisions. Measures can be found in the APPENDIX.

The *Decision Making Styles Inventory* (DMI, Nygren, 2000). The DMI is a 45-item instrument developed to measure decision makers' styles in terms of analytical, intuitive, and regret modes of thinking. The item scores on all three subscales range from 1 to 6, in which "1" represents strongly disagree and "6" strongly agree. Previously, the DMI has shown high internal consistency (alpha = .88, .86, and .86 for the analytical, intuitive, and regret subscales, respectively) and test-retest reliability (alphas = .82, .81, and .87 for the analytical, intuitive, and regret subscales, respectively). The three subscales were found to be orthogonal. In addition the DMI has shown good internal consistency among UTEP students (alphas = .90, .83, and .82 for the analytical, intuitive, and regret subscales, respectively in Morera et al., 2006).

The *Multidimensional Fatalism Measure* (MFM, Esparza & Wiebe, 2008). The MFM consists of a 30-item fatalism measure on five factors: ineluctable destiny, helplessness, internality, luck, and divine control. Each factor consists of six items on a 5-point Likert scale. This measure was found to be language (i.e., English and Spanish) invariant. High scores on the ineluctable destiny (i.e., "I have learned that what is going to happen will happen"), helplessness (i.e., "I feel that nothing I can do will change things"), internality (i.e., "My life is determined by my own actions"), luck (i.e., "Some people are simply born being lucky"), and divine control (i.e., "Everything that happens is part of God's plan") indicate higher fatalistic tendencies. The MFM has shown strong internal consistency for the 5 factors (Cronbach alpha = .76, .76, .80, .82, and .92 respectively in Esparza & Wiebe, 2008). Furthermore, the MFM has a good test-retest reliabilities for all factors ranging from $r(576) = .63$ to .87.

The *Marin Short Acculturation Scale* (MSAS, Marin et al., 1987). This acculturation measure was developed originally for Latinos. As previously mentioned, the MSAS is comprised of 12 questions and 3 subscales. The total MSAS score has an internal consistency of .92. The first subscale consists of 5 items that measure “Language use and ethnic loyalty” (alpha of .90). The second subscale consists of 3 items (alpha of .86) that measure “Media.” The third subscale consists of 4 items (alpha of .78) that measure “Ethnic Social Relations.”

3.3.3 Design

In each session, participants gave ratings for a normative response (i.e., stop or switch a course of action) and for each of the four SCF responses (i.e., continue a course of action). An 8 (set) by 8 (scenario) Latin Square design was employed to control for order effects. Within each condition a combination of three variables was manipulated: Type of decision maker, manner in which the decision was made, and amount of investment. First, mean comparisons were conducted to test the general hypothesis that the normative response received higher ratings than the SCF responses. Second, a correlation analysis of the normative and all the SCF response ratings was conducted to test the general hypothesis that the normative response was measuring the opposite effect of the SCF. Third, a 3 way repeated measures analysis of variance was conducted, in which each response was treated as the dependent variable, to test the specific hypotheses for this study. The three factors in the analysis of variance were type of decision maker (i.e., portrayed as a parent or as an adult acting alone), manner in which the decision was made (i.e., decision made after careful consideration or carelessly), and amount of investment (i.e., large or small amounts of time and/or money).

Covariates were added one at a time to the model to test their effect.

3.4 Procedure

After receiving Institutional Review Board approval, participants were recruited from the Introduction to Psychology courses. Participants registered for the study using the Experimentrix website. During the registration process, an explanation was provided that indicated that the experiment would consist of rating different scenarios or situations. Participants were randomly assigned to one of the eight settings. Participants completed a consent form. After consenting, participants completed the DMI, MFM, and MSAS questionnaires. Finally, participants rated 8 scenarios on a 10-point scale on how desirable they found the normative and each of the four SCF responses.

3.5 Results

3.5.1 Five Responses

As in Bornstein and Chapman (1995), participants rated the quality of each of five responses to the situation using a scale from 1 to 10 (i.e., “1” = a very bad response, should definitely not follow to “10” = a very good response, should definitely follow). Higher mean ratings indicate a higher agreement with the response. One response corresponded to stopping or switching to another course of action (i.e., a rational choice and the normative response), and four other responses involved continuing with a failed course of action (i.e., SCF). The responses corresponding to continuing a course of action were the wasteful, learn-a-lesson, punishment, and consistency responses. The normative response across scenarios had higher mean ratings than the learn-a-lesson response, $t(127) = 6.36$, $p < .001$, $d = .16$; the punishment response, $t(127) = 11.06$, p

< .001, $d = .39$; and the consistency response, $t(127) = 7.23$, $p < .001$, $d = .30$. The wasteful response across scenarios had higher mean ratings than the learn-a-lesson, $t(127) = 8.09$, $p < .001$, $d = .17$; the punishment response, $t(127) = 3.92$, $p < .001$, $d = .42$; and the consistency response, $t(127) = 8.73$, $p < .001$, $d = .32$. The learn-a-lesson response across scenarios had higher mean ratings than the punishment response, $t(127) = 10.67$, $p < .001$, $d = .18$; and the consistency response, $t(127) = 2.53$, $p < .01$, $d = .07$. The consistency response had higher mean ratings than the punishment response, $t(127) = 6.18$, $p < .001$, $d = .12$. Furthermore, all responses were statistically different than “1” . See Table 4.

Furthermore, the normative response was statistically negatively correlated to the wasteful response, $r(126) = -.39$, $p = .000$). Additionally, all the responses reflecting the SCF (i.e., wasteful, learn-a lesson, punishment, and consistency responses) were

Table 4. Mean ratings for the five responses across scenarios for Study 1

Response	Study 1	
	<i>M</i>	<i>SD</i>
Normative	5.44**	1.44
Wasteful	5.32**	1.24
Learn-a-Lesson	4.25**	1.49
Punishment	3.16**	1.66
Consistency	3.89**	1.78

Note. Ratings were made on a 10-point scale (“1” = “a very bad response, should definitely not follow” and “10” = “a very good response, should definitely follow.”). Means with ** differ at $p < .01$. Each mean rating is a response to the 10-point scale. Higher mean ratings indicate a higher agreement with the response.

statistically and positively correlated to each other, $r(126) = .29$ to $.42$, $p < .001$).

Analyses of the main effects and interactions of the five responses are reported individually. In addition, the effects of decision making styles and fatalism covariates are tested one at a time. These are reported below.

3.5.1.1 Normative Response

Ratings for the normative response were subjected to a 2 (investment amount) x 2 (manner of decision) x 2 (decision maker) repeated-measures ANOVA. There were no statistical main effects or interactions involving amount of investment or manner in which the decision was made. However, there was a statistically significant main effect due to type of decision maker, $F(1, 127) = 12.89$, $p = .000$, partial $\eta^2 = .09$. The average ratings of type of decision maker were significantly higher in the adult-alone condition ($M = 5.80$, $SD = 1.78$) than in the parent condition ($M = 5.10$, $SD = 1.82$).

In analyzing the covariates, these were entered one at a time into an analysis of covariance (ANCOVA). The model included the three manipulated variables in the design. Zero order correlations and significance of the covariates' effects are reported for each of the covariates in Table 5. This analysis showed that the Multidimensional Fatalism Measure subscales Helplessness, $F(1, 126) = 6.33$, $p = .01$, partial $\eta^2 = .05$; and Internality, $F(1, 126) = 7.31$, $p < .01$, partial $\eta^2 = .01$ were significantly related to the normative response. Higher ratings for the normative response were positively associated with higher Helplessness scores, while higher ratings for the normative response were negatively associated with the Internality subscale. The regret-based decision making style subscale was significantly related to the normative response, $F(1, 126) = 6.65$, $p = .01$, partial $\eta^2 = .05$. Higher normative ratings were significantly

associated with higher regret-based scores. No other subscales from the Decision Making Style inventory were related to the normative response.

3.5.1.2 Wasteful Response

Ratings for the wasteful response were subjected to a 2 (investment amount) x 2 (manner of decision) x 2 (decision maker) repeated measures ANOVA. There was a

Table 5. *Correlations of Responses and Covariates for Study 1*

	Response				
	Normative	Wasteful	Learn-a-lesson	Punishment	Consistency
1. Analytical style	-.02	-.04	-.10	-.07	-.03
2. Intuitive style	.01	.09	.19*	.16	.19*
3. Regret-based style	.22*	-.05	-.01	-.02	-.07
4. Ineluctable Destiny	.03	.24**	.33**	.29**	.13
5. Helplessness	.22*	.07	.31**	.34**	.26**
6. Internality	-.23**	.18*	-.07	-.12	-.04
7. Luck	.11	.00	.23*	.23**	.21*
8. Divine Control	.06	.12	.17	.16	.04

Note. * $p < .05$. ** $p < .01$ (2-tailed).

statistically significant main effect due to amount of investment, $F(1, 127) = 18.33$, $p = .000$, partial $\eta^2 = .13$. The average ratings of the amount of investment were significantly larger when there were high investments ($M = 5.66$, $SD = 1.63$) than when there were low investments ($M = 4.98$, $SD = 1.43$). There was a statistically significant main effect due to type of decision maker, $F(1, 127) = 6.09$, $p < .05$, partial $\eta^2 = .05$. The average ratings of type of decision maker were significantly higher in the parent condition ($M = 5.54$, $SD = 1.53$) than in the adult-alone condition ($M = 5.10$, $SD = 1.66$).

In the analyses of covariates, although the intuitive decision making style did not have a Zero-order correlation with the wasteful response, entering this style as a covariate made the interaction of decision type and decision maker significant, $F(1, 126) = 7.35, p < .01, \text{partial } \eta^2 = .03$. In the covariates' analyses, the Multidimensional Fatalism Measure subscales Ineluctable Destiny, $F(1, 126) = 7.55, p < .01, \text{partial } \eta^2 = .06$; and Internality, $F(1, 126) = 4.23, p < .05, \text{partial } \eta^2 = .03$ were significantly related to the wasteful response. Higher ratings for the wasteful response were positively associated with higher Ineluctable Destiny scores and higher ratings for the wasteful response were positively correlated to higher Internality scores.

3.5.1.3 Learn-a-Lesson Response

Ratings for the learn-a-lesson response were subjected to a 2 (investment amount) x 2 (manner of decision) x 2 (decision maker) repeated-measures ANOVA. There was a statistical significant main effect due to amount of investment, $F(1, 127) = 4.19, p < .05, \text{partial } \eta^2 = .03$. The average ratings of the amount of investment were significantly larger when there were high investments ($M = 4.40, SD = 1.75$) than when there were low investments ($M = 4.11, SD = 1.62$). There was a statistically significant main effect due to type of decision maker, $F(1, 127) = 17.99, p = .000, \text{partial } \eta^2 = .13$. The average ratings of type of decision maker were significantly higher in the parent condition ($M = 4.54, SD = 1.69$) than in the adult-alone condition ($M = 3.97, SD = 1.82$).

Scores from the Intuition subscale of the Decision Making Styles inventory were significantly related to the learn-a-lesson response, $F(1, 126) = 4.58, p < .05, \text{partial } \eta^2 = .04$. Higher ratings for the learn-a-lesson response were positively associated with higher intuitive scores. In the analyses of covariates, the Multidimensional Fatalism

Measure subscales Ineluctable Destiny, $F(1, 126) = 15.34, p = .000, \text{partial } \eta^2 = .11$; Helplessness, $F(1, 126) = 13.37, p = .000, \text{partial } \eta^2 = .10$; and Luck, $F(1, 126) = 6.69, p < .01, \text{partial } \eta^2 = .05$ were significantly related to the learn-a-lesson response. Higher ratings for the learn-a-lesson response were positively associated with higher Ineluctable Destiny scores, higher ratings for the wasteful response were positively correlated to higher Helplessness scores, and higher ratings for the wasteful response were positively correlated to higher Luck scores.

3.5.1.4 Punishment Response

Ratings for the punishment response were subjected to a 2 (investment amount) X 2 (manner of decision) x 2 (decision maker) repeated-measures ANOVA. There was a statistically significant main effect due to type of decision maker, $F(1, 127) = 10.50, p < .01, \text{partial } \eta^2 = .08$. The average ratings of type of decision maker were significantly higher in the parent condition ($M = 3.34, SD = 1.76$) than in the adult-alone condition ($M = 2.98, SD = 1.78$). There was an interaction between type of decision maker and manner in which the decision was made, $F(1, 127) = 4.83, p < .05, \text{partial } \eta^2 = .04$. The ratings for the punishment response were higher when the decision maker was portrayed as a parent who made careful decisions and when the decision maker was portrayed as an adult acting alone, making a careless decision.

In the analyses of covariates, the Multidimensional Fatalism Measure subscales Ineluctable Destiny, $F(1, 126) = 11.27, p = .001, \text{partial } \eta^2 = .08$; Helplessness, $F(1, 126) = 16.87, p = .000, \text{partial } \eta^2 = .12$; and Luck, $F(1, 126) = 7.10, p < .01, \text{partial } \eta^2 = .05$ were significantly related to the punishment response. Higher ratings for the punishment response were positively associated with higher Ineluctable Destiny scores, higher

ratings for the wasteful response were positively correlated to higher Helplessness scores, and higher ratings for the wasteful response were positively correlated to higher Luck scores.

3.5.1.5 Consistency Response

Ratings for the punishment response were subjected to a 2 (investment amount) x 2 (manner of decision) x 2 (decision maker) repeated-measures ANOVA. There were no statistical findings for the main effects or interactions of levels of investment amount, manner in which the decision was made or levels of type of decision maker.

In the analyses of covariates, the intuitive decision making style subscale was significantly related to the consistency response, $F(1, 126) = 4.75, p < .05$, partial $\eta^2 = .04$. Higher ratings in the consistency response significantly positively correlated with higher ratings in the intuitive subscale. The Multidimensional Fatalism Measure subscales Helplessness, $F(1, 126) = 9.07, p < .01$, partial $\eta^2 = .07$; and Luck, $F(1, 126) = 5.58, p < .05$, partial $\eta^2 = .04$ were significantly related to the consistency response. Higher ratings for the consistency response were significantly positively associated with higher Helplessness and Luck scores.

3.5.2 Subjective Questions and Other Variables

There were three significant differences in preference ratings for the SCF responses that are important to mention: age, sex, participants' understanding of the evaluated scenarios, and desire to teach a lesson to others when making decisions. They are described next.

3.5.2.1 Age and Sex

Table 6 shows there were higher ratings for the learn-a-lesson response were significantly negatively correlated to the increase in age of the participant. Higher ratings

Table 6. Correlations of Responses and Age for Study 1

	Response				
	Normative	Wasteful	Learn-a-lesson	Punishment	Consistency
Age	-.06	-.07	-.20**	-.21**	-.16

Note. ** $p < .01$ (2-tailed).

for the punishment response were significantly negatively correlated to the increase in age of the participant.

There were statistical differences between men and women only for the consistency response. Men gave higher preference ratings to the consistency response than women. See table 7.

Table 7. Mean ratings across responses by Sex for Study 1

	Response									
	Normative		Waste		Learn-a-lesson		Punishment		Consistency	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Males	5.57	1.42	5.32	1.32	4.37	1.42	3.44	1.74	4.27**	1.62
Females	5.34	1.45	5.32	1.78	4.15	1.55	2.93	1.57	3.57	1.86

Note. ** $p < .01$

3.5.2.2 Evaluation of the Scenarios in Study 1

In addition, there were statistical differences in whether or not participants understood the scenarios they were presented with and the preference ratings for the punishment and the learn-a-lesson responses. Participants that indicated they understood the scenarios had higher ratings for the learn-a-lesson and the punishment response than those who indicated they did not understand the scenarios (See Table 8).

There were also statistically significant differences between those who indicated making decisions to teach others and those who indicated not doing this. These differences were found on the learn-a-lesson response and the punishment response. Participants that indicated making decisions trying to teach others about decisions had higher ratings for both responses than those who do not consider teaching others.

Table 8. Mean ratings across responses by subjective questions for Study 1

	Response										
	Normative		Waste		Learn-a-lesson		Punishment		Consistency		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Understand ¹											
Yes	5.02	.85	5.46	.92	5.08*	1.50	4.08*	1.50	4.40	1.50	
No	5.49	1.48	5.30	1.27	4.16	1.46	3.06	1.64	3.84	1.80	
Teach others ²											
Yes	5.52	1.51	5.35	1.34	4.50**	1.42	3.39*	1.63	4.09	1.78	
No	5.30	1.28	5.26	1.02	3.75	1.51	2.71	1.64	3.51	1.78	

Note. ¹ Participants were asked if they understood the scenarios they evaluated. ² Participants were asked if generally they try to make decisions to teach others about making decisions. ** $p < .01$, * $p < .05$

3.5.2.3 The DMI and the MFM

There were statistically significant correlations among the Decision Making Styles Inventory (DMI) and the Multidimensional Fatalism Measure (MFM) as expressed on Table 9. Within the DMI, there was a positive correlation between regret-based and

Table 9. *Correlation Matrix of Decision Making Styles and Fatalism for Study 1*

	Subscale							
	1	2	3	4	5	6	7	8
1. Analytical style	1							
2. Intuitive style	.05	1						
3. Regret-based style	.32**	-.01	1					
4. Ineluctable Destiny	-.07	.23*	.24**	1				
5. Helplessness	-.04	.02	.21*	.49**	1			
6. Internality	.13	.03	.07	.01	-.31**	1		
7. Luck	-.07	.01	.17	.21*	.46**	-.26**	1	
8. Divine Control	.16	.12	.24**	.38**	.21*	-.08	.10	1

Note. ** $p < .01$, * $p < .05$

analytical decision making styles. Among the MFM subscales, Ineluctable Destiny was positively correlated with Helplessness, Luck, and Divine Control. Helplessness was positively correlated with Luck and Divine Control. Lastly, between the DMI and the MFM, regret-based decision making styles were positively correlated with Ineluctable Destiny, Helplessness, and Divine Control.

3.5.2.4 Acculturation

Acculturation was measure using the MSM (Marin et al., 1987). Scores were

obtained by adding the scores for each of the three subscales. There were a total of 12 questions on a 5-point scale. The 5-items for the language/ethnicity loyalty subscale indicated above average acculturation scores ($M = 18$, $SD = 5.73$). The 3-items for the media subscale use indicated high acculturation scores ($M = 13$, $SD = 5.70$). The 4-items for the ethnic social relations subscale indicated an acculturation among this sample below average ($M = 10.4$, $SD = 5.73$). Acculturation had no statistically significant effects on any variable.

3.6 Discussion

As expected, the normative response (i.e., stop or switch a course of action) was the response most preferred and was negatively correlated with the wasteful response, which represents a SCF effect. The normative response was not significantly correlated with the other SCF responses (i.e., learn-a-lesson, punishment, or consistency). However, all the SCF responses were significantly positively correlated with each other indicating convergence. Similar to the results of Bornstein and Chapman (1995) the SCF response with the highest mean ratings was the wasteful response. Interestingly, the mean ratings for SCF responses in study 1 are larger with smaller standard deviations than Bornstein and Chapman's findings, while the normative response mean ratings are smaller. . In addition, expert economists would expect the SCF responses to have an average of "1", which would indicate that participants were not susceptible to the SCF. However, as seen in Table 4, all four SCF responses received preference rating statically different than "1," indicating that individuals in this sample were susceptible to the SCF and that they decided to continue with a course of action even though it was not yielding any benefits.

As seen on the summary on Table 10, similar to Bornstein and Chapman’s (1995) findings, preference ratings were higher for the waste and learn-a-lesson responses when the amount of investment was large. However, the lack of statistical differences for

Table 10. Mean ratings across scenarios and responses for study 1

	Response										
	Normative		Waste		Learn-a-lesson		Punishment		Consistency		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Invested resources											
High	5.34	1.72	5.66**	1.63	4.40*	1.75	3.18	1.75	3.98	1.95	
Low	5.54	1.71	4.98	1.43	4.11	1.62	3.14	1.77	3.81	1.86	
Decision Maker											
Parent and Child	5.10	1.82	5.54*	1.53	4.54**	1.69	3.34**	1.76	3.97	1.85	
Adult Alone	5.80**	1.78	5.10	1.66	3.97	1.66	2.98	1.78	3.82	1.98	
Decision Care											
Carefully	5.44	1.59	5.42	1.51	4.32	1.60	3.21	1.69	3.89	1.86	
Carelessly	5.45	1.72	5.20	1.48	4.18	1.66	3.11	1.76	3.89	1.84	

Note. ** $p < .01$, * $p < .05$

any of the consistency response conditions suggests that participants may not have been preoccupied with appearing consistent on their decisions, which contradicts past research findings (Staw, 1981; Staw & Ross, 1987). In addition, the lack of a statistical difference across responses in terms of the manner in which a decision was made suggests that participants did not consider whether decisions were made in a careful or careless manner initially. However, there was a statistically significant interaction that was not present in Bornstein and Chapman’s study, between type of decision maker and

manner in which the decision was made for the punishment response (See Figure 1). In this interaction, mean ratings for the punishment response in which higher when the decision maker was portrayed as a parent and made the decision carefully than when the decision maker was portrayed as an adult alone. This interaction indicates that participants took into account the manner in which a decision was made initially only, when the decision maker was portrayed as a parent, but not when the decision maker was portrayed as an adult making a decision alone.

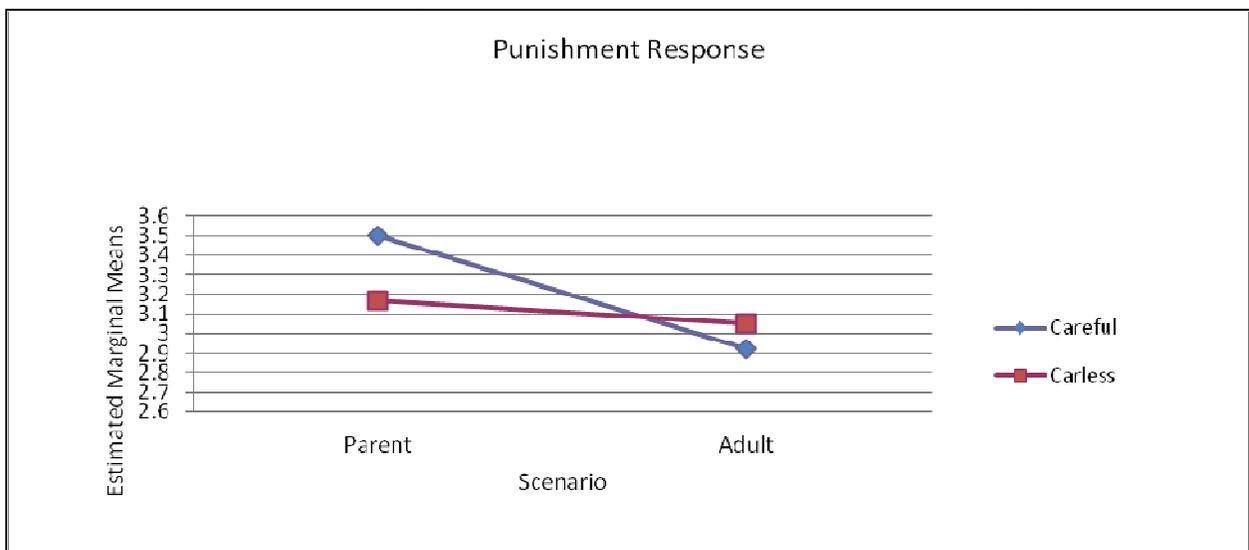


Figure 1. Study 1. Estimated marginal means for the punishment response as a function of type of decision maker and manner in which the decision was made.

The sample characteristics of participants in this study merit attention. There is a possibility that ethnic background may have played a role in some of the significant differences across studies. However, in the present sample the majority (83.8%) were Mexican American, which makes comparisons across groups difficult.

A relevant future study could evaluate different ethnic groups with large enough samples. Another unique attribute in our sample was native language. More than half of

the sample for this study spoke Spanish as their first language. A follow up study would compare the effects across language to evaluate whether there are any significant differences.

The unexpected effect of the regret-based decision making style on the normative response seem to indicate that the more an individual makes decisions based on past regrets, the more that individual is willing to leave a failing course of action. This may relate to Whyte et al.,'s (1997) findings which suggested that decision makers who have positive self-efficacy perceptions tend to remain in a course of action longer and continue to invest greater amounts on a decision. As research has found, individuals with regret-based decision making styles tend to make decisions based upon the consequences of past decisions they regretted. Future studies may want to evaluate the relationship between self-confidence and Sunk Cost effects. Another possible explanation could be that individuals with regret-based decision making styles become overwhelmed with an array of emotions (Wong & Kwong, 2007), thus quitting may seem easier. In addition, this may explain the unexpected significant finding of the positive correlation between the Helplessness subscale and the normative response since there was a significant positive correlation between the regret-based decision making style and the fatalism subscale Helplessness. Individuals may feel so helpless about a present course of action that they feel better off quitting than continuing, which on the surface may seem as a decision made by a rational individual but in reality is a decision affected by individual differences (i.e., generally feeling helpless about decisions).

Furthermore, the effect of the intuitive decision making style on the consistency response was also unexpected. The higher the scores on the intuitive subscale, the

higher the mean ratings on the consistency response. This seems contradictory to past research findings indicating that individuals with intuitive decision making styles make decisions that are not consistent over time (Dawes, 1986; Meehl, 1954).

The significant positive correlations between fatalism subscales and the SCF indicate that individuals in this sample feel they may have little control over making decisions. This may contribute to their decision to stay in the present course of action, regardless of its benefits.

CHAPTER 4

PILOT STUDY FOR STUDY 2

Based on the results from study 1, a pilot study was conducted among Introductory to Psychology students at the University of Texas at El Paso (UTEP). The main goal of the pilot study was to develop scenarios with specific health-related topics that were realistic to test the SCF effects.

4.1 Method

4.1.1 Subjects

Based on the population from which the data was collected for study 1 and the purpose of any studies related to this dissertation, the focus population was college students. The reason for choosing this population was to test developed health scenarios for the first time with a controlled population. Research has shown individuals deal with health issues differently than with non-health related issues (Boehm et al, 1993; Escoffery et al., 2005). In addition, there are significant differences in how individuals deal with health-related decisions and their age (Finucane et al., 2002; Strough et al., 2008). The pilot study and subsequent dissertation studies will use only students from Introduction to Psychology classes to try to control for sample differences. Findings from studies in this dissertation could be compared to different populations.

The variable type of decision maker was changed based on the university population statistics. The variable type of decision maker was defined for the new scenarios as either “you” or some hypothetical person making the decision. This replaced the decision maker portrayed as a parent or an adult in study 1. Participants

were asked whether they make decisions differently based on the type of decision maker. In order to create a pool of names for the hypothetical decision makers, participants were asked to provide 3 common proper names for both males and females.

There were a total of 80 participants who, after completing a 1-hour session, received 1 credit towards their Introduction to Psychology class requirement. Of the sample, half (51.5%) were women, over half (60%) were freshman, and the mean age was 20.24 ($SD = 3.50$). Less than half (40.7%) of the participants reported English was their first language and the majority (75.3%) considered themselves Mexican American. The majority (93.8%) reported being single, and reported (87.5%) not have any children.

4.1.2 Measures

First, participants filled out a demographic questionnaire. Then, they evaluated 20 scenarios. Finally, they completed a questionnaire relating to the scenarios.

4.1.2.1 Scenarios

Health scenarios were developed based on the health topics and issues most relevant to a college population. Based on the literature regarding university students (Collins, Carey, & Otto, 2009; Kiene, Tennen, & Armeli, 2008), health topics relating to this population were narrowed down to five (i.e., eating habits, exercise, sex practices, alcohol consumption, and smoking). Four scenarios were developed for each topic for a grand total of 20 scenarios. The criteria for each scenario were to contain only one continuous bad behavior (i.e., damaging health behavior), an irrecoverable sunk investment (stated clearly in the scenario) in terms of money and time or money-alone by the decision maker, and a point in which the decision maker had to choose between

stopping or continuing a course of action. Additionally, participants were asked to indicate the top 5 health issues related to university students.

The variable manner in which decisions were made and the amount of investment were the same as in study 1. Thus, decisions were either made in a careful or in a careless manner and investments were in large or small amounts. In terms of investments, pilot study scenarios varied from low to high investments by a factor of 2.5. Participants were invited to suggest alternative amounts of investments if scenario provided them with an unrealistic amount. Furthermore, participants were asked to indicate how plausible each scenario would be in terms of the manner in which the decision was made (i.e., careful vs. carelessly). The following is an example of a scenario constructed for the pilot study:

SCENARIO 1. (Martha vs. you) decides (after careful consideration vs. on the spur of the moment) to go to an all-you can eat pizza buffet that costs her (\$7.99 vs. \$19.98). After eating (1 plate of food vs. 3 plates of food) (she vs. you) realizes (she vs. you) is full. But (She vs. you) cannot take any food home.

4.1.3 Procedure

After receiving Institutional Review Board approval, participants were recruited from the Introduction to Psychology courses. Participants were explained that the purpose was to find scenarios that were realistic and clear about health-related issues for college students. A definition of what a scenario is was provided to participants. Participants evaluated all 20 scenarios. Scenarios were presented differently using a Latin square design. This allowed participants to see different combinations of the three variables of interest (i.e., decision maker, manner in which decision was made, and

amount of investment). Participants were asked to circle any words or phrases that were clear or confusing. They were encouraged to provide alternative words or phrases that would make the scenarios clearer. At the end of each scenario, participants indicated if the scenario was clear and realistic. At the end of the four scenarios pertaining to a specific health topic (i.e., eating habits, sex practices, alcohol consumption, and smoking), participants indicated an order of preference for scenarios from most realistic and clear to the least. Scenarios were tested for clarity, realism, relevance and plausibility. Participants were asked to indicate which scenarios were similar to situations they had experienced. Participants were asked to indicate why they would or would not continue with a scenario's course of action. Participants were also asked to indicate if there were factors in each scenario that they would not be able to recover. Finally, participants were assured of the confidentiality of their answers. Each scenario packet was placed by each participant in a box with an opening at the top. Consent forms were collected separately in front of the participants.

4.2 Results

A total of 12.5% considered themselves regular smokers, 26.3% considered themselves social smokers, 51.3% consumed alcohol, and 61.3% exercised on a regular basis. A total of 56.3% reported they would make a decision differently depending on who the decision maker is. Interestingly, the majority (78.8%) of the participants had been in similar situations as those hypothesized on the scenarios. The health issues related to college students participants named were: (1) 22.5 % drinking, (2) 12.5% unsafe sex, (3) 11.3% smoking, (4) 8.8% eating healthier, (5) 7.5% exercise, and (6) 7.3% other issues.

4.2.1 Criteria Selection of Final Health Scenarios

A total of eight scenarios were chosen (See APPENDIX). The scenarios with the highest rating scores on plausibility, relevance, clarity, realism, and similarity were chosen. There were some minor revisions implemented on the scenarios per participants' suggestions, such as a word order change. For scenarios in which the decision maker was some hypothetical person, the top four male and female names suggested by participants were included. Table 11 (see APPENDIX) shows the percentage across participants given to each scenario.

CHAPTER 5

STUDY 2

One way to improve individuals' health is to help them make better decisions regarding their health (Makoul, Arntson, & Schofield, 1995). It is important to evaluate if the SCF affects health-related decisions. If the SCF has an effect on health-related decisions, it would be beneficial to evaluate this effect in an effort to possibly reduce the SCF. There is one study that has evaluated health-related scenarios among medical residents only (Bornstein et al., 1999). There is a need to have more studies evaluating health-related scenarios (Chapman & Sonnenberg, 2000). While study 1 investigated the SCF effects in a replication study, the primary purpose of this study was to investigate the effects of the SCF in health-related scenarios and its association with individual differences. This study used the eight scenarios developed and tested in the pilot study. The eight scenarios included issues related to eating habits, exercise, sexual practices, cigarette and alcohol consumption.

5.1 Hypotheses

Based on the results of study 1, the present study was developed. The hypotheses for this study were:

- (1) SCF responses will be positively correlated with each other.
- (2) Scenarios in which there are large investments will have higher SCF ratings for the wasteful, learn-a-lesson, punishment, and consistency responses.
- (3) Scenarios in which the decision maker is portrayed as "you" will have higher SCF ratings for the learn-a-lesson, punishment, and consistency responses.

- (4) Scenarios in which the decision is made in careful manner will have lower SCF ratings for the learn-a-lesson and punishment responses.
- (5) The regret-based decision making style will be negatively correlated with the SCF responses.
- (6) The analytical decision making style will positively correlate with the normative response.
- (7) Fatalism will be positively correlated with the SCF responses.

5.2 Power Analyses

To determine adequate sample size for experiment 2, using heuristic values associated with “small,” “medium,” and “large” effect size estimates (See Cohen, 1988 and Kittler, Menard, & Phillips, 2007), it was conservatively assumed that the size of the effects of (a) the type of decision maker (i.e., a parent deciding with a child or an adult acting alone), (b) manner in which the decision was made (i.e., careful or carelessly), and (c) the amount of investment (i.e., large or small) in the current study would be small. On the basis of effect sizes found in experiment 1 ($d = .07$ to $.42$; partial $\eta^2 = .03$ to $.13$) and following the same design assumptions as in experiment 1, the same sample size was retained for experiment 2.

5.3 Method

5.3.1 Participants

There were a total of 128 participants who, after completing a 1-hour session, received 1 credit towards their Introduction to Psychology class requirement. More than half (66.4%) were women, the majority (87.5%) were single, one third (33.6%) were

freshman, and the mean age was 21.99 ($SD = 6.12$). Less than half (44.5%) of the participants spoke English as their first language, 71.9% had not taken any judgment and decision making related classes, and the majority (83.8%) considered themselves Mexican American. In terms of health-related issues, close to a fifth (18.8%) considered themselves smokers, the average cigarettes smoked per week were 2.24 ($SD = 1$) and per weekend were 5 ($SD = 4$). A little over half (68%) of the participants consumed 1 to 8 drinks per week and 1 to 12 drinks per weekend. From the sample, the majority (75.8%) exercises on average 3.96 days a week ($SD = 1.55$). Table 11 shows the sample characteristics based on subjective questions that relate to the SCF.

Table 11. *Characteristics based on subjective questions for Study 2*

Characteristic	<i>N</i>	<i>(%)</i>
Understand scenario conditions	123	(96.8)
Has been in a similar situation from at least 3 scenarios	115	(89.8)
Has consumed food even when stomach was full	119	(92.9)
Has opted out from exercising when invested in sedentary event	81	(63.3)
Has consumed an entire alcoholic beverage because of its costs	64	(50.0)
Has engaged in a sexual risky behavior due to time/money invested	43	(33.6)
Makes decisions based on who is watching	33	(25.8)
Makes decisions to teach others a lesson	88	(68.8)
Makes decisions based solely on past experiences	124	(96.9)
Makes decisions based on how much was invested	113	(88.3)

5.3.2 Measures

Prior to evaluating eight scenarios, all participants completed a questionnaire with demographic questions. Participants also completed the *Decision Making Styles*

Inventory (DMI, Nygren, 2000), the *Multidimensional Fatalism Measure* (MFM, Esparza & Wiebe, 2008), and the *Marin Short Acculturation Scale* (MSAS, Marin et al., 1987).

After evaluating the scenarios, participants identified whether they have participated in similar scenarios and what factors influenced them when making decisions.

Questionnaires and measures can be found in the APPENDIX. For a description of these measures see the Measures section in Study 1.

5.3.3 Design

In each session, participants gave ratings for a normative response (i.e., stop or switch a course of action) and for each of the four SCF responses (i.e., continue a course of action). An 8 (set) by 8 (scenario) Latin Square design was employed to control for order effects. Within each condition a combination of three variables was manipulated: Type of decision maker, manner in which the decision was made, and amount of investment. First, mean comparisons were conducted to test the general hypothesis that the normative response received higher ratings than the SCF responses. Second, a correlation analysis of the normative and all the SCF response ratings was conducted to test the general hypothesis that the normative response was measuring the opposite effect of the SCF. Third, a 3 way repeated measures analysis of variance was conducted, in which each response was treated as the dependent variable, to test the specific hypotheses for this study. The three factors in the analysis of variance were type of decision maker (i.e., portrayed as “you” or as a hypothetical individual), manner in which the decision was made (i.e., decision made after careful consideration or carelessly), and amount of investment (i.e., large or small amounts of time and/or money). Covariates were added one at a time to the model to test their effect.

5.4 Procedure

After receiving Institutional Review Board approval, participants were recruited from the Introduction to Psychology courses. Participants registered for the study using the Experimentrix website. During the registration process, an explanation was provided that indicated that the experiment would consist of rating different scenarios or situations. Participants were randomly assigned to one of the eight settings. Participants completed a consent form. After consenting, participants completed the DMI, MFM, and MSAS questionnaires. Finally, participants rated 8 scenarios on a 10-point scale on how desirable they found the normative and each of the four SCF responses.

5.5 Results

5.5.1 Five Responses

As in Bornstein and Chapman (1995), participants rated the quality of each of five responses to a total of 8 scenarios using a scale from 1 to 10 (i.e., 1 = a very bad response, should definitely not follow to 10 = a very good response, should definitely follow.). Higher mean ratings indicate a higher agreement with the response. One response corresponded to stopping or switching to another course of action (i.e., a rational choice and the normative response) and four other responses involved continuing with a failed course of action (i.e., Sunk Cost fallacy). The responses corresponding to continuing a course of action were the wasteful, learn-a-lesson, punishment, and consistency responses. The normative response across scenarios had higher mean ratings than the learn-a-lesson response, $t(127) = 17.49, p < .001, d = .44$; the punishment response, $t(127) = 20.82, p < .001, d = .44$; and the consistency response, $t(127) = 18.02, p < .001, d = .48$. The wasteful response across scenarios had

higher mean ratings than the learn-a-lesson, $t(127) = 8.89, p < .001, d = .12$; the punishment response, $t(127) = 12.24, p < .001, d = .15$; and the consistency response, $t(127) = 11.25, p < .001, d = .14$. The learn-a-lesson response across scenarios had higher mean ratings than the punishment response, $t(127) = 7.29, p < .001, d = .05$; and the consistency response, $t(127) = 2.30, p < .01, d = .02$. The consistency response had higher mean ratings than the punishment response, $t(127) = -3.99, p < .001, d = -.04$. All responses are statistically different from “1”. The Normative response represents the reverse-code of being susceptible to the SCF. In other words, the higher the normative mean the lower the SCF mean (See Table 12). Furthermore, the normative response was statistically negatively correlated to the wasteful response, learn-a-lesson response, punishment response, and consistency response, $r(126) = -.41$ to $-.65, p = .000$. Additionally, all the responses reflecting the Sunk Cost Fallacy (i.e., wasteful, learn-a

Table 12. Mean response ratings across scenarios, sets, and studies

Response	Study 1		Study 2	
	M	SD	M	SD
Normative	5.44**	1.44	6.86**	1.59
Wasteful	5.32**	1.24	3.93**	1.64
Learn-a-Lesson	4.25**	1.49	2.84**	1.41
Punishment	3.16**	1.66	2.35**	1.32
Consistency	3.89**	1.78	2.65**	1.43

Note. Ratings were made on a 10-point scale (“1” = “a very bad response, should definitely not follow” and “10” = “a very good response, should definitely follow.”). Means with ** differ at $p < .01$. Each mean rating is a response to the 10-point scale. Higher mean ratings indicate a higher agreement with the response. These are the means across all 8 scenarios

lesson, punishment, and consistency responses) were statistically positively correlated to each other, $r(126) = .53$ to $.85$, $p < .001$. Analyses of the main effects and interactions of the five responses are reported individually. In addition, the effects of decision making styles and fatalism covariates are tested one at a time. These are reported below.

5.5.1.1 Normative Response

Ratings for the normative response were subjected to a 2 (investment amount) x 2 (manner of decision) x 2 (decision maker) repeated-measures ANOVA. There were no statistical main effects or interactions involving amount of investment, type of decision maker, or manner in which the decision was made.

In analyzing the covariates, these were entered one at a time into an ANCOVA. The model included the three manipulated variables in the design. Zero order

Table 13. *Correlations of Responses and Covariates for Study 2*

Subscale	Response				
	Normative	Wasteful	Learn-a-lesson	Punishment	Consistency
1. Analytical style	.20*	-.09	-.09	-.15	-.19*
2. Intuitive style	.05	-.07	-.01	-.02	-.05
3. Regret-based style	.09	.14	-.04	-.03	-.09
4. Ineluctable Destiny	-.11	.19*	.20*	.23**	.26**
5. Helplessness	-.16	.17	.19*	.26**	.25**
6. Internality	.05	-.01	.13	.03	-.01
7. Luck	-.14	.16	.24**	.22**	.20*
8. Divine Control	-.03	.12	.06	.09	.12

Note. * $p < .05$. ** $p < .01$ (2-tailed).

correlations and significance of the covariates' effects are reported for each of the covariates. Table 13 shows the Zero order correlations. Results showed that Analytical (subscale of the Decision Making Styles inventory) was significantly related to the normative response, $F(1, 126) = 5.09, p < .03, \text{partial } \eta^2 = .04$. Higher ratings on the normative response were positively correlated with higher analytical scores.

5.5.1.2 Wasteful Response

Ratings for the wasteful response were subjected to a 2 (investment amount) x 2 (manner of decision) x 2 (decision maker) repeated measures ANOVA. There was a statistically significant main effect due to amount of investment, $F(1, 127) = 6.11, p < .01, \text{partial } \eta^2 = .05$. The average ratings of the amount of investment were significantly larger when there were high investments ($M = 4.15, SD = 2.02$) than when there were low investments ($M = 3.70, SD = 1.85$).

In an analysis of covariance, the Multidimensional Fatalism Measure subscale Ineluctable Destiny was significantly related to the wasteful response, $F(1, 126) = 4.69, p < .05, \text{partial } \eta^2 = .04$.

5.5.1.3 Learn-a-Lesson Response

Ratings for the learn-a-lesson response were subjected to a 2 (investment amount) x 2 (manner of decision) x 2 (decision maker) repeated-measures ANOVA. There were no statistical main effects or interactions involving amount of investment type of decision maker, or manner in which the decision was made.

In the analyses of covariates, the Multidimensional Fatalism Measure subscales Ineluctable Destiny, $F(1, 126) = 5.11, p < .05, \text{partial } \eta^2 = .04$; Helplessness, $F(1, 126) =$

4.84, $p < .05$, partial $\eta^2 = .04$; and Luck, $F(1, 126) = 7.88$, $p < .01$, partial $\eta^2 = .06$ were significantly related to the learn-a-lesson response. Higher ratings for the learn-a-lesson response were positively associated with higher Ineluctable Destiny scores, higher Helplessness scores, and higher Luck scores. In addition, entering the covariate Ineluctable Destiny made the main effect of type of decision maker significant, $F(1, 126) = 4.40$, $p < .05$, partial $\eta^2 = .04$. Decision maker was defined as “you” had higher ratings than decision maker defined as a hypothetical individual. Also, the interaction between manner in which a decision was made and amount of investment became significant, $F(1, 126) = 5.05$, $p < .05$, partial $\eta^2 = .04$. Figure 2 shows that when there was a high investment, careless decisions had higher learn-a-lesson response ratings.

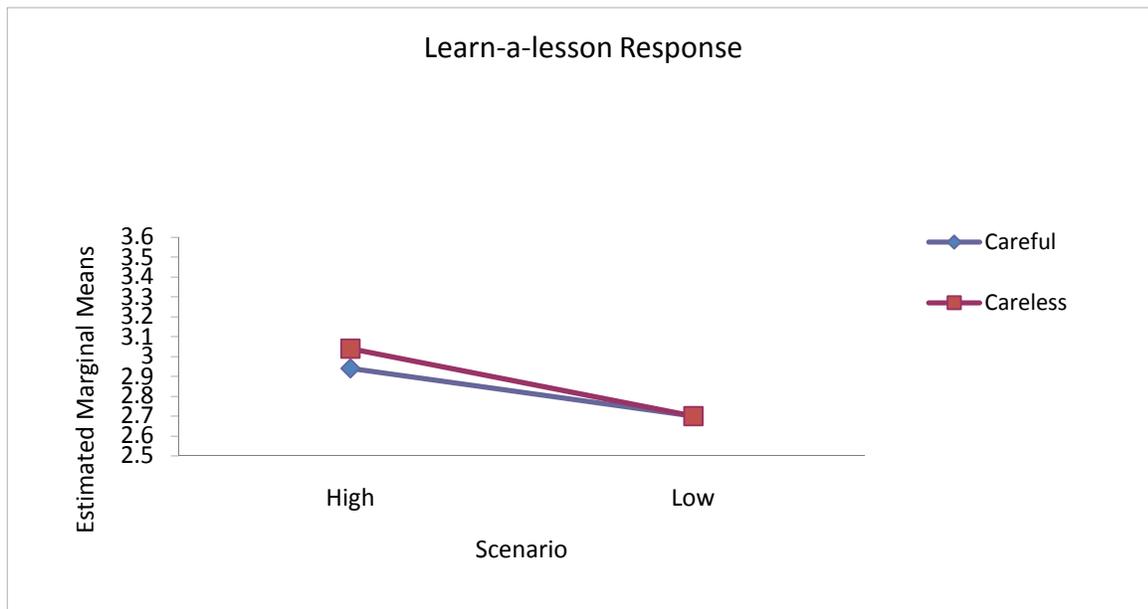


Figure 2. Study 2. Estimated marginal means for the learn-a-lesson response as a function of type of decision maker and manner in which the decision was made.

5.5.1.4 Punishment Response

Ratings for the punishment response were subjected to a 2 (investment amount) X 2 (manner of decision) x 2 (decision maker) repeated-measures ANOVA. There was a statistically significant main effect due to amount of investment, $F(1, 127) = 5.43, p < .05$, partial $\eta^2 = .04$. The average ratings of the amount of investment were significantly larger when there were high investments ($M = 2.47, SD = 1.50$) than when there were low investments ($M = 2.22, SD = 1.41$).

In the analyses of covariates, the Multidimensional Fatalism Measure subscales Ineluctable Destiny, $F(1, 126) = 6.84, p < .01$, partial $\eta^2 = .05$; Helplessness, $F(1, 126) = 8.85, p < .01$, partial $\eta^2 = .07$; and Luck, $F(1, 126) = 6.28, p < .01$, partial $\eta^2 = .05$ were significantly related to the punishment response. Higher ratings for the punishment

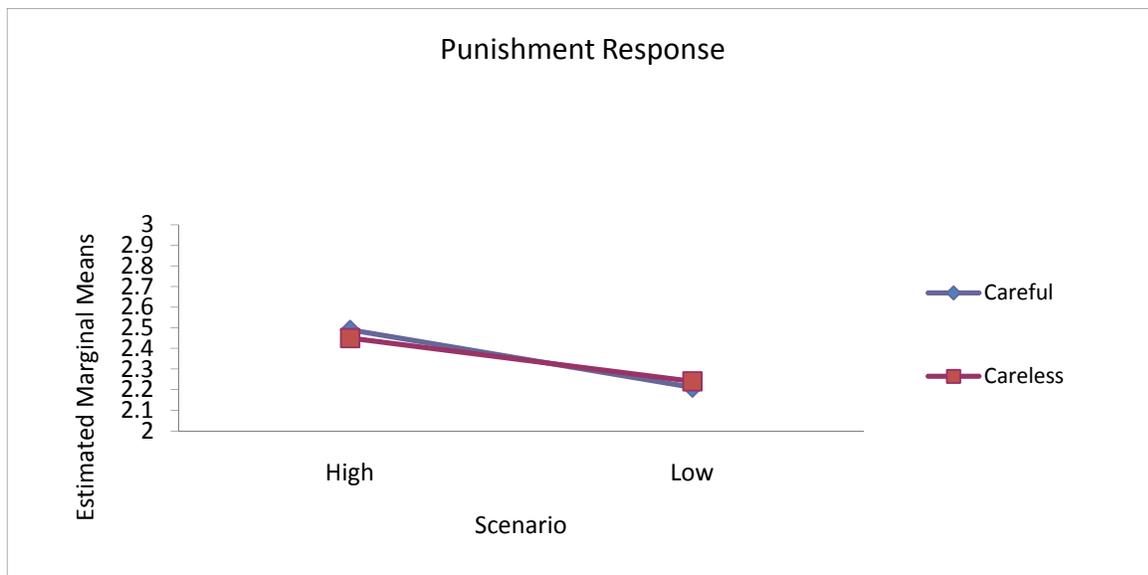


Figure 3. Study 2. Estimated marginal means for the punishment response as a function of type of decision maker and manner in which the decision was made.

response were positively associated with higher Ineluctable Destiny scores, higher Helplessness scores, and higher Luck scores. In addition, entering the covariate Helplessness made the interaction between manner in which a decision was made and amount of investment significant, $F(1, 126) = 5.05, p < .05, \text{partial } \eta^2 = .04$. Figure 3 shows that when there was a high investment, careful decisions had higher punishment response ratings. But the opposite would take place when there were low investments.

5.5.1.5 Consistency Response

Ratings for the punishment response were subjected to a 2 (investment amount) x 2 (manner of decision) x 2 (decision maker) repeated-measures ANOVA. There were no statistical findings for the main effects or interactions of levels of investment amount, manner in which the decision was made or levels of type of decision maker.

In the analyses of covariates, results showed that Analytical (subscale of the Decision Making Styles inventory) was significantly related to the consistency response, $F(1, 126) = 4.84, p < .05, \text{partial } \eta^2 = .04$. Higher ratings on the consistency response were negatively correlated with higher analytical scores. In the analyses of covariates, the Multidimensional Fatalism Measure subscales Ineluctable Destiny, $F(1, 126) = 8.98, p < .01, \text{partial } \eta^2 = .07$; Helplessness, $F(1, 126) = 8.51, p < .01, \text{partial } \eta^2 = .06$; and Luck, $F(1, 126) = 5.16, p < .05, \text{partial } \eta^2 = .04$ were significantly related to the consistency response. Higher ratings for the consistency response were positively associated with higher Ineluctable Destiny scores, higher Helplessness scores, and higher ratings Luck scores.

5.5.2 Subjective Questions and Other Variables

5.5.2.1 Age and Sex

Higher ratings for the learn-a-lesson response were significantly negatively correlated to the increase in age of the participant, $F(1, 126) = 11.77, p < .01$, partial $\eta^2 = .09$. Higher ratings for the punishment response were significantly negatively correlated to the increase in age of the participant, $F(1, 126) = 8.78, p < .01$, partial $\eta^2 = .07$. Higher ratings for the consistency response were significantly negatively correlated to the increase in age of the participant, $F(1, 126) = 9.22, p < .01$, partial $\eta^2 = .07$. Table 14 shows the relationship of age with responses. In addition, there were significant differences between males and females and the mean ratings for the

Table 14. *Correlations of Responses and Age for Study 2*

	Response				
	Normative	Wasteful	Learn-a-lesson	Punishment	Consistency
Age	.11	-.12	-.29**	-.26**	-.26**

Note. ** $p < .01$ (2-tailed).

normative, learn-a-lesson, punishment and consistency responses, as shown on Table 15. Overall, men gave higher ratings for the SCF responses than women. As expected women gave higher ratings ($M = 7.13, SD = 1.40$) than the males ($M = 6.30, SD = 1.81$) for the normative response.

Table 15. Mean ratings across responses by Sex for Study 2

	Response									
	Normative		Waste		Learn-a-lesson		Punishment		Consistency	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Males	6.30	1.81	4.25	1.84	3.31**	1.51	2.81**	1.39	3.27**	1.57
Females	7.13**	1.40	3.76	1.51	2.61	1.32	2.12	1.23	2.34	1.26

Note. ** $p < .01$. Only the highest group between the comparison is being flagged.

5.5.2.2 Evaluation of the Scenarios in Study 2

Participants were asked to rate on a 6-point scale on how strongly they agreed with statements of how they evaluated the scenarios. Higher numbers indicated a higher agreement with the statement. “I evaluated the scenarios based on how much money was invested” received the highest rating ($M = 4.28$, $SD = 1.11$), followed by the statements “I evaluated scenarios based on a combination of who the decision maker was and how careful a decision was made” ($M = 4.02$, $SD = 1.04$) “I evaluated the scenarios based on not wanting to waste anything that was already invested in the scenario” ($M = 3.77$, $SD = 1.24$), and “I evaluated the scenarios based on how much control I felt I had over the decision” ($M = 3.77$, $SD = 1.28$). Although, each scenario was different, due to the complex design, the difference among scenarios was not tested. Past research has found difference in scenarios (Bornstein & Chapman, 1999). However, this difference is not generally the main interest.

5.5.2.3 The DMI and the MFM

There were statistically significant correlations between the Decision Making

Styles and Multidimensional Fatalism Measure. The analytical decision making style is statistically and positively correlated to the intuitive and regret based decision making styles. See Table 16. The Ineluctable Destiny is significantly and positively related to Helplessness, Luck, and Divine Control. Helplessness is statistically and negatively associated with Internality. The analytical decision making style is significantly and negatively correlated to Luck, while positively correlated with Internality. The regret-based decision making styles is significantly and positively correlated to Helplessness.

Table 16. *Correlation Matrix of Decision Making Styles and Fatalism for Study 2*

	Subscale							
	1	2	3	4	5	6	7	8
1. Analytical style	1							
2. Intuitive style	.18*	1						
3. Regret-based style	.42**	-.15	1					
4. Ineluctable Destiny	-.21*	.12	.02	1				
5. Helplessness	-.16	-.10	.24**	.35**	1			
6. Internality	.33**	.16	.05	-.03	-.30**	1		
7. Luck	-.33**	-.12	.03	.31**	.47**	-.09	1	
8. Divine Control	-.11	-.06	.12	.49**	.16	-.09	.09.	1

Note. ** $p < .01$, * $p < .05$

5.5.2.4 Acculturation

The MSM (Marin et al., 1987) was obtained by adding the scores for each of the three subscales. The 5-items for the language/ethnicity loyalty subscale indicated above

average acculturation scores ($M = 18$, $SD = 5.30$). The 3-items for the media subscale use indicated high acculturation scores ($M = 13$, $SD = 2.00$). The 4-items for the ethnic social relations subscale indicated an acculturation among this sample below average ($M = 10.4$, $SD = 2.00$). Acculturation had no statistically significant effects on any variable.

5.6 Discussion

The results showed that the normative response (i.e., switch or stop a current course of action) was negatively correlated with the 4 SCF responses (i.e., continuing with an unbeneficial course of action), as predicted. In addition, the 4 SCF responses were positively correlated with each other, indicating convergence among these responses. Similar to study 1, after the normative response, the waste response was chosen first and the punishment response was chosen last. This indicates that in the current sample, participants would commit the SCF more due to a fear of appearing wasteful than any other SCF justification. Consistently, when participants were asked what factors affected their decisions when evaluating the scenarios, fear of appearing wasteful was one of the factors they selected most. In addition, it would be expected for the SCF responses to have an average of “1”, which would indicate that participants are not willing to continue with a course of action that is not yielding any benefits. However, as seen in Table 12, all four SCF responses received preference rating statically different than “1,” indicating individuals in this sample fell prey to the SCF.

As predicted, the amount of investment was significant for the wasteful, learn-a-lesson, and punishment responses (see Table 17). However, the consistency response had no significant effects due to amount of investment. The lack of this

significant difference may indicate that participants were not preoccupied by the large or small amounts of investments when trying to appear consistent. In addition, the lack of any significant findings for the consistency response contradict past research findings that level of responsibility in terms of who the decision maker is and manner in which the decision is made (Bornstein & Chapman, 1995; Garland & Newport, 1991; Simonson & Nye, 1992). The lack of a significant finding in the wasteful condition contradicts Arkes and Blumer (1985) findings that when the decision maker is defined as “you” (e.g., the participant of the study) there are higher SCF ratings.

Table 17. Mean ratings across scenarios and responses for Study 2

	Response									
	Normative		Wasteful		Learn-a-lesson		Punishment		Consistency	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Decision Maker										
You	6.74	1.88	3.98	1.74	2.95	1.57	2.39	1.36	2.60	1.45
Hypothetical	6.97	1.73	3.87	1.81	2.73	1.61	2.30	1.50	2.71	1.61
Decision Care										
Carefully	6.84	1.77	4.03	2.04	2.87	1.51	2.35	1.52	2.63	1.49
Carelessly	6.87	2.09	3.83	1.97	2.82	1.69	2.35	1.43	2.67	1.70
Invested Resources										
High	6.81	1.93	4.15**	2.02	2.99*	1.77	2.47*	1.50	2.71	1.57
Low	6.90	1.88	3.70	1.85	2.69	1.48	2.22	1.40	2.58	1.60

Note. ** $p < .01$, * $p < .05$

Interestingly, the interactions between amount of investment and manner in which the decision was made were not significant for either the learn-a-lesson or the

punishment responses. However, when the covariates Ineluctable Destiny and Helplessness, were introduced in the model respectively within each response, these interactions were significant. Similar to Bornstein and Chapman (1995), decisions with large investments and made in a careless manner had higher SCF ratings for the learn-a-lesson response. However the opposite situation was present when dealing with the punishment response. This may indicate that participants believed that decisions made in a careful manner with large investments deserved to serve as punishments for the decision maker. However, the overall SCF ratings are still low, thus, caution must be taken when making some generalizations.

The results indicated that there were significant differences in the way males and females rated the normative and three of the SCF (i.e., learn-a-lesson, punishment, and consistency) responses. In general, males prefer to continue with a course of action more than women. Past research has shown that males and females adopt different decision making strategies (Powell & Ansic, 1997). Females have a tendency to be less risk seeking than males.

Findings in this study indicated that age had a strong influence on the SCF, specifically on the learn-a-lesson, punishment and consistency responses. Strough et al (2008) recently found that college students ($M\ age = 19.47, SD = 1.36$) were more likely to be susceptible to the SCF than older adults ($M\ age = 74.15, SD = 8.11$). This suggested that there was a negative linear relationship. Similarly, in this study there was a significant negative correlation between age and responses.

The individual differences defined as decision making styles had an effect on the SCF. As predicted, the analytical decision style was positively correlated with the

normative response. This finding may support the idea that those who use an analytical decision making styles make choices after careful consideration of all attributes (Morera et al, 2006). Furthermore, Heath (1995) suggested that the SCF could be reduced by paying cautious attention to what is being done.

Fatalism seems to be related to the SCF as seen in the results. The positive significant correlations between Ineluctable Destiny and all the SCF responses may indicate that individual differences are playing a role in decisions, aside from external factors such as amount of investment, manner in which the decision is made and type of decision maker. Results indicate that the more participants felt they are governed by destiny, luck or felt helpless, the higher they rated the SCF responses. The fact that participants indicated that they had evaluated scenarios based on amount of investment and how much control they felt they had over decisions indicates that the SCF and fatalism, although related to each other, are two different influences on decision makers. Past research has shown that for some individuals, their decisions are affected by feeling guided by fate (Benavides et al., 2006; Mckirnan et al., 1996).

CHAPTER 6

DISCUSSION AND FUTURE DIRECTIONS

The objective of this dissertation was threefold. First, a replication of the study by Bornstein and Chapman (1995) was conducted to examine the occurrence of the SCF in the present population. Second, scenarios related to health issues were developed based on the replication study and the effects of the SCF on these scenarios were examined. Third, the relationship of the SCF and individual differences was evaluated. For all studies, indicators such as age, ethnicity, and sex were investigated. The major findings across studies are discussed next. The limitations encountered across studies are explained. In addition, suggestions for future studies based on the findings across studies are included.

6.1 Five Responses

Across studies, the normative response (i.e., stop or switch a course of action) received the highest preference ratings. However, the SCF responses also received preference ratings, indicating that some participants felt the best choice would be to continue with a course of action, regardless of its lack of benefits. The significant positive correlations among the SCF responses across studies indicate convergent validity in measuring the same construct. These results indicate both studies were able to replicate the presence of both the normative response and the SCF found in previous research (Bornstein & Chapman, 1995). For the most part, the effect sizes of study 2 approximate findings in study 1 and past findings, indicating a small to modest effect. . Based on expert economists' guides, an average of "1" should be expected, which would indicate that participants are not willing to continue with a course of action that is not yielding any

benefits. However, in both studies, all mean preference ratings for the four SCF responses were statistically different than “1,” indicating that individuals in this sample were susceptible to the SCF.

Although the normative response was given the highest preference ratings, type of decision maker was only significantly different in study 1. In all other scenarios, the normative response had no statistical difference due to amount of investment, type of decision maker, or decision care. This may indicate that across studies, individuals' decision to stop or switch a course of action was not affected by these variables. Furthermore, there were many conditions in which there was no main effect or interaction of these three independent variables. It is possible that the variation within these independent variables needs to be larger to find statistical effects.

6.2 Control Over Decisions

While the inclusion of the Multidimensional Fatalism Measure and the Decision Making Styles inventory was exploratory, their association with the SCF is of interest. Researchers have found that individual differences play an important role in day-to-day changes in behavior (Kiene, Tennen, & Armeli, 2008). Fatalism was a factor predominantly associated with the SCF across studies. Although this association was predicted, future research needs to evaluate in more detail why a feeling of less control over decisions is positively related to the SCF. For instance, fatalism has been associated with lower levels of self-efficacy (Acevedo, 2005). However, some researchers have found that decision makers who had positive self-efficacy perceptions persisted for a longer time on their present course of action and spent greater amounts of effort on that decision (Whyte, Saks, & Hook, 1997). A future study might measure

levels of self-efficacy and evaluate the relationship of fatalism and the SCF.

6.3 Decision Making Styles

Decision making styles were defined as either analytical, intuitive, or regret based (Nygren & White, 2002). Interestingly, there were differences on which style related to the SCF, across studies. In study 1, the regret-based style was positively correlated with the normative response, indicating that higher preference ratings for the rational choice (i.e., stop a course of action) were associated with higher scores on this style. However, when participants were dealing with health-related scenarios, the regret-based style association disappeared. On the other hand, the analytical style was not present in non-health related scenarios. However, the analytical style was positively correlated with the normative response in health-related scenarios, indicating that the more individuals tended to carefully analyze situations the more those individuals were willing to stop a course of action. Nygren (2000) and Andersson and Engelberg (2006) observed that individuals with high intuitive decision style scores were more likely to be impulsive. This may suggest that when individuals are dealing with non-health related scenarios, they may be more impulsive than when dealing with health-related scenarios. This merits further evaluation because individual differences such as decision styles could be considered to encourage decision makers to stop an unhealthy behavior.

6.4 Age Differences

The statistical negative correlation between the learn-a-lesson and punishment responses in study 1 and the addition of the consistency response in study 2 is noteworthy. Previous researchers have shown that the decision maker's age could be an influencing factor on the SCF (Arkes & Ayton, 1999; Klaczynski, 2001; Klaczynski &

Cottrell, 2004; Strough et al., 2008). Arkes and Ayton (1999) suggested that children may be less prone to the SCF than adults. Thus, it was thought that increased age was predictive of the extent of the presence of the SCF (Brown, Asher, & Cialdini, 2005). The idea of evaluating whether the SCF is or is not innate further grew with the evaluation of the presence of the SCF (i.e., Concorde Fallacy) among certain animals such as wasps (Dawkins & Brockmann, 1980) and pigeons (Navarro & Fantino, 2005). However, Klaczynski (2001) found that although early adolescents (M age = 12.81, SD = .96 years) and middle adolescents (M age = 16.77, SD = 1.96 years) do display the SCF, they do not differ from each other nor do they differ from young adults (M age = 21.74, SD = .96). Furthermore, Klaczynski and Cottrell (2004) found that the SCF slightly reduces as children get older, but they are still susceptible to the SCF. However, Strough et al., (2008) recently found that college students (M age = 19.47, SD = 1.36) were more likely to be susceptible to the SCF than older adults (M age = 74.15, SD = 8.11). In addition, the older adults made more correct choices (i.e., normative choices), which suggest that there may be a slight negative linear relationship between the SCF and age. Age is a factor that needs to be further considered when conducting the SCF studies. A future study would look further at age difference within college samples, by including not only freshman but all other college populations.

6.5 Sex Differences

Although significant sex differences were present across studies, they must be reviewed with caution. For instance, study 2 had a larger group of females than study 1. However sex differences were present in both studies. Past research has found that females tend to be less risk-seeking and adopt different strategies than males (Powell &

Ansic, 1997). If this is the case, Prospect Theory (Kahneman & Tversky, 1979) has explained individual choice on the basis of perception of gains and losses (value function). Arkes and Blumer (1985) explained that decision makers initiate in point A before making a choice. Once decision makers begin investing and accumulating fruitless sunk costs, they move to point B. In point B, decision makers get the false feeling that based on past investments that if they continue investing, a large gain will soon occur. Based on Prospect theory, decision makers give larger values to losses than to the value of obtaining a gain (Kahneman & Tversky, 1979). However, the convex shape of the value function in the domain of losses implies that continued losses will not be viewed as more harmful. Furthermore, Powell and Ansic (1997) suggested that females are generally less risk seeking. This hypothesis would explain why males gave lower preference ratings to the normative response, while giving higher preference ratings to the SCF responses.

6.6 Health-Related Behaviors

Since some researchers have found that the SCF will most likely be present and a part of decisions (Ware, 1984), future studies may look at positive behaviors instead of the damaging behaviors found in study 2. Studies could investigate if the SCF can be used to maintain positive behaviors. Additionally, the length of the effect could be measured. Beaton and Beaton (1995) suggested that commitment is a higher predictor of loyalty than quality and value. For instance, the more a customer has spent shopping in a specific store, the more likely that individual will continue to shop at that store. Future studies might examine scenarios in which decision makers would be encouraged to focus on sunk costs (e.g., time and effort spent on quitting smoking) to continue being

loyal to a positive behavior (e.g., remain a non-smoker). However, as suggested by an expert on the SCF, smoking may introduce other variables such as addiction. Also as past research has found, decision makers cannot be presented with too many variables because this will cause a decay in the decision making process (Arkes et al., 2000; Fernandez, 2006; Morera et al., 2006). In addition, participants of this study could be asked to have a detailed plan before making a decision, pay careful attention to the decision and give careful consideration to expected future outcomes and benefits (Heath, 1995; Northcraft & Wolf, 1984; Tan & Yates, 1995).

6.7 Cultural Differences

There were peculiar findings in the samples that could be due to the predominance of the Mexican American ethnicity. The replication study obtained higher preference mean ratings than the original study for each of the justifications. Furthermore, the SCF response that represented avoiding to appear wasteful was not statistically different than the normative response, indicating that continuing with a course of action (i.e., the SCF response) was deemed as important as stopping a course of action (i.e., normative response). This confirms the findings of another study in which a small sample of Latinos was included and they were more susceptible to the SCF (Carpenter, Matthews, & Brown, 2005).

In addition, Hispanics have been considered a collectivistic culture (i.e., achieves goals as a group) as opposed to an individualistic society (Hofstede, 1980). Interestingly, in one study with Asians and non-Asian students, participants with higher collectivistic scores were less willing to continue their participation when asked to complete a second task that would make them appear more inconsistent with their decisions (Petrova,

Cialdini, & Sills, 2007). However, the present studies did not use any scale that would measure collectivistic and individualistic tendencies. Future studies should measure these tendencies. These findings suggest there may be a relationship between culture and the SCF (Keil et al., 2000). This relationship should be further investigated. However, a sample that is less homogeneous in its sex, racial, and ethnic composition would be desirable in order to allow for comparisons and generalizations.

6.8 Hypothetical Scenarios

Although both studies were conducted in the laboratory, Tan and Yates (1995) found that participants evaluating hypothetical day-to-day scenarios elicited the SCF. Tan and Yates (1995) indicated that familiarity with scenarios is an important component in conducting hypothetical evaluations. In addition, subjective measures found that participants have engaged in similar situations described in the hypothetical scenarios (Bornstein & Chapman, 1995). Furthermore, Arkes and Blumer (1985) were able to replicate laboratory findings in the real world. They randomized university ticket purchasers into three conditions: regular price or two discount conditions. Notably, those who paid the full price (i.e., invested more money) attended more events than the discounted ticket purchasers, and this difference was statistically significant. Therefore, the SCF can be tested in either the laboratory or real life situations. However, in terms of the health-related scenarios, real life situations would be more preferable. In study 2, all responses were self-reported. Future studies could have an apparatus to measure how much a participant really smokes on a daily basis or a scale to measure weight. Such studies could further explore the effects of individual differences and the susceptibility to the SCF in terms of specific groups (e.g., smokers).

6.9 Uncertainty in Decisions

Future studies would ask if the specific scenarios being evaluated cause the participant to feel overwhelmed, thus causing the decision maker to stop a course of action. These kinds of studies would evaluate if stopping or switching a course of action is being done as a rational choice or because the decision maker is overwhelmed. In addition, participants could be asked if there are aspects of the decision that feel uncertain. Furthermore, future studies might try to identify them. O'Conner et al., (2003) also found that uncertainty caused decisional conflict among women. Also another question that evaluates how much an individual understands the scenarios should be added. Research has shown that unclear expenses may cause decision makers to give up a project too early when in fact the future benefits were promising (Bragger, Bragger, Hantula, & Kiman, 1998; Curhan & Pentland, 2007).

6.10 Experimental Design

In terms of the designs used across studies, there are suggestions for future studies. Specific designs should be chosen to allow comparisons for each scenario in terms of the specific situation presented. Furthermore, these designs should allow the comparison of hypothetical scenarios and real life situations. Also, if the 10-point scale is used in the future, verbal anchors should be considered for each of the numbers, not only for 1" and "10." Furthermore, there may be populations who may need shorter scales or other types of scales. For instance, some Mexican American samples have had a difficulty with Likert type scales (Korzenny, & Korzenny, 2005).

CHAPTER 7

CONCLUSION

These studies have provided evidence of the presence of the SCF in a predominantly Mexican American population in both non-health related and health-related scenarios. This study adds to the literature because previous research had not defined individual differences in terms of decision making styles and perceived control over decisions. Replications of the second study should be conducted with less homogenous groups. A more extensive study of health-related decisions vulnerable to the SCF is needed. Particular focus should be given to adding different factors one at a time to be able to discern if the SCF is still the primary influencing factor. Finally, it is important to consider that when an individual stays on a course of action, even in an attempt to not make a choice, he is making a choice. As William James said it, not making a choice is a choice in itself.

REFERENCES

- Acevedo, G. A. (2005). The structure and function of fatalism as a social belief system: A cross-national study of collective consciousness. *Dissertation Abstracts International*, 64 (03), 1188A.
- Allinson, C.W., & Hayes, J. (1996). The cognitive style index: A measure of intuition-analysis for organizational research. *Journal of Management Studies*, 33, 119-35.
- Andersson, P., & Engelberg, E. (2006). Affective and rational consumer choice modes: The role of intuition, analytical decision-making, and attitudes to money. Working Paper Series in Business Administration, 2006:13, Stockholm School of Economics.
- Arkes, H. (1996). The Psychology of Waste. *Journal of Behavioral Decision Making*, 9(3), 213-224.
- Arkes, H. (2003). The nonuse of psychological research at two federal agencies. *Psychological Science*, 14(1), 1-6.
- Arkes, H.R., & Ayton, P. (1999). The sunk cost and Concorde effects: Are humans less rational than lower animals? *Psychological Bulletin*, 125, 591-600.
- Arkes, H., & Blumer, C. (1985). The Psychology of sunk cost. *Organizational Behavioral and Human Decision Process*, 35, 124-140.
- Arkes, H., & Hutzell, L. (1999). The role of probability of success estimates in the sunk cost effect. *Journal of Behavioral Decision Making*, 13, 295-306.
- Arkes, H.R., Schiltz, J., Kung, Y., Bailey, N., & Gonzalez-Vallejo, C. (November, 2000). Inferior holistic ratings are preferred to superior disaggregated ones. Paper presented at the Annual Meeting of the Psychonomic Society, New Orleans, LA.

- Arkes, H., Wortmann, R., Saville, P., & Harkness, A. (1981). Hindsight Bias among physicians weighing the likelihood of diagnoses. *Journal of Applied Psychology*, *66*(2), 252-254.
- Bazerman, M.H., Beekun, R.I., & Schoorman, F.D. (1982). Performance evaluation in a dynamic context: A laboratory study of the impact of prior commitment to the rate. *Journal of Applied Psychology*, *67*, 873-876.
- Bazerman, M.H., Giuliano, T., & Appelman, A. (1984). Escalation in individual and group decision making. *Organizational Behavior and Human Performance*, *33*, 141-152.
- Beaton, M., & Beaton, C. (1995). Marrying service providers and their clients: A relationship approach to service management. *Journal of Marketing Management*, *11*, 55-70.
- Beeler, J.D., & Hunton, J.E. (1997). The influence of compensation method and disclosure level on information search strategy and escalation of commitment. *Journal of Behavioral Decision Making*, *10*(2), 77-91.
- Benavides, R., Bonazzo, C., & Torres, R. (2006). Parent-child communication: A model for Hispanics on HIV prevention. *Journal of Community Health Nursing*, *23*(2), 81-94.
- Boehm, S., Selves, E.J., Raleigh, E., Ronis, D., Butler, P.M., & Jacobs, M. (1993). College students' perception of vulnerability/susceptibility and desire for health information. *Patient Education and Counseling*, *21*, 77-87.
- Bornstein, B., Emler, A., & Chapman, G. (1999). Rationality in medical treatment decisions: Is there a sunk-cost effect? *Journal of Social Science & Medicine*, *49*, 215-222.
- Bornstein, B., & Chapman, G. (1995). Learning lessons from sunk costs. *Journal of Experimental Psychology: Applied*, *1*(4), 251-269.

- Bowen, M.G. (1987). The escalation phenomenon reconsidered: Decision dilemmas or decision errors? *Academy of Management Review*, 12, 52-66.
- Bragger, J.L., Bragger D.H., Hantula, D.A., & Kiernan, J.P. (1998). Histeresis and uncertainty: The effect of information on delays to exit decisions. *Organizational Behavior and Human Decision Processes*, 74, 229-253.
- Brockner, J. (1992). The escalation of commitment to a failing course of action: Toward theoretical progress. *Academy of Management Review*. 17, 39–61.
- Brown, S.L., Asher, T., & Cialdini, R.B. (2005). Evidence of a positive relationship between age and preference for consistency. *Journal of Research in Personality*, 39, 517-533.
- Butler, S.K., & Harvey, R.J. (1988). A comparison of holistic versus decomposed ratings of position analysis questionnaire work dimensions. *Personnel Psychology*, 41, 761-771.
- Carpenter, J.P., Matthews, P.H., & Brown, A.D. (2005). The determinants of sunk cost sensitivity in students. Middlebury College Working Paper Series 0524, Middlebury College, Department of Economics.
- Chamot, E., Charvet, A.I., & Perneger, T.V. (2005). Variability in women's desire for information about mammography screening: Implications for informed consent. *European Journal of Cancer Prevention*, 14(4), 413-416.
- Chapman, G., & Sonnenberg, F. (2000). Decision making in health care: Theory, psychology, and applications. Cambridge University Press.
- Cheng, E., Li, H., & Yu, L. (2005). The analytic network process (ANP) approach to location selection: A shopping mall illustration. *Construction Innovation*, 5(2), 83-97.
- Cohen, J. (1988). Statistical power analysis for the behavioral sciences. Hillside, NJ: Erlbaum.

- Collins, S., Carey, K., & Otto, J. (2009). A new decisional balance measure of motivation to change among at-risk college drinkers. *Psychology of Addictive Behaviors*, 23(3), 464-471.
- Curhan, J., & Pentland, A. (2007). Thin slices of negotiation: Predicting outcomes from conversational dynamics within the first 5 minutes. *Journal of Applied Psychology*, 92(3), 802-811.
- Dawes, R. (1986). Forecasting one's own preference. *International Journal of Forecasting*, 2, 5-14.
- Dawkins, R., & Brockmann, H. (1980). Do digger wasps commit the Concorde fallacy? *Animal behaviour*, 25(3/4), 892-896.
- DeNicolis, J.L., & Hantula, D.A. (1996). Sinking shots and sinking costs? or, how long can I play in the NBA? *Academy of Management Executive*, 10, 66-67.
- Epstein, S., Pacini, R., Denes-Raj, V., & Heier, H. (1996). Individual differences in intuitive-experiential and analytical-rational thinking style. *Journal of Personality & Social Psychology*, 71, 390-405.
- Escoffery, C., Miner, K., Adame, D., Butler, S., McCormick, L., & Mendell, E. (2005). Internet Use for Health Information among College Students. *Journal of American College Health*, 53(4), 183-188.
- Esparza, O.A., & Wiebe, J.S. (2006). Factors derived from fatalism scales and their relationship to health-related behaviors. Manuscript submitted for publication.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175-191.
- Fernandez, N.P. (2006). How much information is too much?: A comparison of decompositional and holistic strategies. Masters of Arts thesis, Graduate Department of Psychology, University of Texas at El Paso, El Paso, TX.

- Festinger, L. (1957). *A Theory of Cognitive Dissonance*. Stanford, CA: Stanford University Press.
- Finucane, M., Slovic, P., Hibbard, J., Peters, E., Mertz, C., & MacGregor, D. (2002). Aging and Decision-making Competence: An Analysis of Comprehension and Consistency Skills in Older versus Younger Adults Considering Health-plan Options. *Journal of Behavioral Decision Making*, *15*(2), 142-164.
doi:10.1002/bdm.407.
- 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., & Newport, S. (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.
- Gibson, S.G. (2001). Call me old fashioned – is my job analysis accurate or not? PhD Dissertation, Department of Psychology, Virginia Polytechnic Institute and State University.
- Gourville, J.T., & Soman, D. (1998). Payment depreciation: The behavioral effects of temporally separating payments from consumption. *Journal of Consumer Research*, *25*(2), 160-174.
- Heath, C. (1995). Escalation and de-escalation of commitment in response to sunk costs: The role of budgeting in mental accounting. *Organizational Behavior and Human Decision Processes*, *62*(1), 38-54.
- Hofstede, G. (1980). *Culture's consequences: International Differences in Work-Related Values*. Beverly Hills, CA: Sage.
- Hondagneu-Sotelo, P. (1993). New perspectives on Latina women. *Feminist Studies*, *19*, 193–206.

- Hunt, R.G., Krzystofiak, F.J., Meindl, J.R., & Yousry, A.M. (1989). Cognitive style and decision making. *Organizational Behavior and Human Decision Processes*, 44, 436-53.
- Johnson, B. (2001). Toward a new classification of non experimental quantitative research. *Educational Researcher*, 30, 3-13.
- Juliusson, A. (2006). Optimism as modifier of escalation of commitment. *Scandinavian Journal Of Psychology*, 47(5), 345-348.
- Kahneman, D., Slovic, P., & Tversky, A. (1983). Judgment under uncertainty: Heuristics and biases. Cambridge: Cambridge University Press.
- Kahneman, D., & Tversky, A. (1979). Prospect Theory: An analysis of decision under risk. *Econometrica*, 47, 263-291.
- Kanodia, C., Bushman, R., & Dickhaut, J. (1989). Escalation errors and the sunk cost effect: an explanation based on reputation and information asymmetries. *Journal of Accounting Research*, 27, 59-77.
- Keil, M., Tan, B.C.Y., Wei, K., Saarinen, T., Tuunainen, V., & Wassenaar, A. (2000). A cross-cultural study on escalation of commitment behavior in software projects. *MIS Quarterly*, 24(2), 299-325.
- Kiene, S., Tennen, H., & Armeli, S. (2008). Today I'll use a condom, but who knows about tomorrow: A daily process study of variability in predictors of condom use. *Health Psychology*, 27(4), 463-472.
- Kittler, J.E., Menard, W., & Phillips, K.A. (2007). Weight concerns in individuals with body dysmorphic disorder. *Journal of Eating Behaviors*, 8, 115-120.
- Klaczynski, P.A. (2001). Framing effects on adolescent task representations, analytic and heuristic processing, and decision making: Implications for the normative-descriptive gap. *Journal of Applied Developmental Psychology*, 22, 289-309.

- Klaczynski, P.A., & Cottrell, J.M. (2004). A dual-process approach to cognitive development: The case of children's understanding of sunk cost decisions. *Thinking and Reasoning, 1*, 147-174.
- Knox, R.E., & Inkster, J.A. (1986). Post decision dissonance at post time. *Journal of Personality and Social Psychology, 8*, 319-323.
- Kopstein, D. (1973). Risk taking behavior and cognitive style. *Child Development, 44*, 190-192.
- Korzenny, F., & Korzenny, B.A. (2005). *Hispanic Marketing: A Cultural Perspective*. Butterworth-Heinemann.
- Ku, G. (2008). Before escalation: Behavioral and affective forecasting in escalation of commitment. *Personality and Social Psychology Bulletin, 34*(11), 1477-1491.
- MacGregor, D.G., & Lichtenstein, S. (1991). Problem structuring aids for quantitative estimation. *Journal of Behavioral Decision Making, 4*, 101-116.
- Makoul, G., Arntson, P., & Schofield, T. (1995). Health promotion in primary care: Physician-patient communication and decision making about prescription medications. *Journal of Social Science Medicine, 41*, 1241-1254.
- Marin, G., Sabogal, F., Marin, B.V., Otero-Sabogal, R., & Perez-Stable, E.J. (1987). Development of a short acculturation scale for Hispanics. *Hispanic Journal of Behavioral Sciences, 9*(2), 183-205.
- Mckirnan, D., Ostrow, D., & Hope, B. (1996). Sex, drugs and escape: A psychological model of HIV-risk sexual behaviours. *AIDS Care, 8*(6), 655-670.
- Meehl, P.E. (1954). *Clinical versus Statistical Prediction*. University of Minnesota Press: Minneapolis.
- Messick, S. (1984). The nature of cognitive styles: Problems and promise in educational practice. *Educational Psychologist, 19*, 59-74.

- Moon, H. (2001). The two faces of conscientiousness: Duty and achievement striving in escalation of commitment dilemmas. *The Journal of Applied Psychology, 86*(3), 533-540.
- Moon, H., Hollenbeck, J., Humphrey, S., & Maue, B. (2003). The Tripartite Model of Neuroticism and the suppression of depression and anxiety within an escalation of commitment dilemma. *Journal of Personality, 71*(3), 347-368.
- Morera, O.F., & Budescu, D.V. (1998). A psychometric analysis of the “divide and conquer” principle in multi-criteria decision making. *Organizational Behavior and Human Decision Making, 175*, 187-206.
- Morera, O., Maydeu-Olivares, A., Nygren, T., White, R., Fernandez, N., & Skewes, M. (2006). Social problem solving predicts decision making styles among US Hispanics. *Personality & Individual Differences, 41*(2), 307-317.
- Moyer, D. (2004). That sunk feeling. *Harvard Business Review, 82*(10), 160-160.
- Navarro, A. (2007). The sunk cost effect of time: An exploration and an explanation. PhD. Dissertation, Department of Psychology of University of California, San Diego.
- Navarro, A.D. & Fantino, E. (2005). The sunk cost effect in pigeons and humans. *Journal of the Experimental Analysis of Behavior, 83*, 1-13.
- Nisbett, R., & Wilson, T. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review, 84*, 231-259.
- Northcraft, G.B., & Wolf, G. (1984). Dollars, sense, and sunk costs: A life-cycle model of resource allocation decisions. *Academy of Management Review 9*, 225-234.
- Nygren, T.E. (November, 2000). Development of a measure of decision making styles to predict performance in a dynamic judgment decision making task. Paper presented at the Annual Meeting of the Psychonomic Society, New Orleans, LA.

- Nygren, T.E. & White, R.J. (2002). Assessing individual differences in decision making styles: Analytical vs. intuitive. Proceedings of the Human Factors and Ergonomics Society: 46th Annual Meeting.
- O'Connor, A.M., Drake, E.R., Wells, G.A., Tugwell, P., Laupacis, A., & Elmslie, T. (2003). A survey of the decision-making needs of Canadians faced with complex health decisions. *Health Expectations*, 6, 97-109.
- Parker, A.M., Bruine de Bruin, W., & Fischhoff, B. (2007). Maximizers versus satisfiers: Decision-making styles, competence, and outcomes. *Judgment and Decision Making*, 2, 342-350.
- Payne, J.W., Bettman, J.R., & Johnson, E.J. (1993). *The use of multiple strategies in judgment and choice*. In N. J. Castellan Jr. (Ed.), Individual and group decision making: Current Issues (pp. 19-39). Hillsdale, NJ: Erlbaum.
- Petrova, P.K., Cialdini, R.B., & Sills, S.J. (2007). Consistency-based compliance across cultures. *Journal of Experimental Social Psychology*, 43, 104-111.
- Powell, M., & Ansic, D. (1997). Gender differences in risk behavior in financial decision-making: An experimental analysis. *Journal of Economic Psychology*, 18, 605-628.
- Prelec, D., & Loewenstein, G. (1998). The red and the black: Mental accounting of savings and debt. *Marketing Science*, 17, 4-28.
- Ravinder, H.V. (1992). Random error in holistic evaluations and additive decomposition of multiattribute utility – An empirical comparison. *Journal of Behavioral Decision Making*, 5, 155-167.
- Reese H. (1999). Strategies for Replication Research Exemplified by Replications of the Istomina Study. *Developmental Review*, 19, 1-30.
- Riding, R.J. (1997). On the nature of cognitive style. *Educational Psychology*, 17, 29-49.

- Riquelme, H. (2001). Do consumers know what they want? *Journal of Consumer Marketing*, 18(5), 437-448.
- Sadler-Smith, E. (1999). Intuition-analysis style and approaches to studying. *Educational Studies*, 25, 159-73.
- Schiltz, J. (2004). Sunk costs at an Individual level: the role of responsibility. Master of Science thesis, Department of Psychology and College of Arts and Sciences of Ohio University.
- Scott, S., & Bruce, R. (1995). Decision making Style: The Development of a New Measure. *Educational and Psychological Measurements*, 55, 818-831.
- Simonson, I., & Nye, P. (1992). The effect of accountability on susceptibility to decision errors. *Organizational Behavior and Human Decision Processes*, 51, 416-446.
- Soman, D. (2001). The mental accounting of sunk time costs: Why time is not like money. *Journal of Behavioral Decision Making*, 14(3), 169-185.
- Spicer, D.P., & Sadler-Smith, E. (2005). An examination of the general decision making style questionnaire in two UK samples. *Journal of Managerial Psychology*, 20, 137-149.
- Staw, B.M. (1976). Knee deep in the big muddy: A study of escalating commitment to a chosen course of action. *Organizational Behavior and Human Performance*, 16, 27-44.
- Staw, B.M. (1981). The escalation of commitment to a course of action. *Academy of Management Review*, 6, 577-587.
- Staw, B., & Fox, F. (1977). Escalation: the determinants of commitment to a chosen course of action. *Human Relations*, 30(5), 431-450.

- Staw, B.M., & Ha Hoang. (1995). Sunk costs in the NBA: Why draft order affects playing time and survival in professional basketball. *Administrative Science Quarterly*, 40(3), 474-494.
- Staw, B., & Ross, J. (1987). Knowing when to pull the plug. *Harvard Business Review*, 65(2), 68-74.
- Stillwell, W.G., Barron, F.H., & Edwards, W. (1983). Evaluating credit applications: A validation of multiattribute utility weight elicitation techniques. *Organizational Behavior and Human Performance*, 32, 87-108.
- Strough, J.N., Mehta, C.M., McFall, J.P., & Schullier, K.L. (2008). Are older adults less subject to the Sunk-Cost Fallacy than younger adults? *Psychological Science*, 19, 650-652.
- Tan, H., & Yates, J. (1995). Sunk cost effects: The influences of instruction and future return estimates. *Organizational Behavior and Human Decision Processes*, 63(3), 311-319.
- Tetlock, P.E., & Boettger, R. (1989). Accountability: A social magnifier of the dilution effect. *Journal of Personality and Social Psychology*, 57, 388-398.
- Thaler, R. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior and Organization*, 39, 36-90.
- Thaler, R., & Johnson, E. (1990). Gambling with the house money and trying to break even: the effects of prior outcomes on risky choice. *Management Science*, 36(6), 643-660.
- Von Winterfeldt, D., & Edwards, W. (1986). *Decision analysis and behavioral research*. New York: Cambridge University Press.
- Walton, D. (2002). The Sunk Costs Fallacy or argument from waste. *Argumentation*, 16(4), 473-503.

- Ware, R. (1984). Sunk costs and strategic commitment: A proposed three-stage equilibrium. *Economic Journal*, 94(374), 370-378.
- Whyte, G. (1986). Escalating commitment to a course of action: A reinterpretation. *Academy of Management Review*, 11, 311-321.
- Whyte, G. (1990). Entrapment: Are groups less susceptible? *Academy of Management Proceedings*, 231-235.
- Whyte, G. (1993). Escalating commitment in individual and group decision making: A Prospect Theory approach. *Organizational Behavior and Human Decision Processes*, 54(3), 430.
- Whyte, G., Saks, A., & Hook, S. (1997). When success breeds failure: The role of self-efficacy in escalating commitment to a losing course of action. *Journal of Organizational Behavior*, 18(5), 415-432.
- Wong, K., & Kwong, J. (2007). The role of anticipated regret in escalation of commitment. *The Journal of Applied Psychology*, 92(2), 545-554.
- Wong, K., Yik, M., & Kwong, J. (2006). Understanding the emotional aspects of escalation of commitment: the role of negative affect. *The Journal of Applied Psychology*, 91(2), 282-297.

APPENDIX A: SUNK COST SCENARIOS FOR STUDY 1
Replication of Bornstein and Chapman (1995) Experiment

Scenarios

1. Becky decides to take cello lessons. After Becky buys a cello and pays for lessons (\$1200 for 3 months vs. \$140 for 1 month), Becky finds she is no longer interested and wants to quit.

2. Edith selects a video to rent. After Edith pays for it and she watches the beginning (\$4 for 45 min vs. \$99 for 10 min), Edith realizes she is not enjoying the movie and wants to turn it off.

3. Jill selects a school project. After Jill buys supplies and works on it (1 month vs. 1 week), Jill discovers a better project that will take less time to complete.

4. George buys football tickets (\$35 vs. \$8). Later George's favorite player is hurt, so he doesn't want to go to the game.

5. After a large meal, Paul buys a chocolate soufflé (\$7.95 vs. \$1.50). After a few bites he finds he is too full to finish it.

6. Luis buys ballet tickets (\$80 vs. \$15). A week later, Luis is invited to a party at the same time as the ballet. Luis would prefer to go to the party.

7. Nathan drives (4hrs vs. 30 min) to a state park for a hike. When Nathan arrives it has turned cold and rainy. Nathan would not enjoy the planned hike and wants to go home.

8. Sonya joins the soccer team. After she buys soccer equipment and attends several practices (\$90 and 2 months vs. \$25 and 1 week), Sonya decides she would rather play softball.

APPENDIX B: SUNK COST SCENARIOS FOR STUDY 2

Scenarios

1. You decide, on the spur of the moment, to go to an all-you-can-eat buffet that costs \$7.99. After 15 minutes of eating one plate of food you realize that you are full. The restaurant does not allow food to be carried out. What should you do?
2. Carlos pays \$250 for a non-refundable, non-transferable online dating subscription and meets someone. After getting to know each other through the internet and phone calls for 1 month, Carlos decides, after careful consideration, to meet his match in person. They start to become intimate but neither one has a condom. What should Carlos do?
3. A month ago, Stephanie decided to purchase, on the spur of the moment, a 1 month non-refundable, non-transferable bus pass for \$25 because she used to live 15 miles away from work. But now she lives 6 blocks away and could walk. What should Stephanie do?
4. During dinner at a restaurant, Ana decides, after careful consideration, to order a 44 oz alcoholic Margarita for \$12.48. After a couple of sips, Ana realizes that the Margarita has too much alcohol, which is making her dizzy. No one else on the table wants to share it and Ana cannot return it. What should Ana do?
5. You decide, on the spur of the moment, to buy a meal that consists of a double-burger, fries and a shake for \$8.75. You feel full after eating the burger. You don't feel like eating the fries and the shake but you cannot save them for later. What should you do?
6. At the beginning of the semester, you decided, after careful consideration, to purchase a non-refundable, nontransferable school parking sticker for \$75 because you

used to live 30 miles away from school. But now you lives 6 blocks away from school and could walk. What should you do?

7. John is in a hurry and, on the spur of the moment, stops at a gas station on his way home to buy a pack of cigarettes but the store is out of his favorite brand. John decides to buy a different brand and pays \$3.75. After smoking a couple of cigarettes, John realizes they taste terrible but cannot get a refund nor does he knows anyone that would take them. What should John do?

8. You go to the bar, on the spur of the moment, and buy a pitcher of beer for \$6.95. You finish the beer and then decide to buy a second pitcher of beer for the same price. But after a few sips you feel you had too much to drink. No one else wants to drink it. What do you do?

APPENDIX C: DECISION MAKING STYLES INVENTORY (Nygren, 2000)

We are interested in how you typically go about making decisions. Think about different situations and contexts where you have made decisions recently. Then for each statement below indicates the degree to which you agree or disagree with that statement. Keep in mind that there are no right or wrong answers to any of these items, because there is no single “best” way to make every decision. It is important that you try to answer all questions. However, if you feel uncomfortable with any item, you may choose to omit it. Use the following rating scale for each statement.

1	I feel that if I plan my decisions carefully I will make good decisions.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
2	In spontaneous decision situations I usually find that I have good intuitions.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
3	I think that I could keep myself from worrying later if I had made a bad decision.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
4	In making decisions I first try to make a mental list of all the factors or attributes that will be important to my decision.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
5	I can get a good “feeling” for most decision situations very quickly.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
6	I sometimes spend too much time hesitating before making decisions.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
7	Before I make a decision, I like to figure out the most efficient way of studying it.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
8	I feel that I have a knack for making good, quick decisions.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
9	Before I make a decision, I think about whether others will approve or disapprove of it.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
10	I’m very rational when it comes to evaluating risky options.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
11	I think that relying on one’s “gut feelings” is a sound decision making principle.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
12	I tend to be someone who worries a lot over decisions I’ve made.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
13	In making decisions I first make a careful initial estimate of the situation.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
14	There are many common sense “rules-of-thumb” that I know of that usually lead to good decisions.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree

15	After making a decision, I find that I often go back and re-evaluate the situation.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
16	I try to pay attention to past information in making new decisions.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
17	Sometimes decisions, even important ones, are not difficult to make because they just "feel" right.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
18	I have trouble putting the results of disappointing decisions I've made behind me.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
19	A good rule of thumb is that the more information I have in making a decision, the better that decision will be.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
20	Simple decision rules usually work best for me.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
21	I rarely rethink old decisions I've made.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
22	In making decisions I try to evaluate the importance of each piece of information in the decision process.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
23	When forced to make a quick decision; I find that information that readily comes to mind is usually the most useful in making a choice.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
24	Worrying about future decisions that I have to make is something I often do.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
25	I always try to be fully prepared before I begin working on making a decision.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
26	My first reaction to a decision situation usually turns out to be the best one.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
27	Many times when I look back on a choice I've made, I wish that I would have put more effort into evaluating the alternatives.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
28	In making decisions I try to examine the importance of the good and bad points of each alternative.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
29	If I can't decide what to do, I go with my "best guess".	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
30	When I find out that I've made a bad decision I feel a lot of regret.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
31	I like to take a rational, systematic approach to making decisions.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
32	When making decisions, my first instinct usually turns out to be best.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
33	If I were gambling at a casino I would prefer to play simpler games like slot machines where you don't have to concentrate on playing complex strategies.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
34	My best decisions are those for which I've carefully weighed all of the relevant information.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree

35	I let my intuition play a big part in most decisions I make.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
36	I generally don't make very good decisions under time pressure.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
37	I generally rely on careful reasoning in making up my mind.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
38	I often rely on my first impression when making a decision.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
39	I sometimes get "butterflies" in my stomach when I have to make decisions.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
40	I like to make decisions in an orderly manner.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
41	I rely on my intuition in making many of my personal decisions.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
42	After making a decision I sometimes worry about the regret I'll feel if the outcome turns out to be a bad one.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
43	Most important decisions in life are complex and need to be evaluated in a systematic way.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
44	I find that my best decisions usually result from using the "quick and easy" approach rather than the "slow but sure" method.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree
45	Unexpected bad outcomes have a greater impact on me than do unexpected good outcomes.	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Disagree	5 Moderately Disagree	6 Strongly Disagree

Scoring instructions: Reverse code item 3, 21

Add the following items for each factor:

a) Analytical: 1, 4, 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37, 40, 43;

b) Intuitive: 2, 5, 8, 11, 14, 17, 20, 23, 26, 29, 32, 35, 38, 41, 44;

c) Regret: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45

APPENDIX D: ACCULTURATION MEASURE

Marin et al (1987)

1	Usually what language or languages do you read and speak?	① Only Spanish	② Spanish more than English	③ Both Equally	④ English more than Spanish	⑤ Only English
2	What language or languages did you use when you were a child?	① Only Spanish	② Spanish more than English	③ Both Equally	④ English more than Spanish	⑤ Only English
3	What language or languages do you usually speak at home now?	① Only Spanish	② Spanish more than English	③ Both Equally	④ English more than Spanish	⑤ Only English
4	What language or languages do you usually use when you think?	① Only Spanish	② Spanish more than English	③ Both Equally	④ English more than Spanish	⑤ Only English
5	What language or languages do you usually use with your friends?	① Only Spanish	② Spanish more than English	③ Both Equally	④ English more than Spanish	⑤ Only English
6	What language or languages are most TV shows that you watch?	① Only Spanish	② Spanish more than English	③ Both Equally	④ English more than Spanish	⑤ Only English
7	What language or languages are most radio stations that you listen to?	① Only Spanish	② Spanish more than English	③ Both Equally	④ English more than Spanish	⑤ Only English
8	What language or languages do you prefer for movies, TV shows and radio programs?	① Only Spanish	② Spanish more than English	③ Both Equally	④ English more than Spanish	⑤ Only English
9	Your close friends are:	① All Hispanic	② Mostly Hispanic	③ Equally Hispanics and Anglos	④ Mostly Anglos	⑤ All Anglos
10	You prefer parties and social gatherings where the people are:	① All Hispanic	② Mostly Hispanic	③ Equally Hispanics and Anglos	④ Mostly Anglos	⑤ All Anglos
11	People you visit and who visit you are:	① All Hispanic	② Mostly Hispanic	③ Equally Hispanics and Anglos	④ Mostly Anglos	⑤ All Anglos
12	If you could choose friends for your children you would choose:	① All Hispanic	② Mostly Hispanic	③ Equally Hispanics and Anglos	④ Mostly Anglos	⑤ All Anglos

Language use and ethnic loyalty: 1, 2, 3, 4, 5

Media: 6, 7, 8

Ethnic Social Relations: 9, 10, 11, 12

APPENDIX E: MULTIDIMENSIONAL FATALISM MEASURE
(Esparza & Wiebe, 2008)

Directions: Please answer the following questions based on what you think. Rate how strongly you agree or disagree with each statement. Make sure to answer every question. Remember that there is no right or wrong answers.

1	I have learned that what is going to happen will happen.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
2	I feel that nothing I can do will change things.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
3	I feel that when good things happen, they happen as a result of my own efforts.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
4	When I get what I want, it's usually because I'm lucky.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
5	Everything that happens is part of God's plan.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
6	If something bad is going to happen to me, it will happen no matter what I do.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
7	Sometimes I feel there is nothing to look forward to in the future.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
8	What happens to me in the future mostly depends on me.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
9	How successful people are in their job is related to how lucky they are.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
10	Everything that happens to a person was planned by God.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
11	If bad things happen, it is because they were meant to happen.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
12	I feel that I do not have any control over the things that happen to me.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
13	My life is determined by my own actions.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
14	Some people are simply born being lucky.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
15	Whatever happens to me in my life, it is because that is the way God wanted it to happen.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
16	There is no sense in planning a lot; if something good is going to happen, it will.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
17	No matter how hard I try, I still cannot succeed in life.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

18	What people get out of life is always due to the amount of effort they put into it.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
19	When good things happen to people, it is because of good luck.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
20	God controls everything good and bad that happens to a person.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
21	Life is very unpredictable, and there is nothing one can do to change the future.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
22	I often feel overwhelmed with problems, since I do not have any control over solving these problems.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
23	What happens to me is a consequence of what I do.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
24	The really good things that happen to me are mostly because of luck.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
25	God has a plan for each person, and you cannot change his plan.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
26	People die when it is their time to die and there is not much that can be done about it.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
27	There's nothing I can do to succeed in life, since one's level of success is determined when one is born.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
28	I can do almost anything if I really want to do it.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
29	Luck does not exist	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
30	No matter how much effort I invest into doing things, at the end, God's decisions will prevail.	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

Scoring instructions:

1. Reverse code item 24
2. Add the following items for each factor
 - a. Ineluctable Destiny: 1, 6, 11, 16, 21, 26
 - b. Helplessness: 2, 7, 12, 17, 22, 27
 - c. Internality: 3, 8, 13, 18, 23, 28
 - d. Luck: 4, 9, 14, 19, 24, 29
 - e. Divine Control: 5, 10, 15, 20, 25, 30

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APPENDIX F: RATINGS FOR PILOT STUDY SCENARIOS

	Criteria				
	Plausible	Relevant	Clear	Realistic	Similar
	<i>N (%)</i>				
Eating habits					
Scenario 1	79 (98.8)	78 (97.5)	79 (98.8)	79 (98.8)	78 (97.5)
Scenario 2	78 (97.5)	79 (98.8)	78 (97.5)	79 (98.8)	77 (96.3)
Scenario 3	60 (75)	71 (88.8)	68 (85)	62 (77.5)	54 (67.5)
Scenario 4	60 (75)	70 (87.5)	71 (88.8)	65 (81.3)	52 (65)
Exercise					
Scenario 5	71 (88.8)	77 (96.3)	69 (86.3)	67 (83.8)	69 (86.3)
Scenario 6	78 (97.5)	79 (98.8)	71 (88.8)	65 (81.3)	71 (88.8)
Scenario 7	52 (65)	63 (78.8)	45 (56.3)	39 (48.8)	22 (27.5)
Scenario 8	54 (67.5)	54 (67.5)	50 (62.5)	15 (18.8)	13 (16.3)
Safe Sex					
Scenario 9	65 (81.3)	71 (88.8)	69 (86.3)	45 (56.3)	15 (18.8)
Scenario 10	47 (58.8)	70 (87.5)	15 (18.8)	32 (40)	62 (77.5)
Scenario 11	7 (8.8)	22 (27.5)	32 (40)	5 (6.3)	8 (10)
Scenario 12	25 (31.3)	70 (87.5)	18 (22.5)	13 (16.30)	18 (22.5)
Smoking					
Scenario 13	31 (38.8)	54 (67.5)	51 (63.8)	27 (33.8)	5 (6.3)
Scenario 14	47 (58.8)	63 (78.8)	50 (62.5)	24 (30)	7 (8.8)
Scenario 15	70 (87.5)	79 (98.8)	65 (81.3)	62 (77.5)	25 (31.3)
Scenario 16	56 (70)	53 (66.3)	54 (67.5)	36 (45)	32 (40)
Drinking					
Scenario 17	60 (75)	79 (98.8)	60 (75)	62 (77.5)	32 (40)
Scenario 18	69 (86.3)	79 (98.8)	67 (83.8)	62 (77.5)	65 (81.3)
Scenario 19	36 (45)	71 (88.8)	54 (67.5)	45 (56.3)	54 (67.5)
Scenario 20	66 (82.5)	71 (88.8)	68 (85)	53 (66.3)	66 (82.5)

Note. Participants were asked to either agree or disagree with each criteria. % indicates the number of participants that agreed with that criteria.

VITA

Norma “Patti” Fernandez earned her Bachelor of Science degree in Education from Martin Luther College in 1997. She worked for Publications for Latin America as the Editor-Translator in chief of Spanish materials, coordinating various translators. In 2006, she obtained her Master of Arts degree in Applied Experimental Psychology at the University of Texas at El Paso and her Master in Public Health from the University of Texas Health Science Center at Houston, School of Public Health in 2008.

Patti is an Alliance for Graduate Education and the Professoriate scholar. She was supervised by Dr. Osvaldo F. Morera during her doctoral studies. Patti has obtained grant funding from the Hispanic and Health Disparities Research Center and the National Science Foundation (“East Asia Summer Institutes for US Graduate Students”). These grants accorded her with the educational opportunity of fulfilling and conducting the duties of principal investigator for the first time, while supervised by accomplished scientists.

While pursuing her graduate degrees, Patti worked as a research assistant for the departments of Psychology, Public Health, Education, and Nursing. In addition, she was afforded the opportunity to teach and mentor students as an instructor as well as the Judgment and Decision Making laboratory manager for several semesters. She interned at the World Health Organization in Geneva, Switzerland in 2006 with the Tobacco Free Initiative program and at the National Chung Cheng University in Chia-Yi, Taiwan in 2007.

Patti wants to continue pursuing research related to the development of prevention and intervention health programs that help reduce health disparities among minorities with an additional focus on research related to the study of how people make decisions regarding health issues. Additionally, she wants to continue pursuing her passion for teaching and mentoring students.

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