

THE RELATIONSHIP BETWEEN LIFE SATISFACTION AND SELF-BENEFICIAL
BEHAVIORS

by

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Life Satisfaction and Self-Beneficial Behaviors

Life satisfaction is important. Many governments are deeply involved in trying to promote the life satisfaction of their citizens. They are presumably doing so because they believe that happy people make more productive, responsible citizens. People who are satisfied with their lives are seemingly more likely to control and regulate their own behaviors in self-beneficial rather than self-detrimental ways. They are presumably more likely to work hard, make better decisions, resist temptations, and delay gratification. It is in any government's best interest, then, to take steps intended to increase life satisfaction and self-beneficial behaviors, which are presumed to go hand-in-hand. The present research examines whether these assumptions are correct. What is the empirical relationship between life satisfaction and self-beneficial behaviors? Does increasing one tend to increase the other? These basic questions are explored in three experiments.

Life Satisfaction

Subjective Well-Being (SWB) has been defined as a person's subjective evaluation of his or her life (Deiner, 1984) and these evaluations can occur on many levels. First, individuals can evaluate their life based on affective reactions – most often current mood or retrospective reports of emotion. Second, evaluations of life can occur through a cognitive or thinking component. The cognitive component of happiness or well-being is generally referred to as “life satisfaction.” Life satisfaction, which is the focus of the current experiment, is an overall judgment about one's life based on subjectively determined standards or a global judgment made about one's life that can encompass all aspects of one's life (i.e., family, friends, and work). Individuals evaluate how well they are doing in life and the domains that are important to them

when making life satisfaction judgments. An examination of the conditions of one's life can be based on the weight and importance of these life conditions.

Importance of Life Satisfaction

Because life satisfaction plays a substantial part in overall well-being, the importance of life satisfaction is an essential area of experiment. Being satisfied with one's life can have many benefits beyond a sunny outlook on life. A review by Lyubomirsky, King, and Diener (2005) found that individuals who are happy are successful in many domains of life. Most of the work reviewed in the article focuses on the happy-success link in that not only does success make people happy, but being happy leads to success. Based on experimental evidence, some of the findings reveal that people who are happy are better able to resolve conflicts, and are more creative and flexible in their thinking.

Past research focusing on the benefits of happiness has also shown that satisfaction with one's life can lead to increases in health. People who are satisfied with life, people who are happy, tend to experience better mental and physical health. For example, Siahpush, Spittal, & Singh (2008) examined the effects of happiness and life satisfaction on self-reported health, the absence of long-term conditions limiting health, and physical health over a three year period. Participants who were satisfied with their life and happy most or all of the time during baseline readings, were twice as likely to report very good or excellent health at a two year follow-up. Similarly, people who are happy are less susceptible to catching the common cold (Cohen, Doyle, Turner, Alper, & Skoner, 2003). Essentially, subjective satisfaction can benefit not only physical health, but mental health as well.

Additionally, suppressing the expression of emotion can ultimately lead to adverse effects on the physical body and expressing positive emotions can mute the effects of negative emotions

on the body (Fredrickson & Levenson, 1998). In turn, expressing positive emotions may lend itself to a longer life span for individuals. Previous research has also examined how positivity or positive emotions can influence longevity. Danner, Snowdon, & Friesen (2001) examined the autobiographies of 180 nuns in their early twenties, written prior to their vows. Nuns whose autobiographies consisted of more positive emotion words and/or sentences showed a decrease in mortality rate more than 60 years later. Generally speaking, nuns who were more positive about their life at a young age were more likely to live longer than those who were less positive about their life.

In addition, increased life satisfaction has been shown to increase altruistic behaviors, or more specifically hours spent volunteering. Thoits and Hewitt (2001) postulated that personal well-being would increase volunteer work. Life satisfaction, happiness, and the number of hours spent volunteering were measured at two time points six months apart. As expected, happiness and life satisfaction at Time 1 prospectively predicted volunteering hours six months later while controlling for happiness at Time 2. Furthermore, individuals who experienced an increase in mood after finding a dime (Cunningham, Steinberg, & Grev, 1980) or receiving a cookie (Isen & Levin, 1972) were more apt to help the experimenter at a later date or donate to charity.

With respect to sociability, good social relationships are another consequence of being satisfied with one's life. One social psychologist suggested that the most important factor in the survival of homo sapiens is their ability to love and work together (Berscheid, 2003, p. 39). Individuals who are happy and satisfied generally report having better relationships with their friends, family, and romantic partners. Older women who participated in friendship enrichment programs not only reported improvement in the quantity and quality of their friendships, but also an improvement in their overall well-being (Martina & Stevens, 2006). Young adults who have

harmonious relationships with same sex friends also report greater overall well-being (Sherman, Lansford, & Volling, 2006).

Work satisfaction and job performance are also influenced by levels of life satisfaction. Jones (2006) examined the relationship between life satisfaction and performance on the job, testing whether life satisfaction had a stronger relationship to job performance than job satisfaction. Students enrolled in an MBA program while working full time completed measures of job satisfaction and life satisfaction, while their supervisors indicated the degree to which their employees met the standards and requirements of organizational citizenship behavior. A substantial relationship between life satisfaction and organizational citizenship behaviors (OCB) and role performance was found, suggesting that high life satisfaction can lead to helping other co-workers when it is not required and completing all tasks required and reaching goals. Life satisfaction also significantly contributed to the prediction of OCB controlling for the contributions of job satisfaction or organization commitment. Additionally, people who were satisfied with their lives were more satisfied with their jobs five years later (Judge & Watanabe, 1993).

Increasing life satisfaction can also provide substantial benefits to individuals with profound multiple disorders (PMD's). Several multiple disability students were presented with different stimuli, such as types of songs, vibrating pillows, hairdryers (i.e., stimulation and microswitch-based programs). The researchers measured how often the student smiled, laughed, or had excited vocalizations also known as indices of happiness (Lancioni et al., 2006). Presenting the students with different stimuli increased the participants' happiness. Increasing an individual's indices of happiness (i.e., smiling, laughing) through contact with preferred stimuli might also increase or ensure a greater quality of life (Dillon & Carr, 2007).

Continuing to increase life satisfaction or maintain high levels of life satisfaction has significant influences on many major areas of life. Discovering the methods to help those who are low in life satisfaction so that they might increase their overall well-being could ultimately lead to better performance at work, better health, and/or better relationships, which in turn might continue to increase life satisfaction over time.

Measuring Life Satisfaction

How does an individual assess his or her satisfaction with life? Because subjective well-being by definition is subjective, the most desirable measure to gather information on a subjective experience is self-report. Rather than depending on objective reports given by others, self-reports emphasize an individual's subjective experience. Global evaluations, or life satisfaction judgments, often ask about a person's life or large periods of time such as an individual's job or marriage (Diener, Napa Scollon, Oishi, Dzokoto, & Suh, 2000).

One measure consistently employed to determine life satisfaction is the Satisfaction with Life Scale (SWLS, Diener, Emmons, Larsen, & Griffin, 1985). The SWLS is a 5-item scale used to assess an individual's overall perception of his or her life, while other measures such as the Subjective Happiness Scale (Lyubomirsky & Lepper, 1999) or the General Well-Being Scale (Campbell et al., 1976) measure more general, subjective happiness. The first three items of the SWLS focus on present satisfaction, while the last two items assess life satisfaction up to the present. As with any scale, researchers have examined the reliability and validity of the SWLS as well as how the reliability holds up across different cultures (Bayani, Koocheky, & Goodarzi, 2007) and age groups (Neto, 1993). For instance, participants completed the SWLS two times 13 months apart and found a reliability correlation of 0.40 (Steger and Kashdan, 2007). In a different experiment, participant's reports of life satisfaction at two time points two weeks apart

had a reliability of 0.84 (Pavot, Diener, Colvin, and Sandvik, 1991). Thus the SWLS appears to be relatively stable over short periods of time (two weeks to two months), but only moderately reliable for longer spans of time. However, the use of the Satisfaction with Life Scale is still a good indicator of overall life satisfaction.

Several different types of self-report measures have been employed to gauge life satisfaction over the years. One measure frequently used is the single-item question. For example, respondents could be asked to evaluate “How satisfied are you with your life as a whole?” or “How do you feel about your life as a whole?” on a scale ranging from “Delighted” to “Terrible” (Andrews & Withey, 1976). Reliabilities for single-item measures are moderate (Andrews & Withey, 1976; Palmer & Kivett, 1977) and construct validity with other scales is also moderate (Larsen, Emmons, & Diener, 1983). Single-item measures tend to be skewed on the more positive side and one item can not cover all aspects of well-being because people have many facets to their lives and a single item cannot capture a true overall picture of an individual’s life.

Other measures use multiple items to estimate a person’s life satisfaction. For instance, the Subjective Happiness Scale (SHS) is a 4-item measure of global subjective happiness). Two items ask respondents to characterize themselves using absolute ratings and ratings relative to their peers, while the other two questions offer brief descriptions of happy and unhappy people and ask the participant the extent to which each description characterizes them. Studies that have employed the SHS have found test-retest reliabilities between 0.55 and 0.90 and convergent validity estimates between 0.57 and 0.72. By using more than one item to measure life satisfaction, researchers can tap into several areas of an individual’s life and gain a greater overall picture.

Life satisfaction judgments can also be made based on broad categories, domains of life, or information that seems relevant at the time of judgment. Essentially, when individuals evaluate their life satisfaction, they use different sources of information. The accessibility of the sources of information can vary and these sources can have different meaning for the stability and variability of life satisfaction judgments (Schimmack, Diener, & Oishi, 2002). Some individuals use temporarily accessible information, such as current mood, that is salient for one evaluation, but not for other evaluations. The use of mood, or temporarily accessible information, only occurs when the information is relevant. If it becomes clear that an individual's mood is not a relevant piece of information to make a life satisfaction judgment, he or she will find other information to use. Relying on mood one minute and some other piece of information the next minute can produce variability in life satisfaction judgments.

Individuals can also use chronically accessible information that can provide either variable or stable information. In terms of variable information, some people chronically use their mood when evaluating their overall life. Life satisfaction judgments can be different each time people are asked how satisfied they are overall because mood can change from one time to the next (Schwarz, Strack, Kommer, & Wagner, 1987). For example, the type of day an individual is experiencing can influence mood and subsequently overall well-being (Schwarz & Clore, 1983). Stable information that is chronically accessible can consist of satisfaction with specific domains of one's life (i.e., romantic relationship, academics). Consequently, it is the domains that are closest and most immediate to a person's life that may influence well-being the most (Andrews & Withey, 1976). For instance, the domain of academics would be one of the more important domains that would be considered for a college student evaluating their life

satisfaction. Using chronically accessible stable information could be one explanation why life satisfaction evaluations remain stable over time.

Stability of Life Satisfaction

When making life satisfaction judgments, individuals tend to rely on sources that are relevant, important, and representative of the important aspects of their life. Because of the heavy reliance on relevant information, people use chronically accessible information when making life satisfaction judgments, which in turn keeps life satisfaction judgments stable. For instance, substantial stability has been found for life satisfaction judgments over the course of several weeks (Eid and Diener, 2004). Participants completed several measures including current mood, personality measures, and life satisfaction measures on three different occasions four weeks apart. Findings from the experiment revealed that the variability in life satisfaction ratings and personality judgments was relatively small, suggesting that life satisfaction does remain stable over time.

Research on life satisfaction stability is also based on the idea that most of the variance in life satisfaction comes from stable individual differences such as personality traits. The majority of studies on life satisfaction and stability have focused on the genetics of personality traits (Lykken & Tellegen, 1996). Individuals from the Minnesota Twin Registry self-rated several items on a questionnaire including how happy and content they were at two time points 10 years apart. After correlating the twins' scores at Time 1 and Time 2, the stable component of happiness (trait happiness) was determined genetically (for MZ twins only). These results are similar to those of Tellegen et al (1988) who found 39 – 58% of the variance of well-being was due to genetics.

Work on the stability of life satisfaction has been based on the idea that an individual's happiness is heritable and therefore unlikely to change. Yet there are those who say that life events can influence life satisfaction levels and therefore change levels of life satisfaction. These are the two contrasting ideas that are examined within research on the set-point hypothesis of life satisfaction.

The Set-Point Hypothesis

The first idea behind the life satisfaction set-point is that individuals have a stable baseline of life satisfaction and there are homeostatic forces such as inborn temperaments or a hedonic treadmill, which brings the set-point back to its original baseline after life events or changing circumstances move or change it (Fujita & Diener, 2005). There are several concepts behind the idea of a life satisfaction set-point. One concept is based on heritability. From a theoretical perspective, the set-point makes predictions about the relation of temperament and environment, or events, that influence life satisfaction. Research on understanding subjective well-being has focused on the ideas that life satisfaction has a set-point and that life satisfaction will return to this baseline after certain events move the baseline. As stated above, long-term levels of life satisfaction can be genetically determined or based on genetic dispositions (Lykken & Tellegen, 1988).

Another concept behind the life satisfaction set-point pertains to adaptation. Individuals are able to return to their original baseline of life satisfaction because they can learn to adapt. Essentially individuals will eventually habituate to changing experiences throughout their lives. The ability to adapt stems from the idea that individuals have what is termed a "hedonic treadmill" (Brickman & Campbell, 1971). The idea behind the "hedonic treadmill" is that people

will react to changing events, but then return to their original baseline because of their inborn temperaments.

The intensity of an event can wear off and people can learn to habituate to their circumstances after events occur, whether good or bad. For instance, individuals' who had won the lottery and others who had suffered a debilitating accident were interviewed face-to-face or over the phone (Brickman, Coates, & Janoff-Bulman, 1978). Based on past findings, individuals who won the lottery should, after a period of time, find that their new wealth no longer contributes to their overall happiness. In contrast, accident victims should start contrasting everyday events to their ill fortune and find that the accident no longer contributes to their unhappiness. Brickman et al. (1978) discovered that after time had passed, lottery winners were not any happier than a control condition and accident victims were not any less happy compared to people from a control group.

As mentioned above, the stability in life satisfaction is primarily due to heritability (Lykken & Tellegen, 1996). Personality traits such as extraversion and neuroticism are heritable and very stable and can contribute to stable levels of life satisfaction (Costa & McCrae, 1980). Similarly, after examining data on personality, life satisfaction, and life events from four waves of an Australian panel experiment, stable personality characteristics largely accounted for the stability in life satisfaction and that personality characteristics influence life events, which in turn influence life satisfaction (Heady & Wearing, 1989).

Even though research has suggested that life satisfaction is stable, the idea of the life satisfaction set-point has not been extensively examined. The focus of most research on life satisfaction stability has been on people over small or short periods of time. Most of the studies from the past have not taken into account factors that could influence a person's average level of

life satisfaction. An additional problem with life satisfaction set-point research is that the population that is used consists primarily of college students, not necessarily a representative sample of the entire population.

Fujita and Deiner (2005) tested the stability of a life satisfaction set-point by examining a nationally representative sample of individuals from the German Socio-Economic Panel (GSOEP) for a period of 17 years. They predicted there would be substantial stability in life satisfaction despite momentary influences, but that some people would show significant changes in life satisfaction beyond single occasions of measurement. Several questions of interest included the stability of life satisfaction, whether stability was greater for satisfied versus dissatisfied individuals, and how life satisfaction stability matches up to the stability of other physiological and financial variables (height, weight, income, etc.). Results revealed that 24% of their respondents experienced a significant change from baseline. Also, those who had greater change in life satisfaction were less satisfied with their life. The stability of life satisfaction was also lower than the stability of the physical indicators such as height and weight. From these results, it was suggested that individuals possess a “soft baseline” for life satisfaction. People will fluctuate around a stable set-point, but one that can move for some people.

A more recent experiment examined whether individuals return to some baseline level of life satisfaction after life and labor market events occur (Clark, Diener, Georgellis, & Lucas, 2008). The authors’ focus was on anticipation of an event as well as adaptation to an event. Essentially, the objective was to measure the movement of an individual’s life satisfaction before, during, and after an event (i.e., unemployment, birth of a child, marriage, divorce, widowhood, and layoff) over a 20 year span. Using data from the GSOEP, the researchers found full adaptation to all events except unemployment. Individuals, both men and women, returned

to baseline levels of life satisfaction after the birth of a child, marriage, divorce, widowhood, and being laid off, but neither men nor women fully returned to their baseline life satisfaction after being unemployed. Similarly, those who experienced a change in marital or employment status did show an increase or decrease in baseline levels of life satisfaction relative to those whose status did not change (Costa, McCrae, & Zonderman, 1987).

A second idea behind the life satisfaction set-point is that life satisfaction can change over time. Although there is substantial evidence for the stability and heritability of life satisfaction, there is also some indication that life satisfaction can be influenced by events and occurrences in an individual's environment. There are some who suggest that what we do and how we think on a daily basis can alter one's happiness (Lyubomirsky, Sheldon, & Schkade, 2005). The pursuit of happiness can lead to change not only through life events, but also through intentional actions or the activities one chooses to engage in daily.

Even though there is strong evidence that stable levels of life satisfaction are due to genetic factors, events could make a difference in the long run. For example, there are nation-level differences in life satisfaction and also long-term mean shifts in life satisfaction when living conditions change (Inglehart & Klingemann, 2000). There is also evidence that certain big events can change a person's level of life satisfaction (Lucas, Clark, Georgellis, & Diener, 2003, 2004; Clark, Diener, Georgellis, & Lucas, 2008).

What are these events that could change a person's set-point? Long-term levels of life satisfaction can be altered after an experience of unemployment (Lucas et al., 2004; Lucas, 2005). Lucas and his colleagues (2004), using information from the GSOEP, found that individuals who experienced unemployment at some point during the span of the experiment were less satisfied than they had been before the bout of unemployment. The experience of

unemployment moved people at least half a point below their original baseline of life satisfaction, meaning that the experience of unemployment seemed to create a new baseline level of life satisfaction and ultimately a lasting effect on life satisfaction. A similar pattern was found for people who had lost their spouse (Lucas et al., 2003). Studies have also shown increases in individual set-points. People who have received cosmetic surgery have shown increased satisfaction with results of the surgery over time as well as improvements in psychological health (Fredrickson & Loewenstein, 1999).

What the studies above show are changes in life satisfaction after rather traumatic or very serious circumstances. A more recent experiment on the life satisfaction set-point focused not on traumatic events, but everyday goals of individuals (Heady, 2008). There is the idea that life goals can influence life satisfaction. For instance, certain life goals such as commitment to family and friends can promote life satisfaction while other goals such as getting ahead at work and gaining material goods can be detrimental.

Based on these distinctions and data from the GSOEP, high levels of life satisfaction were strongly associated with giving high priority to family goals and altruistic goals, while success goals, such as getting ahead at work, seemed to have a detrimental effect. Additionally, domain satisfaction with children and partners was higher than domain satisfaction with finances and salary.

With life satisfaction levels remaining relatively stable over time except after relatively rare events (i.e., unemployment or widowhood), perhaps life satisfaction is just a stable cognitive reaction that cannot be permanently moved. However, there is also evidence to the contrary, that life satisfaction can change over time. The idea for the proposed research is to increase a person's life satisfaction and ultimately move the person's baseline for life satisfaction. In order

to change a person's life satisfaction, it may be that we need to take a different perspective on life satisfaction and view life satisfaction as an attitude towards one's own life.

An Attitude Process Perspective

Attitude Representation Theory (ART; Lord & Lepper, 1999) has examined the stability of attitudes as well as attitude-behavior consistency. According to the ART model, when individuals make an evaluative response to a target or situation, they take into account the perceived situation as well as the representation of the attitude object itself to make an overall evaluation. People examine the characteristics of the target or situation, as well as previous actions taken and emotions felt towards the target or situation when making judgments.

People also think about specific exemplars (examples) of a particular situation or target when responding. Previous studies have shown that people use category exemplars to assess their social category attitudes. One series of three studies used process measures of concept activation such as ambiguous anagrams, word fragment completions and response latencies to provide evidence that people use exemplars when assessing social category attitudes (Sia, Lord, Blessum, Thomas, & Lepper, 1999). In all three studies, social category exemplars were more likely to be activated when assessing attitudes toward a social category than when defining the category. For example, individuals who provided their attitudes for a social category and then worked on an anagram puzzle completed the anagrams with exemplars for the particular social category more than those who simply gave a definition of the category.

Other attitude research has examined attitude change through the use of exemplars. For example, several studies have focused on the stability of exemplars and their effect on attitude change. In most of the work on attitude stability and attitude-behavior consistency, researchers have focused on the idea of matching vs. mismatching exemplars and the stability of recalling

the same exemplar each time participants rate their attitudes towards a specific attitude object (i.e., gay men or politicians). Lord, Lepper and Mackie (1984) tested the idea that a person's attitude and behavior toward a social group would be more consistent if a group member's characteristics match well with the person's attitude prototype. Results from two experiments found that an individual's behavior toward a target was more consistent with the person's attitudes when confronted with a target whose attributes matched those of the individual's prototype 100% than a target who matched the individual's prototype 50%.

Attitude research has also focused on changes in social category exemplars and their impact on attitude change (Sia, Lord, Blessum, Ratcliff, & Lepper, 1997). Participants were initially asked to provide their attitudes and list exemplars for several categories, including politicians (Experiment 3). Two weeks later, each participant provided liking ratings for famous people, including some politicians. From these liking ratings, the experimenters identified one politician that each student liked more and one they liked less than the politician they had originally listed. In the final session, participants completed two tasks. The first task was to estimate the height of ten famous target persons where the tenth one was the politician they had named in the first session and had rated as more likable or the one that they had rated less likable. The second task had the participants reporting their attitudes toward the same categories as in the initial session. Students who were reminded of the same exemplar they had previously named retained their earlier attitudes, whereas those who were reminded of a different exemplar from the initial attitude questionnaire changed their attitudes in the predicted direction.

Another experiment tested whether activating different exemplars would increase susceptibility to counter-attitudinal messages (Lord, Paulson, Sia, Thomas, & Lepper 2004; Experiment 2). After indicating their attitudes towards several groups and listing exemplars for

those groups, over a three week period researchers manipulated participants' exemplar accessibility. Participants had to guess the height, weight, and age of 12 famous people. At the end of each list, 1/3 of participants saw the same exemplar, 1/3 saw a different exemplar, and 1/3 saw no exemplar. Finally, participants read a counter-attitudinal message and reported their attitudes towards the same social groups as in the beginning. Individuals who had been primed with different exemplars changed their attitudes more in the direction of the essays than those in the other two groups.

The idea of exemplars could be similar to using life events when evaluating life satisfaction. People could use information about their satisfaction with specific life events to give an overall evaluation of their life or life satisfaction. In the case of attitudes research, life events could be used as examples or exemplars for a person's life.

If life satisfaction is viewed as an attitude towards one's life and exemplars can be used to change attitudes, could the same be true if specific life events and domains were primed? Suppose a person recalls several positive or negative life events. Could priming positive life events temporarily increase or decrease a person's life satisfaction? Conversely, could priming less positive life events decrease a person's life satisfaction? And in turn, could increasing or decreasing a person's life satisfaction lead to increases or decreases in self-beneficial behaviors?

Consequences of Life Satisfaction

Indicators of General Well-Being

Increasing life satisfaction or a primary focus on well-being is not a new concept. For years researchers have studied and written about the importance of focusing on increasing the general well-being of citizens through public policy (Dolan & White, 2007). For instance, most public policy is based on objective indicators of well-being, such as poverty rates and violent

crimes. Objective or social indicators of well-being are essentially societal measures reflecting people's objective circumstances (Diener & Seligman, 2004). Some of the other frequently sampled societal indicators include longevity, morbidity, and education (Diener & Suh, 1997). These indicators, however, do not paint a total picture. There are weaknesses to relying only on objective indicators when trying to improve an individual's quality of life.

Because social or objective indicators do not provide a complete or adequate picture of well-being, measuring subjective indicators of well-being such as people's judgments about their own states and life satisfaction are also important. How a person assesses these subjective indicators like life satisfaction can include such things as comparison standards, salient information, and life domains. For example, people's life satisfaction judgments were higher when a person in a wheelchair was in their line of sight. The higher reports of life satisfaction occurred because the participants compared themselves to the person with a disability (Schwarz and Strack, 1999).

Using salient information at the time of the judgment can also influence well-being. For most people, it can be difficult to remember and examine all aspects of one's life; therefore, individuals may use short cuts or heuristics to make overall judgments. For example, the weather at the time of an evaluation can influence a person's judgment (Schwarz and Clore, 1983). People who were asked about their mood and life satisfaction on sunny days reported higher life satisfaction and mood than people who were asked about their satisfaction on rainy days. This experiment suggests that current mood can be an influencing factor in life satisfaction judgments.

A person could also focus on specific aspects of his or her life when making judgments about life satisfaction, such as specific life domains (i.e., academics, romantic relationships). In

several studies, Schwarz and colleagues (1991, 1999) found that when specific domains are primed, that domain information will be assimilated into an overall life satisfaction judgment. For instance, if you ask a question about dating satisfaction and then ask about general life satisfaction, people will use the previous information about their dating life as an exemplar to answer the general satisfaction question.

To truly understand a person, directly measuring life satisfaction through life domains and affect is important. If life satisfaction is an important concept to increasing the quality of a person's life, then discovering how to increase life satisfaction should be something all researchers strive to accomplish. But simply increasing life satisfaction may not be enough. Increasing self-beneficial behaviors because of increasing life satisfaction is an even more important goal.

Self-Beneficial Behaviors

Temporarily changing a person's life satisfaction could affect more than self-reports of satisfaction. Changes in life satisfaction might lead to increases or decreases in self-beneficial behavior, in particular self-control behavior. Research on the benefits of frequent positive affect has shown that increases in positive affect can lead to specific beneficial behaviors such as altruism and sociability. For instance, happiness and life satisfaction can prospectively predict volunteering hours six months later (Thoits & Hewitt, 2001). Similarly, a positive mood can induce participants to engage in more overt social interactions and more intimate self-disclosures than individuals induced to experience a negative mood (Cunningham, 1988). Research on self-regulation and ego depletion has even found that a positive mood can counter the effects of ego depletion (Tice, Baumeister, Shmueli, & Muraven, 2006).

Self-control is another behavior that has been studied with relation to mood and is viewed as a self-beneficial behavior. Self-control is the exertion of control over the self by the self and occurs when the person tries to change his or her thinking or behavior (Muraven & Baumeister, 2000). Over the course of six studies, Fishbach and Labroo (2007) tested whether people in a happy mood versus an unhappy mood that adopt a more accessible goal, such as a self-improvement goal, would perform better on a self-control task. Results revealed that happy people with accessible self-improvement goals were more likely to donate money to charity, squeeze a handgrip device longer, and perform better on a challenging test. Other research has examined self-control in relation to stamina and depletion of resources (Muraven, Tice, & Baumeister, 1998), impulse control (Baumeister, Bratslavsky, Muraven, & Tice, 1998), logical reasoning and information processing (Schmeicherl, Vohs, & Baumeister, 2003), interracial interactions (Richeson & Shelton, 2003), the threat of death (Gailliot, Schmeichel, & Baumeister, 2006), and self-presentation and self-regulation (Vohs, Baumeister, & Ciaracco, 2005).

Self-control can also be depleted by prior exertion. Once an individual has exerted any energy towards one self-control task, self-control for another task will have been diminished. For example, suppressing forbidden thoughts can impair a subsequent self-control task such as solving anagram puzzles (Muraven, Tice, and Baumeister, 1998, Experiment 2). Participants began the experiment by listing all of their thoughts on a sheet of paper while either thinking about a white bear or expressing their thoughts, not thinking about a white bear or suppressing their thoughts, or participants were given no thought control instructions. As a “second” experiment, participants solved as many anagrams as possible in 20 minutes. Individuals who tried to suppress thoughts of a white bear spent less time working on the anagrams than

individuals who were told to think about the white bear. Exerting self-control on one task impairs self-control on a second task.

A similar experiment by investigated whether exerting impulse control would influence time spent on unsolvable puzzles (Baumeister, Bratslavsky, Muraven, and Tice, 1998, Experiment 1). In front of the participants were a plate of chocolate chip cookies and a plate of radishes. Participants were instructed to eat either the cookies or to eat several radishes while the smell of the cookies wafted around the room. Each student was then given a cognitive task of tracing the lines of a geometric puzzle without lifting the pencil from the paper and not tracing the same line twice. The main measure was how long the participant persisted at the unsolvable puzzle. Individuals in the radish condition quit the puzzle task sooner than the individuals in the cookie or control condition. Exerting impulse control through ignoring the cookies and eating the radishes depleted the participants' resources to complete another challenging task that required self-control.

Though depleting an individual's resources can impair a later self-control task, the impairment could be specific to the task being performed. Some tasks require simple and straightforward processing while others require more elaborate and complex processing. Initially exerting self-control could impair performance on a complex processing task, but not necessarily on a simple cognitive task. One relevant experiment had some participants suppress all emotional responses to a film while other participants reacted naturally to the film, followed by completion of the GMAT, a simple processing task, and the CET, a complex processing task (Schmeichel, Vohs, & Baumeister, 2003, Experiment 2). Participants who suppressed their emotions had fewer correct answers and worse scores on the CET than those who expressed their

emotions. In addition, no difference in performance on the GMAT was found between the groups.

Racial bias can lead to impairment of executive functioning. Richeson and Shelton (2003) assessed how prior racial attitudes and interactions with interracial groups can attenuate executive functioning, specifically whether interracial interactions would affect cognitive functioning. Early in the experiment, members of a dominant racial group (i.e., caucasians) indicated their attitudes towards several groups, including African Americans. During a second session, participants initially completed the Implicit Association Test (IAT) assessing automatic racial prejudice. Following the IAT, participants interacted with a second experimenter who was either black or white. The dependent measure consisted of a color-naming Stroop task. Engaging in the interracial interaction task impaired performance on a Stroop task, especially for high-prejudice people.

Suppressing thoughts about death can require a fair amount of self-control. Because of the self-control involved in solving anagrams, it was believed that trying to suppress thoughts of death would decrease the number of anagrams an individual would complete (Gailliot, Schmeichel, and Baumeister, 2006, Experiment 8). Participants started by completing as many anagrams as possible in five minutes, followed by answering questions regarding either dental pain or death. The final measure was another five minutes to complete as many anagrams as possible. As predicted, when participants' mortality was made salient, they solved fewer anagrams revealing that thinking about death depletes self-control strength.

Depleting self-control strength could also arise from the way people present themselves. Self-presentation varies as a function of how well acquainted an individual is with an audience. When interacting with a stranger, the motto is to put your best foot forward. With friends,

however, a modest approach is the safest route because they may know your personal history. In one experiment, participants presented themselves in a modest way or a favorable way to either a stranger or a friend. Presenting yourself in a contrary way to a strange audience could decrease performance on a self-control task, particularly a 3-digit by 3-digit multiplication task that has been shown to be quite tedious. Modest participants who interacted with a stranger rather than a friend spent less time on the multiplication task, whereas favorable participants who interacted with a friend rather than a stranger spent less time on the same multiplication task (Vohs, Baumeister, & Ciaracco, 2005, Experiment 1).

In terms of life satisfaction and self-beneficial behaviors, the research is rather limited. A large body of research has examined the effects of specific activities on increased life satisfaction. For instance, exercise could influence indices of emotional well-being (Mueller, Dennis, & Gorrow, 2006). Students enrolled in different health courses (i.e., lecture only or health and fitness) completed a measure of self-concept during the first and last week of the class. Scores for self-concept were obtained by using scores on seven sub-scales (i.e., global self-worth, appearance, romantic relationships, social acceptance, close friends, athletic competence, and intellectual ability). By participating in exercise during a health course, students had higher scores on global self-worth and romantic relationships, suggesting that exercise can increase students' well-being in several areas.

In a similar vein of research, Cheung (2000) explored how experimenting can also be a source of life satisfaction among college students. Researchers gathered information on such constructs as life satisfaction, experimenting (i.e., critical thinking, theorizing effort, & learning strategies), experiment time, and academic achievement over the course of a semester. Consequently, critical thinking and theorizing contributed to the students' life satisfaction.

There has also been research on the implications of drug use and abuse on life satisfaction. For example, college students who abstain from drinking report better life satisfaction than those students who experience alcohol related problems (Murphy, McDevitt-Murphy, & Barnett, 2008). Continued use of tobacco and other drugs such as marijuana, cocaine, and steroids is associated with lower life satisfaction (Georgiades & Boyle, 2007; Zullig, Valois, Huebner, Oeltmann, & Drane, 2001). Very little research however, exists on the idea that high (low) life satisfaction would lead to an increase (decrease) in self-beneficial behaviors, particularly self-control behaviors.

Experiment 1: Life Satisfaction and Self-Beneficial Behaviors

The central hypothesis of the three experiments was that life satisfaction and self-beneficial behaviors are intimately related. People who are satisfied with their lives tend to behave in self-beneficial ways, and people who behave in self-beneficial ways tend to be satisfied with their lives. Temporary increases in self-satisfaction, then, might result in temporary increases in self-beneficial behaviors, and temporary increases in self-beneficial behaviors might result in temporary increases in life satisfaction. Similarly, temporary decreases in life satisfaction might result in temporary increases in self-detrimental behavior, and temporary increases in self-detrimental behavior might result in temporary decreases in life satisfaction.

The goal of Experiment 1 was to develop a new measure of "self-beneficial behaviors" that would be correlated with at least one standard measure of life satisfaction. The new measure of "self-beneficial behaviors" was adapted from previous research by Vohs et al. (2006). Briefly, the new measure involved telling participants that doing multiplication problems would help them score well on a very important future test of executive ability, giving them time to do one set of tedious multiplication problems, interrupting them, and then giving them a chance to do a

second set of tedious multiplication problems. The second set of multiplication problems, unlike the first, had several fun paper-and-pencil puzzles interspersed among the multiplication problems. Set 1 established a baseline of how many multiplication problems participants could do in 15 minutes when they had no temptations to waste time with fun puzzles. Increases in number of multiplication problems from set 1 to set 2 were thought to assess self-beneficial behavior, and decreases in number of multiplication problems from set 1 to set 2 were thought to assess self-detrimental behavior. If participants believed that the multiplication problems would help them do well on an important future test, then doing even more of the multiplication problems in the second set (presumably by resisting the temptation to do the fun puzzles instead) would be self-beneficial. Conversely, doing fewer of the multiplication problems in the second set (presumably succumbing to the temptation to do the fun puzzles instead) would be self-detrimental.

In the first session of Experiment 1, participants completed three standard scales of life satisfaction, four standard scales of self-control, two standard scales of procrastination, an impulsivity scale, a persistence scale, and a delay of gratification scale. In the second session, two days later in an unrelated context, the same participants completed both sets of multiplication problems that were intended to measure self-beneficial versus self-detrimental behavior. The experimental hypotheses were that Diener et al.'s (1985) 5-item Satisfaction with Life Scale would significantly predict scores on the new multiplication problems measure of self-beneficial versus self-detrimental behaviors, and that none of the other scales (developed to measure related constructs) would add significantly to the variance explained by the 5-item Satisfaction with Life scale.

Method

Participants

A total of 106 undergraduates participated in the first session of Experiment 1. Ten students failed to return session two, leaving 96 (35 males, 61 females) in the first sample. Gender had no effects on any of the results to be reported in any of the three experiments.

Procedure

Experiment 1 was run in two sessions (presented as two separate studies) over a two day period. In Session 1, participants completed several scales. In Session 2, the same participants completed the new multiplication problem test of self-beneficial behavior.

Session 1

Over the course of an hour, participants completed three scales intended to measure life satisfaction and happiness, three scales intended to measure tendencies toward impulsivity, four scales intended to measure self-control, a scale with three sub-scales intended to measure different spheres of control, and a locus of control scale.

Life Satisfaction Scales

The three scales that were intended to measure life satisfaction included Diener et al.'s (1985) Satisfaction with Life Scale, Lyubomirsky and Lepper's (1999) Subjective Happiness Scale, and Campbell et al.'s (1976) General Well-Being Scale.

Satisfaction with Life Scale. The Satisfaction with Life Scale (SWLS; Appendix A) is a 5-item scale used to assess an individual's overall perception of his/her life satisfaction. Participants indicated the extent to which they agreed with a list of five statements (e.g. "In most ways my life is close to ideal") using a 1 (*Disagree Strongly*) to 7 (*Agree Strongly*) scale.

Subjective Happiness Scale. The Subjective Happiness Scale (SHS; Appendix B) is a 4-item scale of global subjective happiness. Two questions asked respondents to characterize themselves with absolute ratings (e.g., “In general, I consider myself...”) using a 1 (not a very happy person) to 7 (a very happy person) scale. The other two questions ask respondents the extent to which the characterization represents them (e.g., “Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterization describe you?”) using a 1 (*not at all*) to 7 (*a great deal*) scale.

General Well-Being Scale. The General Well-being Scale (Appendix C) is a two part measure of self-reported well-being based on current experiences of life. The first part of the scale, index of general affect, consists of 8 semantic differential scales (e.g. Interesting vs. Boring) using a 1 to 7 scale. The second part of the scale has participants respond to a single item assessment of life satisfaction that asks, “How satisfied or dissatisfied are you with your life as a whole?” using a 1 (*Completely Dissatisfied*) to 7 (*Completely Satisfied*).

Impulsivity Scales

The three scales that were intended to measure impulsivity included Lay’s (1986) Procrastination Scale, Tuckman’s (1990) Procrastination Scale, and Grush’s (1986) Impulsivity Scale.

Lay’s Procrastination Scale. Lay’s Procrastination Scale (Appendix D) consisted of 20 items that people may use to describe themselves. For each of the statements (e.g. “I often find myself performing tasks that I had intended to do days before.”), participants were to decide if the statement was uncharacteristic or characteristic of themselves using a 1 (*Extremely Uncharacteristic*) to 5 (*Very Characteristic*) scale.

Tuckman's Procrastination Scale. The second Procrastination Scale (Appendix E) consisted of 16 items used to detect student's tendencies to procrastinate on academic requirements (e.g. "I am an incurable time waster."). Individuals indicated their agreement with each statement using a 1 (*That's me for sure*) to 4 (*That's not me for sure*) scale.

Impulsivity Scale. The Impulsivity Scale (Appendix F) is an 18-item scale used to tap various aspects of impulsivity as well as the tendency to respond quickly without thinking (e.g. "Do you do things on the spur of the moment?"). Each item had a 4 point response format with impulsive responding at one end point and reflective responding at the other end.

Self-Control Scales

The four scales that were intended to measure self-control included Tangrey et al.'s (2004) Self-Control Scale, Schwarzer et al.'s (1999) Self-Regulation Scale, Duckworth et al.'s (2007) Grit Scale, and Bembenutty et al.'s (1996) Academic Delay of Gratification Scale.

Self-Control Scale. The Self-Control Scale (Appendix G) consisted of 36 items that asked participants to indicate how much each of the statements reflects how they typically are. Students responded to each statement (e.g. I am good at resisting temptation.) using a 1 (*Not at all*) to 5 (*Very much*) scale.

Self-Regulation Scale. The Self-Regulation scale that was used (Appendix H) consisted of 10 items that reflect both attention-regulation and emotion-regulation. Participants indicated their agreement with each item (e.g. "I can concentrate on one activity for a long time, if necessary.") using a 1 (*Not at all true*) to 4 (*Exactly true*) scale.

Grit Scale. The Grit Scale (Appendix I) is a 12-item scale used to measure perseverance and passion for long-term goals. Individuals indicated their agreement with each statement (e.g.

“I often set a goal but later choose to pursue a different one.”) using a 1 (*Not at all like me*) to 5 (*Very much like me*) scale.

Academic Delay of Gratification Scale. The Academic Delay of Gratification Scale (Appendix J) is a 10-item scale used to measure a student’s willingness to postpone immediately available opportunities in favor of more temporally remote academic goals that are more valuable (e.g. “A. Miss several classes to accept an invitation for a very interesting trip. OR B. Delay going on the trip until the class is over.”). Students responded to each statement using a 1 (*Definitely choose A*) to 4 (*Definitely choose B*) scale where tendencies to choose B related to more willingness to postpone immediate available opportunities.

Spheres of Control Scales

The three scales that were intended to measure spheres of control included Personal Control, Interpersonal Control, and Sociopolitical Control (Paulhus, 1983).

Spheres of Control Scale. The Spheres of Control scale (Appendix K) is comprised of three 10-item scales that measure Personal Efficacy (e.g. “When I make plans I am almost certain to make them work.”), Interpersonal Control (e.g. “I have no trouble making and keeping friends.”), and Sociopolitical Control (e.g. “With enough effort we can wipe out political corruption.”). Individuals indicated the extent to which they agreed with all 30 statements using a 1 (*Disagree*) to 7 (*Agree*) scale.

Locus of Control

The Locus of Control Scale (Appendix L) is a 29-item forced choice scale that measures the extent to which individuals believe they can control the events that affect them. Individuals select one statement from the pair of statements they more strongly believe to be true (e.g. A “There are certain people who are just no good.” or B “There is some good in everybody.”).

After completing all 13 scales, participants were reminded to return in two days to complete the second half of the experiment.

Session 2

At the beginning of Session 2, participants were told that the session would consist of work that the administration of Texas Christian University had asked the Psychology Department to help them complete. For the next part of the session, participants were told they would be taking a test to measure intellectual and executive leadership qualities in college students. To give the participants more background information, a cover story (Appendix M) was read to each participant explaining what the test was and the importance of the test.

“Because the mission of Texas Christian University is to “educate individuals to think and act as ethical leaders and responsible citizens in the global community,” it is very important that students take the TEP seriously and strive to do as well as possible on the test. Average TEP scores for each class (freshman, sophomore, juniors, and seniors) will be reported to the Southern Association of Colleges and Universities as part of TCU’s accreditation process. If you are in the top 10% of scores on the list, you will be nominated for the Dean’s Academic Leadership Commendation.

Please remember that your score on the TEP reflects not only on what type of leader you would make in the community, but also on your classmates and on TCU’s stated mission. The test is important.”

The cover story also relayed information on the type of preparation that might help students achieve a higher score on the upcoming test. The cover story discussed current research suggesting that practicing multiplication problems before the test can improve student’s scores. Following the cover story, participants learned they would be given two opportunities to practice on multiplication problems before taking the actual test. Each participant was given 15 minutes for each practice.

Each multiplication packet consisted of 60 to 70 2-digit by 2-digit multiplication problems. The first multiplication packet (Appendix N) given to participants contained exactly 70 multiplication problems and nothing else. Once the participant received the first packet, he/she had 15 minutes to complete as many of the multiplication problems as they could. During the practice, participants were asked to circle their answer to each question once they had found an answer. After the first 15 minute practice, participants were given a second multiplication practice packet, but with one difference. On each page of the second packet, along with the 60 2-digit by 2-digit multiplication problems were “fun items” (Appendix O). These “fun items” ranged from word search puzzles to picture find puzzles. Again, participants were given 15 minutes to complete as many of the multiplication problems as they could, but if they decided to take a break from practicing the multiplication problems there were other “fun items” in their booklets they were free to try. Participants were reminded they could work on the fun items first, but not to put the multiplication problems off because the fun items would do nothing to help boost their score on the upcoming test.

After the second multiplication practice was over, participants were told there was no actual test and were then probed for suspicions and asked if they knew the connection between completing all of the scales in the first session and working on the multiplication problems in the second session. No student guessed the connection. Finally, participants were debriefed.

Results

The first question Experiment 1 set out to answer was whether Satisfaction with Life was a significant predictor of self-beneficial behavior. Would participants who scored high on Diener et al.’s (1985) Satisfaction with Life Scale be less likely than participants who scored low

to decrease the number of multiplication problems they did from the first set (with no fun puzzles) to the second set (with fun puzzles)?

Scale Averages

The first step was to make an average score for each participant on each of the 13 scales described above to be used as predictors in a linear regression. All scales were scored according to instructions provided by the authors in published studies. Table 1 displays means and standard deviations for each scale.

Table 1

Means and Standard Deviations for all 14 Scales, Math Difference, Math Test 1, and Math Test 2.

	Mean	Standard Deviation
SWLS	5.15	1.15
SHS	5.12	1.16
General Well-Being	5.44	0.99
Lay's Procrastination Scale	2.88	0.68
Tuckman's Procrastination Scale	2.50	0.30
Impulsivity	2.15	0.35
Entire Self-Control Scale	3.32	0.48
Self-Regulation	2.82	0.48
Grit	3.49	0.57
Delay of Gratification	2.94	0.32
SOC Personal	5.50	0.67
SOC Interpersonal	4.68	0.73
SOC Sociopolitical	3.78	0.92
Locus of Control	0.70	0.14
Math Test 1	36.58	12.35
Math Test 2	38.98	17.27
Math difference	-2.40	14.00

Multiplication Difference Score

In order to determine whether the participant exhibited more or less self-beneficial behavior (e.g. completing the same amount or more vs. less multiplication problems on the second multiplication test) a multiplication difference score was calculated. Each participant was given a score on each multiplication practice based on how many problems they completed

on each packet by simply counting up how many problems had a circled answer (see Table 1 for means and standard deviations for each test). Multiplication difference was calculated by subtracting the number of completed problems on multiplication set 2 from the number of completed problems on multiplication set 1 (see Table 1 for the mean and standard deviation for multiplication difference). A zero or negative answer indicated the participant had completed the same amount or more problems on the second packet, therefore showing more self-beneficial behavior than those who had a positive multiplication difference score, which indicated that the participant completed fewer problems and showed less self-beneficial behavior. Note that the average participant completed more multiplication problems in set 2 than in set 1 even though set 2 contained tempting fun puzzles.¹

Linear Regression

To determine whether satisfaction with life was the best predictor of self-control on the multiplication practice task, a linear regression was run predicting the multiplication difference score from each of the scales used in Experiment 1. Satisfaction with life was the only significant predictor of multiplication difference, $\beta = -.226$, $t(95) = -2.25$, $p < .05$. The higher an individual's life satisfaction score the more that individual resisted temptation by doing more of the multiplication problems in set 2 than set 1.

¹ Simple linear regressions were run to also determine whether life satisfaction influenced the number of problems completed on the first math test, second math test, and total number of problems completed over both tests. Life satisfaction did not significantly predict the number of math problems completed on test 1, $F(1,94) = .03$, *ns*. Life satisfaction marginally predicted the number of math problems completed on the second math test, $F(1,94) = 1.68$, $p = .096$. Life satisfaction did not significantly predict total number of math problems completed, $F(1,94) = 1.00$, *ns*.

To rule out the possibility that Satisfaction with Life was a poor substitute for another construct, a stepwise linear regression was computed entering the mean of Satisfaction with Life into the first step and all other scales entered into the second step. Again, multiplication difference was used as the dependent variable. Satisfaction with Life remained the only significant predictor of multiplication difference, $\beta = -.272$, $t(89) = -2.653$, $p < .01$, while all other measures were excluded from the equation.

Factor Analysis – All Scales

A factor analysis on each of the individual difference scales was conducted to further examine whether the construct of Life Satisfaction would remain the best predictor of math difference over all other constructs. Each scale mean was entered into a factor analysis with Varimax rotation. The analysis revealed four factors with Eigenvalues greater than 1. Table 2 lists all four factors, the scales, and factor loadings.

The first factor, which seemed to focus on Control, accounted for 32% of the variance and included the self-control, grit, self-regulation, delay of gratification, impulsivity and both of the procrastination scales. The four self-control scales loaded positively on the first factor while the three impulsivity scales all loaded negatively onto the first factor. The second factor, which seemed to involve Life Satisfaction, accounted for 13% of the variance and included all three life satisfaction and happiness scales. Spheres of control sub-scales for personal and interpersonal control loaded on one factor, which might be called Personal Control, which accounted for 11% of the variance. Finally, locus of control and the spheres of control sub-scale for sociopolitical control loaded on one factor which might be called Control Locus, which accounted for 7% of the variance.

Table 2

Factor Analysis (with Varimax Rotation) of the 14 Individual Difference Scales

Component	Eigenvalue	Loadings
Factor 1	4.559	
Self-Control		0.795
Grit		0.654
Self-Regulation		0.585
Delay of Gratification		0.56
Impulsivity		-0.713
Lay's Procrastination Scale		-0.631
Tuckman's Procrastination Scale		-0.702
Factor 2	1.843	
Satisfaction with Life		0.791
Subjective Happiness		0.782
General Well-Being		0.896
Factor 3	1.625	
Personal Control		0.797
Interpersonal Control		0.591
Factor 4	1.033	
Sociopolitical Control		0.88
Locus of Control		-0.692

The three spheres of control sub-scales were deliberately constructed to measure constructs different not only from other existing scales, but also from each other (Paulhus, 1966). The constructs most relevant to self-beneficial behavior seemed to come from the first factor (which could be divided into self-control scales and impulsivity scales) and from the second factor that involved life satisfaction, happiness, and general well-being.

The separate scores within each of these groups of scales were made into standardized z-scores so that all scales were on the same metric. A mean score was calculated from each of the z-scores for the three life satisfaction scales, the three impulsivity scales, and the four self-control scales. For instance, for the Life Satisfaction factor, the z-scores for satisfaction with life, subjective happiness, and general well-being were averaged to make a score for each participant for that factor. The same procedure was used for the impulsivity and self-control scales.

A linear regression was run entering all three factors simultaneously to predict math difference. None of the three factors significantly predicted math difference, $R^2 = .08$, ($F(3, 86) = 2.43$, $p = .07$). Table 3 shows the results for the 3 factor linear regression.

Table 3

Summary of Linear Regression Analysis for Factors from Data Reduction Analysis Predicting Math Difference

	Unstandardized		<i>Beta</i>	<i>t</i>	<i>p</i>
	<i>B</i>	SE			
Factor					
Control	0.191	2.9	0.01	0.066	0.948
Life Satisfaction	-1.89	1.88	-0.13	-1.01	0.315
Impulsivity	4.36	2.71	0.23	1.61	0.111

Because it was probable that Diener et al's (1985) Satisfaction with Life Scale might best capture the specific type of life satisfaction that was of most concern in the present research, it seemed useful to explore what would happen if the 3-scale life satisfaction construct were divided into two parts – the Satisfaction with Life Scale and the other two scales.

A second linear regression was run entering the Satisfaction with Life Scale, average of the other two life satisfaction scales, mean of the three impulsivity scales, and the mean of the four self-control scales as predictors of math difference. The overall regression model was a significant predictor of math difference, $R^2 = .12$ ($F(4, 85) = 2.82, p < .05$) and the Satisfaction with Life Scale was a significant predictor of math difference controlling for all other factors, $\beta = -.337, t(85) = -2.14, p < .05$. Table 4 displays the results of the regression.

Table 4

Summary of Linear Regression Analysis for Variables Predicting Math Difference

Factor	Unstandardized		Beta	t	p
	B	SE			
Satisfaction with Life	-4.9	2.29	-0.34	-2.14	0.035
Control	0.191	2.9	0.01	0.066	0.948
Life Satisfaction	-1.89	1.88	-0.13	-1.01	0.315
Average for SHS and GWB	5.61	4.88	0.17	1.15	0.253

Note: SHS = Subjective Happiness Scale; GWB = General Well-Being

Factor Analysis – Individual Scale Questions

To determine which individual questions from each of the 14 scales were best associated with multiplication difference scores, correlations were run between multiplication difference and all 199 scale questions from Session 1 of Experiment 1. The analysis revealed that out of the 199 questions, only 13 questions were significantly correlated with multiplication difference scores. Table 5 lists all 13 questions that were significantly correlated with math difference, which scale they were pulled from, and their correlation with multiplication difference.

Interestingly, 3 of the 5 Satisfaction with Life Scale questions were significantly correlated with multiplication difference. Even much longer scales contributed only 2, 1, or no questions to this list.

Table 5

13 Individual Scale Questions and Their Correlations with Math Difference

Item	Scale	Correlation
In most ways, my life is close to the ideal	SWLS	r = -.209, p=.041
So far I have gotten everything I want in life	SWLS	r = -.227, p=.026
If I could live my life over I would change almost nothing	SWLS	r = -.204, p=.047
I am continually saying I will do it tomorrow	PC 19	r = .244, p=.017
Do you look for excitement?	IMP 1	r = .237, p=.020
One of the major reasons we have wars no interest in politics	SOC 26	r = .234, p=.022
I can control my thoughts from distracting me from the task at hand	SREG 6	r = -.221, p=.030
I usually have to rush to complete a task on time	PC 10	r = .258, p=.011
The extent of personal achievement is usually determined by chance	SOC 8	r = -.260, p=.010
I usually don't make plans because I have a hard time following through	SOC 6	r = -.249, p=.014
I spend too much	SC 14	r = -.203, p=.047
I do many things on the spur of the moment	SC 20	r = -.204, p=.046
A leave right after class, B stay after class	DOG 9	r = -.203, p=.048

Note: PC = Lay's Procrastination Scale; IMP = Impulsivity; SOC = Spheres of Control; SREG = Self-Regulation; SC = Self-Control; DOG = Delay of Gratification

A Factor Analysis with Varimax rotation was applied to the 13 scale questions. The 13 questions loaded onto 5 different factors with Eigenvalues greater than 1. Table 6 shows each factor and the factor loadings for each of the questions. The first factor, which explained 24.5%

of the variance, contained two of the three Satisfaction with Life scale questions (e.g. “So far I have gotten everything I want in life.” And “In most ways my life is close to the ideal.”).

Table 6

Factor Analysis (with Varimax Rotation) of the 13 Individual Questions

Component	Eigenvalue	Loadings
Factor 1	3.192	
SWLS 1		0.859
SWLS 4		0.811
Factor 2	1.609	
PC 10		0.821
PC 19		0.799
SREG 6		-0.571
Factor 3	1.391	
SOC 8		0.802
DOG 9		0.721
SOC 6		0.611
Factor 4	1.155	
IMP 1		0.809
SC 20		-0.754
Factor 5	1.04	
SC 14		0.886
SWLS 5		0.584

Two separate scales were made from the 13 individual questions to be used in a linear regression predicting math difference. All three Satisfaction with Life Scale questions were averaged together to make the first factor while the remaining 10 questions were averaged

together to make the second factor. Both factors were entered in to in a linear regression predicting math difference. Table 7 displays the results of the regression. The overall regression was a significant predictor of math difference, $R^2 = .07$, ($F(2, 93) = 3.51, p < .05$). The mean of SWLS questions 1, 4, and 5 was a significant predictor controlling for the second factor of the remaining 10 scale questions, $\beta = -.244$, $t(93) = -2.34, p < .05$.

Table 7

Summary of Linear Regression Analysis for Variables Predicting Math Difference

Factor	Unstandardized		<i>Beta</i>	<i>t</i>	<i>p</i>
	<i>B</i>	SE			
SWLS 1, 4, and 5	-2.69	1.14	-0.24	-2.34	0.021
Remaining 10 Questions	-2.07	3.18	-0.06	-0.54	0.588

Even when the 10 best single-item predictors from all 194 questions on all 13 other scales were chosen *after-the-fact*, knowing that they correlated significantly with self-beneficial behavioral as measured by math difference, an alternative scale composed of those 10 best items proved to be a non-significant predictor when controlling for 3 of the Satisfaction with Life Scale items.

Experiment 2: Increasing Life Satisfaction Increases Self-Control

Experiment 1 showed that Diener et al.'s (1985) 5-item Satisfaction with Life Scale predicted the extent to which participants worked fewer multiplication problems to prepare for an important test when they were tempted to do fun puzzles instead. The higher a participant's life satisfaction score, the more that participant resisted temptation and engaged in self-beneficial rather than self-detrimental behavior. Of 12 other scales known to measure related constructs such as general well-being, subjective happiness, procrastination, self-control, self-regulation, persistence, impulsivity, delay of gratification, locus of control, personal control, and interpersonal control, none of them significantly increased the variance explained by Diener et al.'s (1985) Satisfaction with Life Scale.

Experiment 2 was designed to test whether a manipulation intended to increase or decrease temporary life satisfaction might also increase self-beneficial as opposed to self-detrimental behavior on the multiplication test that included fun puzzles. All participants were told about an important test of executive ability and how working multiplication problems would help them prepare, just as in Experiment 1. After they completed the baseline set of multiplication problems, they were asked to do another task. The other task was adapted from research by Emmons and McCullough (2003), and was intended to change temporary life satisfaction. Some participants were asked to recall and describe 5 events when they felt grateful, others were asked to recall and describe 5 events when they felt irritated, and others were simply asked to recall and describe any 5 events in their lives. Following this task, all participants did the second set of multiplication problems (with fun puzzles interspersed), and then completed all the same scales as in Experiment 1, including Diener et al.'s (1985) Satisfaction with Life Scale.

Method

Participants

A total of 92 undergraduates, who did not participate in Experiment 1, participated in groups of up to 12 for class credit. Two participants did not correctly follow the directions for the life satisfaction manipulation and were therefore eliminated. The final analysis included 90 participants (37 males, 54 females).

Procedure

Experiment 2 was completed in one session. When participants entered the lab, they were seated two to a table with a wooden divider between them. Participants were told the session would consist of several activities. One of the activities would involve completing some work for the University and the other activity would include completing some information on their thoughts and feelings. For the first part of the session, the participants were told they would be practicing for an upcoming test the University had asked the Psychology department to administer. At this point in time, a cover story was read out loud to the participants. The cover story was identical to the one used in Session 2 of Experiment 1 which explained what the test was about as well as the best way to prepare for the test (Appendix M). After reading the cover story, participants were given an importance rating sheet (Appendix P) that asked them to rate the importance of the upcoming test to the average person and the importance of the test to themselves, on scales from 1 (*Not at all important*) to 10 (*Very important*). Once each participant had completed the rating form, the first multiplication practice packet was given to participants (Appendix N). The packet was identical to the first multiplication practice packet used in Experiment 1. Participants were given 15 minutes to complete as many problems as they could.

After 15 minutes, participants were told they were going to take a break from practicing multiplication problems and complete some information on their thoughts and feelings. Here is where the participants completed the manipulation that was intended to affect life satisfaction and self-beneficial behavior. Participants could have received one of three sheets asking them to write about either 5 events when they remembered feeling grateful, 5 events when they remembered being hassled, or 5 random events (Appendix Q). Five minutes was allowed to complete the activity. Once all participants had written about 5 events, they were asked to rate the importance of each event on a 1 (Not important at all) to 10 (Very important) scale. Each importance rating was written next to each event on the same sheet of paper.

After the manipulation, participants were told they were going to work on the second multiplication practice packet. The packet was identical to the packet used in Experiment 1, with half multiplication problems and half “fun items” (Appendix O). Participants were told they could work on the fun items first, but not to put the multiplication problems off because the “fun items” would do nothing to improve their score on the upcoming test. Again, 15 minutes was given to complete as many multiplication problems as possible.

At the end of 15 minutes, the experimenter told the participants that before they took the test for the University there were just a few more activities for them to complete. Participants started by completing the same life satisfaction scales as in Experiment 1 (Appendices A – C). Following the completion of those scales, participants made a second rating of how importance of the upcoming test to the average person and to themselves (Appendix P). At this point, the experimenter told the participants that he/she was running late that day and had to have someone else get the tests together for them. While the experimenter went to check on the test, the participants completed a Sudoku puzzle (Appendix R). After 5 minutes, the experimenter

returned with two stacks, one that was supposedly the test and another stack of all the other scales from Experiment 1 (Appendices D-L). At the end of the session, participants were told they would not be taking a test. The participants were then probed for suspicions and asked if any of them knew the connection between the multiplication practice and the event writing. None did. Finally, participants were debriefed.

Results

Experiment 2 was designed to test whether the manipulation could increase life satisfaction and in turn increase self-beneficial behavior. Prior to running analyses, each of the individual difference scales was scored according to the author's instructions, as in Experiment 1. A multiplication difference score was also computed for each participant. Table 8 displays the means and standard deviations for each scale.

Multiplication Difference Score

As in Experiment 1, in order to determine whether the participant exhibited more or less self-beneficial behaviors (e.g. completing the same amount or more vs. less multiplication problems on the second multiplication test) a multiplication difference score was calculated. Each participant was given a score on each multiplication practice based on how many problems they completed on each packet by simply counting up how many problems had a circled answer. Multiplication difference was calculated by subtracting the number of completed problems on multiplication test two from the number of completed problems on multiplication test one. A zero or negative answer indicated the participant had completed the same amount or more problems on the second packet, therefore showing more self-beneficial behaviors than those who had a positive multiplication difference score indicating the participant completed fewer problems and showed less self-beneficial behaviors. The bottom section of Table 8 displays the

mean and standard deviation for multiplication difference as well as the mean number of problems participants did on each multiplication test.

Table 8

Means and Standard Deviations for All Scales, Math Test 1, Math Test 2, and Math Difference

Scales	Mean	Standard Deviation
SWLS	5.44	0.98
SHS	5.44	1.00
General Well-Being	5.72	0.98
Lay's Procrastination Scale	2.81	0.66
Tuckman's Procrastination Scale	2.47	0.31
Impulsivity	2.30	0.46
Self-Control	3.27	0.61
Self-Regulation	2.84	0.48
Grit	3.47	0.56
Delay of Gratification	2.91	0.48
SOC Personal	5.45	0.63
SOC Interpersonal	4.65	0.75
SOC Sociopolitical	3.55	0.81
Locus of Control	0.46	0.14
Math Test 1	28.88	9.48
Math Test 2	32.42	15.59
Math Difference	-3.54	15.51

Manipulation Checks

The manipulation checks included whether participants in the different conditions wrote about events with different valence, and whether they differed in how important they thought the test of executive ability was.

Event Valence. The five events each participant listed during the Life Satisfaction manipulation were coded for valence using a -3 (Extremely negative) to +3 (Extremely positive) scale. In order to determine valence, criteria were made to ensure that ratings were consistent across all participants. A rating of 0 or neutral was given when the event was about mundane tasks such as checking one's email. A rating of 1 was given when the participant wrote about such things as trips to the movies or the grocery store. Events received a rating of 2 if they mentioned anything that pertained to doing well on a test or enjoying a particular lecture which led to a good grade. And a rating of 3 was given to events that mentioned family events such as the birth of a baby or getting married. On the other end of the spectrum, a rating of -1 was given to events such as being behind a slow driver or having to eat in between classes. A -2 was given to events that mentioned having to experiment all day or being on a diet. And finally, a -3 rating was given when the event talked about the death of a friend or a loved one. From these valence ratings, an average valence score was calculated for each participant.

To ensure that participants followed directions correctly when writing about gratitude, hassles, or random events and circumstances, a one-way Analysis of Variance (ANOVA) was run on the average valence of all five events for each condition. Participants in the hassles condition listed more negative events ($M = -1.38$, $SD = .42$) than the control condition ($M = .28$, $SD = .90$) and the gratitude condition ($M = 1.73$, $SD = .44$), $F(2, 88) = 188.71$, $p < .001$. These findings suggest that participants in the hassles condition wrote mostly negative events and

participants in the gratitude condition wrote mostly positive events as instructed. Table 9 displays the means and standard deviations for event valence for each condition.

Importance Ratings. Importance ratings before and after the manipulation were highly correlated, $r = .93$ for importance to the individual and $r = .78$ for the average person, so they were averaged. A one-way ANOVA was run on the average importance ratings of the test to the individual and to the average person. No significant differences were found for the average importance rating of the test for the individual ($F(2, 88) = 1.19, p > .05$) nor for the average person ($F(2, 88) = .156, p > .05$). Table 9 displays the means and standard deviations for both importance ratings for each condition. Note that the means in all conditions were near or above 8 on a 1 – 10 scale of importance. Participants evidently believed the cover story, and did so equally with all conditions.²

Table 9

Means (Standard Deviations) for Event Valence and Importance Ratings

	Hassles	Control	Gratitude
Event Valence	-1.38 (.418)	.280 (.903)	1.73 (.437)
Importance to Individual	8.68 (1.39)	8.00 (2.39)	8.57 (1.55)
Importance to Average Person	8.08 (1.55)	7.85 (2.13)	8.07 (1.67)

²Rated importance of the upcoming test to the average person decreased marginally from before ($M = 8.11$) to after ($M = 7.89$) the manipulation, $F(1,88) = 2.92, p < .01$, but did not decrease more in one condition than another, Time X Condition interaction $F(2,88) = 1.52, ns$. Also, rated importance of the upcoming test to the participants themselves decreased significantly from before ($M = 8.54$) to after ($M = 8.30$) the manipulation, $F(1,88) = 10.40, p < .05$, but it did not decrease more in one condition than another, Time X Condition $F(2,88) = 1.16, ns$.

Math Test Performance.

To determine whether the manipulation influenced self-beneficial behavior as predicted, a linear regression was run predicting math difference from manipulation group, which was coded as 1 = hassles, 2 = control, and 3 = gratitude. Manipulation group was a significant predictor of math difference, $\beta = .206$, $t(89) = 2.02$, $p < .05$. Contrary to predictions, participants in the hassles condition exhibited greater self-beneficial behaviors ($M = -7.67$, $SD = 11.26$) than did participants in the control condition ($M = -3.00$, $SD = 14.4$) or the gratitude condition ($M = .200$, $SD = 19.36$).

A second linear regression was run predicting math difference from manipulation group controlling for average importance of the test to the participant. As shown in Table 10, manipulation group remained a significant predictor of math difference. Importance was also a significant predictor. The more important participants thought the upcoming test of executive ability was, the less they succumbed to temptation by decreasing math practice.³

Table 10

Summary of Linear Regression with Variables predicting Math Difference

	Unstandardized		<i>Beta</i>	<i>t</i>	<i>p</i>
	<i>B</i>	SE			
Manipulation Group	3.79	1.87	0.20	2.03	0.045
Importance of Test to Participant	-2.60	0.84	-0.31	-3.10	0.003

³For twenty participants, the first event they described was related to academics (e.g. Thankful to be at TCU). The remaining participants wrote about events that were not related to academics. In a 2(First Event: Academic, Non-academic) X 3(Manipulation: Gratitude, Control, Hassles) ANOVA, type of first event did not interact with the main effect of the manipulation, $F(2,85) = .13$, *ns*. Also the number of events (out of five) that were about academics did not interact with manipulation in affecting the math difference score, $F(1,87) = .03$, *ns*.

Effects of Manipulation on Individual Difference Scales

To test whether the manipulation affected life satisfaction and other possibly related constructs, a Multivariate Analysis of Variance (MANOVA) was run using all individual difference scales as dependent variables and manipulation group as the independent variable. As shown in Table 11, no significant effects emerged for any of the individual difference measures.

Table 11

Means and Standard Deviations for All 14 Scales for Each Condition

	Hassles	Control	Gratitude	F (2, 87)	<i>p</i>
SWLS	5.52 (.768)	5.26 (1.35)	5.52 (.717)	0.687	0.506
SHS	5.55 (.833)	5.26 (1.13)	5.50 (1.01)	0.714	0.493
General Well-Being	5.74 (.786)	5.51 (1.36)	5.89 (.624)	1.150	0.319
Locus of Control	.441 (.143)	.456 (.141)	.491 (.126)	1.040	0.358
SOC Personal	5.53 (.576)	5.35 (.674)	5.47 (.631)	0.691	0.504
SOC Interpersonal	4.54 (.923)	4.68 (.616)	4.73 (.683)	0.510	0.602
SOC Sociopolitical	3.58 (.976)	3.46 (.640)	3.61 (.803)	0.401	0.671
Self-Regulation	2.85 (.436)	2.90 (.537)	2.77 (.482)	0.537	0.586
Lay's Procrastination Scale	2.71 (.677)	2.71 (.636)	3.01 (.625)	2.200	0.117
Tuckman's Procrastination Scale	2.49 (.344)	2.41 (.287)	2.50 (.280)	0.845	0.433
Impulsivity	2.31 (.470)	2.25 (.476)	2.33 (.456)	0.228	0.797
Grit	3.54 (.505)	3.55 (.594)	3.31 (.564)	1.830	0.167
Self-Control	3.32 (.570)	3.31 (.720)	3.18 (.538)	0.462	0.631
Delay of Gratification	2.98 (.398)	2.87 (.597)	2.86 (.436)	0.652	0.523

Effects on Math Difference

A linear regression was run predicting math difference from manipulation group. Manipulation group affected self-beneficial behaviors in the math practice (see Table 12) , but did not affect life satisfaction or any of the other related constructs. Also, satisfaction with life did not predict math difference for all participants.

Table 12

Summary of Linear Regression with Manipulation Group Predicting Math Difference

	Unstandardized		<i>Beta</i>	<i>t</i>	<i>p</i>
	β	SE			
Manipulation Group	3.943	1.953	0.209	2.019	0.047

Experiment 3: Could Manipulating Perceived Control Influence Levels of Life Satisfaction?

Contrary to predictions, participants who were induced to recall and describe 5 events when they felt irritated were more likely to engage in subsequent self-beneficial behavior (doing more rather than fewer multiplication problems in the second set that included fun puzzles) than were participants who were induced to recall and describe 5 events when they felt grateful. Also, the experimental manipulation had no effect on life satisfaction as measured by Diener et al.'s (1985) 5-item Satisfaction with Life scale. One possible interpretation of these results is that recalling and describing irritating events made the multiplication problems seem less tedious by comparison, whereas recalling and describing events that elicited gratitude made the multiplication problems seem more tedious by comparison. The experimental manipulation may have affected self-beneficial behavior on the multiplication problems, but it may have been

poorly chosen if the goal was to alter life satisfaction. If the ultimate goal is to influence self-beneficial behaviors through temporary changes in life satisfaction, it would seem necessary to first find a manipulation that has an effect on life satisfaction itself. Experiment 3, therefore, was designed to test a different method of manipulating life satisfaction. That manipulation involved recalling and describing either events when the participant successfully resisted temptation or events when the participant succumbed to temptation. Following the manipulation, all participants completed the same scales as had been completed in Experiments 1 and 2, including Diener et al.'s (1985) 5-item Satisfaction with Life scale.

Method

Participants

A total of 92 undergraduates, who did not participate in Experiment 1 or Experiment 2, participated in groups of up to 6 for class credit. Two participants who did not correctly follow instructions for the manipulation were dropped from analyses leaving a final sample of 90 participants (29 males, 61 females).

Procedure

Experiment 3 was completed in one session. Participants were told they would be providing information about their thoughts and feelings through several activities. The first activity participants completed was the manipulation of self-control. Participants received one of three sheets where they were asked to list either 5 events where they exhibited self-control, 5 events where they gave into temptation, or 5 random events (Appendix S). Participants were given five minutes to complete the manipulation. Once participants had listed all five events, they were asked to rate the importance of each event on a 1 (Not important at all) to 10 (Very

important) scale. The importance rating was written at the end of each event on the same sheet of paper with the events.

After the manipulation, participants completed the same packet of individual difference scales from Experiments 1 and 2 (Appendices D-L). The last packet participants completed included the SWLS (Appendix A), SHS (Appendix B), and General Well-Being scale (Appendix C).

At the end of the session, participants were probed for suspicions and asked if anyone knew what the connection between the event listing and scale completion was. None did. Finally, participants were debriefed.

Results

For Experiment 3, the question was whether manipulating perceived control would influence levels of life satisfaction. Specifically, participants who thought about times when they exhibited self-control would show an increase in life satisfaction whereas participants who thought about times when they had given into temptation would show a decrease in life satisfaction. Before running any analyses, average scores were made for each individual difference scale using the same procedures in Experiments 1 and 2. Table 13 lists means and standard deviations for each scale.

Table 13

Means and Standard Deviations for Each Individual Difference Scale

	Mean	Standard Deviation
SWLS	5.45	0.86
SHS	5.54	1.04
General Well-Being	5.72	0.79
Lay's Procrastination Scale	2.91	0.69
Tuckman's Procrastination Scale	2.48	0.26
Impulsivity	2.23	0.42
Self-Control	3.30	0.51
Self-Regulation	2.79	0.49
Grit	3.40	0.56
Delay of Gratification	2.89	0.39
SOC Personal	5.47	0.58
SOC Interpersonal	4.73	0.73
SOC Sociopolitical	3.33	0.88
Locus of Control	0.49	0.16

Manipulation Check

Control. The five events the participant wrote down during the Perceived Control manipulation were coded for amount of control using a -3 (*Very Little Control*) to +3 (*Very Much Control*) scale. A rating of 0 or neutral was applied to events such as, "I did not brush my teeth today." A rating of 1 was given to events such as "I did not eat too much dinner." Events received a 2 for such things as, "Staying home instead of going out to a party." And a 3 rating was given to such events as, "I resisted the urge to retaliate." or "I did not partake in illicit drug use." On the other end of the scale, a -1 rating was given to events such as, "I went to the

movies instead of staying home.” A -2 rating was given to events such as, “I spent my money instead of saving it.” And a rating of -3 was given to events such as, “I did drugs even though I knew they were bad for me.” From these valence ratings, an average valence score was calculated for each participant.

To ensure that participants followed directions when writing about resisting temptation, giving in to temptation, or random events and circumstances, a one-way Analysis of Variance (ANOVA) was run on the average amount of control participants showed in each of the five events. As expected, participants in the resisting temptation condition wrote about events that exhibited more control ($M = 1.69, SD = .334$) than those who wrote about random events and circumstances ($M = .607, SD = .997$) and those who wrote about giving in to temptation ($M = -1.40, SD = .502$).

Effects of Manipulation on Individual Difference Scales

A Multivariate Analysis of Variance (MANOVA) was run using all individual difference measures as dependent variables and which condition the participant was in as the independent variable. As shown in Table 14, a significant main effect of manipulation group emerged only for academic delay of gratification ($F(2, 81) = 5.20, p < .05$). By Scheffe’s test ($p < .05$) participants who wrote about resisting temptation subsequently scored higher in delay of gratification ($M = 3.06, SD = .35$) than did those who wrote about random events ($M = 2.82, SD = .344$) or those who wrote about giving in to temptation ($M = 2.77, SD = .420$).

Table 14

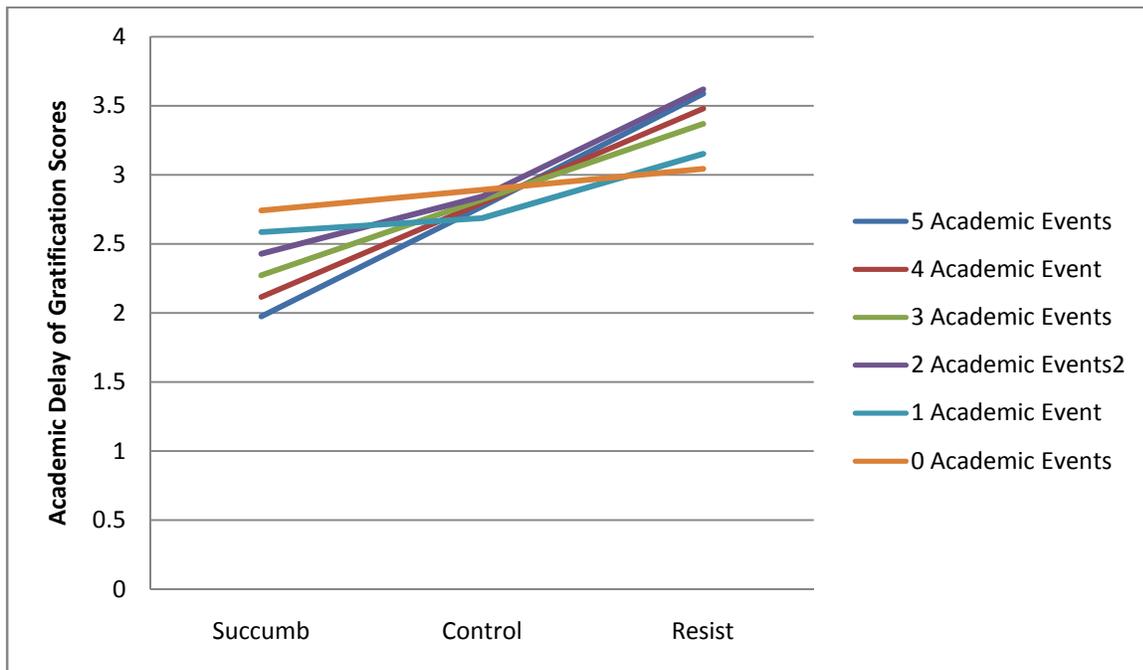
Means and Standard Deviations for All 14 Scales for Each Condition

	Resist Temptation	Control	Give in to Temptation	F (2, 87)	<i>p</i>
SWLS	5.56 (.924)	5.40 (.811)	5.39 (.872)	0.380	0.685
SHS	5.73 (1.04)	5.39 (1.08)	5.47 (1.01)	0.888	0.415
General Well-Being	5.76 (.675)	5.74 (.699)	5.75 (.898)	0.002	0.998
Locus of Control	.497 (.152)	.482 (.162)	.490 (.181)	0.065	0.937
SOC Personal	5.56 (.542)	5.40 (.579)	5.38 (.628)	0.814	0.447
SOC Interpersonal	4.65 (.698)	4.69 (.820)	4.83 (.681)	0.530	0.590
SOC Sociopolitical	3.19 (.813)	3.52 (.909)	3.28 (.881)	1.110	0.331
Self-Regulation	2.85 (.445)	2.79 (.407)	2.75 (.621)	0.308	0.736
Lay's Procrastination Scale	2.83 (.679)	2.97 (.680)	2.97 (.738)	0.383	0.683
Tuckman's Procrastination Scale	2.41 (.237)	2.49 (.270)	2.54 (.266)	1.950	0.148
Impulsivity	2.20 (.436)	2.26 (.411)	2.22 (.437)	0.142	0.868
Grit	3.41 (.428)	3.42 (.636)	3.35 (.617)	0.115	0.892
Self-Control	3.41 (.547)	3.27 (.476)	3.22 (.515)	1.150	0.320
Delay of Gratification	3.06 (.348)	2.82 (.344)	2.77 (.418)	5.200	0.007

When the number of described events that involved academics (out of a possible 5) was used along with the (dummy-coded) manipulation to predict scores on the subsequent Academic Delay of Gratification Scale (Bembunatty, 1996), the regression analysis yielded a significant interaction, $F(2, 86) = 2.73, p = .008$. Figure 1 shows the mean academic delay of gratification scores plotted across the three levels of the manipulation, for participants who listed 0, 1, 2, 3, 4 or 5 academic events.

Figure 1

Academic Delay of Gratification Scores for each Condition for the Amount of Academic Events listed



General Discussion

Experiment 1 examined the relationship between life satisfaction and self-beneficial behaviors by trying to develop a new measure of self-beneficial behavior. Of all the constructs that were chosen to possibly predict math difference (self-control, impulsivity, locus of control, spheres of control), the satisfaction with life scale was the only significant predictor of change in performance on the multiplication problems. Even when controlling for subjective happiness and general well-being, satisfaction with life was still a significant predictor. Specifically, SWLS items 1, 4, and 5 were the best predictors of math difference.

Being Specific About Life Satisfaction and Self-Beneficial Behavior

The task of self-beneficial behavior used during Experiment 1, and later in Experiment 2, was adapted from Vohs et al. (2005). During Vohs et al's experiment, participants completed as many 140 3-digit by 3-digit multiplication problems as they could during a single 30 minute period. The idea of a long multiplication test has been shown to be very tedious and a desire to stop arises very quickly. So, persistence on the task requires a person to override the urge to quit and exert extra effort to continue.

Using this particular task seemed to be a good way to measure whether increases or decreases in life satisfaction could influence individuals to continue to practice for a test that has been deemed highly important by a major institution. Studies on satisfaction and work persistence (Sears, 1977) have shown that persistence is best predicted by feelings of satisfaction. Also people who are satisfied overall are usually more satisfied with work and are more productive (Jones, 2006).

So why would satisfaction with life be the best predictor of performance change of all three life satisfaction scales? And why would the three specific items mentioned above be the

most predictive of math difference? The Satisfaction with Life Scale does correlate with other personality characteristics. Conscientiousness, from the Big 5 Personality assessment, has been shown to be a good predictor of the Satisfaction with Life Scale (Hayes & Joseph, 2003). People who are conscientious show self-discipline and aim for achievement. Being conscientious can influence how a person controls, regulates, and directs impulses. Perhaps the participants in Experiment 1, who were high in satisfaction with life, were also very conscientious. These particular individuals could have wanted to make sure they did well on the upcoming test and show self-discipline by continuing to practice the math problems, even more in the face of temptation.

As for the three most predictive Satisfaction with Life Scale items, each of those particular questions could be tapping into the idea of being conscientious and keeping on top of tasks. Because of persistence at certain tasks and showing self-discipline by completing tasks, individuals might feel as though they have gotten everything they could want out of life. Also, because of the need for achievement and having received all that is important to them, they see their life as close to ideal and there is nothing they need to change about it. Therefore, the Satisfaction with Life Scale (Diener et al, 1985) appears to be a good measure of self-beneficial behavior.

Attempts to Manipulate Self-Beneficial Behaviors

Experiment 2 revealed that the more pleasant events a participant wrote down the less they resisted temptation on the math problems. Essentially, those who wrote about events they were grateful for in their life actually “goofed off” more than the other two groups, presumably expending more effort on the “fun items” than the multiplication problems.

It is possible that writing about hassles in one's life could make other activities, like a 2-digit by 2-digit multiplication problems practice test, seem less tedious in comparison. Another possibility could be that writing about gratitude or the things an individual is grateful for kept individuals from taking the math practice seriously. It is sometimes possible for people who are extremely happy versus very happy to view situations as no big deal, such as an illness (Pressman & Cohen, 2005). Perhaps the same was true for the upcoming test. In the instance of the test of executive ability, the individuals in the gratitude condition may have thought they had practiced enough on the first set of math problems and there was no need to work on the second set of math problems. For those participants it seemed possible to work on the fun items and still do well on the test.

There is also the possibility that the people in the gratitude group did not view the events they wrote about as all that important and so the manipulation had no real influence on life satisfaction and subsequently on practicing for the upcoming test. On the other side of that, people who wrote about hassles could have chosen rather negative events and in essence the prospect of taking a test really did not compare to the unpleasant events they had once faced. It would also make sense that if the test the participant was practicing for was not an important endeavor for them, they would have spent more time on the puzzles and less time on the math problems. However, no significant differences were found for importance between the conditions. In fact, most everyone found the test to be both important for them as well as for the average person.

The manipulation of hassles versus gratitude in Experiment 2 had a significant effect on doing the multiplication problems, but it did not affect scores on life satisfaction as measured by the Satisfaction with Life Scale (Diener et al., 1985). The lack of an effect on life satisfaction

might be taken as support for the set point hypothesis and the intractable stability of life satisfaction, except for two caveats. First, many previous studies have shown that answers to the items on the life satisfaction scales are easily changed by the respondent's temporary mood (Schwarz et al, 1987), the particular life domain that happens to be salient (Andrews & Withey, 1976), the outdoor weather (Schwarz & Clore, 1983), and even the sight of a person in a wheelchair (Schwarz & Strack, 1999). Second, the gratitude versus hassles manipulation that was used in Experiment 2 did not have a significant effect on scores for any of the 12 other individual difference measures. It is hard to argue that life satisfaction is uniquely immune to change among individual differences when the manipulation was apparently so weak that it had no effect on any of these other measures. Furthermore, writing about life events has been shown not to be the most effective way to change life satisfaction (Lyubomirsky, Sousa, Dickerhoof, 2006).

The individual difference measures in Experiment 2, however, were completed after participants had done both sets of multiplication problems. The sequence was that they did the first set of multiplication problems, did the manipulation of writing about hassles or gratitude, did the second set of multiplication problems, and then completed the life satisfaction measures and finally the other individual difference measures. In the original study that used the hassles versus gratitude manipulation (Emmons & McCullough, 2003), measures of general well-being were taken immediately after the manipulation. Participants wrote about events that made them feel grateful or irritated, and then immediately completed scales designed to tap general well-being. In the present Experiment 2, a set of tedious multiplication problems (the primary dependent variable) intervened between the manipulation and the measures of life satisfaction, happiness, and general well-being. The effects of the manipulation may have dissipated during

the 15 minutes of math problems and fun puzzles and/or may have been diminished because participants were still anticipating an important test of executive ability.

It still remains, however, to provide an explanation of the significant effect that the gratitude versus hassles manipulation had on doing math problems instead of fun puzzles. Why might describing events that elicited gratitude rather than irritation have increased positive and optimistic appraisals of one's life, time spent exercising, positive affect, and helping others in experiments by Emmons and McCullough (2003), and decreased persistence at tedious practice for an important test in the present Experiment 2? In commenting on their results, Emmons and McCullough (2003) speculated that gratitude (versus hassles) might be distinct from "positive thinking." People who feel grateful might be more likely to help others, but not necessarily more likely to force themselves to continue with tedious tasks. Gratitude makes people feel loved and cared for by others (Reynolds, 1983), which might provide the reassurance necessary to relax and "lighten up" during tedious tasks. Writing about gratitude might have made participants in Experiment 2 feel that the burden of representing TCU on the upcoming test did not rest entirely on them. Also, gratitude is known to facilitate creative thinking (Aspinwall, 1998; Folkman & Moskowitz, 2000), which would apply more to the fun puzzles than to the tedious multiplication problems. Gratitude might not have been the optimal positive emotion, then, to serve as a manipulation in the present Experiment 2.

Limited Effects on Mentally Receiving Self-Control

Experiment 3 tested whether thinking about resisting temptation versus giving in to temptation influences life satisfaction. Those in the resisting temptation condition did have higher scores on satisfaction with life, yet they were not significantly different from the other two conditions. Even though the resisting temptation group had higher means on life

satisfaction, there were no significant changes in satisfaction with life or subjective happiness from the beginning of the semester to the time the participant completed Experiment 3.

So why would the scores on satisfaction with life be similar in the resisting temptation and the giving in to temptation group? One possibility could be that even though the temptations could have been big (e.g. taking drugs or unprotected sex), the impact on their overall view of life satisfaction may not have been huge. The satisfaction with life scale measures overall life satisfaction not moment to moment feelings about particular events. When answering the items on the Satisfaction with Life Scale (Diener et al., 1985), an individual is asked to think back over their entire life and make a decision based on all kinds of different events and circumstances. It is possible, in this particular experiment, that participants listed single, one-time occurring events and those single events did not have enough importance to affect their overall life satisfaction.

Similar to Experiment 2, the life satisfaction measures were completed last, after the manipulation and the other 10 individual difference measures. There is the possibility that the effect of the perceived control manipulation had worn off by the time the participant was finally able to rate their life satisfaction.

However, the manipulation of perceived control was not entirely unsuccessful. Writing about resisting temptation or giving in to temptation might not have affected scores on all of the individual difference measures, but the manipulation did significantly influence scores on Bembunatty et al.'s (1996) Academic Delay of Gratification Scale. In retrospect, this may have been because that scale contained the items that were most relevant to everyday ways in which students can exercise self-control. When asked to describe times when they resisted temptation, many students are likely to think first of times when they forced themselves to do school work instead of doing something that was more fun. The items on the Academic Delay of Gratification

scale refer specifically to studying for an exam instead of spending time with friends and finishing an assignment instead of having fun.

The Academic Delay of Gratification Scale (Bembunatty, 1996) is related to student's motivational tendencies and use of certain learning strategies. Three experiments testing the validity of the Academic Delay of Gratification Scale found that student's motivation for learning, their utilization of resource management, and cognitive and metacognitive learning strategies were positively correlated with academic delay of gratification. So it would make sense that these items would be very relevant to what participants in the resisting temptation condition had just finished writing about, and much more relevant than items on any of the other individual difference scales.

Concluding Remarks

Changing levels of life satisfaction is not an easy task to achieve. Research has shown over periods of several months to several years that life satisfaction remains stable for most individuals (Fujita & Diener, 2005). There can be small fluctuations from what is termed a baseline level of life satisfaction, but most people return to their baseline after different events (positive and negative). Perhaps writing about recurring events where an individual resisted temptation or gave in to temptation could have an influence on these more stable levels of life satisfaction. Governments and organizations should not abandon efforts to change life satisfaction, however, because the results of Experiment 1 affirm that life satisfaction and persisting at important but tedious tasks are significantly related.

Appendix A: Satisfaction with Life Scale (SWLS)

Below are five statements that you may agree or disagree with. Using the 1 – 7 scale below, please write a number next to each statement to indicate the extent to which *you agree or disagree with that statement*.

1	2	3	4	5	6	7
Disagree strongly	Disagree	Disagree slightly	Neither agree nor disagree	Agree slightly	Agree	Agree strongly

- ___ 1. In most ways my life is close to the ideal.
- ___ 2. The conditions of my life are excellent.
- ___ 3. I am satisfied with my life.
- ___ 4. So far I have gotten the things I want in life.
- ___ 5. If I could live my life over, I would change almost nothing.

Appendix B: Subjective Happiness Scale

Instructions to participants: For each of the following statements and/or questions, please circle the point on the scale that you feel is most appropriate in describing you.

1. In general, I consider myself:

1	2	3	4	5	6	7
Not						A very
A very						happy
Happy						person
Person						

2. Compared to most of my peers, I consider myself:

1	2	3	4	5	6	7
Less						More
Happy						Happy

3. Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterization describe you?

1	2	3	4	5	6	7
Not at						a great
All						deal

4. Some people are generally not very happy. Although they are not depressed, they never seem as happy as they could be. To what extent does this characterization describe you?

1	2	3	4	5	6	7
Not at						a great
all						deal

Appendix C: Index of General Well-Being

Using the scales provided, for each of the following questions circle the number that best represents how you feel about your life.

- | | | | | | | | | |
|-----------------------------------|---|---|---|---|---|---|---|------------------------------|
| a) Boring | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Interesting |
| b) Miserable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Enjoyable |
| c) Useless | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Worthwhile |
| d) Lonely | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Friendly |
| e) Empty | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Full |
| f) Discouraging | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Hopeful |
| g) Disappointing | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Rewarding |
| h) Doesn't give
me much chance | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Brings out the
best in me |

How satisfied or dissatisfied are you with your life as whole?
Which number comes closest to how satisfied or dissatisfied you feel?

COMPLETELY DISSATISFIED	1	2	3	4	5	6	7	COMPLETELY SATISFIED
----------------------------	---	---	---	---	---	---	---	-------------------------

Appendix D: Procrastination Scale (Lay, 1986) - For student populations

Instructions:

People may use the following statements to describe themselves. For each statement, decide whether the statement is uncharacteristic or characteristic of you using the following 5 point scale. Note that the 3 on the scale is Neutral – the statement is neither characteristic nor uncharacteristic of you. In the box to the right of each statement, fill in the number on the 5 point scale that best describes you.

- | | | | | | |
|--|--------------------------|--------------------------|---------|----------------|----------------|
| | 1 | 2 | 3 | 4 | 5 |
| | Extremely | Moderately | Neutral | Moderately | Extremely |
| | <u>Un</u> characteristic | <u>Un</u> characteristic | | Characteristic | Characteristic |
-
- ___1. I often find myself performing tasks that I had intended to do days before.
- ___2.* I do not do assignments until just before they are to be handed in.
- ___3.* When I am finished with a library book, I return it right away regardless of the date it is due.
- ___4. When it is time to get up in the morning, I most often get right out of bed.
- ___5. A letter may sit for days after I write it before mailing it.
- ___6. I generally return phone calls promptly.
- ___7. Even with jobs that require little else except sitting down and doing them, I find they seldom get done for days.
- ___8. I usually make decisions as soon as possible.
- ___9. I generally delay before starting on work I have to do.
- ___10.* I usually have to rush to complete a task on time.
- ___11. When preparing to go out, I am seldom caught having to do something at the last minute.
- ___12. In preparing for some deadline, I often waste time by doing other things.
- ___13.* I prefer to leave early for an appointment.
- ___14.* I usually start an assignment shortly after it is assigned.
- ___15. I often have a task finished sooner than necessary.
- ___16. I always seem to end up shopping for birthday or Christmas gifts at the last minute.
-
- ___17. I usually buy even an essential item at the last minute.
- ___18. I usually accomplish all the things I plan to do in a day.
- ___19. I am continually saying “I’ll do it tomorrow.”
- ___20. I usually take care of all the tasks I have to do before I settle down and relax for the evening.

Appendix E: The Procrastination Scale Tuckman et al. (XXXX)

Using the scale provided below, please indicate the best answer for each question by writing the correct letter on the space next to each question.

A. That's me
for sure

B. That's my
tendency

C. That's not
my tendency

D. That's not
me for sure

- ___ 1. I needlessly delay finishing jobs, even when they're important.
- ___ 2. I postpone starting in on things I don't like to do.
- ___ 3. I delay making tough decisions.
- ___ 4. I keep putting off improving my work habits.
- ___ 5. I get right to work, even on life's unpleasant chores.
- ___ 6. I manage to find an excuse for not doing something.
- ___ 7. When something's not worth the trouble, I stop.
- ___ 8. I am an incurable time waster.
- ___ 9. I'm a time waster now but I can't seem to do anything about it.
- ___ 10. I wish I could find an easy way to get myself moving.
- ___ 11. I always finish important jobs with time to spare.
- ___ 12. When I am done with my work, I check it over.
- ___ 13. I look for a loophole or shortcut to get through a tough task.
- ___ 14. I still get stuck in neutral even though I know how important it is to get started.
- ___ 15. I put the necessary time into even boring tasks, like experimenting.
- ___ 16. Putting something off until tomorrow is not the way I do it.

Appendix F: Impulsivity Scale

Please circle your answer.

1. Do you look for excitement?
 - a. Almost always
 - b. Often
 - c. Occasionally
 - d. Almost never
2. Are you carefree?
 - a. Almost always
 - b. Often
 - c. Occasionally
 - d. Almost never
3. Do you hit someone for calling you a name?
 - a. Almost always
 - b. Often
 - c. Occasionally
 - d. Almost never
4. Do you feel like saying, "I just did it, I don't know why?"
 - a. Almost always
 - b. Often
 - c. Occasionally
 - d. Almost never
5. Would you do almost anything for a dare?
 - a. Almost always
 - b. Often
 - c. Occasionally
 - d. Almost never
6. When people shout at you, do you shout back?
 - a. Almost always
 - b. Often
 - c. Occasionally
 - d. Almost never
7. Do you stop and think things over before doing something?
 - a. Almost always
 - b. Often
 - c. Occasionally
 - d. Almost never

8. Do you do things on the spur of the moment?
 - a. Almost always
 - b. Often
 - c. Occasionally
 - d. Almost never
9. Which one do you think you would pick
 - a. Three dollars given to you today
 - b. Five dollars given to you in four days
 - c. Seven dollars given to you in one week
 - d. Ten dollars given to you in two weeks
10. Do you like doing things in which you have to act quickly?
 - a. Almost always
 - b. Often
 - c. Occasionally
 - d. Almost never
11. If I had a free evening, I would rather stir up some excitement with friends than go to a movie.
 - a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree
12. Do you say things quickly without stopping to think?
 - a. Almost always
 - b. Often
 - c. Occasionally
 - d. Almost never
13. The President of the United States should give the people what they want and not worry about the due process of law.
 - a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree
14. When you sit down to experiment, are you easily distracted by other things?
 - a. Almost always
 - b. Often
 - c. Occasionally
 - d. Almost never
15. Which activity appeals to you most?
 - a. Chess
 - b. Baseball

- c. Sky diving
 - d. Trying a new drug
16. Which is the best description of your behavior?
- a. Impulsive
 - b. Spontaneous
 - c. Careful
 - d. Hesitant
17. I have never had and would never have a sexual encounter with someone I do not know well.
- a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree
18. I have a short attention span.
- a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree

Appendix H: Self-Regulation Scale (Schwarzer, Diehl, & Schmitz, 1999)

I can concentrate on one activity for a long time, if necessary.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

If I am distracted from an activity, I don't have any problem coming back to the topic quickly.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

If an activity arouses my feelings too much, I can calm myself down so that I can continue with the activity soon.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

If an activity requires a problem-oriented attitude, I can control my feelings.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

It is difficult for me to suppress thoughts that interfere with what I need to do.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

I can control my thoughts from distracting me from the task at hand.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

When I worry about something, I cannot concentrate on an activity.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

After an interruption, I don't have any problem resuming my concentrated style of working.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

I have a whole bunch of thoughts and feelings that interfere with my ability to work in a focused way.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

I stay focused on my goal and don't allow anything to distract me from my plan of action.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

Appendix I: The Grit Scale

Using the scale provided below, please indicate the best answer for each question by writing the correct number on the space next to each question.

1	2	3	4	5
Not at all like me				Very much like me

- ___ 1. I often set a goal but later choose to pursue a different one.
- ___ 2. New ideas and new projects sometimes distract me from previous ones.
- ___ 3. I become interested in new pursuits every few months.
- ___ 4. My interests change from year to year.
- ___ 5. I have been obsessed with a certain idea or project for a short time but later lost interest.
- ___ 6. I have difficulty maintaining my focus on projects that take more than a few months to complete.
- ___ 7. I have achieved a goal that took years of work.
- ___ 8. I have overcome setbacks to conquer an important challenge.
- ___ 9. I finish whatever I begin.
- ___ 10. Setbacks don't discourage me.
- ___ 11. I am a hard worker.
- ___ 12. I am diligent.

Appendix J: Academic Delay of Gratification

Using the scale provided below, please indicate the best answer for each question by writing the correct number on the space next to each question.

1	2	3	4
Definitely	Probably	Probably	Definitely
Choose A	Choose A	Choose B	Choose B

- ___ 1.A. Go to a favorite concert, play, or sporting event and experiment less for a course even though it may mean getting a lower grade on an exam you will take the next day, **OR**
B. Stay home and experiment to increase your chances of getting a higher grade.
- ___ 2.A. Experiment a little everyday for an exam in a course and spend less time with your friends, **OR**
B. Spend more time with your friends and cram just before the test.
- ___ 3.A. Miss several classes to accept an invitation for a very interesting trip, **OR**
B. Delay going on the trip until the courses are over.
- ___ 4.A. Go to a party the night before a test in a course and experiment only if you have time, **OR**
B. Experiment first and party only if you have time to.
- ___ 5.A. Spend most of your time experimenting just the interesting material in a course even though it may mean not doing so well, **OR**
B. Experiment all the material that is assigned to increase your chances of doing well in the course.
- ___ 6.A. Skip a class when the weather is nice and try to get the notes from somebody later, **OR**
B. Attend class to make certain that you do not miss something even though the weather is nice outside.
- ___ 7.A. Stay in the library to make certain that you finish an assignment in this course that is due the next day, **OR**
B. Leave to have fun with your and try to complete the assignment when you get home or later that night.
- ___ 8.A. Experiment for a course in a place with a lot of pleasant distractions even though it may mean not learning the material, **OR**
B. Experiment in a place where there are no distractions to increase the likelihood that you will learn the material.
- ___ 9.A. Leave right after a class to do something you like even though it means possibly not understanding the material for an exam, **OR**

B. Stay after class to ask your instructor to clarify some material for an exam that you do not understand.

- ____ 10.A. Select now an instructor for a course who is fun even though he/she does not do a good job covering the course material, **OR**
B. Wait for an instructor for a course who is not much fun but who does a good job covering the course material

Appendix K: Spheres of Control

When I get what I want it's usually because I worked for it.

1	2	3	4	5	6	7
Disagree						Agree

When I make plans I am almost certain to make them work.

1	2	3	4	5	6	7
Disagree						Agree

I prefer games involving some luck over games requiring pure skill.

1	2	3	4	5	6	7
Disagree						Agree

I can learn almost anything if I set my mind to it.

1	2	3	4	5	6	7
Disagree						Agree

My major accomplishments are entirely due to hard work and intelligence.

1	2	3	4	5	6	7
Disagree						Agree

I usually don't make plans because I have a hard time following through on them.

1	2	3	4	5	6	7
Disagree						Agree

Competition encourages excellence.

1	2	3	4	5	6	7
Disagree						Agree

Appendix L: Rotter's Locus of Control

Instructions:

This is a questionnaire to find out the way in which certain important events in our society affect different people. Each item consists of a pair of alternatives lettered a or b. Please select the one statement of each pair (and only one) which you more strongly believe to be the case as far as you are concerned. Indicate your choice by circling the appropriate letter (a or b). Be sure to select the one you actually believe to be more true rather than the one you would like to be true. This is a measure of personal beliefs; obviously, there are no right or wrong answers. In some instances, you may discover that you believe both statements or neither one. In such cases, be sure to select the one you more strongly believe to be the case as far as you are concerned.

- 1.** a. Children get into trouble because their parents punish them too much.
 b. The trouble with most children nowadays is that their parents are too easy with them.
2. a.* Many of the unhappy things in people's lives are partly due to bad luck.
 b. People's misfortunes result from the mistakes they make.
3. a. One of the major reasons why we have wars is because people don't take enough interest in politics.

- b.* There will always be wars, no matter how hard people try to prevent them.
4. a. In the long run, people get the respect they deserve in this world.
- b.* Unfortunately, an individual's worth often passes unrecognized no matter how hard he or she tries.
5. a. The idea that teachers are unfair to students is nonsense.
- b.* Most students don't realize the extent to which their grades are influenced by accidental happenings.
6. a.* Without the right breaks, one cannot be an effective leader.
- b. Capable people who fail to become leaders have not taken advantage of their opportunities.
7. a.* No matter how hard you try, some people just don't like you.
- b. People who can't get others to like them don't understand how to get along with others.
- 8.** a. Heredity plays the major role in determining one's personality.
- b. It is one's experiences in life which determine what one is like.
9. a.* I have often found that what is going to happen will happen.
- b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
10. a. In the case of the well-prepared student, there is rarely if ever such a thing as an unfair test.
- b.* Many times, exam questions tend to be so unrelated to course work that experimenting is really useless.
11. a. Becoming a success is a matter of hard work and luck has little or nothing to do with it.
- b.* Getting a good job depends mainly on being in the right place at the right time.
12. a. The average citizen can have an influence in government decisions.
- b.* This world is run by the few people in power and there is not much the little guy

can do about it.

13. a. When I make plans, I am almost certain that I can make them work.
b.* It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
- 14.** a. There are certain people who are just no good.
b. There is some good in everybody.
15. a. In my case, getting what I want has little or nothing to do with luck.
b.* Many times, we might just as well decide what to do by flipping a coin.
16. a.* Who gets to be the boss often depends on who was lucky enough to be in the right place first.
b. Getting people to do the right thing depends upon ability and luck has little or nothing to do with it.
17. a.* As far as world affairs are concerned, most of us are the victims of forces we can neither understand nor control.
b. By taking an active part in political and social affairs, the people can control world events.
18. a.* Most people don't realize the extent to which their lives are controlled by accidental happenings.
b. There really is no such thing as "luck".
- 19.** a. One should always be willing to admit mistakes.
b. It is usually best to cover up one's mistakes.
20. a.* It is hard to know whether or not a person really likes you.
b. How many friends you have depends on how nice a person you are.
21. a.* In the long run, the bad things that happen to us are balanced by the good ones.
b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

22. a. With enough effort, we can wipe out political corruption.
- b.* It is difficult for people to have much control over the things politicians do in office.
23. a.* Sometimes I can't understand how teachers arrive at the grades they give.
- b. There is a direct connection between how hard I experiment and the grades I get.
- 24.* * a. A good leader expects people to decide for themselves what they should do.
- b. A good leader makes it clear to everybody what their jobs are.
25. a.* Many times, I feel that I have little influence over the things that happen to me.
- b. It is impossible for me to believe that chance or luck plays an important role in my life.

Appendix M: Instructions for Multiplication Packets

As part of the accreditation process of the Southern Association of Colleges and Universities, each accredited academic institution must submit evidence that their academic environment promotes qualities essential to leadership and executive ability. One way to provide such evidence is to submit average scores from the Test of Executive Potential (TEP). The TEP was developed by the Educational Testing Service at Princeton, New Jersey to measure intellectual and executive leadership qualities in college students. It has been administered at colleges and universities throughout the United States, and has demonstrated high validity in predicting future career success in a wide variety of professional domains. It is a far better predictor of career success than standard achievement or intelligence tests.

Previous research has investigated the types of preparation that might help students to achieve higher scores on the TEP (ETS, 2006). So far, the only type of preparation that reliably increases scores on the TEP is to practice multiplication problems within one hour prior to taking the test (Ardelson, Bagwell, Donder, 2007). This finding is surprising in that there are no multiplication problems on the TEP, but neuroimaging procedures have shown that doing multiplication problems activates the same regions of the brain as is required by the conceptual problems on the TEP (Blancovich & Testa, 2008). Doing multiplication problems may serve as a type of “mental stretching” comparable to muscle stretching prior to athletic competitions. Interestingly, no other type of multiplication practice has this effect. Addition and subtracting problems, for instance, have no effect on test scores, nor does trigonometry or even calculus problems. Only multiplication problems work, and the more multiplication problems a student does before taking the TEP, the better will be the student’s score.

Because the mission of Texas Christian University is to “educate individuals to think and act as ethical leaders and responsible citizens in the global community,” it is very important that students take the TEP seriously and strive to do as well as possible on the test. Average TEP scores for each class (freshman, sophomore, juniors, and seniors) will be reported to the Southern Association of Colleges and Universities as part of TCU’s accreditation process. If you are in the top 10% of scores on the list, you will be nominated for the Dean’s Academic Leadership Commendation.

Please remember that your score on the TEP reflects not only on what type of leader you would make in the community, but also on your classmates and on TCU’s stated mission. The test is important.

Because the test is important you will first be given 30 minutes to practice some sample multiplication problems before taking the TEP that shows how much intellectual and executive leadership ability you have.

The practice packet consists of 140 3-digit by 3-digit multiplication problems and several other activities not related to multiplication. Practice on as many of the problems as you can in the next 30 minutes because remember past research has shown that practicing

multiplication problems before taking this particular test can improve performance on the test.

There are also other fun items within the packet of multiplication problems. In case you decide to take a break from practicing for the test, feel free to work on the crossword puzzles, word search puzzles and the picture find puzzles when you come to them. Just remember that these items will do nothing to boost your score on the important upcoming test, so try to leave at least some time for practicing the multiplication problems. The multiplication problems are the only ones that will help you achieve a high score on the upcoming TEP test that shows how much intellectual and executive leadership ability you have.

Appendix N: Packet of Multiplication Problems Only

1.
$$\begin{array}{r} 214 \\ \times 112 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 979 \\ \times 234 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 51 \\ \times 34 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 43 \\ \times 55 \\ \hline \end{array}$$

5.
$$\begin{array}{r} 66 \\ \times 32 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 95 \\ \times 20 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 15 \\ \times 21 \\ \hline \end{array}$$

8.
$$\begin{array}{r} 38 \\ \times 39 \\ \hline \end{array}$$

Appendix N (cont.)

9. 86
X 53

10. 10
X 20

11. 59
X 63

12. 52
X 60

13. 33
X 51

14. 96
X 84

15. 43
X 34

16. 32
X 44

Appendix N (cont.)

17. 48
X 77

18. 22
X 33

19. 15
X 46

20. 44
X 66

21. 59
X 35

22. 28
X 95

23. 69
X 14

24. 48
X 65

Appendix N (cont.)

25. 77
X 99

26. 88
X 66

27. 13
X 26

28. 44
X 11

29. 66
X 95

30. 55
X 55

31. 99
X 88

32. 66
X 52

Appendix N (cont.)

33. 94
X 48

34. 65
X 12

35. 15
X 65

36. 48
X 29

37. 85
X 96

38. 77
X 99

39. 14
X 25

40. 66
X 98

Appendix N (cont.)

41. 65
X 32

42. 75
X 74

43. 34
X 99

44. 95
X 20

45. 55
X 55

46. 38
X 39

47. 44
X 66

48. 73
X 23

Appendix N (cont.)

49. 11
X 99

50. 20
X 37

51. 33
X 22

52. 12
X 34

53. 44
X 22

54. 65
X 98

55. 10
X 20

56. 81
X 61

Appendix N (cont.)

57. 42
X 42

58. 53
X 24

59. 10
X 81

60. 87
X 12

61. 33
X 97

62. 77
X 44

63. 48
X 25

64. 47
X 28

65. 35
X 15

66. 88
X 11

67. 47
X 77

68. 85
X 14

69. 52
X 60

70. 17
X 25

Appendix O: Packet of Multiplication Problems and Fun Activities

1. $\begin{array}{r} 40 \\ \times 98 \\ \hline \end{array}$

2. $\begin{array}{r} 22 \\ \times 52 \\ \hline \end{array}$

3. $\begin{array}{r} 33 \\ \times 20 \\ \hline \end{array}$

4. $\begin{array}{r} 42 \\ \times 24 \\ \hline \end{array}$

5. $\begin{array}{r} 21 \\ \times 23 \\ \hline \end{array}$

6. $\begin{array}{r} 42 \\ \times 32 \\ \hline \end{array}$

7. $\begin{array}{r} 84 \\ \times 38 \\ \hline \end{array}$

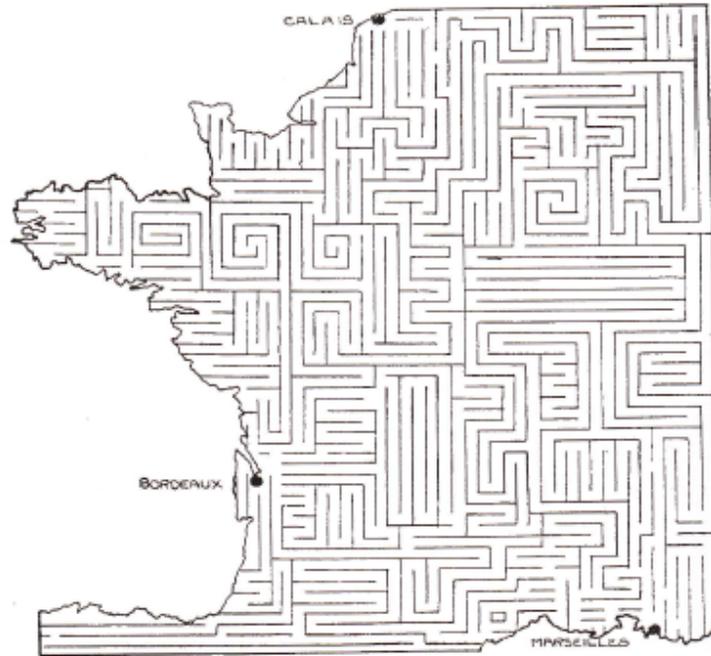
8. $\begin{array}{r} 61 \\ \times 62 \\ \hline \end{array}$

Where is the other person in this picture? Circle your answer on the picture.



Appendix O (cont.)

Try to make your way from Marseilles to Calais then to Bordeaux then back to Marseilles.



9. 83
X 31

10. 72
X 36

11. 16
X 74

12. 42
X 26

13. 32
X 22

14. 58
X 82

15. 66
X 48

16. 22
X 83

Appendix O (cont.)

Find the child in the picture below. Circle your answer in the picture.



17. 13
X 14

18. 12
X 24

19. 12
X 31

20. 10
X 11

21. 23
X 33

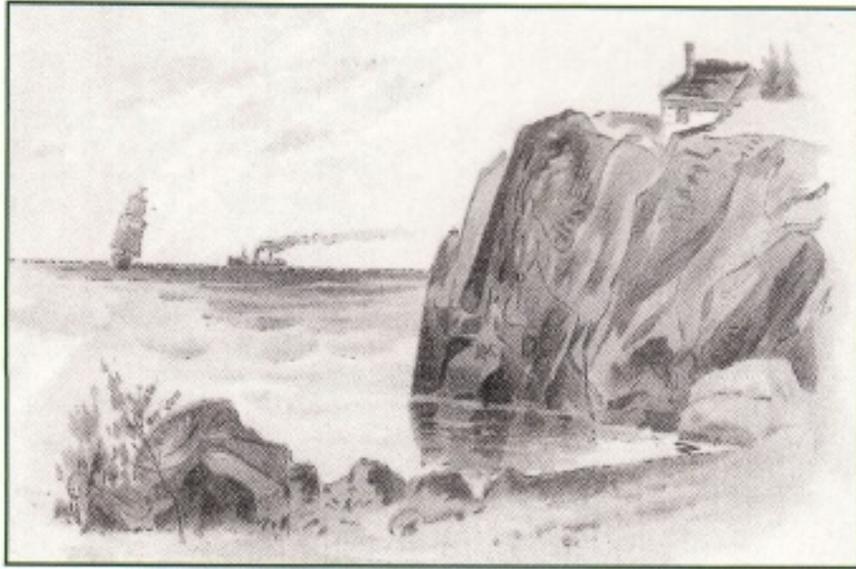
22. 10
X 11

23. 13
X 23

24. 12
X 13

Appendix O (cont.)

Find the antelope, wolf, bat, and flamingo in the picture below.



31. 22
X 34

32. 23
X 64

33. 44
X 41

34. 22
X 51

35. 10
X 11

36. 81
X 51

37. 12
X 15

38. 64
X 94

Appendix O (cont.)

41. $\begin{array}{r} 72 \\ \times 82 \\ \hline \end{array}$

42. $\begin{array}{r} 31 \\ \times 46 \\ \hline \end{array}$

43. $\begin{array}{r} 50 \\ \times 41 \\ \hline \end{array}$

44. $\begin{array}{r} 16 \\ \times 12 \\ \hline \end{array}$

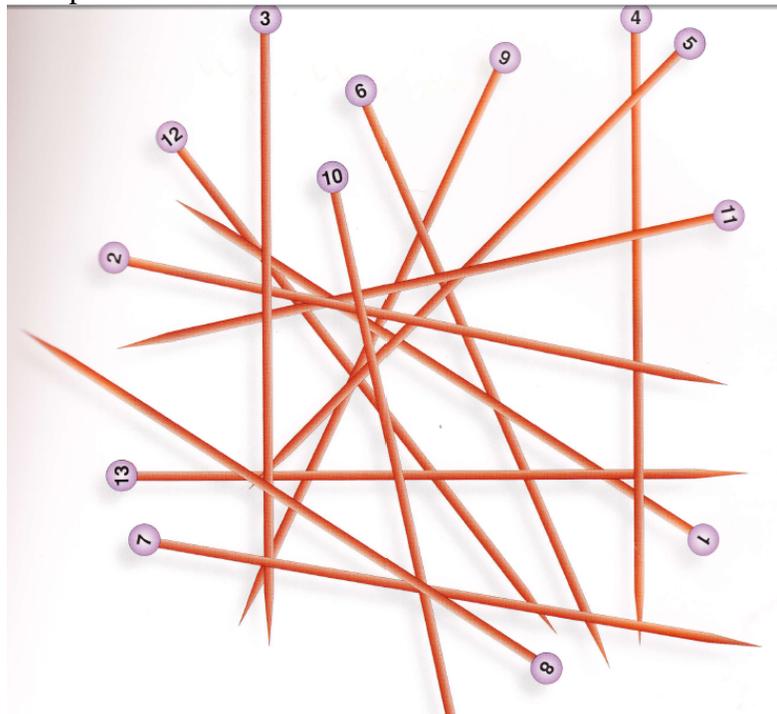
45. $\begin{array}{r} 60 \\ \times 93 \\ \hline \end{array}$

46. $\begin{array}{r} 75 \\ \times 15 \\ \hline \end{array}$

47. $\begin{array}{r} 63 \\ \times 43 \\ \hline \end{array}$

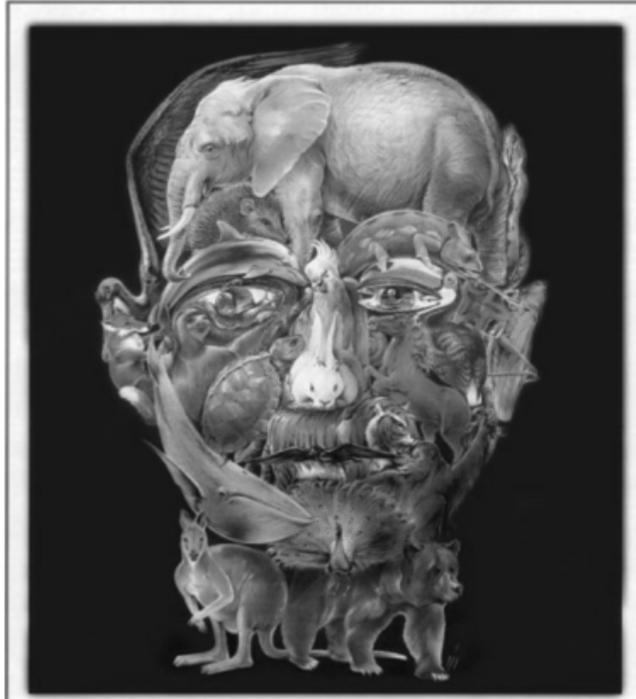
48. $\begin{array}{r} 20 \\ \times 31 \\ \hline \end{array}$

In what order should the sticks below be picked up in to “free” stick # 12? Write the order you think next to the picture.



Appendix O (cont.)

Circle as many animals as you can find in the picture below.



51. 66
X 70

52. 30
X 60

53. 55
X 66

54. 44
X 58

55. 20
X 10

56. 66
X 88

57. 30
X 50

58. 10
X 10

Appendix O (cont.)

61. 66
X 32

62. 44
X 11

63. 68
X 15

64. 32
X 96

65. 96
X 84

66. 87
X 16

67. 62
X 54

68. 22
X 69

Cooking

C	O	L	A	N	D	E	R	A	W	T	A	L	F	E
A	U	P	O	H	C	U	P	R	E	P	P	E	P	L
N	M	T	I	M	E	R	B	E	L	P	R	T	E	T
I	I	W	L	K	N	I	S	A	D	A	E	A	T	T
S	L	H	N	E	V	O	T	S	K	N	H	R	S	E
T	L	I	O	B	R	E	I	N	G	E	E	G	A	K
E	S	P	O	E	S	Y	R	N	O	S	A	L	T	E
R	B	M	T	R	E	C	I	U	J	O	T	A	B	V
T	O	A	A	F	B	N	A	E	L	C	P	S	R	A
E	W	S	I	E	E	P	P	A	R	F	A	S	E	W
L	L	N	H	T	T	P	L	A	Q	U	E	E	C	O
L	K	M	R	A	W	S	L	I	C	E	S	S	I	R
I	M	O	L	D	K	O	P	E	N	E	R	A	P	C
K	H	P	U	R	E	E	R	C	A	R	A	F	E	I
S	P	A	T	U	L	A	R	E	T	S	A	O	T	M

BAKE	CUP	MICROWAVE	PUREE	SPOON
BLEND	CUTLERY	MILLS	RECIPE	STEAM
BOIL	FLATWARE	MOLD	SALT	STIR
BOWL	FRAPPE	OPENER	SAUCER	STOVE
BROIL	GLASSES	OVEN	SHAKER	TASTE
CANISTER	GRATE	PAN	SHORTENING	TIMER
CARAFE	JUICER	PEPPER	SINK	TOASTER
CHOP	KETTLE	PLAQUE	SKILLET	WARM
CLEAN	KNIFE	PLATES	SLICE	WATER
COLANDER	MEASURE	PREHEAT	SPATULA	WHIP

Appendix Q: Life Satisfaction Manipulation

Gratitude Condition:

There are many things in our lives, both large and small, that we might be grateful about. Think back over the past week and write down on the lines below up to five things in your life that you are grateful or thankful for.

1. _____
2. _____
3. _____
4. _____
5. _____

Hassles Condition:

Hassles are irritant – things that annoy or bother you. They occur in various domains of life, including relationships, work, school, housing, finances, health, and so forth. Think back over today and, on the lines below, list up to five hassles that occurred in your life.

Events Condition:

What were some of the events or circumstances that affected you in the past week? Think back over the past week and write down on the lines below the five events that had an impact on you.

Appendix R: Sudoku Puzzle

W	E	B
S	U	D
O	K	U

Easy Puzzle 1,197,984,091

			2		8			4
5					6	1	2	
	3	2	4		1			
		6	9	2		5		
4	1			7			6	3
		5		1	3	9		
			3		2	8	7	
	8	7	5					6
6			1		7			

Appendix S: Perceived Control Manipulation

Control Condition:

There are many times in our lives when we could do one thing that is tempting or something not as tempting, but better for you. Think back over the past couple of years and write down on the lines below up to 3 separate events where you have exercised self-control and chosen to do what is better for you over something more tempting.

1. _____
2. _____
3. _____
4. _____
5. _____

Less Control Condition:

There are many times in our lives when we could do one thing that is tempting or something not as tempting, but better for you. Think back over the past couple of years and write down on the lines below up to 3 separate events where you have given in to temptation and chosen to do the thing that was more tempting even though you knew the other course of action would be better for you.

Control condition:

What were some of the events or circumstances that affected you in the past couple of years? Think back over the past couple of years and write down on the lines below the five events that had an impact on you.

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Psychological Affiliations

Society for Personality and Social Psychology

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ABSTRACT

THE RELATIONSHIP BETWEEN LIFE SATISFACTION AND SELF-BENEFICIAL BEHAVIORS

By Amanda Elaine Caldwell, Ph.D., 2009
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Three experiments tested the relationship between life satisfaction and self-beneficial behaviors. Experiment 1 was run to determine whether a new measure of self-beneficial behavior, completing tedious math problems, would correlate with Diener et al's (1985) Satisfaction with Life Scale. Results showed that those who were higher in life satisfaction completed more problems than those who were low in life satisfaction. Experiment 2 tested whether manipulating life satisfaction by having individuals write about gratitude versus hassles would influence self-beneficial behavior. Contrary to predictions, those who wrote about hassles completed more tedious math problems than those who wrote about gratitude. Finally, Experiment 3 tested whether manipulating perceived control would influence levels of life satisfaction. There were no changes in life satisfaction between the three conditions. However, those who wrote about resisting temptation had higher scores for academic delay of gratification than those who wrote about giving in to temptation. Further work is needed to determine whether levels of life satisfaction actually do influence self-beneficial behaviors.