2011

Creative achievement, feedback, and regulation of motivation for creative behaviors

Ryan Edward Holt

CREATIVE ACHIEVEMENT, FEEDBACK, AND REGULATION

OF MOTIVATION FOR CREATIVE BEHAVIORS

A Thesis

Presented to the

Faculty of

California State University,

San Bernardino

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

in

Psychology:
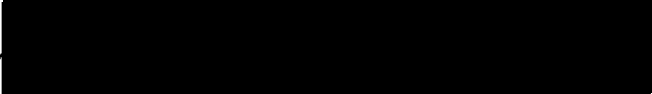
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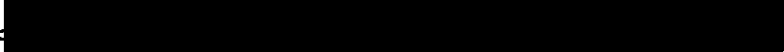California State University,

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Approved by:

Dr. James C. Kaufman, Chair, Psychology   Date 10/27/11

Dr. Matt Riggs

Dr. Allen Butt

ABSTRACT

To better understand the development of future programs involving the growth of creative skills, this study will explore the effects of self-regulation and the tendency to commit to or refrain from creative projects. The relationship between one's feelings of creative achievement and motivation to pursue creative activities will also be investigated. It is hypothesized that motivation will be affected by experimentally-induced heightened feelings and lowered feelings of creative achievement. Specifically, individuals primed to feel an inflated sense of creative achievement will decline further creative opportunities, whereas individuals primed to feel a deflated sense of creative achievement will pursue creative opportunities.

Comparisons will be made between the inflated and the deflated group as well as the different domains of achievement questionnaires (creative writing, scientific, and general). These results will provide a greater understanding of how creative individuals make different patterns of decisions while reflecting on past achievements, as well as how to foster creative motivation.

ACKNOWLEDGMENTS

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INTRODUCTION

For persons interested in creativity, it is essential to understand what motivates people to be creative. Such information is important for educators, instructors, employers, and anyone else interested in fostering the creative spirit. Ever since Sputnik was launched by the USSR in 1957, Western psychological interest was piqued for the development and study of creativity (Currie, 2005). This event and the recognition by Joy P. Guilford, gave significant weight to the previously overlooked construct of creativity. Often, creative individuals are faced with the decision of engaging in the pursuit of a creative activity or taking care of more mundane necessities, such as paying the rent. A review of creativity will be provided to help understand what processes affect the creative individuals' modulation of their creative pursuits with conventional necessities. For those interested in motivating creativity, or capitalizing on the goods rendered from creative services, it is valuable to understand what factors will affect an individual's motivation to engage in a creative opportunity or to pursue a conventional opportunity. This

includes both internal forces which drive one's creative motivation as well as external forces which encourage one to be creative.

Creativity

Creativity research investigates the production of novel ideas or products that are useful and relevant to the task (Sternberg, 2003; Sternberg & Lubart, 1993; Kaufman & Sternberg, 2006). Creativity is typically measured along four different dimensions: the person, the process, the product, and the pressures of the environment (Rhodes, 1962). In terms of ability, creativity has been shown to be fairly consistent across a variety of demographics including ethnicity and gender (Stricker, Rock & Bennett, 2001; Kaufman, Baer, & Gentile 2004; Baer & Kaufman 2008). It is a quality that exists in all persons, but varies from person to person in terms of realization and development (Runco, 2003). Four different levels of creative development have been articulated in the *Four C Model* (Kaufman & Beghetto, 2009). The type of creativity related to everyday creativity encountered by the average person is "little-c". To further clarify the broad construct of little-c, Kaufman and Beghetto (2007) proposed "mini-c" to account for creativity that was novel

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relative to the individual. Mini-c is the creative process involved in the construction of personal knowledge and understanding (Beghetto & Kaufman, 2007). "Pro-c" is the creativity of an established professional who has not yet reached a level of eminence, yet still has obtained expertise (Kaufman & Beghetto, 2009). The type of creativity related to genius is "Big-C". Big-C is the type creativity that retains its recognition and acclaim over long periods of time. These four different stages of creativity combine to account for the varying levels of creativity produced by individuals.

Creativity is an important construct that can result in innovation, which can lead to better performance, lower cost of products, and improved happiness (Utterback, 1996; Feurer, Chaharbaghi, & Wargin, 1996; Giacinto, Ferrante, & Vistocco, 2007). Although creativity is mostly investigated at the level of the individual, creativity has broad effects on the global social arena through the effects of innovation and industry (Grimm, Faeth, Golubiewski, Redman, Wu, Bai, & Briggs 2008). Even wide reaching innovations began as prototypes based on a novel idea.

Novelty

Novelty, or the quality of being new, is a part of creativity. Novelty has been demonstrated to function as a reward in both human as well as rats (Bevins, 2001). Novelty seeking behaviors have been investigated both in consumer behavior and animal models of learning. The conclusion among consumer behaviorists is that individuals have varying levels of novelty seeking behavior which reflects a need for stimulation (Hoyer & Ridgway, 1984). Models of consumer behavior are based on the idea that repeated use of a brand or product will result in a loss of utility due to a "satiation" effect (Jeuland, 1978, McAlister, 1979). This satiation has been linked with creative consumer behavior as well (McAlister & Pessimier, 1982). Learning theory has shown that animals on variable schedules of reinforcement learn tasks more quickly than animals on fixed schedules of reinforcement. The increased novelty of the stimulus seems to capture more attention on the part of the animal (Ferster & Skinner 1957).

In a study that used functional magnetic resonance imaging, 25 adults were administered either water or fruit juice at either a predictable or unpredictable schedule. The results showed that 72% of the adults preferred the fruit juice (the other adults preferred the water).

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However, the more important finding was that adults who were on the random schedule of receiving their preferred liquid showed larger areas and heightened activation in the medial orbitofrontal cortex and the nucleus accumbens. The adults predictably receiving their preferred liquid showed decreased levels of activation, the authors suggest that the reliable rates of reward are not as exciting as the unpredictable rate (Berns, McClure, Panoni, & Montague, 2001). In other words, the adults who did not know when they were going to receive their preferred liquid enjoyed they stimulus much more, because it was relatively novel to them. The axiom "Variety is the Spice of Life" seems to be exemplified through the available research on novelty seeking behavior, product switching, unexpected juice drinking, and creativity.

While variety may be reinforcing, predictability can sometimes be more favorable. For example, when punishment is administered randomly depressive states such as learned helplessness can occur (Seligman, 1975; Zimbardo, 2008). However, reliability and conventionality can become aversive, which can be demonstrated through boredom, routinization, and employee burnout. Burnout is defined as the experience of diminished interest, exhaustion, and lack of motivation: Burnout can occur if one experiences a

reduced sense of personal accomplishment (Maslach &
Jackson 1981). Routinization, or overlearning, of an
activity has also been shown to detrimentally affect
motivation (Ford & Gioia, 2000). Finally, boredom of an
activity that once was fulfilling may result in an
individual seeking a new activity (Weissinger, Caldwell, &
Bandalos, 1992; Larsen, 1988). These factors which reflect
a predictable schedule can lead to a decrease in
motivation to stay on a task, but may also lead to
increasing creativity in another task (Harris, 2000).
Additionally, it has been demonstrated that creative
persons show a greater sensitivity to repetition and are
motivated to seek out novelty (Martindale, Anderson,
Moore, & West, 1995). In an organizational setting it
would seem important to provide employees with novel
opportunities or else they will creatively find ways to
enjoy themselves at another job.

Creative Impetus

History provides many examples of people having
creative sparks or a creative impetus. For example,
Alexander Graham Bell was inspired by the shape of the ear
when inventing the telephone, George deMestral was
inspired by burrs stuck to his dog and invented Velcro,

and James Crocker was inspired by a flexible shower head and created a corrective lens device to fix the Hubble telescope. These inventors were inspired by the world around them, and then motivated by their excitement, they made a decision to engage in creative activities (Holyoak & Thagard, 1995). The word eureka, which means "I have found", is a Greek interjection meant to express the triumph of discovery. This sense of enthusiasm is described in a blog post by artist Skipp Ennis (2007) pg 1, in which he states:

> I cannot help it. I love this drive inside of me that is impelling me to communicate my thoughts through my art. I have found it to be the most potent form of meditation and focus I have ever experienced. ...It must be the same with all art disciplines. Our art is our spirits communicating. It never ceases to amaze me every day I am creating, just how potent our natural creative energy really is.

The feeling described by Ennis is similar to the accounts provided by many other artists, and may provide a case that a drive based theory may be a suitable one to consider when investigating the effects of motivation on creativity. This process of being in a creative state has been coined *flow* by researcher Mihály Csíkszentmihályi

(1988). Csíkszentmihályi explains that the mental states
of *flow* occur when a person is fully immersed in the
process of an activity and invested in the activities'
success. Another way to conceptualize *flow* is as complete,
focused motivation on the performance of a task. While in
this state of *flow*, persons have reported having high
degrees of concentration, distorted sense of time,
personal control over the activity, and a lack of
awareness of bodily needs. These combined feelings equate
to a state of reward for the person engaged in a creative
activity. Participation in a creative activity or
discovery results in the intrinsically rewarding state of
flow, and as a result, individuals will seek the
opportunity to flex their creative muscles in the future.

In a longitudinal study which investigated the
effects of motivation among students, it was shown that
students would be increasingly engaged in activities that
represented a sufficient challenge to their skills.
Additionally, students were shown to spend more time
working on individual or group projects that they found to
be intrinsically motivating (Shernoff, Csikszentmihalyi,
Shneider, & Shernof, 2003). It is argued that the state of
flow is motivating creative behavior, and while persons
are actively engaged in creative behaviors activation of

frontal lobe as well as nucleus accumbens are shown to increase (Flaherty, 2005). The driving reason, or creative impetus, to choose to spend time on an activity is a particularly important influence of creative performance.

Creative Achievement and Self-Concept

Acting upon one's creative impetus and turning an idea into a product creates a history of creative achievement for an individual. This individual will then begin to have a creative sense of self. Two important factors to consider when exploring the internal processing of the individual are *self-concept* and *achievement*. These two concepts have been largely investigated in the domain of academics and have been shown to correlate with each other (Harackiewicz, Durik, Barron, Linnenbrink-Garcia, & Tauer, 2008). This relationship has been explored through a meta-analysis by Möller, Pohlmann, Köller, and Marsh (2009) in which they revealed a significant positive relationship between self-concept and achievement across 63 empirical studies. Hamacheck (1995) summarizes 25 years of research on self-concept and academic achievement by describing a relationship that is both interactive and reciprocal. A positive or negative change in one variable is likely associated with a corresponding change in the

other variable. Additionally, academic self-concept and academic achievement were shown to be more highly correlated than general self-concept and academic achievement. However, the exact relationship between these two constructs is still in debate. Academic self-concept has been demonstrated to be a significant mediator of academic performance (Flook, Repetti, & Ullman, 2005; Shavelson & Bolus, 1982), but other studies have shown significant direct paths from achievement to self-concept (Newman, 1984). Additionally, paths from academic self-concept to academic achievement have been shown to be stronger than standardized achievement measures (Marsh, 1990). Compared to the bulk of research on academic self-concept and academic achievement, less research has been conducted on creative self-concept and creative achievement. Although the relationship between these constructs has not received the same level of interest as the academic connection, some research has been conducted (Silvia, Kaufman, & Pretz, 2009; Carson, Peterson & Higgins, 2005). Most research examines the constructs themselves; however the relationship between creative self-concept and creative achievement has demonstrated a similar domain specific relationship found in the

self-concept and academic achievement (McInerney, Yeung, & Russell-Bowie, 1999; Silvia, Kaufman, & Pretz, 2009).

This research demonstrates that self-concept and achievement, although distinct constructs, are related to each other. This relationship becomes even stronger when investigated within a specific domain rather than generalized forms of the constructs. However, researchers still have not determined whether changes in academic self-concept will lead to changes in academic achievement or if the order is reversed. Exploration of this model is important for researchers developing interventions designed to improve academic performance. Understanding the causal relationship between these variables will affect which construct is targeted and invested in when developing academic interventions.

Two models have been proposed to support each hypothesis of causational order. The *skill development model* proposes that academic self-concept is a result of past academic achievement (Marsh, Byrne, & Yeung, 1999). In contrast, the *self-enhancement model* proposes that development of academic self-concept will result in changes in academic achievement.

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Skill Development Model

The skill development model has been used to explain how mastery, or expertise, occurs. The factors of practice, feedback, and motivation have been incorporated into the model to explain how one transverses the journey from novice to master. Research has shown that it usually takes around 10 years of experience to obtain mastery (Hayes, 1981; Kaufman & Kaufman, 2007). This process of practice also needs to coincide with feedback, usually through the form of a guided apprenticeship. One way to conceptualize this relationship has been proposed through the Four C Model of Creativity, specifically through the development of Pro-c creativity (Kaufman & Beghetto, 2009). This eminent level of creativity usually involves 10 years of formal training and forms of achievement. Feedback provided during the one's professional development has been shown to aid performance (Wulf, Mcconnel, Gertner, & Schwarz, 2002). The final factor related to mastery or expertise within the *skill development model* is the presence of motivation. *Achievement motivation* is achieving success in the aspirations of a persons' life and are primarily driven by a desire to develop competence or mastery of a skill (Harackiewicz, Barron, Carter, Lehto, & Eliot, 1997).

Achievement motivation has also been conceptualized into a *Hierarchal Model of Achievement Motivation* which proposes that at a basic level, there is a need for achievement and an avoidance of failure. This need is further distinguished into *achievement motives* and *achievement goals*. *Achievement motives* reflect the underlying motives to direct behavior towards or away from positive and negative results.

Achievement goals are cognitive representations which help keep a person focused toward a specific end. *Achievement goals* can be further divided into three types of goals: a performance-approach goal, a performance-avoidance goal, and a mastery goal. A performance goal is when the focus is on the end product or the result of a process, rather than the process itself. Additionally, this focus may be to seek out a positive end result in the case of a performance-approach goal, or to avoid a negative end result in the case of a performance-avoidance goal (Nichols, 1979). A mastery goal or learning goal is when the focus is on the learning acquired during the process, not so much on the end result. These goals are seen to work together to regulate achievement behavior (Elliot & McGregor, 1999).

Also related to the study of motivation are the concepts of *intrinsic* and *extrinsic motivation*. Extrinsic motivation is behavior motivated by a source outside of a person, while intrinsic motivation comes from within the person (Malone & Lepper, 1987). An intrinsically motivated person may be motivated by feeling of enjoyment, a personal challenge represented by the goal, or an attempt to develop expertise associated with an activity. In contrast, an extrinsically motivated person will be motivated by the appetitive aspects associated with external rewards, such as money, grades, and verbal praise.

These types of motivations are similar to past learning theory, which reasoned that organisms were motivated to restore a balance of cell and tissue needs, or by the expectancy of a reward. Hull (1935) was influenced by the concept of homeostasis and proposed a biologically entrenched *Drive theory*. Drive theory works on the assumption that the behavioral costs of an organism results in deprivation. This deprivation creates a need, this need activates a drive, this drive activates goal driven behaviors, and achieving the goal enhances survivability. This model of motivation focused on the presence of a drive, without which the drive behavioral

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responses would not occur (Hull, 1935). Hull's Drive

theory was initially celebrated by many psychologists as a

way to explain motivation, discrimination/generalization,

and variability in learning. However, experimenters had

difficulties in explaining behavior when behavior seemed

to be motivated by other factors than simply deprivation

and cell needs.

Goals, Motivation, and Creativity

A contemporary theory of Hull's Drive theory that

sought to explain the motivations of behaviors was

proposed by Edward Tolman. Tolman, a rival of Hull,

demonstrated that behaviors can occur in the absence of

biological deprivation, and they were instead motivated by

the expectancy of pleasurable or punishing consequences.

Tolman (1955) proposed his model of *Incentive Motivation*

after demonstrating that animals were motivated and

reinforced by the expectancy of a reward, rather than the

reduction of a drive. Two qualities were used to describe

the stimulus: *liking* and *wanting*. Liking is a passive

function that evaluates the stimulus as something as a

reinforcer or a non-reinforcer. The wanting quality is an

active process that motivates or attracts an animal or

person towards a stimulus, which would have varying levels

or attractiveness depending on the type of stimulus and the preference of the organism.

The primary difference between Incentive theory and Drive theory is the nature of the reinforcers that are used. In Drive theory, the process involves negative reinforcement as the body tries to return itself to a state of homeostasis through the removal of strains and punishments associated with cell deprivation. In contrast, Incentive theory involves positive reinforcement, by obtaining a reward which results in the satisfaction of innate, hedonic needs of the organism. These theories have been colloquially termed *push* and *pull theories*, where Drive theory pushes a species to relieve a state, and Incentive theory pulls a species to an attractive reward. Typically researchers in laboratory environments use primary reinforcers, which do not require learning and are inherently rewarding to the organism. In natural settings, these stimuli are often secondary in nature, which are learned, and often include a social component such as money or verbal praise. Successful pairings of these reinforcers with behaviors results in greater rates of behavior and eventually repetitive pairings can result in habits.

Extrinsic motivation is similar to the pull theory, in that the person is attracted to a reward and performs a task in order to achieve the award. Intrinsic motivation is similar to push theory, in that motivation comes from within the person to satisfy their growing sense of achievement or for mere enjoyment. The type of motivation is important for predicting the longevity of a behavior. When a reward is no longer present, an extrinsically motivated person will no longer pursue an activity, but an intrinsically motivated person will continue to pursue an activity even with the absence of an external reward (Lepper & Cordova, 1992; Eisenberg & Shanock, 2003).

Performance goals are reflective of extrinsic motivation and pull theory, in that the person is attracted to the outcome and the secondary reinforcers accompanied with obtaining that outcome. Mastery, or learning goals, are reflective of intrinsic motivation and push theory, in that a person is more attracted to the feelings associated with the activity rather than the outcome. Performance goals are seen to undermine intrinsic motivation by associated perceptions of threat, anxiety, and pressure to perform (Elliot & Harackiewics, 1996). When problems arise for the performance oriented person, they are more likely to give up and display a state

similar to learned helplessness (Elliot & Church, 1997).
Mastery goals promote intrinsic motivation by placing the
focus on the ability to improve. When problems arise for
the mastery oriented person, it is seen as another
challenge and they continue working on the task (Thompson,
Davidson, & Barber, 1995).

Intrinsic motivation has been shown to be highly
conducive to creativity (Amabile 1985; Amabile, Goldfarb,
& Brackfield, 1990; Greer & Levine, 1991), while extrinsic
motivation can result in less creative work and also have
a negative impact on intrinsic motivation (Amabile, 1998).
A previous intrinsically rewarded behavior, once
extrinsically motivated, can result in less creative
performance (Lepper & Greene, 1975). This is of particular
importance because an individual who intrinsically enjoys
and engages in a creative activity will engage in this
activity less frequently if placed on a reward schedule.
While the qualities of extrinsic motivators have been
analyzed through a variety of behavioral and economic
theories, e.g., incentive motivation, prospect theory, and
subjective expected utility model, fewer studies have
investigated intrinsic motivation, the creative spark, and
experiences of creative states or flow (Tolman, 1955;
Kahneman & Tverksy, 1975; Savage 1965). However, rather

than viewing intrinsic motivation and extrinsic motivation as opposites of each other, Deci and Ryan (1985) have proposed that motivation exists on a continuum with intrinsic motivation on one side, amotivation on the other and extrinsic motivation in the middle. Learning environments which encourage mastery tend to foster intrinsic motivation, while environments which encourage performance result in a reduction of motivation and achievement (Barron & Harackiewics, 2001). Motivation can switch between these states, but to avoid states of amotivation, researchers propose that individuals engage in forms of motivation regulation (Ryan & Deci, 2000).

Gender Differences and Creativity

While tests of creativity typically demonstrated equal performance between males and females, a historical difference has been noticed by creativity researchers such that males tend to have a higher representation in Big-C levels of creativity. To explain this paradoxical finding, researchers have examined differences in motivation to explain why this pattern of gender differences has been observed in Big-C (Baumeister, 2007). Some argue that gender differences in representation in the fields of math and science can be attributed to differences in motivation

rather than ability (Eccles, 2005). An overall lower number of interested individuals in the fields of math and science will result in a lower number of extreme individuals. Evolutionary theory has explained differences in motivation to be the result of differences in seeking reproduction. Extreme behaviors among males, such as exploration, risk taking and being creative has been rewarded with increased opportunities to reproduce. On the other hand, conservative behaviors have been rewarded among females since female responsibilities related to reproduction (i.e. pregnancy and childbirth) put the female at greater risk and involve a greater investment of time and energy (Buss, 1989).

Self-Regulation and Manipulation Self-Concept

Self-regulation is the ability to make decisions through self-control provided by executive functions (Vohs et al., 2008). Boekarts, Pintrich, and Zeidner (2000) argue that an individual who is motivated and who can self-regulate is more likely to maintain their motivation to pursue an activity. Self-regulation has been studied in a variety of settings, such as academic and organizational, and has been established as a means of maintaining the pursuit of an activity (Zimmerman, 1989;

Zimmerman & Bandura, 1994; Hong, 1999). However, few studies have been done on self-regulation and creativity.

An individual's motivation to develop mastery or expertise in a creative activity may involve internal *self-monitoring*. Self-monitoring is a process in which an individual evaluates their process or finished performance as satisfactory or as unsatisfactory. For both the mastery and performance oriented person, underperformance in an activity may encourage him or her to try harder or to avoid the task in order to preserve self-esteem/self-concept. Self-concept is a construct that refers to an individual's perception of "self" in relation to various characteristics. Self-concept is also driven from past experience (Bong & Clark, 1999). When presented with a violation or reduction of self-concept, individuals will engage in a variety of behaviors to restore it (Tetlock, Kristel, Elson, Green & Lerner 2000). In contrast, overperformance may cause a person eventually to decline from activities. The overperformance of a task may no longer represent a sufficient challenge to a person's capabilities, and therefore, they may experience boredom (Kellogg, 2006). A task that provides a sufficient challenge is a necessary component of flow, without this optimal level of challenge an individual may lose interest

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or develop performance anxiety (Csikszentmihalyi, 1975; Deci & Ryan, 1985). Additionally, once individuals feel they have performed above and beyond a level usually encountered, they may refrain from future performance (Csikszentmihalyi, 1990). This inflated self-concept can result in decreased drive (Hable, 2009). Without the presence of a new suitable task or challenge for the individual learning a skill, they may reach a state of amotivation.

An important factor to consider when looking at self-regulation is self-concept. An individual may have an imperfect sense of his or her actual abilities (Dunning, Johnson, Ehrlinger, & Kruger, 2003). This has been investigated through a variety of domains, which demonstrates that depending on the task, an individual may have more or less accurate senses of their abilities. For example, college students tend to be more accurate in their assessment of their math or verbal abilities, skills in which they have familiarity. However, when presented with unfamiliar or novel task, students do not know their ability in relation to that task (Kruger & Dunning, 1999). Additionally, performance feedback can create a temporary bias towards an individual's performance (Kim, Chui, & Zou, 2010). Since individuals do not often have an

accurate sense of their own creative abilities, this makes creative self-concept ripe for manipulation.

Self-Efficacy and Moral Regulation

Research conducted on self-efficacy by Bandura (1981, 1982) has demonstrated a positive relationship between engagement in an activity and subsequent motivation for the activity. Bandura explained that as individuals work on an activity, they establish a feeling of esteem, accomplishment, and familiarity with the activity. Self-efficacy has also been linked with perseverance with activities (Bandura, 1977). Perceptions of one's own efficacy affects an individual's judgment toward their performance in comparison to standards or other performance which may be encouraging or discouraging-based on the standards they set for themselves. Individuals with low self-efficacy may become discouraged and lose motivation to pursue an activity when presented with failure while others with high self-efficacy may continue on despite their performances falling short until success is achieved.

This process is occurs through internal comparisons and an individual's interest in pursuing an achievement may be motivated by a perceived discrepancies of their

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current performance compared to their future goal. This temporary state of self-dissatisfaction along with the anticipation of obtaining an achievement creates a heightened sense of motivation and enhanced effort (Bandura, 1978). However, if the performances of an individual consistently do not approximate towards the eventual achievement, then frustration and goal abandonment -may occur (Bandura & Cervone, 1983). This pattern of goal abandonment typically occurs when the standard or achievement is too difficult for the individual. When an individual's performance is moderately distance from the desired goal, then the previously mentioned states of self-dissatisfaction and anticipation are activated (Atkinson, 1964; Lock 1968). This pattern of sustained motivation typically occurs when the standard or achievement is moderately difficult yet attainable for the individual. Finally, when an individual's performance surpasses a personal standard or achievement they create a sense of satisfaction which serves reinforce for future achievements (Bandura & Cervone, 1983). This is pattern achievement seeking behavior is likely to occur with low task difficulty and positive attitudes (Bandura, 1986; Schunk 1991).

Past research on self-efficacy has indicated a trend between personal feelings of esteem and motivation to pursue future goals as well as a trend between failure and goal abandonment. However, current research conducted on moral self-regulation has shown a paradoxical relationship between positive feelings and subsequent motivation. Individuals primed to feel increased states of moral self-worth inhibit prosocial behaviors, whereas persons primed to feel decreased states of moral self-worth promoted prosocial behaviors. It was demonstrated that when participants were instructed to write positive traits about themselves or someone they knew, these participants indicate they would donate less money than participants instructed to write negative traits about themselves or someone they knew (Sachdeva, Illiev, & Medin, 2009). When moral elf-concept is threatened, compensatory behaviors become activated to make up for the loss of value, e.g., moral cleansing. When moral self-concept is praised, however, compensatory behaviors become activated, resulting in people passing on opportunities because they have an excess value, e.g., moral licensing. In other words, an individual may feel excessively satisfied with their self-concept after feeling good about an achievement and decline an opportunity to continue increasing his or

her level of self-concept (Sachdeva, Iliev, & Medin, 2009). It is expected that the manipulation of creative self-concept will provide similar results to those found within the field of moral self-regulation.

Introduction and Purpose

Self-concept has been implicated to be involved motivation specifically through two different models. The self-efficacy model demonstrates that greater feelings associated with an activity will result in increased motivation for that activity in the future. On the other hand, the moral regulation model presents a paradoxical relationship between greater feelings of self-worth and reduced motivation for seeking opportunities for achievements in the future. It is well known that motivation plays a large role in process, persons, and products related to a creative activity and that self-regulation of this motivation is necessary to obtain goals and achievements important to the individual. For example differences in creative motivation have been observed to be a result of differences gender. However, little is known about how the process of self-regulation of motivation specifically occurs among creative activities.

In order to understand the role of motivation and how it functions as a result of self-regulation, the experiment focuses on experimentally manipulating sources of creative self-concept and assessing motivation to determine methods of creative self-regulation. The purpose of this experiment is to explore this balancing act of creative self-concept, creative achievement and the resulting behaviors of motivation, through a true experimental design. Additionally, this research compares two competing explanations for motivation resulting from increased and decreased feelings of self-concept.

This experiment investigates the effects of priming creative self-concept through creative achievement on the maintenance of motivation. Drawing upon previous research on moral self-regulation, a framework suggests that motivation to pursue or not pursue creative activities can result from an internal balancing of self-concept after an appraisal of creative achievement. In other words, an individual will have an opportunity to appraise his or her creative achievement. If an individual feels his or her creative achievement is currently satisfactory and that pursuing an activity will not increase feelings of creative self-concept, then he or she may decline the opportunity. It is expected that the converse will work

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the same way. If a person feels that his or her creative achievement is unsatisfactory and that pursuing an activity may benefit creative self-concept, he or she may engage in or participate in the opportunity.

Hypotheses

There are several hypotheses for the proposed experiment, which examine aspects of the overall relationship individually, and then as a whole.

$H1_a$: Manipulation of achievement is expected to affect motivation/decision making. More specifically, there will be a significant difference in choice of activity as a result of completing an inflated (easy) achievement questionnaire compared to receiving a deflated (hard) achievement questionnaire.

$H1_b$: Manipulations of domain are expected to affect motivation/decision making. In general, it is expected that there will be a significant difference in choice of activity as a result of completing either a creative writing/humor questionnaire, a scientific inquiry/invention questionnaire or a general/academic questionnaire.

H2: Specific manipulations of creative achievement (creating writing/humor and scientific inquiry/inventions)

will result in different choices of activities compared to manipulations of conventional achievement (general/academic).

H3$_a$: A comparison of the top 33% and bottom 33% creative identity scores will result in a difference of motivation/decision making. The specific trends that are expected to be observed will either support the self-efficacy model or the paradoxical moral self-concept model. Specifically, when the bottom 33% of participants are exposed to an easy (inflated) achievement questionnaire, they are expected to favor a same domain task. Additionally, when the bottom 33% are exposed to a hard (deflated) achievement questionnaire, they are expected to favor a different domain task.

H3$_b$: The top 33% of participants when exposed to an easy (inflated) achievement questionnaire will favor a different domain task rather than same domain. Additionally, the top 33% of participants when exposed to hard (deflated) achievement task will favor a same domain task over a different domain task.

H4: It is expected that creative self-identity and gender will function as covariates in predicting choice of activity (art, science, or conventional) using initial group questionnaire completed (easy/hard creative

writing/humor, easy/hard scientific inquiry/inventions, or easy/hard general/academic).

CHAPTER TWO

METHODS

Participants

A total of 274 (77 male, 194 female, and 3 declined
to report) students of California State San Bernardino
University (CSUSB) were recruited from lower division and
upper division psychology courses. Incentive for
participation for the study was 2 extra credit points for
psychological classes. All participants were treated in
accordance with the "Ethical Principles of Psychologists
and Code of Conduct" (American Psychological Association,
1992).

Materials

A Creative Identity Measure was created by adapting
an existing 12 item Multigroup Ethnic Identity Measure
(Roberts et al., 1999). This scale was created by changing
mentions of "ethnic identity" to "creative domain" in
order to measure how individuals valued their creative
identities. The 12 item Multigroup Ethnic Identity Measure
also includes two subscales (affirmation/belonging
subscale, and an exploration subscale), however these were
not related to the central hypothesis and not tested.
Questions were rated on a scale of 1-4 (1 = Strongly

Disagree; 4 = Strongly Agree) e.g., "I have a clear sense of my creative identity and what it means for me" see Appendix A.

Materials included six different surveys to prime for inflated and deflated levels achievement in three different domains of *artistic creativity, scientific creativity,* and *academic/conventional achievement* for the control group (see Figure 1). The use of the control group is to rule out the possibility that appraisal of general/academic achievement will result in increased motivation to perform a creative task.

Creative achievement was operationalized through the modified combination of the Creative Achievement Questionnaire (CAQ) and individually developed items (Carson, Peterson & Higgins, 2005). The CAQ was developed to separate and give weight to different levels of achievement. The CAQ is a self-report 80 item checklist divided into 10 domains of creative achievement in the arts and sciences based on a review of previous literature (Hocevar, 1979; Taylor & Ellison, 1967; Torrance 1972). These domains include visual arts, music, dance, architectural design, creative writing, humor, inventions, scientific inquiry, theatre and film, and culinary arts. Each domain includes a list of rank-ordered items which

are assigned ascending weights from 0 to 7 points. All items have been assessed and weighted based on frequency of being chosen by a sample of gifted university students (N = 120). It has shown an internal consistency as a whole of (α = .96). Convergent validity with three other measures of creative personality was also within accepted limits and finally reliability of the test was shown to be in acceptable ranges (Carson, Peterson, & Higgins, 2005).

Four domains were adapted from the CAQ (Creative Writing, Humor, Inventions and Scientific Discovery) to develop the Creative Writing/Humor Achievement and Creative Science/Innovation Achievement domains. A comparable scale for General/Academic achievement was based on alterations of items from the Student Self-Concept Scale and the Achievement Goal Questionnaire (Finney, Pieper, & Barron, 2004; Young, 1998). Each of the three domains for this study − (Creative Writing/Humor Achievement, Creative Science/Innovation Achievement, General/Academic Achievement) was composed of six middle level achievement questions and an additional six easily obtainable achievement questions for the High Creative Achievement Survey or six rarely obtainable achievements for the Low Creative Achievement Survey and a High Creative achievement survey for a total of 12 items for

each survey (see Appendix B,C,D). The scoring of the tests is not the particular interest of this study, rather these tests are being used as primes to evoke different states of creative achievement.

A sample Unusual Uses divergent thinking item, modeled after those in the Torrance Test of Unusual uses (Torrance, 1966), measured divergent thinking. The prompt "Name as many different possible uses that you can think of for a cup" was used to assess creativity through the frequency of ideas generated by each participant.

All measures and tests were displayed through a computer program written in Python capable of random assignment and storage of inputted data. In addition to the measures and tests, the debriefing statement was also displayed through the computer program (Hetland, 2010).

Procedure

Participants were seated in a computer room with two computers per table for a total of eight available stations. A copy of the informed consent was provided to each participant at their stations. The participants individually agreed to participate in the study by typing "I give my informed consent to participate" on the first screen of the program. After indicating their consent,

participants were asked to indicate their gender through the following options: male, female, or decline to respond.

Participants began the Creative Identity Measure by first responding to indicate the domain they considered themselves to be the most creative in. Following this prompt, participants rated 12 questions regarding their creative identity on a 4 point scale (1 Strongly disagree, 4 Strongly Agree) for a possible range of 12 to 24 points with higher scores representing a stronger creative identity.

Upon completion of the Creative Identity Measure-, participants were be randomly assigned to one of six groups (high achievement creative writing/humor, high achievement scientific inquiry/inventions, high achievement general/academic, low achievement creative writing/humor, low achievement scientific inquiry/inventions, low achievement general/academic). Regardless of the group assigned, each of the 24 achievement questions was presented individually and from order of easiest to most difficult to achieve. High achievement questionnaires would present 12 common items and then move onto 12 moderate items. Low achievement questionnaires used the same 12 moderate items, but also

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include 12 more rate items. Participants were asked to indicate if they had obtained each achievement through a yes or no response. After answering all 24 achievement related questions, each participant was presented with an achievement score which represented the sum of their indicated achievements. Participants were informed of the possible range of scores from 0 to 24 with greater numbers indicating higher levels of achievement.

Participants were then instructed that they were to choose from three brief psychological assessments, a creative writing and humor creativity task, a scientific and inventive creativity task, or a general psychological test of preferences. Regardless of the choice they indicated, all participants were then instructed to complete an Unusual Uses item for one minute. After the time expired on the Torrance Test of unusual uses, participants were then displayed information relevant to their debriefing and thanked for their participation. The participants were informed that the intent of the experiment was to examine the roles that self-concept, achievement, self-regulation, and have on the motivation to engage in creative behaviors.

Statistical Analysis

Verification of the absence of gender differences across the developed Creative Self-Identity measure and the Creative Achievement measures was assessed through the use of an independent samples t test.

All statistical analyses were conducted using the SPSS package with the use of a significance value of $p < .05$. Chi-square test of Independence was used to compare differences in responses based on different levels of the independent variables (easy/inflated sense of achievement vs. hard/deflated sense of achievement and creative domains vs. conventional domains).

A multinomial logistic regression will be used to model data based on the three available responses (creative art task, creative science task, general psychological test of preferences). Multinomial logistic regression does not make assumptions of normality, linearity, or homogeneity of variance, therefore screening the data was not necessary. In this model, exposure to one of the six achievement groups was used as an independent variable. Creative identity scores and gender were used as covariates, as they both have been demonstrated to affect motivation. The Nagelkerke's coefficient (r^2) was used to indicate the percentage of variability of the dependent

variable explained by the significant independent

determinant(s). Additionally, classification accuracy and

odds ratios were used to determine group prediction.

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CHAPTER THREE

RESULTS

A review of the creativity self-identification scores gathered from the 12 item Creative Identity Measure were shown to be normal in shape ($M = 36.22$, $SD = 6.07$) as can be seen in Figure 1. Differences between the hard items and easy items in the experimentally created achievement tests were supported with participants in the easy achievement groups reporting more achievements ($M = 12.35$, $SD = 3.91$) compared to participants in the hard achievement groups ($M = 7.62$, $SD = 5.05$), $t(271) = 8.65$, $p < .05$. There were no significant differences in achievement as a result of gender with males ($M = 37.66$) and females reported similar levels of achievement, $t(269) = -0.78$, $p < .05$, 95% CI [−2.26, 0.97]. To assess the possibility of significant differences in achievement as a result of initial domain a one-way ANOVA was conducted with a Bonferroni post hoc comparison. A significant difference was observed in achievement as a result of initial domain $F(2, 273) = 42.47$, $p < .05$. The Bonferroni pot hoc comparison revealed that creative writing/humor ($M = 8.20$, $SD = 4.53$) and scientific
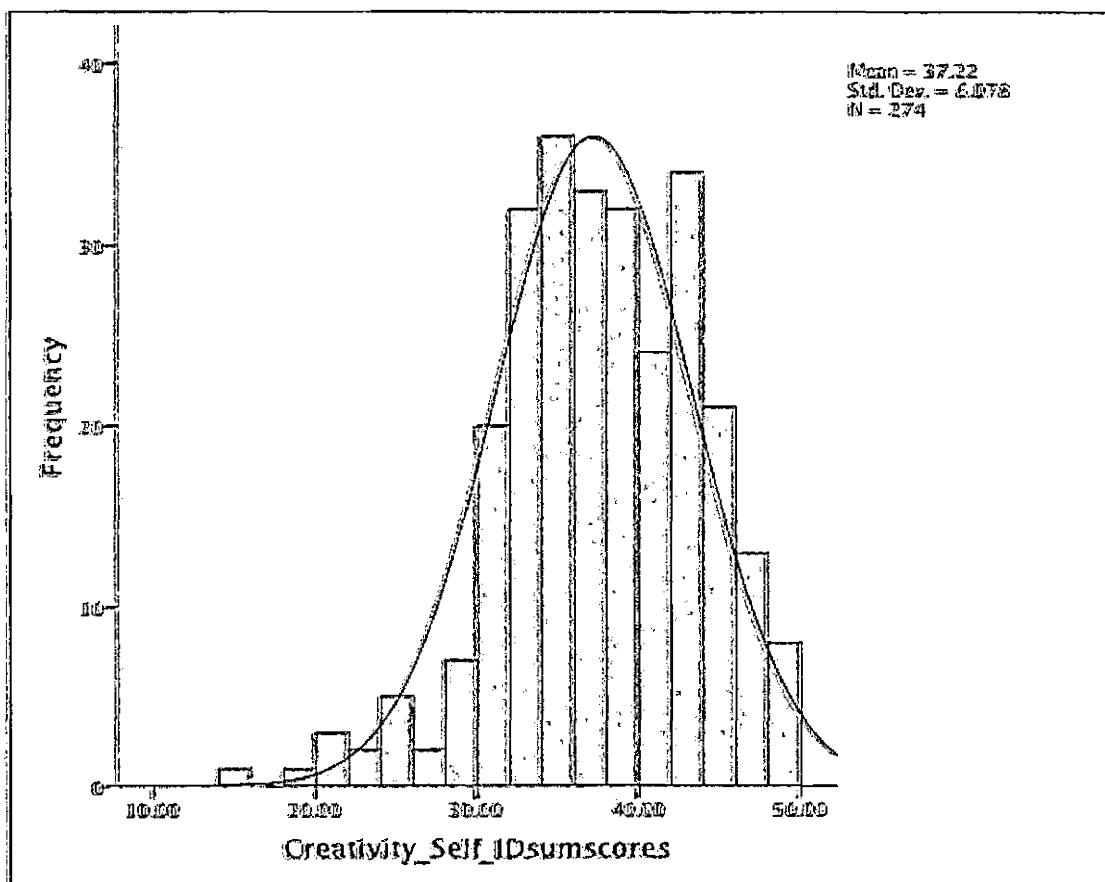
Figure 1. Histogram of Creative Self-Identity Displaying
Normality

inquiry/inventions (M = 8.23, SD = 4.62) having
significantly lower achievements than general/academic
(M = 13.44, SD = 4.21).

H1$_a$: A comparison of the frequency of making a same
domain choice, a creative different domain choice, or a
conventional domain choice by starting in an easy/inflated
achievement group or a hard/deflated achievement group was
conducted. The chi-square test of independence indicated

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that the choice of domain was not associated with either easy or hard achievement group $\chi^2(2, N = 274) = 0.68$, $p < .05$. The results for this finding can be observed in Figure 2.

H1$_b$: A comparison of the frequency of making a same domain choice, a creative different domain choice, or a conventional domain choice by starting in creative writing/humor domain, scientific inquiry/inventions domain or general/academic domain was conducted. The chi-square test of independence indicated that choice of domain was associated with the type of initial domain achievement questionnaire $\chi^2(4, N = 274) = 102.103, p < .05$. A comparison of standardized residuals demonstrates that those initially in the art and science groups most frequently chose a conventional different choice, while individuals who were initially in the general group tended to make a creative different choice, as seen in Table 1 and Figure 3.
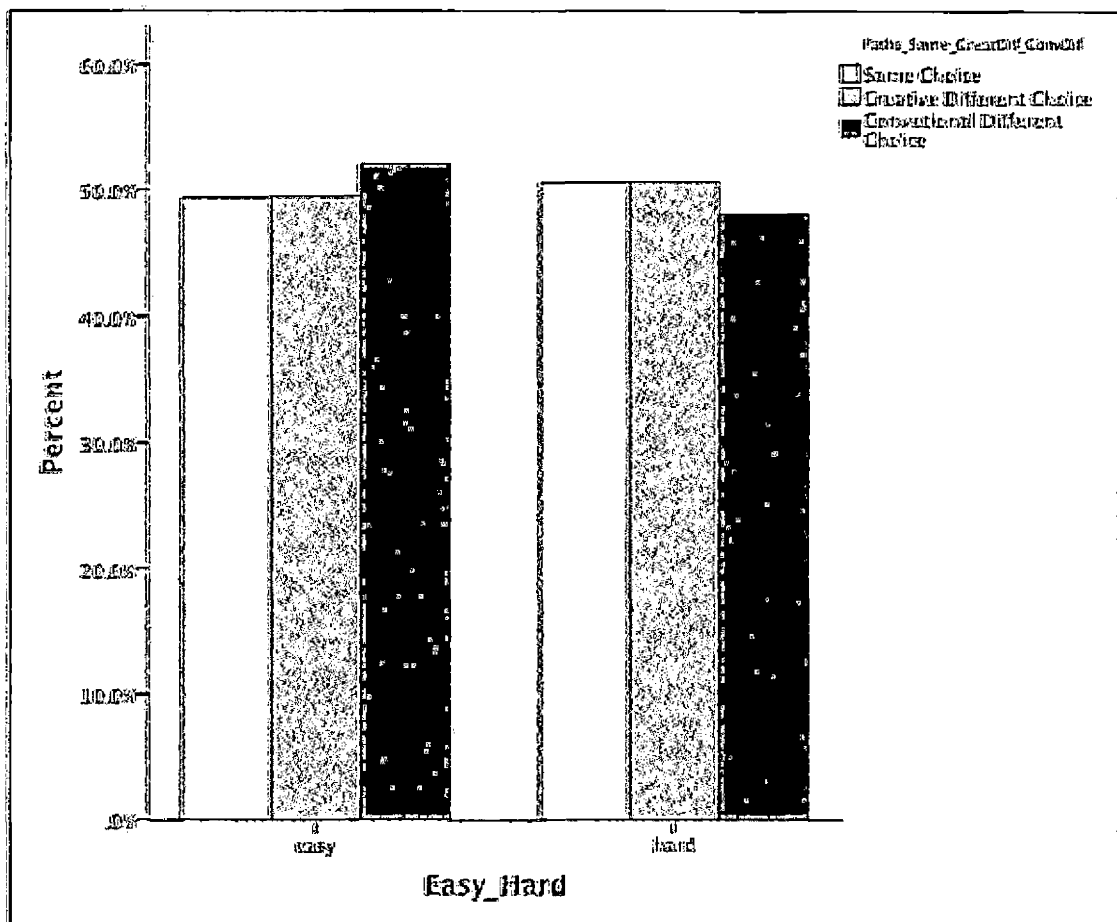
Figure 2. Results of Domain Task Choice after Exposure to Either an Easy or Hard Type of Achievement Questionnaire

H2: A comparison of the frequency of making a same domain choice, or a different domain choice, by starting in creative domain or general/academic domain was conducted. The chi-square test of independence indicated that choice of domain was associated with the type of initial domain achievement questionnaire $\chi^2(1, N = 274) = 14.234, p < .05$ see Figure 4.

Table 1. Standardized Residuals and Counts for H1$_b$

		Same Choice	Creative Different Choice	Conventional Different Choice	Total
Art	Count	32	7	44	83
	Expected Count	26.4	26.4	30.3	83
	Std. Residual	1.1	-3.8	2.5	
Science	Count	11	29	56	96
	Expected Count	30.5	30.5	35	96
	Std. Residual	-3.5	-0.3	3.5	
General	Count	44	51	0	95
	Expected Count	30.2	30.2	34.7	95
	Std. Residual	2.5	3.8	-5.9	
Total	Count	87	87	100	274
	Expected Count	87	87	100	274
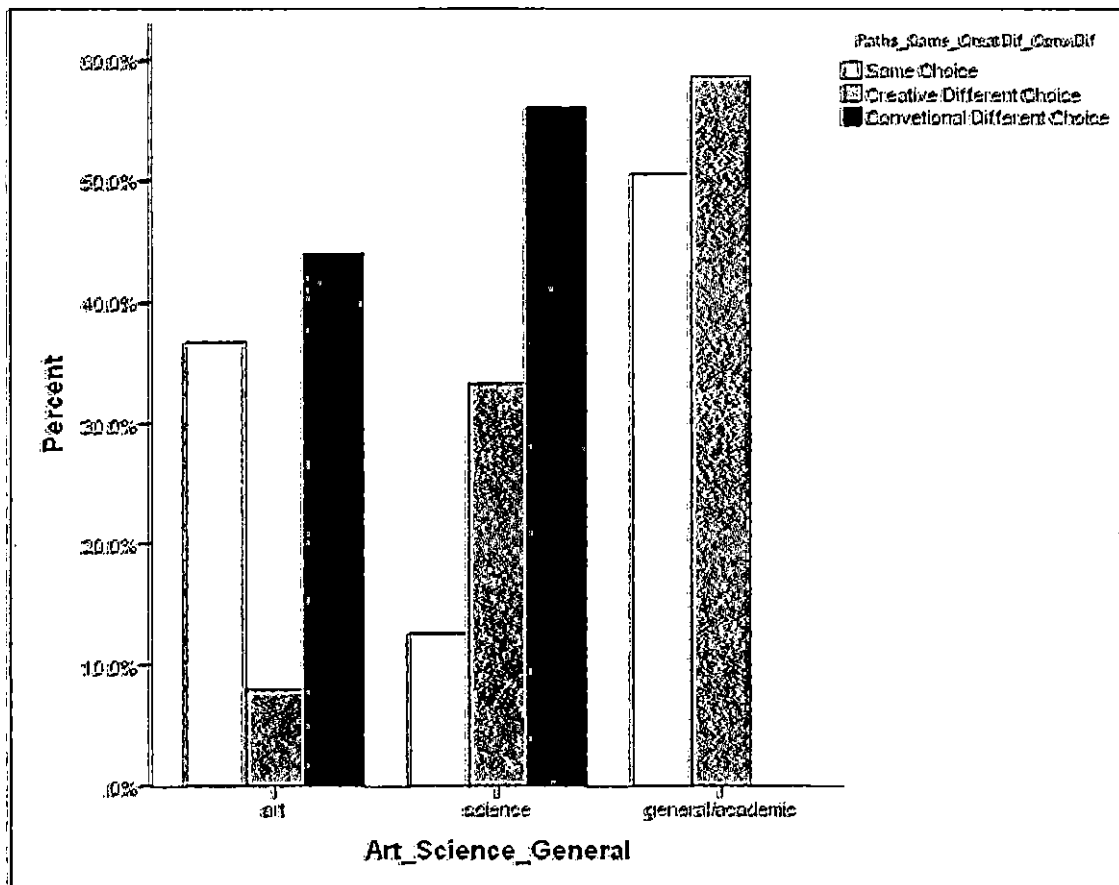
Figure 3. Results of Type of Task Choice after Exposure to Either an Art, Science, or General/Academic Type of Achievement Questionnaire
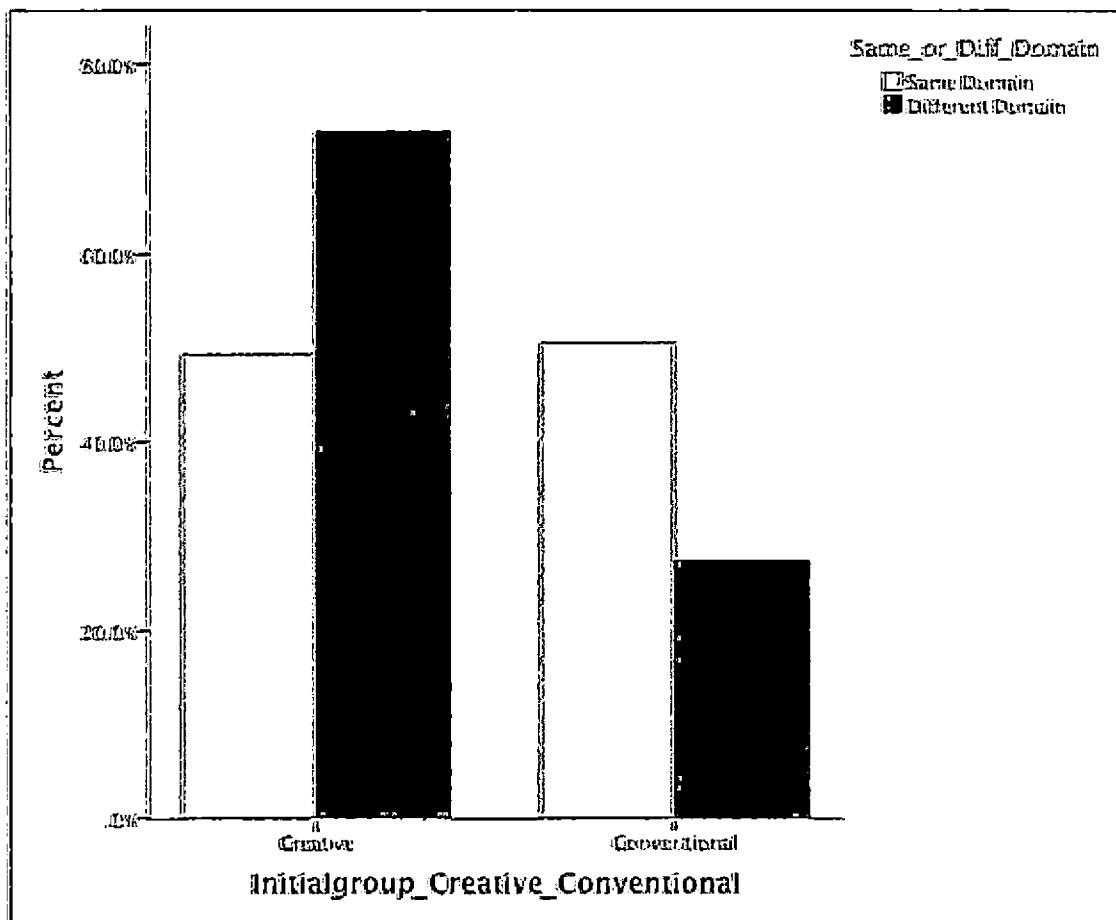
Figure 4. Results of Type of Task Choice after Exposure to Either a Creative or Conventional Type of Achievement Questionnaire

H3$_a$: A comparison of the frequency of making a same domain choice, a creative different domain choice, or a conventional domain choice by starting in creative writing/humor domain, scientific inquiry/inventions domain or general/academic domain was conducted. This analysis was then further divided by selecting participants who had

the top 33% of creative self-identity scores and the bottom 33% of creative self-identity scores. The chi-square test of independence indicated that choice of domain was associated with the type of initial domain achievement questionnaire for participants with the top 33% of creative self-identity scores $\chi^2(4, N = 149) = 53.672, p < .05$ as well as participants for with the bottom 33% of creative self-identity scores $\chi^2(4, N = 125) = 54.041, p < .05$. The standardized residuals demonstrate a significant trend of a science-phobic response, with many participants avoiding this response. Additionally, participants with high creative self-identity significantly preferred a creative different choice see Figure 5 and Table 2.

H3$_b$: A comparison of the frequency of making a same domain choice, or a different domain choice by starting in easy/inflated or hard deflated achievement group was conducted. This analysis was then further divided by selecting participants who had the top 33% of creative self-identity scores and the bottom 33% of creative self-identity scores. The chi-square test of independence indicated that choice of similar or different domain was not associated with the type of initial easy or hard achievement questionnaire for participants with the top

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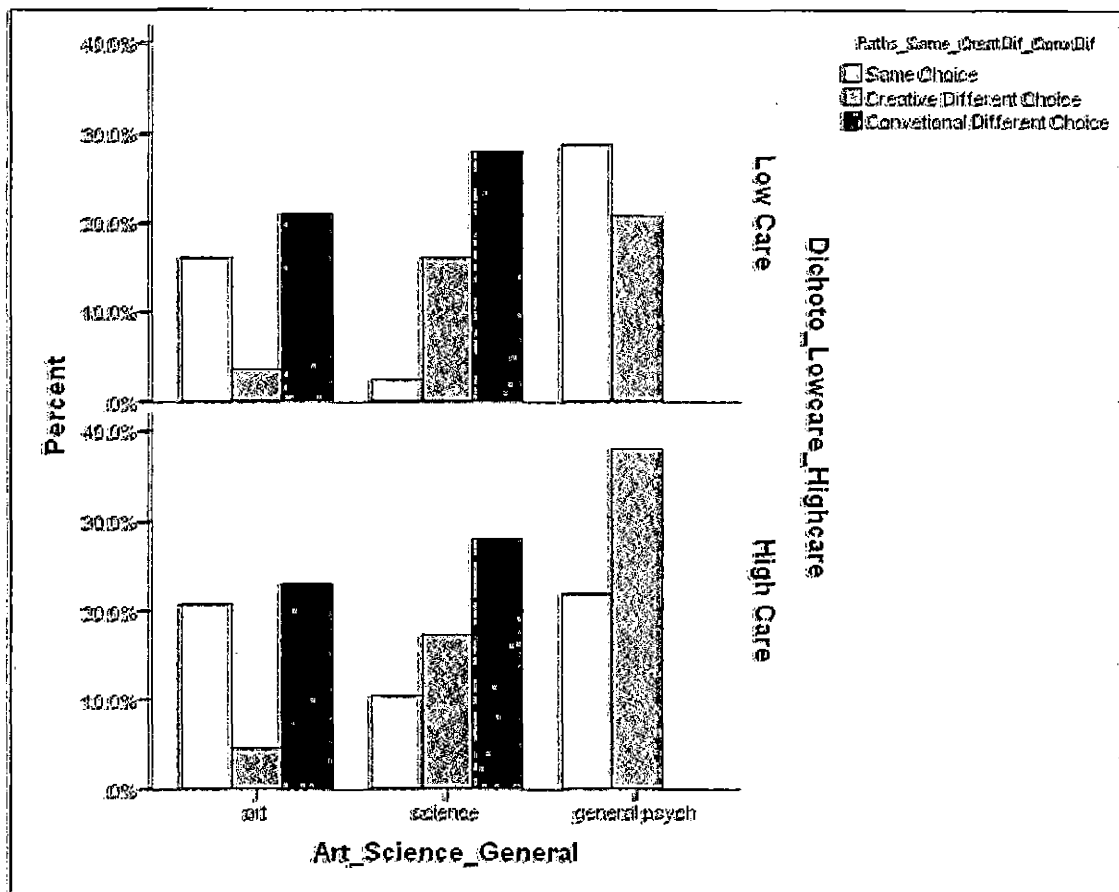
Figure 5. Differences between High and Low Creative Self-Identities and Type of Task Choice after Exposure to Either a Creative or Conventional Type of Achievement Questionnaire

33% creative self-identity scores ($\chi^2(2$, $N = 274) = 0.89$, $p > .05$) or participants for with the bottom 33% of creative self-identity scores ($\chi^2(2$, $N = 274) = 0.31$, $p > .05$) see Figure 6.

Table 2. Standarized Residuals and Counts for H3$_a$

			Same Choice	Creative Different Choice	Conventional Different Choice	Total
Low Care	Art	Count	14	3	21	38
		Expected	12.5	10.6	14.9	38
		Std. Residual	0.4	−2.3	1.6	
	Science	Count	2	14	28	44
		Expected	14.4	12.3	17.2	44
		Std. Residual	−3.3	0.5	2.6	
	General	Count	25	18	0	43
		Expected	14.1	12	16.9	43
		Std. Residual	2.9	1.7	−4.1	
	Total	Count	41	35	49	125
		Expected	41	35	49	125
High Care	Art	Count	18	4	23	45
		Expected	13.9	15.7	15.4	45
		Std. Residual	1.1	−3	1.9	
	Science	Count	9	15	28	52
		Expected	16.1	18.1	17.8	52
		Std. Residual	−1.8	−0.7	2.4	
	General	Count	19	33	0	52
		Expected	16.1	18.1	17.8	52
		Std. Residual	0.7	3.5	−4.2	
	Total	Count	46	52	51	149
		Expected	46	52	51	149

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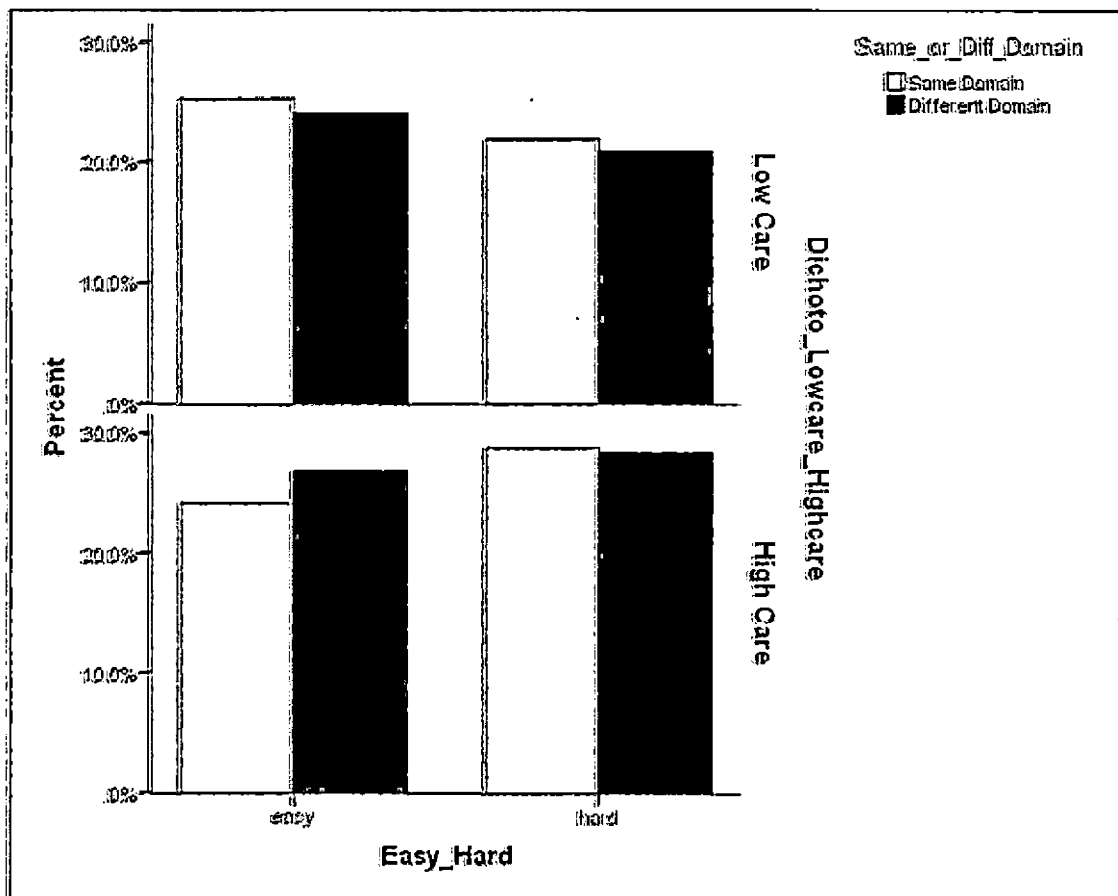
Figure 6. Differences between High and Low Creative Self-Identities and Type of Task Choice after Exposure to Either an Easy or Hard Type of Achievement Questionnaire

H4: A multinomial logistic regression was performed to assess the impact of initial group on the likelihood that participants would choose and creative art task, a creative science task or a general psychological test of preferences. The model contained three independent variables (creative self-identity scores, gender, and initial group). The full model containing all predictors

was statistically significant χ^2 (14, N = 274) = 30.35, p < .05, indicating that the model was able to distinguish between participants who choose a creative art task, a creative science task, or a general psychological test of preferences. The model as a whole explained between 12.4% (Nagelkerke R squared) and 10.6% (Cox and Snell R squared) of the variance in task choice, and correctly classified 57.2% of cases. There were differences in classification accuracy among the three task choices with conventional having the highest accuracy and science having no successful identification at all. See Table 3 for information regarding the classification table outcomes. Only one of the independent variables made a unique statistically significant contribution to the model (gender χ^2 (2, N = 271) = 12.16, p < .05.

Table 3. Classification Outcomes for H4

| | Classification Predicted | | | |
Observed	Art	Science	Conventional	Percent Correct
Art	30	0	66	31.30%
Science	12	0	20	0.00%
Conventional	18	0	125	87.40%
Overall Percentage	22.10%	0.00%	77.90%	57.20%

The strongest predictor of choosing a creative art task was gender, recording an odds ratio of 2.07. This indicated that males were 2 times more likely to choose a creative artistic task over a general psychological test of preferences than females, controlling for all other factors in the model. The strongest predictor of choosing a creative science task was gender, recording an odds ratio of 3.82. This indicated that males were almost 4 times more likely to choose a creative scientific task over a general psychological test of preferences than females, controlling for all other factors in the model.

H5: An additional hypothesis was created based on the results from hypothesis H3a which demonstrated a trend among participants with high levels of creative self-identity to choose a conventional task when exposed to a creative achievement questionnaire and to choose a creative task when exposed general/academic achievement questionnaire. A comparison of frequency of making creative choices or conventional choices was than conducted based on exposure to a creative or general achievement questionnaire. This was further divided among the highest and lowest 33% of creative self-identity. The chi-square test of independence indicated the choice of creative or conventional domain was associated with type

of initial creative or general/academic achievement questionnaire for participants with the top 33% creative self-identity scores (χ^2 (1, N = 175) = 3.88, p < .05) but not among participants with the bottom 33% of creative self-identity scores (χ^2 (1, N = 175) = 0.86, p > .05) see Figure 7. The difference in standardized residuals among participants with the highest 33% of creative self-identity in the conventional group and the creative group demonstrates a difference in behavior trends see Table 4.
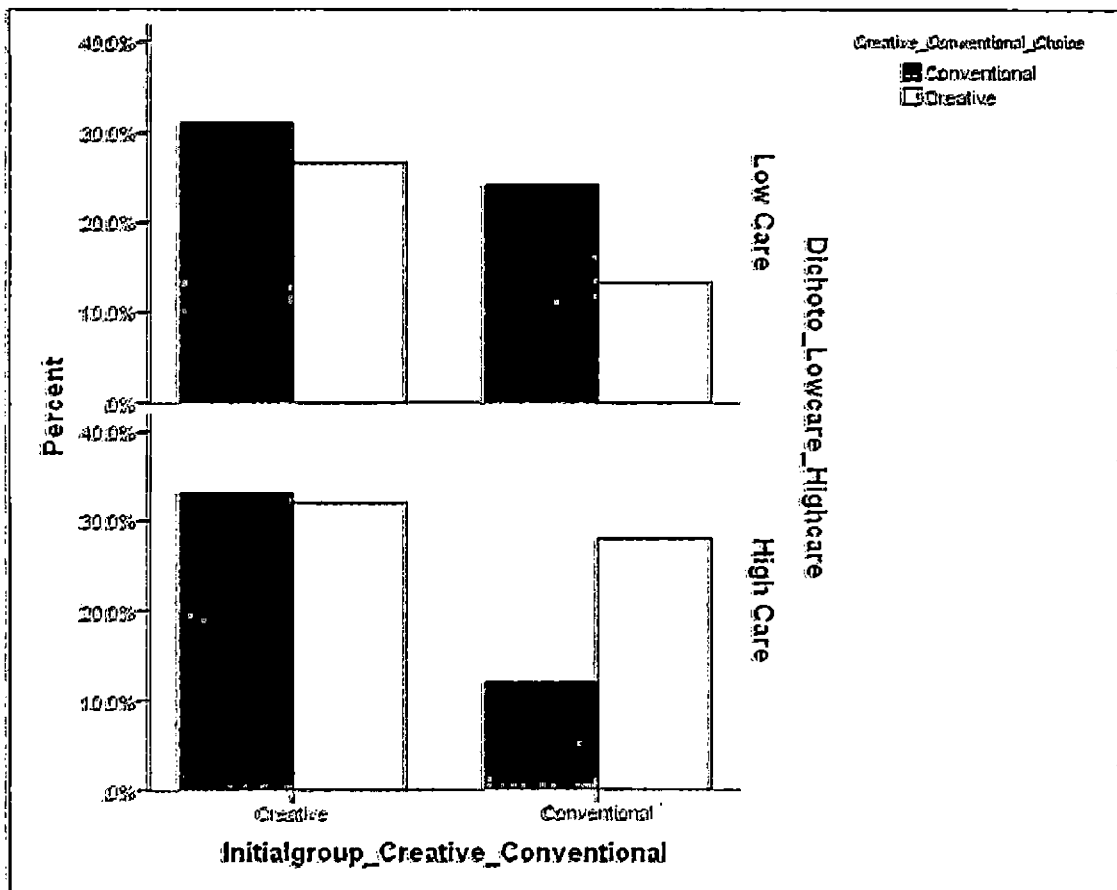
Figure 7. Differences between High and Low Creative
Self-Identities and Type of Task Choice after Exposure to
Either a Creative or Conventional Type of Achievement
Questionnaire

Table 4. Standardized Residuals and Counts for H5

			Choice		
			Conventional	Creative	Total
Low Care	Creative	Count	31	20	51
		Expected Count	33	18	51
		Std. Residual	−0.3	0.5	
	Conventional	Count	24	10	34
		Expected Count	22	12	34
		Std. Residual	0.4	−0.6	
	Total	Count	55	30	85
		Expected Count	55	30	85
High Care	Creative	Count	33	24	57
		Expected Count	28.5	28.5	57
		Std. Residual	0.8	−0.8	
	Conventional	Count	12	21	33
		Expected Count	16.5	16.5	33
		Std. Residual	−1.1	1.1	
	Total	Count	45	45	90
		Expected Count	45	45	90
Total	Creative	Count	64	44	108
		Expected Count	61.7	46.3	108
		Std. Residual	0.3	−0.3	
	Conventional	Count	36	31	67
		Expected Count	38.3	28.7	67
		Std. Residual	−0.4	0.4	
	Total	Count	100	75	175
		Expected Count	100	75	175

CHAPTER FOUR

DISCUSSION

Overall, the results of this study partially

supported the hypotheses choice of tasks would be affected

by type of initial achievement group and personality

variables.

Hypothesis 1a: Manipulation of Levels of
Achievement (Easy versus Hard) and
Decision Making (Same, Creative
Different, Conventional
Different)

The first hypothesis was that exposure to different

achievement questionnaires would result in different

patterns of choices for similar domain activities,

creative different activities or conventional different

activities was not supported. It would appear that the

manipulation of an individual's perception of their

achievement did not occur. While a statistical difference

was observed between the easy and hard achievement scores,

this did not translate into an actual difference in

perception of achievement. Since the manipulation of

achievement for both the hard and easy groups resulted in

only an achievement sum score and a range, my attempt at

an implicit manipulation of achievement may have not been

effective without providing a comparison to a peer group's level of achievement.

Bandura and Cervone (1983) state in reference the self-evaluative process of evaluating one's performance, that the activation of this process requires knowledge of personal standards and level of performances of others. Without this knowledge there is no basis for "self-evaluative reactions" and no motivation to change. This statement certain is reflected in the data comparing easy and hard achievement groups with difference of choice. The relatively equal dispersion of choice based on this variable reflects a lack of ability to compare the obtained achievement score to anything and thus the lack of corresponding motivation to either improve or decline from any specific domain of activity. However, now having conducted the experiment I have average achievement scores for each that could be used to provide a meaningful reference point to attempt a manipulation of achievement in the future.

Hypothesis 1b: Manipulation of Domains (Creative
Writing, Science, General) and Decision
Making (Same, Creative Different,
Conventional Different)

The second component of the first hypothesis was that exposure to different domain of questionnaires would

result in different patterns of choices for similar domain activities, creative different activities or conventional different activities. This hypothesis was supported. The manipulation of type of domain of questionnaire that my participants received did cause a motivational difference in choice of task. For example, participants who received the creative writing/humor achievement questionnaire choose a creative art task or general psychological test of preferences more often than a creative science task.

The participants who received the scientific inquiry/inventions achievement questionnaire most frequently chose the general psychological tests of preferences least frequently chose to partake in a creative science task. Finally, the participants who received the general/academic achievement questionnaire choose the psychological test of preferences at a similar rate to either of the creative domain tasks. The pattern of choices from the science domain seems to reflect an exodus of participants who were motivated to choose something potentially easier. The pattern of choices from the creative writing/humor domain seems to reflect an aversion to choosing a creative science approach, while the pattern of choices from the general academic domain seems to reflect no particular preference or motivation.

These patterns of choices seem to reflect a difference in perspective of artistic creativity and scientific creativity. A meta-analysis of personality factors of artists, non artists, scientists, non scientists and creative personalities was conducted by Feist (1998) who demonstrated differences in personality traits of scientists and artists. One of the observed differences was that artists tended to have more affective traits (anxious or sensitive) while scientists tended to have more social traits (dominant, autonomous, introverted). A possible personality difference in students who may be artistically inclined versus scientifically inclined may be an additional factor in choice of task that was not accounted for by this study.

Hypothesis 2: Manipulation of Domain (Creative versus Conventional) and Decision Making (Same or Different Domain)

The second hypothesis was an exploration of the different effects that creative domain achievement questionnaires would result in making different decisions than exposure to the conventional achievement questionnaires. This hypothesis was supported with participants who initially received a creative domain questionnaire to frequently choose a different domain task

rather than a same domain task. The participants who received the conventional domain questionnaire did not seem to differ in their preference of same or different domains of choices. A possible explanation for this finding is that exposure to creative domains may prime individuals to try something different. This explanation does have to considered with caution however, because the decision to choose something different does not necessary reflect a motivation to try something creative, but may include something conventional as well.

Hypothesis 3a: Highest Creative Identities versus
Lowest Creative Identities, Manipulation of
Achievement (Creative Writing, Scientific,
or General) and Decision Making (Same,
Different Creative, or Different
Conventional)

The first component of the third hypothesis was an exploration of the difference of decisions made between participants with the highest 33% and lowest 33% creative identity scores. Differences in tasks chosen were observed among the highest 33% and the lowest 33%, but more interesting is the change of patterns of choice among individuals who received the general/academic achievement questionnaire. Specifically, participants with the highest 33% creativity self-identity scores who started out with the general/academic achievement questionnaire have an

opposite pattern of choice than the lowest 33% of creativity self-identity scores. These participants had chosen a creative different domain task more frequently than repeating with a conventional task. The opposite trend was identified among participants with the lowest 33% creativity identity scores who started out with the general/academic achievement questionnaire (both easy or hard) had chosen a same domain task more frequently than a creative different domain task.

This pattern of differences for the control group would suggest that increased creative self-identity leads to seeking more creative opportunities when presented with conventionality. The participants who started out with a creative achievement questionnaire (either creative writing or science) most frequently chose a conventional task with no differences in trends observed when looking at participants with the highest 33% of creative identity scores versus the lowest 33% of creative identity scores. This pattern of similarities for the experimental creative groups would suggest that creative achievement may satisfy the motivation to seek additional creative opportunities (creative satiation) while conventional reflection may drive motivation to seek additional creative opportunities (creative deprivation). This finding created the impetus

for Hypothesis 5, which investigated this finding even closer.

Hypothesis 3b: Highest Creative Identities versus Lowest Creative Identities, Manipulation of Achievement (Easy versus Hard) and Decision Making (Same Domain, or Different Domain)

The second component of the third hypothesis was also an exploration of the difference of decisions made between participants with the highest 33% and lowest 33% creative identity scores. Differences in tasks chosen were not observed among the highest 33% and the lowest 33%. Whether receiving a easy or hard achievement test, the pattern of decision making was the same among participants with the highest and lowest 33% creativity scores. The decision to choose a different domain task than the initial achievement questionnaire received was observed more frequently than the decision to choose a same domain task.

Once again this speaks to the resilience of attempts to manipulate perceptions of achievement. The combined effort of an individual's value of their creative identity combined with manipulation of perceived achievement did not affect an individual's motivation for seeking similar opportunities or novel opportunities. Rather participants

were motivated to seek novel opportunities over similar opportunities.

Hypothesis 4: Gender and Creative Self-Identity will Aid in the Prediction of Choice of Activity (Creative Art, Creative Science, or Conventional) Based on Initial Achievement Questionnaire (Easy/Hard Creative Writing/ Humor, Easy/Hard Scientific Inquiry/Inventions, or Easy/Hard General/ Academic)

The fourth hypothesis tested whether gender and creative self-identity would assist in the prediction of choice of task based on the initial achievement questionnaire received. The results from the multinomial regression revealed a significant model with the variables predicting approximately 10-12% of the variability in task choice. However further inspection demonstrated that gender was the only significant factor in this model. Males were demonstrated to be twice more likely to choose a creative artistic task over a conventional task than females. Additionally, males were indicated to be approximately 4 times more likely to choose a creative scientific task over a conventional task than females, controlling for all other factors in the model. Creative self-identity did not affect task choice in this model as predicted. Additionally, initial group did not serve as significant predictors in this model.

The finding regarding gender fits with previous findings regarding differences in creative motivation (Baumeister, 2007; Buss, 1989; Eccles, 2005). Males have been demonstrated to have higher rates of risk taking (Byrnes, Miller, & Shafer, 1999), higher rates of sensation seeking (Arnett, 1994), and higher rates of novelty seeking (Becker, Laucht, El-Faddagh, & Schmidt, 2005). These observed gender differences in creative motivation agree with past findings along with differences in risk taking and sensation seeking may help explain the differences of representation in Big-C levels of creativity. The finding regarding creative self-identity was surprising since caring about one's creative identity was thought to be a motivating factor in regards to the pursuit of obtaining creative achievements. However as mentioned earlier, it may be the case that a domain exposure created a form of satiation which resulted in the greater amounts of different-domain choices observed. Due to the paucity of research in the area of creative self-identity, it is necessary to explore additional manipulations of this construct to examine its relationship with creative motivation.

The finding that initial group did not serve as a significant predictor is in agreement with the previously

tested hypotheses and suggests that achievement is a particularly resilient construct to manipulate. The classification table demonstrated that the group with the highest correct prediction was the conventional task followed by the creative art task.

> Hypothesis 5: Highest Creative Identities versus
> Lowest Creative Identities, Manipulation of
> Achievement (Creative or General) and
> Decision Making (Creative Domain,
> or Conventional Domain)

The fifth hypothesis further tested an observed trend from hypothesis 3b. Specifically the fifth hypothesis tested whether or not exposure to conventional tasks (general/academic achievement questionnaire) would result in different choices of behavior among participants with the top and bottom 33% of creative self-identity. Although the findings from previous hypotheses did not support either a Bandura model of motivation or the paradoxical model of self-regulation, the role of the achievement questionnaire when considered as a means of self-reflection, can be used to support a similar motivation model to the paradoxical model.

The achievement questionnaires allow participants to self-reflect upon their past levels of creative achievement and an interesting trend has been

differentiated among those who value their creative identities and those who do not. Among participants who value their creative identity and are exposed creative self-reflection, the motivation to pursue subsequent creative behaviors is appeased rather than spurred on. On the other hand, when participants who value their creative identity are prompted to reflect upon general/academic achievement and then have the opportunity to choose between a conventional and creative task; these individuals are motivated to seek oppurtunities for creativity. The immediate self-feedback of a creative self-reflective experience appears to satiate the drive for flexing one's creative muscles, while the deprivation of creativity results in a stronger urge to pursue the immediate chance to engage in a creative activity.

The difference in motivation between the participants with the lowest and highest creative self-identity scores is that the lower score individuals have a smaller threshold of creative satiation, and higher score individuals will seek to relieve creative deprivation. Sachdeva, Iliev, and Medin (2009) described moral self-regulation as a regression to the mean. When moral self-concept had been inflated, participants would engage in fewer moral behaviors having felt satisfied. On the

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other hand, when moral self-concept had been threatened, participants would engage in greater rates of moral behaviors to atone. Similarly, individuals who value creativity engage in creative self-reflection they may potentially exceed their baseline for creative motivation. On the other hand when individuals who value creativity have not had opportunities to be creative may experience a decrease below their baseline for creative motivation. The subsequent behavior is a reflection of self-regulating this perceived changes in baseline.

Limitations

There are several limitations that influence the interpretation of the results. Although great efforts were made to recruit from general requirement classes, a majority of participants were undergraduate psychology students which may have affected the large pool of participants who chose the general psychological test of preferences. While this large pool of decisions may reflect that a sample of mostly psychology students prefer to do psychological tasks and avoid creative scientific tasks, it should be noted that participants were primed to identify a particular domain/area they felt most creative during the creative self-identity questionnaire. When

looking at the responses for type of creative domain/area, no participants reported feeling the most creative in the domain of psychology, which offers some support that the general test of psychological preferences functioned as a conventional category.

Another potential limitation was the group testing format. Participants worked at desks arranged with two computers per desk. Although great efforts were taken to only activate one computer per desk to run the program, sometimes there were difficulties with the computers in the laboratory that necessitated two active computers at the same desk. While participants worked adjacently to each other on the questionnaire, it may be possible that responses of one participant could have affected the others. When it was necessary to have participants work at two adjacent computers at the same desk, participants were informed to only look at their monitor and wait for both participants to finish before leaving the laboratory.

Problems with the achievement manipulation could also be a manipulation to this study. While the different domain achievement questionnaires were shown to have different effects on creative motivation/decision making, the attempts to manipulate achievement based on taking a easy or hard questionnaire did not work. As stated

previously, without a point of reference to make an internal comparison there is no motivation for change. While I did provide an achievement score which represented the participant's number of indicated achievements and the possible range, a more meaningful form of feedback would have an achievement score with a mean achievement score.

As stated previously, achievement may be a resilient construct to manipulate, and perhaps a manipulation of creative performance would have been a better choice. It has been stated this resilience necessitates additional criteria in order to infer causality. For example it has been suggested that self-concept and achievement should be measured multiple times, inferred on the basis of multiple indicators, and include a large and diverse sample (Marsh, 1993; Marsh, Byrne, & Yeung, 1999). While measures of creative self-identity achievement and a creative performance task were included in this study, perhaps an additional brief post-test measure of creative self-identity would assist with an explanation of the findings beyond the inference of creative motivation and serve as a manipulation check.

While many studies have examined feedback on creative performance, the intent of this study was to examine how individuals examined their personal history of

achievements and the effect of this examination on motivation for obtaining additional creative achievements. A manipulation of performance may have affected immediate decision making without a specific reference to an individual's history of performance. Evidence exists that suggests that the self-regulatory processes used by individuals to make decisions are largely unconscious and automatic (Bargh & Cartrahnd, 1999). This process leads individuals to becoming governed by self-regulatory habits developed earlier in life. Despite the influence that this automatic self-regulation has on individuals in regard to personal beliefs about efficacy, it is still possible to influence decision making by providing external feedback (Pajares, 1996; Pajares, & Valiante, 1997). In the future it may be possible to compare the efficacy of manipulating creative achievement feedback compared to manipulating creative performance feedback now that I have group means for both constructs.

Future Directions and Recommendations

The results of this study indicate that priming individuals to think about certain domains of achievement will influence behavior to choice between creative and conventional tasks. Since there was a large response to

the general psychological tests of preferences, a
different category should be created especially
considering the participant sample. Additionally, it may
be possible to see if participants would be willing to
choose from a fourth option "No task, but wait". The
addition of this measure would create a possibility of
assessing amotivational states as well.

Attempts to prime individuals to feel inflated or
deflated states of achievement were unsuccessful and
warrants additional research to understand how to achieve
a successful manipulation. Additionally, now that a sample
of data has been collected it is not possible to supply
averaged scores for points of comparison. As stated
previously, it would be possible to compare the efficacy
of performance manipulation versus achievement
manipulation (via bogus feedback). Bogus feedback has been
indicated to be a functional manipulation of performance
on IQ tests, which indicates this manipulation should also
work with creative performance (Baumeister, Twenge, &
Nuss, 2002).

Additionally, since gender functioned as the best
indicator of motivation, it would be interesting to
incorporate additional personality measures as covariates.
Research has demonstrated personality differences between

artists and scientists (Burch, Pavelis, Hemsley & Corr, 2006; Feist, 1993, 1998). Recent research by Silvia, Kaufman, Reiter-Palmon, and Wigert (2011) has demonstrated that certain patterns of personality factors may explain observed differences of attraction to creative fields.

Finally, the programming language Python functioned successfully for the purposes of random assignment and data collection. Current commonly available software is capable of data collection (e.g. *Survey Monkey*), however current software with the capabilities for random assignment is rare. Python is a easily understandable computer language which is capable of accomplishing both tasks and has small storage space making it useful for data collection on multiple computer stations.

Conclusion

The goal of testing whether individuals a self-efficacy model or paradoxical model of self-regulation (Sachdeva, Iliev, & Medin, 2009) was somewhat unsuccessful due to the limited manipulation of perceptions of achievement. However, the results from the current study provide the necessary information to achieve successful manipulations for future studies. Although the process of creative motivation still warrants additional

research, the current findings regarding personality differences affecting motivation are in agreement with previous literature. Perhaps the most interesting finding of the current study is the successful creation of a creative self-identity scale as well the successful modification of the CAQ to examine lower and higher levels of achievement.

APPENDIX A

CREATIVE SELF-IDENTITY QUESTIONNAIRE

Creative Self-Identity Questionnaire

Instructions: Many individuals feel creative in a particular domain < such as visual arts, music, dance, individual sports, team sports, architectural design, entrepreneurial ventures, creative writing, humor, inventions, scientific inquiry, culinary arts, theatre and film>. The following 12 questions are about your own creative identity within a domain and how you feel about it or react to it.

I consider myself to be most creative in the area of _____

Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4

1. I have spent time trying to find out more about this creative area, such as its history, traditions, and methods.

2. I am active in organizations or social groups that include mostly members who consider themselves creative.

3. I have a clear sense of my creative identity and what it means for me.

4. I think a lot about how my life will be affected by being creative.

5. I am happy that I am creative in the area of my interest I belong to.

6. I have a strong sense of belonging and being creative in my area of interest.

7. I understand pretty well what my creative identity means to me.

8. To learn more about my creativity, I have often talked to other people about my area of interest.

9. I have a lot of pride in my creative accomplishments in my area of interest.

10. I participate in activities within my creative area of interest, such as special events, sessions, or meetings.

11. I feel a strong attachment towards my own creative area of interest.

12. I feel good about my creative identity.

Developed by Roberts, R. E., Phinney, J. S., Masse, L. C., Chen, R., Roberts, C. R., & Romero, A. (1999). The structure of ethnic identity of young adolescents from diverse ethnocultural groups. *The Journal of Early Adolescence, 19*, 301-322.

APPENDIX B

CREATIVE WRITING/HUMOR ACHIEVEMENT QUESTIONNAIRE

Creative Writing/Humor Achievement Questionnaire

Low Creative:

I do not have training or recognized talent in this area.

I have thought about possible stories to write about.

I have imagined about plots, settings, and characters.

I have talked to another person about a story I imagined.

I have watched a program or read an article about creative writing.

I have written in my spare time.

Mid Creative:

I plan to further develop one of my ideas through creative writing.

I have written an original short work (poem or short story).

I have participated in a workshop for creative writing.

I have written an original long work (epic, poem, novel, or play).

I have posted one of my original projects on a website.

I have won a local award or prize for one of my written stories.

High Creative:

I have independently published my own work.

I have sold my work to a publisher.

My work has been printed and sold publicly.

My work has been reviewed in local publications.

My work has been reviewed in a national publication.

I have received an award for my writing from a national organization.

Low Humor:

I do not have training or recognized talent in this area.

I have often thought about how things could be humorous.

I have thought about making jokes based on everyday experiences.

I have told jokes to people I know.

I have watched a program or read an article about humor.

People have often commented on my original sense of humor.

Mid Humor:

I have entertained others with jokes and humor.

I have created jokes that are now regularly repeated by others.

I have written jokes or cartoons and shared them with others.

I have performed in front of an audience using jokes and humor.

I have written jokes for other people for money.

I have received an award for a comedic performance.

High Humor:

I have written a joke or cartoon that has been published.

I have performed at a professional venue.

I have worked as a professional comedy writer.

My humor has been recognized/reprinted in a national publication.

I have toured the country as a professional comedian.

I have been cast in a movie or television for my comedic endeavors.

Adapted by Ryan Holt

APPENDIX C

CREATIVE SCIENTIFIC INQUIRY/INVENTIONS

ACHIEVEMENT QUESTIONNAIRE

Creative Scientific Inquiry/Inventions Achievement Questionnaire

Low Science:

I do not have recognized talent in this area.

I have thought about possible ways to solve problems.

I have imagined how to utilize science.

I have talked to another person about science.

I have watched a program or read an article about science.

I regularly find ways to use the scientific method in my daily life.

Mid Science:

I plan to investigate the science behind how something works.

I have researched about a scientific topic.

I have written a paper about a scientific topic.

I have worked with laboratory equipment for a scientific project.

I have won a prize at a science fair or other local competition.

I have received a scholarship based on my work in science ore medicine.

High Science:

I have presented a poster of my findings at a scientific convention.

I have been an author or coauthor of a study published in a scientific journal.

I have won a national prize in the field of science or medicine.

I have received a grant to pursue my work in science or medicine.

My work has been cited by other researchers in scientific publications.

I have been recognized for my scientific contributions by a national or world-wide committee.

Low Invention:

I do not have recognized talent in this area.

I have thought about possible inventions to make my life easier.

I have imagined how to improve an existing object.

I regularly find novel uses for household objects.

I have watched a program or read an article about creating inventions.

I have thought about building something based on a design I created.

Mid Invention:

I plan to work on creating something based on a design I created.

I have sketched out an invention that I had thought of.

I have worked on fixing design flaws on an invention I thought of.

I have built a prototype of one of my designed inventions.

I have created original software for a computer.

I have created and updated an existing prototype or software.

High Invention:

I have received recognition among my peers for an invention I have created.

I have been able to sell my inventions.

I have received recognition in the press for an invention I have created.

I have received a patent for one of my inventions.

I have sold one of my inventions to a company or manufacturing firm.

I have been contacted by a department within the government concerning an invention I have created.

Adapted by Ryan Holt

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APPENDIX D

GENERAL/ACADEMIC ACHIEVEMENT QUESTIONNAIRE

General/Academic Achievement Questionnaire

Low General

I do not have training or recognized talent in working with people.

I have thought about getting involved in the community.

I have thought about organizing an event among my friends.

People have commented on my ability to interact with others.

I have watched a film or read a journal about a current event.

I have formed lasting and meaningful relationships with friends.

Mid General

I have donated to a charity..

I have worked as part of a team.

I have volunteered for community service.

I have performed a public speech in front of a crowd.

I have planned and directed a community event.

I have directed or organized a political group.

High General

I have won a 1st place trophy for an event.

I received a raise as a result of my performance at work.

I have been recognized as the employee of the month.

I have received a certificate of appreciation for my civic contributions.

I have been recognized in a magazine or newspaper for my acts of service in the community.

I have been recognized by an international group as a result of my contributions to society.

Low Academic:

I do not have training or recognized talent in school.

I have thought about improving my efforts in academics.

I have used things I learned in an academic setting and applied them to my personal life.

I have communicated things I learned in an academic setting to other individuals.

I have watched a program or read an article about an academic topic.

I have studied academic topics in my spare time.

Mid Academic:

I have done well in most of my academic pursuits.

People come to me for help in most school subjects.

I have met with a professor outside of class.

I am proud of my GPA and have obtained a 100% grade on a test.

I have demonstrated an entry level proficiency in understanding and use of tools/software/formatting regulations associated with my academic field.

I have created a vitae, portfolio, or resume based on my academic achievements.

High Academic:

I have earned a 4.0 GPA for a quarter/semester.

I have received a scholarship as a result of my academic achievements.

I have been recognized for my academic achievements and participated in an Honors program.

Compared to all my classmates, I have received the best grade in a class.

I have been nominated and placed on the Dean's list.

I have been recognized as a valedictorian for my performance in an academic setting.

Your score is ___

Thank you for providing your levels of achievement. Your scores is listed above; the score range is between 0 and 24, with higher number indicating higher levels of achievement.

Adapted by Ryan Holt

APPENDIX E

TORRANCE TEST OF UNUSUAL USES

Torrance Test of Unusual Uses

Name as many different possible uses that you can think of for a cup:

Developed by Torrance, E.P. (1974). *Torrance Tests of Creative Thinking.* Scholastic

Testing Service, Inc.

APPENDIX F

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

**Human Subjects Review Board
Department of Psychology
California State University,
San Bernardino**

PI: Kaufman, James & Holt, Ryan

From: Donna Garcia

Project Title: Creativity, Achievement, and Motivation

Project ID: H-11WI-19

Date: Sunday, March 06, 2011

Disposition: Administrative Review

Your IRB proposal is approved. This approval is valid until 3/6/2012.

Good luck with your research!

Donna M. Garcia, Chair
Psychology IRB Sub-Committee

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