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Analysis of Procrastination and Flow Experiences

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AN ANALYSIS OF PROCRASTINATION AND FLOW EXPERIENCES

by

BRYAN LEIGHTON DAWSON

(Under the Direction of Katherine E. Wiegand)

Abstract

Flow is a subjective state that occurs when an individual is completely engaged in a particular activity (Csikszentmihalyi, 1975). This state encompasses arousal and intense interest in a task. Procrastination is the tendency of the individual who is in control of some activity to postpone or avoid that activity. Some researchers have suggested that perhaps there is more than one kind of procrastinator (Chu & Choi, 2005). The current study explored the differences between procrastination types and how these types relate to flow experiences. Participants were 60 upper-level Psychology students, working on a class term paper who completed weekly diaries assessing several factors of flow experiences and procrastination habits. Active procrastinators viewed themselves as better students than passive procrastinators. A subjective flow scale was positively correlated with more instances of being in flow as measured by a balance of challenge and skill. Time spent in flow or anxiety was not related to procrastinator type.

INDEX WORDS: Flow, Procrastination, Motivation

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CHAPTER 1

INTRODUCTION

What are you doing right now? Are you sitting there, apathetic, bored, and

probably musing over several articles that only mildly hold your interest? Now imagine

yourself immersed in the task at hand. You are alert, attentive, and focused on the goal

ahead. All of a sudden, a few hours have passed, and you find that you have not only

retained all of the information, but you enjoyed it. You have just imagined a flow

experience. Flow is often recognized as a state of intense task-absorption and high

cognitive efficacy brought about by intrinsic motivation and a feeling of oneness with the

activity in which the person is involved (Emerson, 1998; Jackson & Marsh, 1996;

Moneta, 2004). What if you only left yourself a week to read these articles? You have put

off the task, because something more important needed to be finished. Could you still

experience flow?

This flow state encompasses arousal and intense interest in a task, leading to an

enjoyable experience in which a person actively uses his/her skills to meet a challenge.

The match between an individual's perceived skills and the challenge of a task is often

seen as a prerequisite for flow to occur (Csikszentmihalyi, 1975). This balance between

high skills and high challenge is often contrasted with anxiety, boredom, and apathy

(Csikszentmihalyi, 1975). For instance, when the demands of a task outweigh an

individual's skills, anxiety can occur, or when the challenge does not meet an

individual's skill level, boredom is likely. It is believed that flow is brought about by

intrinsically motivating activities that provide opportunities for a person to demonstrate

and challenge his/her skills (Csikszentmihalyi, 1975; Emerson, 1998; Moneta, 2004).

Csikszentmihalyi (1975)

Mihaly Csikszentmihalyi (1975) questioned why certain people were willing to make sacrifices of material goals for the pursuit of intrinsically motivating activities such as artistry, chess playing, and rock climbing. He felt that since most of our daily time is spent doing unpleasant activities, that perhaps by studying the pleasant activities he could learn what makes everyday life meaningful (Csikszentmihalyi, 1975). A distinction between work activities and leisure activities was made. Work activities being the ones that we *must* do, and leisure being those that we *wish* to do. During the course of his research, Csikszentmihalyi (1975) felt that psychological studies were focused on performance and behavior of subjects and researchers spent their time modifying human behavior through extrinsic rewards during a laboratory setting. However, as he noted, people's behaviors change once they leave the experimental setting, because his/her behaviors are dependant on the external rewards. Instead, Csikszentmihalyi felt it was important to study the inner events of people to understand enjoyment.

Originally, he and other researchers asked people why they engaged in autotelic activities (Csikszentmihalyi, 1975). When people engage in an activity just for the sake of doing the activity, they are considered to be engaging in an autotelic activity. The researchers conducted interviews with 60 participants, including hockey players, spelunkers, a mountain climber, and a long-distance swimmer. Based on their responses, the researchers developed a questionnaire and surveyed another group of respondents involved in autotelic activities: rock climbers, chess players, professional composers of music, and basketball players. The analyses of these responses helped the researchers

express and develop definitions for the instances that are now known as *flow* experiences, which seemed to be an essential element of enjoyment (Csikszentmihalyi, 1975).

Through further questionnaires, Csikszentmihalyi and colleagues discovered that enjoyment of an activity depended on whether or not the organization of the activity allowed the person to match his/her skills with the demands of the challenge, to receive clear feedback about how he/she was doing, and gave a sense of control of his/her actions (Csikszentmihalyi, 1975). This raised the question of whether or not flow experiences were limited to structured activities or if it existed in everyday life (Csikszentmihalyi, 1975).

According to Csikszentmihalyi (1989), an imbalance between skills and challenges leads to either boredom or anxiety, whereas the match of skills and challenges leads to flow. In Csikszentmihalyi's initial research, he identified three channels: flow, boredom, and anxiety; see Figure 1. Within each, people are more likely to experience the emotion for which the channel is named (e.g., anxiety in the anxiety channel). More recently, researchers have employed various models involving up to eight channels to describe where a person's skills meet the present challenge (Clark & Haworth, 1994; Moneta, 2004); see Figure 3. Within these channels, peak experiences can occur. However, they occur more often in the flow channel than any other channel. When an individual enters into the flow channel, his/her perceived skills match the current challenge (Clark & Haworth, 1994; Csikszentmihalyi, 1975; Csikszentmihalyi & Csikszentmihalyi, 1988; Emerson, 1998; Moneta, 2004).

Csikszentmihalyi and Csikszentmihalyi's Flow theory (1988) suggests that these peak experiences are more likely to occur during an activity where the task at hand is

challenging, and a person's skills are matched with a particular challenge (Moneta, 2004; Waterman et al., 2003). This state is often characterized by (a) an existence of clear goals; (b) a feeling of control over one's actions and the outcome of the present activity; (c) the loss of self-consciousness; (d) a distortion in the person's sense of time; and (e) a lack of anxiety about failing (Bakker, 2005; Csikszentmihalyi, 1975; Novak & Hoffman, 1997; Waterman et al., 2003).

Some researchers feel that flow experiences can promote psychological growth (Clarke & Haworth, 1994). Csikszentmihalyi, for example, felt that flow experiences acted as a "built in thermostat that indicates whether we are operating at full capacity, at the leading edge of growth" (Csikszentmihalyi & Larson, 1984, p. 269). The term 'optimal experience' was used by Csikszentmihalyi to identify the flow experience, since he felt it was the most enjoyable experience possible, although he did not have much empirical data to back up his claims (Clarke & Haworth, 1984). However, other research has suggested that the amount of flow experienced during a learning course may be a better predictor of success in the course than aptitude (Clarke & Haworth, 1984).

Brinthaupt and Shin (2001)

Although researchers have found flow experiences across the world in work, music, art, and athletic performances, Brinthaupt and Shin (2001) felt that no research had been conducted that examined a possible relationship between flow experiences and study habits. In particular, cramming and flow was addressed. Crammers may put off studying until the level of challenge of a particular task matches his/her perceived skills, thereby making the experience more engaging. Furthermore, the activity of studying course materials may be seen as boring preceding a deadline (where one's skills outweigh

the challenge), and waiting too long to begin studying may result in anxiety (the challenge outweighs one's skills). It was reasoned that procrastination and cramming would be associated with lower instances of flow.

The researchers defined procrastination as the tendency of the individual who is in control of some activity to postpone or avoid that activity. It should also be noted that flow experiences seemed to be closely tied to aspects of how interested the subject was rather than extrinsic or functional aspects of studying, such as acquiring knowledge for later use on a test. The results suggest that students who procrastinate increase the challenge of adequately studying for a test.

Using 167 Introductory Psychology students, Brinthaupt and Shin (2001) allowed students to provide his/her own definition of academic cramming. Participants were then provided with a standard definition of cramming: "a period of neglect of studying followed by a heavy burst of studying immediately before an exam" (p. 458). The students then completed a questionnaire on his/her individual study habits. The questionnaire included items such as "Frequency of cramming for exams during the current semester," "How often one crammed by choice," and "How often one crammed by necessity." All items were scored on a 5-point scale ranging from 1 = never to 5 = always. After completing the questionnaire, students placed themselves into one of four categories: ideal student, confident student, zealous student, and crammer.

The participants were also given the 23-item Academic Procrastination State Inventory developed by Schouwenburg (1995). This scale addresses students' tendencies to postpone academic study and instead take part in alternate activities. The scale has three subscales to measure fear of failure, lack of motivation, and procrastination. The

Academic Procrastination Scale has items such as "gave up studying early in order to do more pleasant things." Students also read a short paragraph detailing what flow experiences were and were asked to make an overall rating of how often they experienced flow, using a 5-point scale ranging from 1 = never to 5 = very frequently.

Participants were then exposed to the cramming session consisting of reading a 34-page chapter from a research methods textbook within 10 minutes and were then given a multiple-choice test on the material. Immediately after the cramming session, participants completed the Flow State Scale (FSS) developed by Jackson and Marsh (1996). The scale consists of 36 items designed to objectively measure the subjective flow state as described by Csikszentmihalyi (1975, 1989).

Using Pearson correlations, Brinthaupt and Shin (2001) found that although academic procrastination is associated with cramming (i.e., neglecting one's studies and then showing a burst of activity directly before the exam), those who chose to procrastinate reported higher flow scores in a cramming simulation. Furthermore, for those who procrastinated, his/her scores on the test were positively related to the challenge-skill balance, action-awareness merging, and unambiguous feedback, all components of the flow experience. It was found that choice-crammers scored significantly higher than necessity crammers did on the multiple-choice test (t (188) = 2.36, p < .02).

Perhaps cramming sometimes promotes flow-like experiences, because the students choose to put off their studies. Students may cram because they enjoy it, thereby increasing the likelihood that they will experience a higher challenge when they have less time to complete an assignment or study for a test. This creates a situation where an

individual can monitor his/her goals and feedback and alter his/her perception of time (e.g., pulling an "all-nighter"). Furthermore, Lay, Edwards, Parker and Endler (1989) found that directly before a test, procrastinators reported higher perceptions of challenge characterized by increased reporting of confidence and hopefulness, compared to his/her perceptions a week before. This can be explained as an increase in conditions that promote flow.

Lee (2005)

There remains a disparity concerning the effects of academic procrastination on flow experiences. Lee (2005) felt that previous research on procrastination still left one question unanswered. Does the relationship between procrastination and motivation differ based on whether that motivation is intrinsic or extrinsic? Lee (2005) surveyed 262 South Korean college students using Tuckman's (1991) Procrastination Scale. The scale is a 16-item measure of procrastination including items such as "I needlessly delay finishing jobs, even when they're important," and "I postpone starting in on things I don't like to do." To measure flow the Korean version of Jackson and Marsh's (1996) Flow State Scale was used. To discern the effect of motivation, the Academic Motivation Scale was utilized (Vallerand, Pelletier, & Blais, 1993). The scale consists of 16 items that address possible reasons why the student would go to school, whether it is because of intrinsic motivation, self-determined extrinsic motivation, non-self-determined extrinsic motivation, or amotivation.

Using a hierarchical multiple regression analysis the investigator found that intrinsically motivated students tended to report lower instances of procrastination. Furthermore, a negative relationship between students' procrastination tendencies and

their flow experiences was found, indicating that those who put off or avoid their academic work were less likely to experience flow in a learning context (Lee, 2005).

Whereas Lee (2005) used a between-groups survey questionnaire, Brinthaupt and Shin (2001) utilized a between-groups task to measure flow. Both studies implement the Flow State Scale. However, Lee (2005) attempted to tie procrastination to intrinsic/extrinsic motivation, whereas Brinthaupt and Shin (2001) assessed procrastination based on study habits. Also, Lee (2005) surveyed Korean students, whose study habits and procrastination tendencies may differ from the American students in Brinthaupt and Shin's (2001) research. Additionally, Lee (2005) placed participants in categories based on their scores on Tuckman's (1991) Procrastination Scale, whereas Brinthaupt and Shin (2001) gave participants the choice of which category they wished to place themselves in. What may be most important about both studies is the method by which they defined procrastination.

Defining Procrastination

What if a student enjoys the pressure associated with making an assignment more challenging by choosing to put it off but still intends to complete the assignment on time? Instead, the student chooses to focus on other assignments to finish so he/she can devote time to complete the more challenging task. Is this considered procrastination or time management?

The items on Tuckman's (1991) Procrastination Scale would suggest that this is not procrastination. This scale includes items such as "I needlessly delay finishing jobs, even when they're important," and "I postpone starting in on things I don't like to do." These items portray procrastination in a negative manner, and people who put off a job so

they can finish another would not indicate on this scale that they were a procrastinator.

Furthermore, the widely used definition of procrastination would suggest that this student

would be procrastinating ("the tendency of the individual who is in control of some

activity to postpone or avoid that activity;" Brinthaupt & Shin, 2001, p. 458). Although

Lee (2005) would not consider a person who uses procrastination as a time management

technique a "procrastinator," the person may consider him/herself a "choice crammer" if

they participated in Brinthaupt and Shin's (2001) study. This same person's behavior

may be catalogued in two different manners. Some researchers have found that people

who utilize this as a method of time management do not suffer from lower instances of

flow, but rather engage in more flow experiences (Lee & McGrath, 1995).

Types of Procrastinators

Lee and McGrath (1995) conducted a study in which 250 individuals described, in

writing, a recent event in which they experienced time pressure, and then completed a

questionnaire rating their behavior and experiences during the time-pressure situation

according to different factors. The responses demonstrated that those individuals who

identified themselves as being high on a challenge orientation factor enjoyed the

excitement of being under pressure. These individuals felt that their time went faster and

worried less about little things, enabling them to use their time more efficiently. Lee and

McGrath (1995) reasoned that these individuals were effectively dealing with the time

pressure situation and were having flow experiences during the situation. In essence,

these individuals utilized procrastination as a time management technique to aid in

dealing with challenging situations. This notion is contradictory to several researchers'

views of procrastination (e.g., Ferrari, O'Callaghan & Newbegin, 2005; Lee, 2005; Specter & Ferrari, 2000).

Often, investigators depict procrastination negatively relating it to low states of self-confidence, social anxiety, disorganization, and high states of depression, juxtaposing non-procrastinators as having high levels of efficiency and productivity (Ferrari, Doroszko, & Joseph, 2005; Specter & Ferrari, 2000). Some researchers contend that procrastinators and non-procrastinators differ in many ways. For example, procrastinators tend to fear failure, and the anxiety that results from this leads to physical discomfort, especially when deadlines loom. Therefore, some investigators (e.g., Brownlow & Reasinger, 2000) insist that procrastination should be seen as a chronic ailment that is reflected in self-report scales of procrastination. For instance, the Mann's (1982) Decisional Procrastination Scale (DPS) includes items such as "I delay in making decisions until it is too late," and "I put off making decisions." McCown and Johnson's (1988) Adult Inventory of Procrastination (AIP) includes items such as "I don't get things done on time," and "I am not very good at meeting deadlines."

Ferrari et al. (2005) use the AIP to measure procrastination, and included Lay's (1986) General Procrastination (GP) scale to measure sensation-seeking tendencies and boredom-proneness. The GP includes items such as "I often find myself performing tasks that I had intended to do days before," and "I generally return phone calls promptly" (reverse-coded). Using convenience samples, Ferrari et al. (2005) asked participants to fill out surveys containing the two scales, and found that the GP and AIP scales were significantly correlated, measuring almost the same aspect of procrastination. The

investigators found that 20% of American adults classified themselves as chronic

procrastinators according to the scales.

Other studies have employed a combination of these three measures of

procrastination (e.g., Dewitte & Schouwenburg, 2002; Ferrari, 2001; Ferrari et al., 2005;

Hammer & Ferrari, 2002). Some investigators have utilized the Tuckman (1991)

Procrastination Scales that include items like, "I needlessly delay finishing jobs, even

when they are important," and "I am an incurable time waster" (Jackson, Fritch,

Nagasaka, & Pope, 2003; Lee, 2005). Some investigators studying college students have

used the Procrastination Assessment Scale-Students (PASS; Solomon & Rothblum, 1984)

which identifies procrastination by fear of failure, task aversion, and difficulty making

decisions (Brownlow & Reasinger, 2000). All of these measures are negatively biased

towards procrastination and seem to focus on a particular type of procrastination.

As mentioned earlier, some research has suggested that perhaps there is more than

one kind of procrastinator, offering several dichotomous classifications such as arousal

versus avoidant (Ferrari et al., 2005), choice versus necessity (Brinthaupt & Shin, 2001),

and active versus passive (Chu & Choi, 2005) to describe the potential categories of

procrastination. These classifications illustrate that one form of procrastination is

characteristic of individuals who do not intend to procrastinate but do so because of

his/her incapacity to manage his/her time effectively, or intend to procrastinate because

of the aversive nature of the task. In contrast, the alternative type (active procrastinators)

is able to manage his/her time, and choose to postpone tasks in order to focus on other

important tasks (Brinthaupt & Shin, 2001; Chu & Choi, 2005). According to Chu and

Choi (2005), active procrastinators feel challenged and motivated when deadlines approach.

When procrastination is viewed dichotomously, it appears as though some researchers may be focusing on the negative aspect of procrastination and not extracting the information (or confounding the effects of both types) from their samples about active procrastinators. Chu and Choi (2005) argue that although the majority of the literature on procrastination investigates negative outcomes, research has also shown that procrastinators may enjoy short-term benefits such as decreased stress and better overall health when deadlines are not imminent (Tice & Baumeister, 1997). The investigators assert that the quality of work does not necessarily reflect when the task was completed and that task performance is not always affected by procrastination (Chu & Choi, 2005).

Chu and Choi (2005)

This line of thought, coupled with reports from several people who claim they can start a project at the last minute and finish on time because the pressure makes them work harder, suggests that more than one type of procrastinator may exist (Chu & Choi, 2005). Chu and Choi (2005) identified two types of procrastinators in order to examine whether they had distinctly different characteristics in terms of time use, perception of time, motivation, and personal outcomes. Passive procrastination is defined as any time an individual does not intend to procrastinate but ends up putting off tasks because of an inability to actively make decisions. In turn, passive procrastinators may become pessimistic as deadlines approach and end up doubting themselves. Chu and Choi (2005) contend that this is what is often interpreted as traditional procrastination. However, this may not encompass all procrastination. Another type of procrastinator, the active

procrastinator, is defined as a "positive" type of procrastinator who is capable of finishing tasks on time, and deliberately put certain tasks off to focus on other important tasks.

The investigators asked 230 undergraduate participants to complete a series of questionnaires and created and administered their own 18-item scale ($\alpha = .67$) to measure active procrastination using items such as, "I tend to work better under pressure," "Since I often start working on things at the last moment, I have trouble finishing assigned tasks most of the time" (reverse scored), with all factor loadings greater than .50 and low cross-loadings (all less than .24). Adopting questions from the Time Structure Questionnaire (Bond & Feather, 1988) two aspects of time use were assessed: structure of time use (e.g., "I have a daily routine, which I follow") and purposive use of time (e.g., "I often feel that my life is aimless, with no definite purpose"). Grade point averages (GPAs) were used as a measure of academic performance. To test non-procrastinators, active, and passive procrastinators the subjects were first separated by whether they procrastinated or not. Using a mean split, participants who scored higher than the mean of the Active Procrastination Scale were categorized as non-procrastinators whereas those who scored lower than the mean were classified as procrastinators. In the second step, the remaining procrastinator group was divided into two groups. Using a mean split, 4.33 was chosen as the cutoff point on the Active Procrastination Scale. Participants who scored less than 4.33 were categorized as passive procrastinators (n=74) and participants who scored greater than 4.33 were active procrastinators (n=79).

A one-way analysis of variance (ANOVA) was used to compare the three groups across academic procrastination, time use and perception, GPA, stress, purposive use of time, and task coping. No difference was expected between non-procrastinators and

active procrastinators concerning time structure, use of time and perception of control of time, indicating a similarity between the two groups. Chu and Choi (2005) found that both active and non-procrastinators had significantly higher self-efficacy beliefs than passive procrastinators. Furthermore, both active and non-procrastinators utilized task-coping strategies better than passive procrastinators. Also, non-procrastinators and active procrastinators experienced less stress and depression overall and had higher GPAs than passive procrastinators. Interestingly, the results revealed that passive procrastinators exhibit higher levels of extrinsic motivation compared to active procrastinators, although there was no difference in concerning intrinsic motivation when comparing non-procrastinators to active procrastinators.

Chu and Choi (2005) concluded that, contrary to previous research (e.g., Ferrari et al., 2005; Janssen & Carton, 1999), active procrastinators have positive attitudinal and behavioral characteristics similar to non-procrastinators, even though they procrastinate just as much as passive procrastinators. Furthermore, the investigators asserted that active procrastinators may organize their activities as a way of not forcing themselves to follow a strict time structured schedule. Active procrastinators have a more flexible time structure than passive procrastinators. The results suggest that active procrastination may be beneficial for individuals working in highly demanding, fast-changing environments where constant reprioritization is necessary. Active procrastinators may be better able to deal with unexpected changes and act accordingly. Furthermore, it was suggested that the long-held belief of procrastination, as an unproductive behavior, should be reassessed.

Procrastination and Flow

Based on the research, it seems quite possible that for some individuals, procrastination may be beneficial, helping them to organize their task behavior and evaluate their own performance. The majority of researchers studying procrastination (e.g., Brownlow & Reasinger, 2000; Ferrari, Doroszko et al., 2005; Lee, 2005; Specter & Ferrari, 2000) may be measuring procrastination ineffectively, and thereby only assessing passive procrastination in their studies. This may lead them to believe that all procrastinators fear failure, are anxious about their work, wish to put their tasks off on others, and blame the world for their shortcomings. As noted, other investigators have found that active procrastination fosters conditions suitable for flow experience (e.g., Chu & Choi, 2005; Lee & McGrath, 1995). However, do people intentionally procrastinate to put themselves in a situation where flow can occur? That is, are procrastinators aware that close deadlines create these flow experiences? If so, do they purposely put off certain assignments to raise the challenge level to match their perceived skill? Even researchers who feel that procrastination is a negative character trait acknowledge there are certain procrastinators who possess a thrill-seeking nature and exhibit increased excitation when deadlines approach (Ferrari, Doroszko, et al., 2005; Ferrari, O'Callaghan, et al., 2005).

Therefore, a question that still remains is, "Why do individuals procrastinate?" Chu and Choi (2005) have asserted that some individuals choose to procrastinate as a means of time management, whereas others do not purposely procrastinate and become overwhelmed with the challenge of a given task. Although active procrastinators exhibit many traits (e.g., self-efficacy beliefs, existence of clear goals, lack of anxiety about failing, and a feeling of control over one's actions) that are characteristic of flow, they are

by definition extrinsically motivated to procrastinate because a deadline exists. However, intrinsic motivation has traditionally been viewed as important for flow experience to occur. Is intrinsic motivation necessary to promote flow?

Intrinsic Motivation and Procrastination

In his early research, Csikszentmihalyi (1975) found evidence to support that intrinsic motivation was important for an individual to have a flow experience. Several researchers have found that negative procrastination (passive and traditional) often stems from extrinsic motivation (Chu & Choi, 2005; Ferrari, Doroszko, et al., 2005; Ferrari, O'Callaghan, et al., 2005). However, research exists to suggest that procrastination can also stem from intrinsic motivation, and certain individuals who are extrinsically motivated experience flow more than those who are intrinsically motivated (Conti, 2000; Deci & Ryan, 1985; Haworth & Hill, 1992; Waterman et al., 2003). This seems contradictory. Perhaps it illustrates the correlation between flow and intrinsic motivation and not necessarily the causal relationship between intrinsic motivation and flow. Therefore intrinsic motivation may not cause flow rather it is often correlated with flow. Research has shown that perhaps more important to the elicitation of a flow experience is the balance between challenge and skills (Csikszentmihalyi & Csikszentmihalyi, 1988; Hoffman & Novak, 1996). Therefore, it is possible that interest, regardless of motivation, is a necessary component for the match between skills and challenges to occur. The question then remains, "Is intrinsic motivation necessary to promote flow?" Recent research suggests that it is not. One study in particular (Conti, 2000) illustrates intrinsic motivation leading to passive procrastination, and extrinsic motivation leading to task completion.

Conti (2000)

Conti (2000) conducted a study measuring the effects of extrinsic and intrinsic motivation on summer projects. These were projects that participants either had to complete or wanted to complete. More than three times as many 'want to' projects were never started when compared to the 'have to' projects, and that almost twice as many 'have to' projects were completed providing evidence that procrastination is more common among projects that people chose to do. Although procrastination was positively related to intrinsic motivation, extrinsic motivation was a significant predictor of procrastination on 'have to' projects in the first month. 'Have to' projects were also finished more often and earlier than 'want to' projects. Conti (2000) concluded from these results that extrinsic motivation is necessary for preventing task incompletion. Therefore, extrinsic motivation may be associated with starting delays of tasks, but it is also associated with finishing tasks more often and on time.

Motivation and Flow

Flow research has paid careful attention to the dimensions of the skill-challenge relationship, and how it can predict levels of various experience, such as loss of self-consciousness, an awareness of time, apathy, relaxation, and boredom. However, flow research often assumes that individuals should be intrinsically motivated or posses an 'autotelic' personality (doing things for his/her own sake, rather than for an external goal) in order to experience flow (Asakawa, 2004; Csikszentmihalyi, 1975; Hoffman & Novak, 1996; Parr, Montgomery, & DeBell, 1998; Rathunde & Csikszentmihalyi, 2005). Considering the potential to alter the currently negative view of procrastination, it is

important to consider certain influences of intrinsic or extrinsic motivation that may contribute to active or passive procrastination.

Although intrinsic motivation has often been assumed to exist with flow, interest in a task may be a better determinant for flow experience. For instance, Deci and Ryan (1985) found that while individuals who were intrinsically motivated often experienced interest, they only experienced flow some of the time. Interest is considered an expression of 'feeling like doing' an activity (Waterman et al., 2003). The investigators contended that it is the match between perceived level of skill and level of challenge that is the major determinant of the flow experience (Deci & Ryan, 1985; Waterman et al., 2003). Waterman et al. (2003) found that 88.4% of the activities high on flow were also high on interest, but only 25.6% of the activities reported to be high on interest were also high on flow. It was also found that expression of interest in an activity varied widely even including activities where intrinsic motivation was mild (Waterman et al., 2003). Although these results suggest that some people experience flow during an intrinsically motivating or an interesting activity, there is other research to suggest that the balance of challenges and skills serves as a better predictor of flow experiences (Csikszentmihalyi & Csikszentmihalyi, 1988; Novak & Hoffman, 1997). Watermen et al. (2003) assert that although the balance between challenge and skill is necessary for flow experience, the activities that elicit this balance may not always be experienced as intrinsically motivating. In conclusion, it seems that interest and intrinsic motivation in a task are associated, but not sufficient for the experience of flow. Rather the flow experience derives from the balance of challenges and skills (Waterman et al., 2003).

Additionally, it seems possible that even those individuals who are extrinsically motivated may be interested in their current task because of the challenge it provides. These individuals may also possess a perceived balance of skill and challenge that appears to be necessary for flow. Haworth and Hill (1992) found that concerning work, perceived freedom of choice characterized by extrinsic motivation (doing something for someone else, or for one's own long-term benefit) was associated with beneficial aspects of mental health, and competence, thereby creating a feeling of enjoyment at work. These beneficial aspects increased as the balance between challenge and skill levels increased. In this study, flow states were highest in situations in which the individual was extrinsically motivated. These situations consisted of the highest perceived levels of skill matching challenge (Haworth & Hill, 1992). The results are consistent with previous research (e.g., Mannell, Zuzaneck & Larson, 1988) that found that the highest levels of flow were produced when subjects engaged in freely chosen but extrinsically motivating activities (Haworth & Hill, 1992).

Balance of Challenge and Skills

As previously discussed Csikszentmihalyi and Csikszentmihalyi (1988) contend that flow is obtained through the congruence of a person's skills and his/her perception of the challenge in a given task, and that both must be above a certain level (usually the median of a 7-point scale). For instance, a balance between low skills and low challenge results in apathy [see Figure 2]. Although it has often been assumed that flow occurs under the condition of intrinsic motivation (i.e., doing a task for the sake of doing the task), the balance of challenge and skill is a better predictor of flow experience. Novak and Hoffman (1997) contend that the role of skill and challenge in determining what is

necessary for flow is a central component in the majority of flow definitions (e.g., Csikszentmihalyi & Csikszentmihalyi, 1988; Hoffman & Novak, 1996). Novak and Hoffman (1997) illustrate that in all flow channel models, skill and challenge are always expressed. Three different models are used in most research: a three channel model (flow, anxiety, and boredom; see Figure 1), a four channel model (flow, anxiety, boredom, and apathy; see Figure 2), and an eight channel model (arousal, flow, control, boredom, relaxation, apathy, worry, and anxiety; see Figure 3). These models classify different combinations of skill and challenge. For instance, anxiety is identified as high challenge and low skill. Boredom is identified as high skill and low challenge. In all models, flow occurs under the condition in which a balance between high skill and high challenge exists.

The degree of challenge inherent in a task can increase interest. Clarke and Haworth (1994) measured the flow experiences of college students using the experience sampling method. The experience sampling method involves participants assessing themselves on several variables in a diary at fixed or random times during the day. The investigators had students fill in a "time diary" that focused on the balance between challenge and skill. Motivation was not assessed. There was a significant positive correlation between subjects' interest and enjoyment during tasks. Their results suggested that as challenge increases so does interest, as well as the enjoyment of the task (Clarke & Haworth, 1994).

The literature discussed above suggests that a match between challenge and skill is necessary for flow, and that interest in a particular task is also beneficial. However, it appears as though intrinsic motivation, which has been highly correlated with interest in a

task and has sometimes been associated with the challenge/skill dynamic, has not been show to be necessary for a flow experience to occur. Furthermore, concerning task initiation and completion, it seems that extrinsically motivated people are more likely to fulfill the requirements of a given task and may have flow experiences. This appears to contradict the assumption that intrinsic motivation is necessary for flow experiences to occur.

However, interest in the task appears to be an important component in experiencing flow. This may further explain why passive procrastinators, who are extrinsically motivated, do not experience flow as often as active procrastinators. Passive procrastinators do not express interest in a challenging task and more importantly do not feel as though their skills meet the challenges of the task. Passive procrastinators may not have confidence in their skills, whereas active procrastinators believe their skills will enable them to complete a challenging task. Based on the literature, it seems that passive procrastination should inhibit flow experiences, but active procrastination should increase the likelihood of flow in certain individuals, allowing them to create challenges to meet their skills as needed. That is, active procrastinators establish the level of challenge of a particular task depending on their perceived skill level.

Locke & Latham (1990)

Other bodies of research have also found evidence to suggest that individuals who are extrinsically motivated and are confronted with challenging tasks that interest them may have experiences similar to flow. Locke and Latham's (1990b) research on goal setting is an example of how challenging goals can interest individuals who wish to prove their skills and therefore may lead to a beneficial outcome. Locke and Latham's (1990a)

Goal Setting Theory asserts that an individual's task performance is directly determined by the conscious goals that the individual is trying to achieve. Individuals with challenging goals usually feel that the task at hand may improve his/her skills and provide an opportunity to prove what they can do. Locke and Latham (1990b) found that if individuals are presented with highly challenging, yet achievable goals that are complemented by high self-efficacy, a high performance cycle will result. A high performance cycle occurs when an individual's goals and self-efficacy lead to rewards, satisfaction and commitment to future goals, thereby promoting high performance.

Chu and Choi (2005) have shown that active procrastinators do not differ on self-efficacy levels, compared to non-procrastinators. It may be possible that if an active procrastinator is faced with a highly challenging goal, and perceives his/her skills to match this goal, a flow experience may occur. Considering that unambiguous feedback, the feeling that the goals of the task are clear, and the feeling of control over one's actions are by definition a part of the flow experience, it seems that a correlation between high performance cycles and flow experiences in active procrastinators may exist.

Although flow researchers have focused on measuring flow in the sport context (e.g., Jackson & Marsh, 1996), during workplace experiences (e.g., Csikszentmihalyi & LeFerve, 1989; Eisenberger et al., 2005; Emerson, 1998; Haworth & Hill, 1992), and on college students' experiences (e.g., Bakker, 2005; Brinthaupt & Shin, 2001; Clarke & Haworth, 1994; Lee, 2005), few studies have focused on flow and procrastination. However, some researchers (e.g., Chu & Choi, 2005) have found promising results concerning procrastination tendencies that suggest there may be a relationship between the frequency of flow experiences and the type of procrastination (active versus passive)

an individual engages in. The literature reviewed here would suggest that active procrastinators are better candidates for flow than passive procrastinators.

Current Research Study

Although Chu and Choi (2005) re-examined procrastination and found evidence to support at least two different types of procrastination and their effects on study behavior, there have been no studies to the investigator's knowledge that examine the relationship between type of procrastinator and flow experiences. Some research (e.g., Brinthaupt & Shin, 2001; Lee, 2005) has examined traditional procrastination and flow in an academic environment but has found contradictory results. Therefore, the purpose of the present study is to help clarify whether more than one type of procrastinator exists, and if so, whether type of procrastination is related to entering a flow state.

In the present study, it is predicted that a correlation will exist between the balance of challenge and skill and number of reported flow experiences. These results would support the view that balance of challenge and skills is important for flow to occur.

Hypothesis 1: The balance of challenge and skill across individuals will correlate with reported number of flow experiences.

To assess the validity of Chu and Choi's (2005) Active Procrastination Scale, it is expected that procrastinators (regardless of type) will spend less time on a task when the deadline is distant and should report more hours worked on a task as the deadline approaches.

Hypothesis 2: Active and passive procrastinators will show a greater percent of their time spent on a particular task during the later stages of the task and less time spent in the early stages of the task compared to non-procrastinators.

Based on the literature, active procrastinators should differ from passive procrastinators on perceived skill and challenge ratios. Passive procrastinators' perception of skill and challenge should be significantly lower than active procrastinators' perceptions.

Hypothesis 3: Students who are identified as active procrastinators will demonstrate significantly higher scores than passive procrastinators when measured by the ratio of perceived skill and challenge measures.

It has been suggested that active procrastinators should experience flow more often than passive procrastinators, perhaps because active procrastinators are better able to handle challenges (Chu & Choi, 2005). Active procrastinators have been shown to be similar to non-procrastinators in several measures related to flow states (i.e., time management and purposive use of time) suggesting that both active and non-procrastinators should be better candidates for flow.

Hypothesis 4: Active procrastinators are expected to experience flow during the task more often than passive procrastinators.

Furthermore, if previous literature on active and passive procrastination is valid and there are at least two different types of procrastinators, passive procrastinators should spend more time in the anxiety context of the flow model than active procrastinators. Passive procrastinators are characterized by feelings of inadequacy concerning the challenge of a task, and have been shown to have lower self-efficacy beliefs than active procrastinators. Passive procrastinators have also been shown to report higher levels of stress than active procrastinators (Chu & Choi, 2005). Passive procrastinators are expected to perceive the challenge of an objective task to outweigh his/her perceived skill

throughout the study, whereas active and non-procrastinators are expected to perceive a significantly closer match between his/her skill and the challenge of the task.

Hypothesis 5: Passive procrastinators are expected to experience anxiety (as a function of high challenge/low skills) during the task more often than active procrastinators.

CHAPTER 2

METHOD

Participants

Participants were 62 Psychology and Sociology students doing a class term paper. Each participant received extra credit for his or her participation. Participants' ages ranged from 18 to 34 years old. There were 24 males and 38 females. Of the 62 participants who completed the initial questionnaire, 35 (56.5%) completed at least 75% of the weekly online study. Participation was voluntary and confidential. Participants gave their names to the investigator, which were used to verify who completed the study so the participants could receive extra credit. All participants received extra credit determined by their instructor for completing the study.

Procedure

Research volunteers were asked to participate during the first few weeks of the Fall 2006 semester. Participants were informed that if they chose to participate, they were to complete a weekly diary over the course of the semester that related to his/her current paper. Participants' instructors had no knowledge of how much the participant had worked on the task, and participation in the study did not affect a participants' grade in the course. Participants were then notified that their classes were chosen because of the paper that was due in their class.

Outside of class, there were several afternoon meetings where those who chose to participate completed the initial questionnaires. Each participant only needed to attend one of the meetings. Upon completion of the informed consent, students were asked to

complete an initial questionnaire, consisting of Chu and Choi's (2005) Active

Procrastination Scale.

Participants were asked to reminisce about a paper they wrote the previous

semester and to complete Jackson and Marsh's (1996) Flow State Scale and Waterman et

al.'s (2003) Flow Scale concerning their paper in the previous semester. Participants were

then asked to complete questions concerning their confidence and skill level while

writing the paper in the previous semester as well as demographics.

Participants were informed by the researcher that they were to fill out the weekly

diary every week until the paper had been turned in. The researcher informed the

participants about a secure website where the questionnaire could be found and

completed. The investigator was the only person who had access to the data from the

website. Weekly emails were used to remind participants when the questionnaires should

be completed. The weekly diary was used to assess how much time the individual

devoted to the paper and how confident he/she currently felt about successfully

completing the paper.

For each entry, participants were asked questions concerning their experiences of

flow while working on the project. On the final entry, participants were asked questions

concerning how they felt about the paper over the course of the current semester.

Participants were coded using two-digit numerical codes, and no identifying information

was attached to the responses.

Materials

Procrastination. Chu and Choi's (2005) Active Procrastination Scale is an 18-

item measure with a 7-point response scale ("not at all true" to "very true"; $\alpha = .67$),

including items such as, "I tend to work better under pressure," "Since I often start working on things at the last moment, I have trouble finishing assigned tasks most of the time" [reverse scored]. The mean score is used to determine the split between non-procrastinator and procrastinator. Procrastinator is then further split to determine active and passive procrastinators. Active procrastinators are those who score above the mean split of procrastinator. The continuous score [PROCR] is used in Table 1.

Flow. Flow was measured in two ways. First, using Jackson and Marsh's (1996) 36-item Flow State Scale (α = .83). Students rated each item on a 5-point Likert scale. The questionnaire includes items such as "I felt in total control of what I was doing," "I was aware of how well I was performing," and "I was challenged, but I believed my skills would allow me to meet the challenge." The Flow State Scale measures flow on nine dimensions: challenge-skill balance, merging of action and awareness, clear goals, unambiguous feedback, concentration on the task at hand, sense of control, loss of self-consciousness, transformation of time, and autotelic experience. The subscale of challenge-skill balance was the only subscale this study focused on and is comprised of items 1, 10, 19, and 26, which are added together for a maximum score of 20. The survey was used during the initial questionnaire [FSS-CS.I] and as the final measure of flow in the weekly survey [FSS-CS.E].

Second, Waterman et al.'s (2003) Flow Scale, which is an 8-item scale was used for the initial survey regarding a past project [FLOW.I] and during each diary response for the present project [FLOW.W]. The scale includes items such as "I feel I have clear goals," "I feel self-conscious (reverse scored)," "I feel in control" with a 7-point response scale ranging from "not at all true" to "very true." The Flow Scale assesses flow by the

characteristics typified by the flow experience, rather than a match between balance of challenge and skills

Two different measures of flow were used because the FLOW assesses flow by the characteristics typified by flow experience (e.g., feeling of control, loss of time, realization of clear goals) rather than a match between challenge and skills, whereas one of the subscales in Jackson and Marsh's (1996) FSS assesses flow as a match between challenge and skill.

Both the FSS-CS and the FLOW were used during the initial questionnaire. However, only Waterman et al.'s (2003) Flow Scale was used during the weekly diary because of its shortened length. Instead of Jackson and Marsh's (1996) 36-item FSS (concerning the previous paper), that measures flow based on the balance of challenge and skill, a concise 2-item challenge and skill measure developed by Waterman et al. (2003; see below) was used.

Challenge and Skills. Measurement of challenge and skill consisted of self-reports of skill and perceived challenge on 7-point scales for the initial survey regarding a past project [C/S.I] and during each diary response for the present project [C/S.W]. Number of times in flow as determined by a balance of challenge and skills was also calculated [#C/S.W]. The scale responses range from "not at all skillful/challenged" to "very skillful/challenged." The items are "How skillful did you feel in what you were doing?" and "How challenged did you feel by what you were doing?" (Voelkl & Ellis, 1998). Each individual's response was measured against the mean response of everyone who answered that portion of the questionnaire to determine which of the four 'challenge and skill' contexts the subjects were in based on Csikszentmihalyi's four-channel model

(Csikszentmihalyi, 1975; Csikszentmihalyi & LeFerve, 1989); see Figure 2. The global

mean was used in order to obtain a better indicator of the average challenge and average

skill levels across people, since there was limited data about each individual.

The flow context is defined by when both skills and challenges are greater than

the middle response. The anxiety context is defined by when challenges are greater than

the middle response and skills are less than the middle response. The boredom context is

defined by when skills are greater than the middle response and challenges are less than

the middle response. The apathy context is defined by when both skills and challenges

are below the middle response. The scores from this two-item measure were also used as

a measure of a participant's confidence in completing the paper.

Time Spent on Project. The amount of time devoted to the completion of the

paper was divided into quarters, in terms of weeks as well as halves [HALF1 & HALF2].

Hours spent on the project during each quarter were calculated into percentages of the

students' overall time spent on the paper. Percentages of time spent were used to

standardize time spent for each student [%TIME1, %TIME2, %TIME3, %TIME4]. This

was used to determine if procrastinators spent more time on the task when the deadline

was approaching rather than when the deadline was distant.

Time Spent in Flow. Percentage of time spent in flow was measured in two ways.

The percent of time spent in flow as determined by the Waterman et al.'s (2003) Flow

Scale [%FLOW.WAT] and the match between challenge and skills [%FLOW.C/S].

Time Spent in Anxiety. Percentage of time spent in anxiety was measured as the

percent of time challenge was higher than the middle response and skills were lower than

the middle response [%ANXIETY.C/S]. Waterman et al.'s (2003) Flow Scale could not

measure percentage of time spent in anxiety since the scale was developed for the purpose of assessing flow and no instructions were given as to how to utilize the scale to measure other contexts.

Demographics. Demographics such as age, gender, class standing and race were assessed through the initial questionnaire. Participants' perceptions of themselves as students were assessed, ranging from "extremely above average student" to "extremely below average student" [STUDENT]. Students were asked to provide the date their current term paper was due and in which class it was assigned.

CHAPTER 3

RRESULTS

Part I: The Previous Semester

Descriptive statistics were conducted on the variables from the initial survey. The mean of PROCR was 4.17 (SD = .59).The data suggest that overall students were above the middle response for procrastination. Analyses on student self-perception (M = 3.21, SD = 1.04) suggest that participants in the sample view themselves as slightly above average students. The analyses on the skill measure (M = 4.94, SD = 1.20) and the challenge measure (M = 5.24, SD = 1.29) are not significantly different, indicating that overall skill level was viewed as a match with the challenge of the task in the previous semester. Participants' scores on the FLOW.I score (M = 4.37, SD = .70) and FSS-CS.I (M = 15.05, SD = 3.13) suggest that participants exhibited many states conducive to flow.

Next, one-way ANOVAs were used to determine if values on age or STUDENT differed by procrastinator type. No significant differences were found on age (F(2,59) = .50, p = .61). A significant effect was found for STUDENT (F(2,59) = 5.95, p= .004). A Tukey's post hoc analysis was conducted to determine which groups were significantly different. Non-procrastinators (n = 7, M= 2.43, SD = 1.27) rated themselves as better students than passive procrastinators (n = 25, M = 3.68, SD = 1.03). Active procrastinators (n = 30, M = 3.00, SD = .83) also rated themselves as better students than passive procrastinators. There was no significant difference between non-procrastinators and active procrastinators (p >. 05; see Figure 4). A Chi-squared test was conducted to determine if procrastination type differed based on gender. There was no significant difference between genders (x^2(2, N = 62) = .71, p = .70).

Pearson's correlations were conducted between FSS-CS.I, for the reminisced project, and the responses on FLOW.I. FSS-CS.I was significantly correlated with FLOW.I ($r(62) = .41$, $p = .001$). The data suggest that higher scores on the challenge and skill subscale as measured by FSS-CS.I correlated with higher scores on the subjective flow analysis of the FLOW.I Several other variables were significantly correlated (see Table 1).

For C/S.I and FLOW.I, a median split was conducted and scores above the median were considered to be in flow, producing an "in flow"/"not in flow" variable [C/S-F.I, FLOW-F.I]. A Chi-squared test was conducted to determine if answers on either scale were significantly different from each other. However, this analysis yielded no significant differences ($x^2(1, N= 62) = 1.60$, $p = .31$). Whether or not participants were in flow during the previous semester term paper was comparable on both questionnaires.

A one-way ANOVA was also performed to assess differences in levels of FSS-CS.I for the different procrastination types. There was a significant difference on FSS-CS.I ($F(2,59) = 6.08$, $p < .01$). A Tukey's post hoc analysis was conducted to determine which groups were significantly different. Active procrastinators *(M = 16.30, SD = 2.58)* scored significantly higher than passive procrastinators ($M = 13.56$, $SD = 3.34$) on FSS-CS.I.

Part II: The Current Semester

Descriptive statistics were conducted on percent of time in flow based on Waterman et al.'s Flow Scale [%FLOW.W] ($M = 32.52$, $SD = 29.21$) and percent of time in flow based on a match between challenge and skills [%FLOW.C/S] ($M = 27.02$, $SD = 25.19$). The results indicate that both scales measured flow in similar ways and that

participants spent about one-third of their time in flow. Analyses on %ANXIETY.C/S (M = 11.43, SD = 19.28) indicated that participants spent relatively little time in the anxiety context. The overall challenge mean (M = 4.55, SD = 1.16) and overall skill mean (M = 4.09, SD = 1.04) were not significantly different. According to the analyses on the four quarters, %TIME.1 (M = 24.02, SD = 32.68), %TIME.2 (M = 20.82, SD = 25.83), %TIME.3 (M = 28.13, SD = 38.36), and %TIME.4 (M = 34.94, SD = 32.29) participants did not spend a similar amounts of time in each quarter.

For Hypothesis 1, Pearson's correlations were conducted between-person to assess any correlation between average scores on FLOW.W and #C/S.W. A significant correlation was found ($r(51)$ = .42, $p < .01$). Higher scores on FLOW.W correlated with more time spent in the flow context.

For Hypothesis 2, a two-way, 3 (procrastination type) by 4 (quarter) ANOVA was performed to determine if any differences existed between the three groups on percent of time spent on the paper in each quarter. These analyses were conducted on those who completed the study (n=35) consisting of 6 non-procrastinators, 20 active procrastinators and 9 passive procrastinators. However, no significant differences were found. According to the analyses on the four quarters, %TIME.1 ($F(2,32)$ = .96, p=.39), %TIME.2 ($F(2,32)$ = .21, p = .81), %TIME.3 ($F(2,32)$ = .27, p = .76), and %TIME.4 ($F(2,32)$ = .25, p = .78) each procrastinator type spent similar amounts of time in each quarter. The results for HALF1 ($F(2,32)$ = .08, p = .93) and HALF2 were ($F(2,32)$ = .08, p = .93). The results indicated that the three groups did not differ in the amount of time spent during each half.

For Hypothesis 3, a one-way ANOVA was performed to assess differences between the three procrastinator types on %FLOW.C/S. No significant differences were

found ($F(2,32) = .37$, $p = .70$). Non-procrastinators spent on average 36.11% of their time in flow, active procrastinators spent 39.58% and passive procrastinators spent 46.30%. Challenge scores were averaged across all participants [CHAL] as were skill scores [SKILL] to determine if any of the procrastinator groups differed in their view of the project or their perceived skill level. There was no difference in how active procrastinators ($n= 20$, $M = 4.49$, $SD = 1.01$) and passive procrastinators ($n = 9$, $M = 4.84$, $SD = 1.41$) on CHAL of the current semester's term paper ($t(27) = -.76$, $p = .45$). Active procrastinators ($n = 20$, $M = 4.27$, $SD = .82$) did not differ significantly from passive procrastinators ($n = 9$, $M = 4.43$, $SD = 1.16$) on SKILL ($t(27) = -.44$, $p =.66$).

For Hypothesis 4, a one-way ANOVA was performed to assess differences between the three groups and %FLOW.WAT. However, no significant differences were found ($F(2,32) = .48$, $p = .62$).

For Hypothesis 5, a one-way ANOVA was performed on participants who started the online study to assess differences between the three groups on %ANXIETY.C/S. The results were not significant ($F(2,32) = 1.33$, $p = .28$). Additionally, the direction of the means was unexpected. The trend shows that non-procrastinators spent a greater percentage of their time in the anxiety context ($M = 30.56$, $SD = 31.98$) than either active ($M = 13.33$, $SD = 16.97$) or passive procrastinators ($M = 19.44$, $SD = 27.95$; see Figure 5). The possible reasons for this occurrence are discussed below.

CHAPTER 4

DISCUSSION

Summary

Hypothesis 1 was supported. Higher scores on the Waterman et al. (2003) Flow

Scale were positively correlated with more instances of being in flow, as measured by

challenge and skill. Hypothesis 2 was not supported. The three groups did not differ in

the amount of time spent during each quarter. Hypothesis 3 was not supported. The three

groups did not differ on the percentage of time spent in flow based on a match between

challenge and skills. Hypothesis 4 was not supported. The three groups did not differ on

the percentage of time spent in flow based on Waterman et al.'s (2003) Flow State Scale.

Hypothesis 5 was not supported. The three groups did not differ on the percentage of time

spent in the anxiety context as measured by a mismatch of challenge and skill.

A significant difference was found between the three groups on student self-

perception of ability. Non-procrastinators and active procrastinators viewed themselves

as better students than passive procrastinators.

A significant difference was found between the three groups on perception of the

balance of challenge and skills during the previous semester's paper, FSS-CS.I. Active

procrastinators rated themselves as having a better match between challenge and skill

than passive procrastinators.

Interpretation

It is interesting that one of the only significant differences found was self-

perception of ability as a student. Non-procrastinators and active procrastinators seemed

to see themselves as better students than passive procrastinators, yet no difference was

found between active procrastinators and non-procrastinators. It seems that active procrastinators are different, or at least view themselves differently, on some level than passive procrastinators. This gives additional credibility to Chu and Choi's (2005) Active Procrastinator Scale findings.

Furthermore, the one-way ANOVA data on FSS-CS.I suggest that active procrastinators perceive themselves to have a better match between challenge and skills than passive procrastinators. Previous research (i.e., Clark & Haworth, 1994; Csikszentmihalyi, 1975; Csikszentmihalyi & Csikszentmihalyi, 1988; Emerson, 1998; Moneta, 2004) has stated that this match between challenge and skills is an important component to flow. Previous research on procrastination may have been looking too broadly at procrastination and in turn, may have falsely inflated the differences between non-procrastinators (that may have included active-procrastinators in the sample) and procrastinators by creating groupings where they may not necessarily exist.

It was found that higher scores on FLOW.W did correlate with more time spent in the flow context as measured by the two-item challenge and skill measure thereby giving further validation to both measures. While this may help shed more light on how flow can be measured, the high mortality rate of online participants may have diluted the differences and reduced the power of each group. Furthermore, some active-procrastinators may not have been procrastinating on this specific task. Chu and Choi's (2005) research suggests that active procrastinators may use procrastination as a time management tool to balance tasks. Since these students were participating in several upper-level college courses, it is reasonable to assume that in some cases, students

working on their paper that pertained to this study did not procrastinate, but rather chose to procrastinate on some other task.

The anxiety measure revealed something completely unexpected. Non-procrastinators spent 30% of their time in the anxiety context, whereas active and passive procrastinators spent less than 20% of their time in the anxiety context. Previous research has suggested that procrastinators may enjoy short-term benefits such as decreased stress and better overall health when deadlines are not imminent (Tice & Baumeister, 1997). This may account for the decreased amount of overall stress during the semester compared to non-procrastinators.

This study attempted to replicate previous findings that indicated that more than one type of procrastinator exists. However, some of the individuals labeled as "procrastinators" behave more like individuals who do not procrastinate. However, aside from Conti's (2000) summer project study, none of the investigators, studying procrastination, has attempted to conduct a real world investigation. Prior procrastination studies have given the participants either some task to complete or a packet of questionnaires. This study attempted to further the study of procrastination in a real world setting and to assess how the behavior relates to flow.

Procrastination may not be dichotomous as previously thought. Rather, there may exist several "types" of procrastinators ranging on a continuum of procrastination. Some individuals may be higher on the procrastination continuum than others and splitting this variable at certain points may give the appearance of distinct "groups."

It appears as though the notion of differences between an "active" procrastinator and a "passive" procrastinator may be falsely magnified. All of the procrastination scales

discussed in this paper measure procrastination as a continuous variable and establish cut-offs to place individuals into groups. Before Chu and Choi's (2005) research, procrastination was measured dichotomously. However, Chu and Choi (2005) managed to further divide the sample into three groups. This raises the question of whether "active" procrastinators are truly procrastinators, and for that matter, where the distinction line to determine each type is drawn. If there are distinct types of procrastinators, it may make more sense to have separate scales assessing the behaviors related to those types.

The data in this study's sample suggest that somewhere on this gamut of procrastination, differences do exist. This gamut of procrastination ranges from finishing tasks ahead of time and distributing allocated time evenly to putting off tasks until the last minute and rushing to finish in time. Active procrastinators did perceive a better match between their skills and the perceived challenge of the previous semester's paper than passive procrastinators did. This outcome falls in line with the constructed hierarchy of procrastinator type and comes as no surprise that the groups in this study ranked themselves in hierarchical order on the student self-perception scale.

Interestingly, results from the weekly study seemingly contradict results from the initial questionnaire. The active procrastinator group in the initial questionnaire had a better match between perceived skill level and challenge (FSS-CS.I), which was correlated with more instances of being in flow (FLOW.I (Y/N) and C/S.I(Y/N)). However, the passive procrastinator group spent 46% of their time in flow compared to active procrastinators who only spent 39%.

If we think about procrastination as a continuum with an unknown number of tiers then perhaps the high mortality rate of the weekly survey is due to the bottom tier dropping out of the study, and our "passive" procrastinator group may contain several sub-groups. The non-procrastinator group lost one member (14%) over the weekly study, the active procrastinator group lost five (16%), and the passive procrastinator group lost 14 members (56%). We must consider the possibility that those "passive" procrastinators who finished the study are different from those who dropped out after a few weeks.

Perhaps these individuals are closer to being in the "active" procrastinator group and may account for the differences in flow over the weekly study. Many different conclusions could be reached depending on where the cut-off between groups is set. However, from the present data it seems that flow is not inhibited by procrastination and is quite possible even for those who procrastinate. All three procrastinator types spent similar amounts of time in the flow context. However, as stated earlier, non-procrastinators spent more time in the anxiety context than either active or passive procrastinators. While these results were non-significant, it seems interesting that passive procrastinators can experience similar amounts of flow and far less anxiety than non-procrastinators. It should be noted that this difference could be due to a number of different variables, namely TYPE A and B personality types.

This study does support previous literature that the match between challenge and skill is important to flow occurring. Furthermore, while the different scales used in this study assessed different aspects of flow, they seemed to report its instance equally often. The results suggest that only one of the flow measures need be used since all are highly correlated.

Limitations

The main limitation to this study is the small sample size, particularly for the weekly diary portion of the study. The mortality of the passive procrastinator size leaves an enormous hole in the data and may bias the results, which could further explain the lack of differences between the procrastinator types and their instances of flow. One of the classes comprised of 22 students, completed the weekly survey over four weeks and students who dropped out of the last week are missing one quarter of their data. This results in a bias of the fourth quarter data, which makes determining percentage of time spent in each quarter and the percent of time in flow difficult. Ideally, only participants who completed all four quarters would be used, in order to see the full picture of the data. However, in the case of the data of this study, the sample size would be far too small to have any power. According to the literature, active procrastinators may wait until the last minute when the challenge of a particular task is as high as their perceived skill level. During this time, they would presumably have a match between high challenge and high skill, making them excellent candidates for flow. Without the fourth quarter data and the effect of the mortality overall, it is difficult to detect accurate differences in flow during this time.

Furthermore, the subsamples for the procrastination types were very small. Future studies should utilize a much larger sample to combat these effects. Since there are several variables being analyzed a larger sample would create more power for each subsample which would allow for more significant results. In this study, mean differences in percentages were sometimes 10% and still non-significant. Thus, there is a possibility of a Type II error. This study only examined a snapshot of the students' life, in one

classroom over one assignment. This excludes several variables such as the students' other classes and other assignments in the class for which they did this study. Without these data, it is difficult to tell if the student was procrastinating on this assignment or not. Furthermore, this study does not contain the grades from previous or current semester to further analyze how students performed comparatively on their term papers.

Since this study uses nested data, hierarchical linear modeling may be a more appropriate analysis. Since there are several measurement points within each student as well as individual differences across people that are of interest, this method of analysis would provide more appropriate statistical tests of the hypotheses.

Future Directions

It would interesting to see a study that approached this idea in a more comprehensive manner, involving all the classes the students were taking over a longer period of time to obtain a more accurate measure of how flow, procrastinator type, Type A and B personalities, and need for success, etc. interact. This approach would expose which classes, if any, students were procrastinating in and what types of tasks students usually procrastinate on, allowing for a more idiosyncratic assessment of each individuals experiences of challenge and skill in different areas. This method would allow for using the personal mean (within-subject) of SKILL and CHAL to determine when each individual was in flow, instead of using the global mean (between-subjects) of participants. If personality type or need for achievement are factors in regard to whether or not students enter into the anxiety context, a longer more comprehensive study should reveal this effect. It would be expected that those with a Type A personality would spend a great deal of time in the anxiety context regardless of which procrastinator "type" they

fell into. Individuals with a high need for achievement would be expected to be classified as non-procrastinators who manage their time and balance tasks to maximize efficiency. Including other variables will help determine which factors most affect procrastination and/or flow on a particular type of task.

Furthermore, how the interaction of procrastinators and other variables affect team-based groups and effectiveness of teams, social loafing, and leadership could be helpful in determining how to structure teams at the workplace. This could help to explain how to combine procrastinators and non-procrastinators, and for instance, whether or not Type B non-procrastinators can work well with Type B procrastinators or if this will lead to further social loafing. Hopefully, further research will give a better insight as to how different groupings of variables will interact in certain situations to produce effective performance.

Much is still unknown about how procrastination may interact with different tasks in novel situations. Previous studies have shown contrasting effects (i.e., Brinthaupt & Shin, 2001; Lee, 2005) of the benefits or shortcomings of procrastination. Brinthaupt & Shin (2001) found positive effects of procrastination and cramming, that they suggested can lead to flow or flow-like experiences. However, Lee (2005) suggests that procrastination may inhibit the occurrence of flow. In order to further this area of study, more research is needed concerning procrastination. Future research should focus on determining the intricacies of procrastination and then look at its role in several contexts. While the current results were non-significant concerning percentage of time spent in the anxiety context, it appears as though some previous literature on procrastination is correct about the short-term benefits of lessened anxiety for procrastinators. Research should

continue to analyze anxiety as well as the other contexts of challenge and skill to determine what trends may exist. In essence, a person must spend some time in all of the four contexts during a given task as measured by the weekly outcome. Perhaps there is a trend concerning when types of procrastinators are anxious, bored, or apathetic.

Although procrastination was divided into types for this study, it is still based on a continuous variable in which previous research has created cut-offs that may not yield reliable results.

CHAPTER 5

CONCLUSION

The study of procrastination may be limited by the method of measurement. The use of

cut-offs for a continuous measurement may be an ineffective path to understanding the

complexities of how procrastination interacts with other variables. This study attempted

to assess how procrastination may relate to the occurrence of flow over a semester long

task. Future research should investigate alternative measures of procrastination that

eliminate the artificial cut-offs. Utilizing the continuous variable or using separate scales

to assess the different types of procrastination may be more effective.

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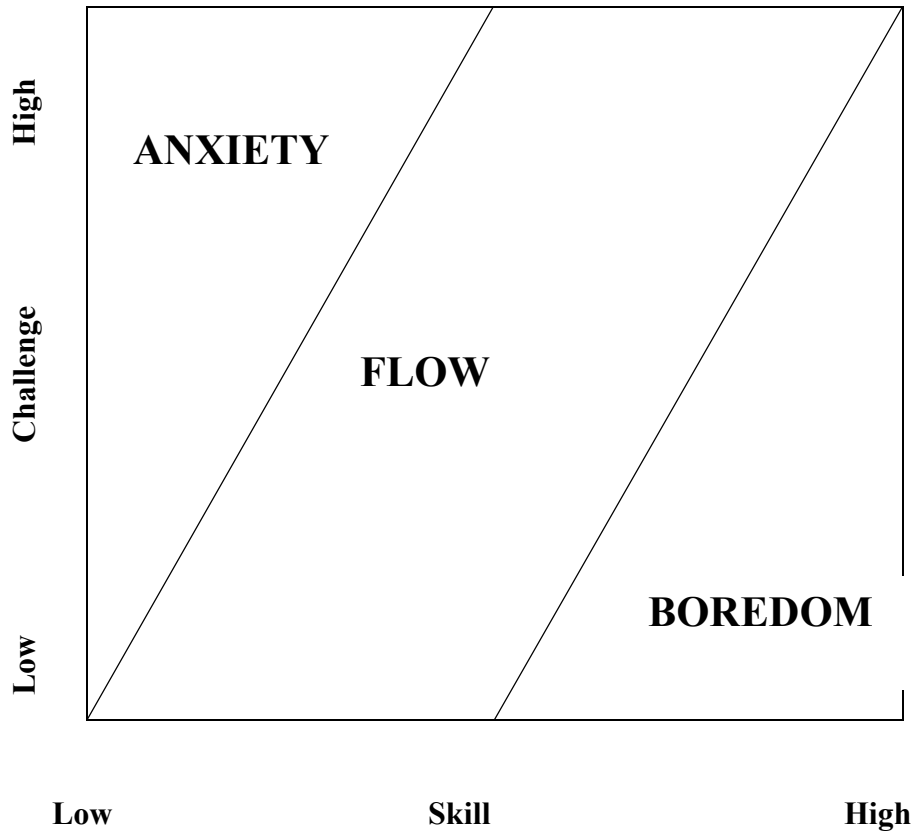
Figure 1. Three channel flow model
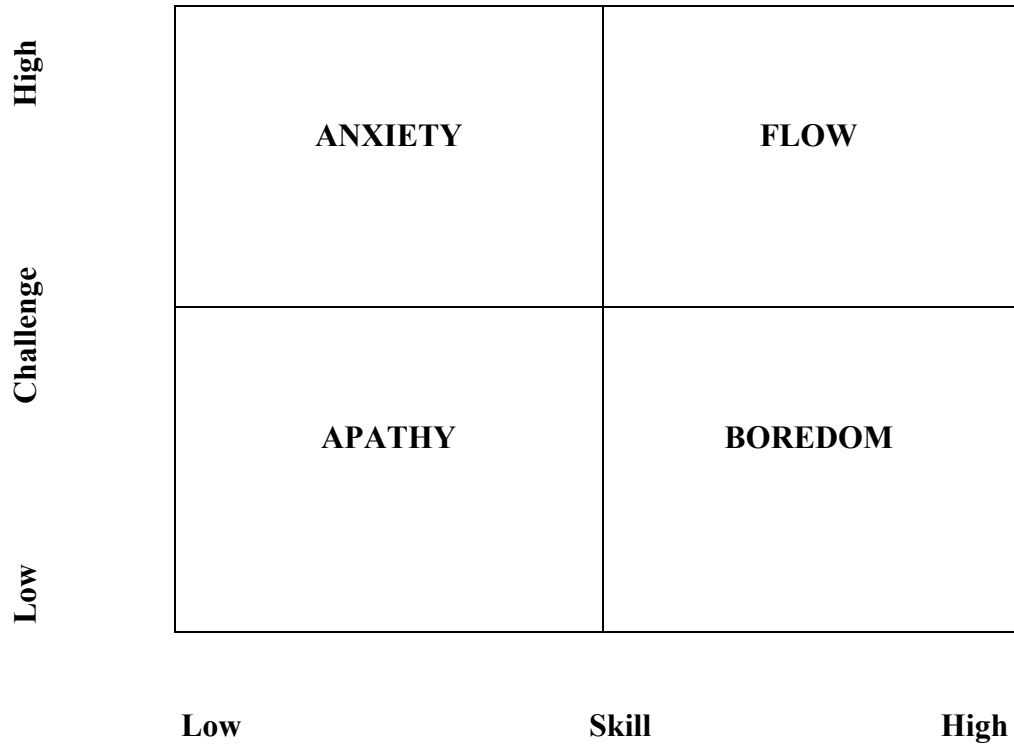
Figure 2. Four channel flow model

HIGH CHALLENGE

SKILL<CHALLENGE

HIGH CHALLENGE

SKILL=CHALLENGE

MODERATE CHALLENGE

SKILL<CHALLENGE

Anxiety

Flow

Worry

LOW CHALLENGE

SKILL<CHALLENGE

Apathy

Arousal

HIGH CHALLENGE

SKILL>CHALLENGE

Relaxation

Control

Boredom

MODERATE
CHALLENGE

SKILL>CHALLENGE

LOW CHALLENGE

SKILL=CHALLENGE

LOW CHALLENGE

SKILL>CHALLENGE
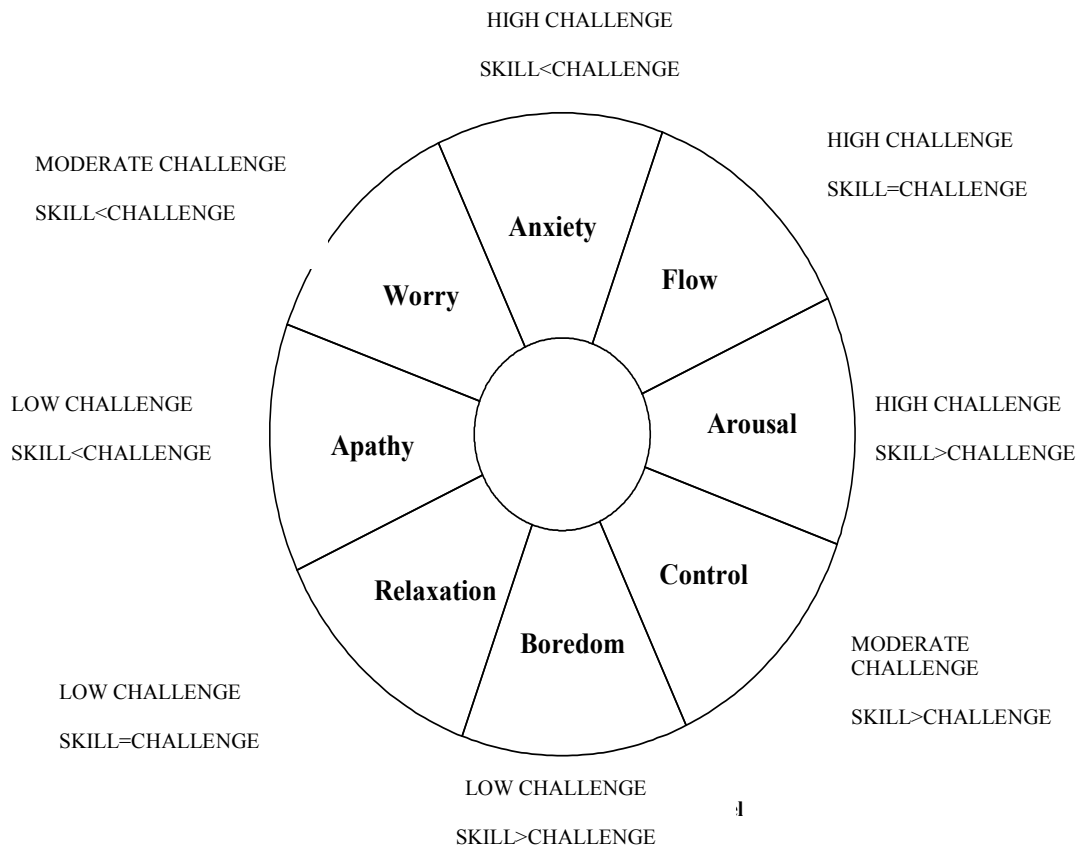
Figure 3. Eight channel flow model
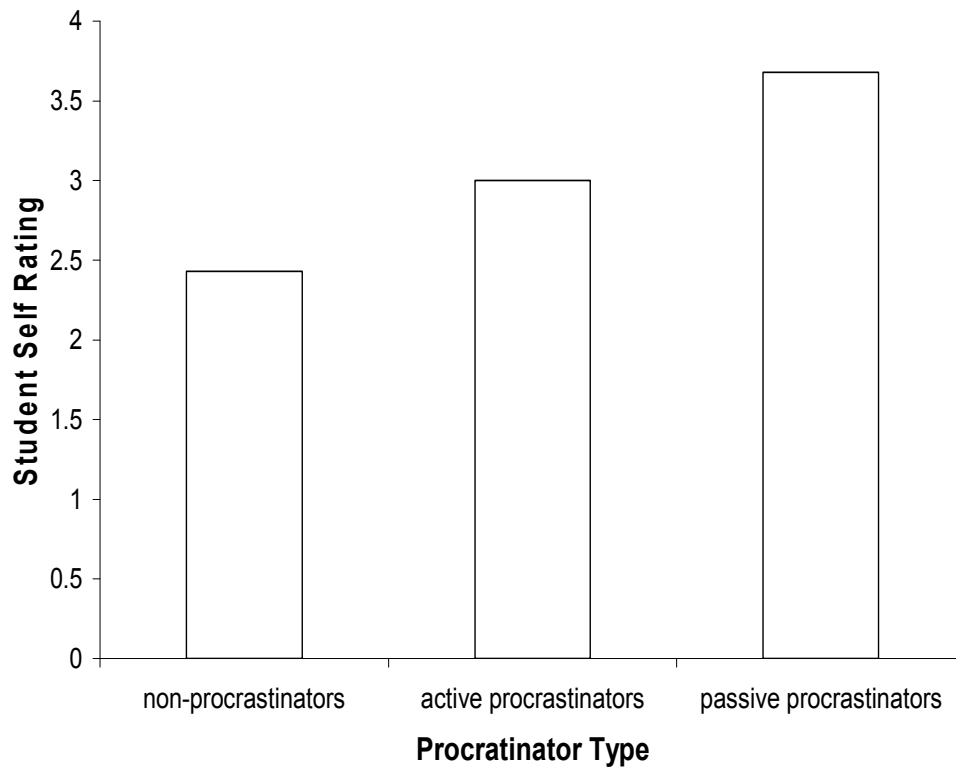
Figure 4. Student self rating (lower numbers are better) for non-procrastinator (n = 7), active procrastinators (n = 30) and passive procrastinators (n = 25).
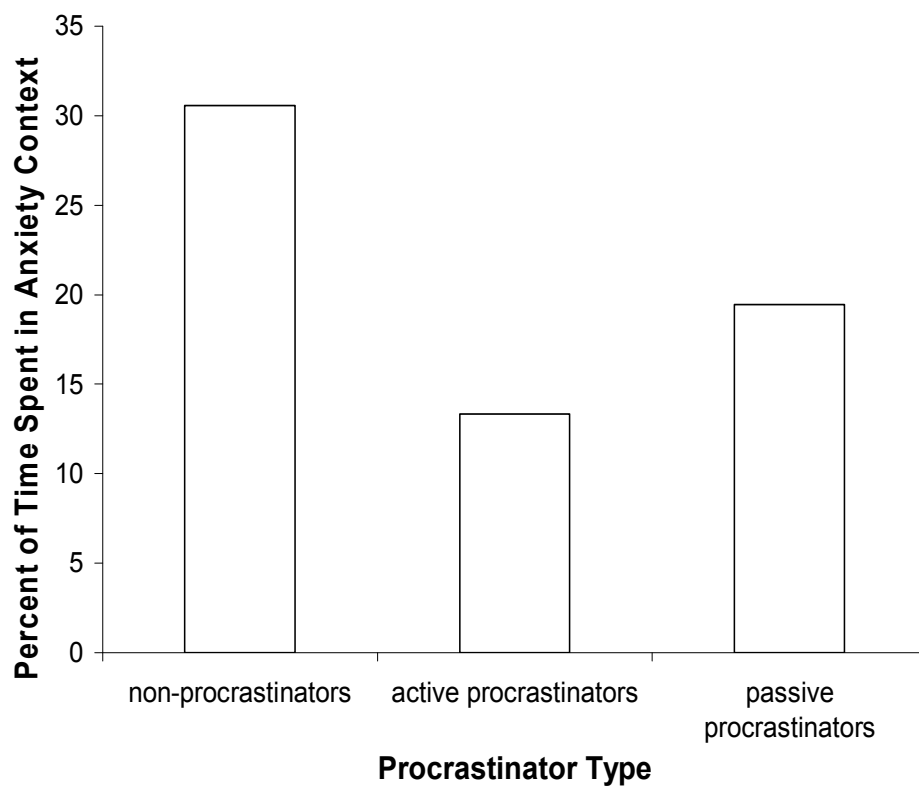
Figure 5. Mean percent of time spent in anxiety context for non-procrastinator (n = 6), active procrastinators (n = 20) and passive procrastinators (n = 9)

Table 1

Correlation Table of all variables. Cronbach's Alpha in parentheses.

	N	M	SD	1	2	3	4	5	6	7	8	9	10
Initial Survey													
1. PROCR	62	4.17	.59	(.66)									
2. FLOW.I	62	4.37	.70	.25	(.50)								
3. FLOW.I (Y/N)	62	1.48	.50	-.31*	-.80**	na							
4. C/S.I (Y/N)	62	1.48	.50	.02	-.18	.16	na						
5. STUDENT	62	3.21	1.04	.41**	-.44**	.43*	.24	na					
6. FSS-CS.I	62	15.0	3.13	.41**	.41**	-.44**	-.34**	-.51**	(.86)				
Weekly Survey													
7. C/S.W	35	27.01	25.19	-.25	.08	-.06	-.30	.17	.25	(.74)			
8. %ANXIETY.C/S	35	11.42	19.28	-.22	.16	-.03	.28	.06	-.30	-.08	(.74)		
9. FLOW.W	35	32.53	29.21	-.20	.18	-.21	-.11	-.06	.04	.38*	-.25	(.76)	
10. FSS-CS.E	33	12.00	3.08	.04	.32	-.26	-.27	-.29	.58**	.35*	-.10	.33	(.82)

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

APPENDIX A
ACTIVE PROCRASTINATION QUESTIONNAIRE

Active Procrastination Scale (Chu & Choi, 2005) (Part of Initial Questionnaire)

The following questions ask about your actual use of time. Please rate yourself according to the scale provided and **circle a number** that best describes you.

1. I tend to work better under pressure.
      1   2   3   4   5   6   7
Not at all true   Very true

2. Even though I tend to work on papers or study for exams at the last moment, I am still motivated to do my best.
      1   2   3   4   5   6   7
Not at all true   Very true

3. Since I often start working on things at the last moment, I have trouble finishing assigned tasks most of the time.
      1   2   3   4   5   6   7
Not at all true   Very true

4. It is hard to keep myself motivated while working against an impending deadline.
      1   2   3   4   5   6   7
Not at all true   Very true

5. I feel like giving up the task when I know there is no way that I can finish it on time.
      1   2   3   4   5   6   7
Not at all true   Very true

6. I intentionally put off work to maximize my motivation.
      1   2   3   4   5   6   7
Not at all true   Very true

7. To use my time more efficiently, I deliberately postpone some tasks.
      1   2   3   4   5   6   7
Not at all true   Very true

8. I am unsatisfied with the outcome of my work when I put it off until the last moment.
      1   2   3   4   5   6   7
Not at all true   Very true

9. I am more focused and motivated while I am working against the impending deadline.
      1   2   3   4   5   6   7

Not at all true   Very true

10. I find the return for working under a deadline is great.
        1   2   3   4   5   6   7
Not at all true   Very true

11. I tend to do things at the last minute and often find it difficult to complete them on time.
        1   2   3   4   5   6   7
Not at all true   Very true

12. I feel that putting work off until the last minute does not do me any good.
        1   2   3   4   5   6   7
Not at all true   Very true

13. I tend to finish tasks well ahead of deadlines.
        1   2   3   4   5   6   7
Not at all true   Very true

14. Even after I make a decision I delay acting upon it.
        1   2   3   4   5   6   7
Not at all true   Very true

15. I prepare to study at some point of time but don't get any further.
        1   2   3   4   5   6   7
Not at all true   Very true

16. I tend to leave things until the last minute.
        1   2   3   4   5   6   7
Not at all true   Very true

17. I often find myself performing tasks I intended to do days earlier.
        1   2   3   4   5   6   7
Not at all true   Very true

18. I generally delay before starting on work I have to do.
        1   2   3   4   5   6   7
Not at all true   Very true

Reminiscing Exercise (Part of Initial Questionnaire)

Please recall a recent term paper you completed in either Spring 2006 or Fall 2005. This does not include any research methods papers or papers where you are required to turn in parts of the paper throughout the semester. You were asked to complete a questionnaire concerning that term paper and how you felt about doing it. There are no right or wrong answers. Please answer the questions to the best of your ability. This exercise is only for one particular paper. If you wrote more than one term paper within the previous two semesters, please recall only one paper and complete this exercise concerning only that paper.

Subjective Flow State Scale (Waterman, Schwartz, Goldbacher, Green, Miller, Philip, 2003) (Part of Weekly Diary, and Reminiscing Exercise)

The following scale pertains to how you felt about your work on the paper during the past week.
Please circle the number that best describes how you feel about your paper, in terms of completion and performance.

1. I feel I have clear goals.

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

2. I feel self-conscious.

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

3. I feel in control.

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

4. I lose track of time.

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

5. I feel I know how well I am doing.

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

6. I have a high level of concentration.

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

7. I forget personal problems.

    1   2   3   4   5   6   7

Not at all true   Very true

8. I feel fully involved.

    1   2   3   4   5   6   7

Not at all true   Very true

Objective Flow State Scale (Jackson & Marsh, 1996) (Part of Reminiscing Exercise, and the final Weekly Diary)

Please answer the following questions in relation to your experience in the event you were asked to reminisce about. These questions relate to the thoughts and feelings you may have experienced during the event. There are no right or wrong answers. Think about how you felt during the event and answer the questions using the rating scale below. Circle the number that best matches your experience from the options to the right of each question.

	Strongly Disagree				Strongly agree
1. I was challenged, but I believed my skills would allow me to meet the challenge.	1	2	3	4	5
2. I made the correct movements without thinking about trying to do so.	1	2	3	4	5
3. I knew clearly what I wanted to do.	1	2	3	4	5
4. It was really clear to me that I was doing well.	1	2	3	4	5
5. My attention was focused entirely on what I was doing.	1	2	3	4	5
6. I felt in total control of what I was doing.	1	2	3	4	5
7. I was not concerned with what other	1	2	3	4	5

may have been thinking of me.

8. Time seemed to alter   1   2   3   4
     5
     (either slowed down or speeded up).

9. I really enjoyed the experience.   1   2   3   4   5

10. My abilities matched the   1   2   3   4   5
     high challenge of the situation

11. Things just seemed to be   1   2   3   4   5
     happening automatically.

12. I had a strong sense of what I wanted to do.   1   2   3   4
     5

13. I was aware of how well I was performing   1   2   3   4
     5

14. It was no effort to keep my   1   2   3   4
     5
     mind on what was happening.

15. I felt like I could control what I was doing   1   2   3   4
     5

16. I was not worried about my   1   2   3   4
     5
     performance during the event.

17. The way time passed seemed   1   2   3   4   5
     to be different from normal.

18. I loved the feeling of that performance   1   2   3   4   5
     and want to capture it again.

19. I felt I was competent enough to   1   2   3   4   5
     meet the high demands of the situation

20. I performed automatically   1   2   3   4   5

21. I knew what I wanted to achieve   1   2   3   4   5

22. I had a good idea while I was   1   2   3   4   5

performing about how well I was doing

23. I had total concentration   1   2   3   4   5

24. I had a feeling of total control.   1   2   3   4   5

25. I was not concerned with   1   2   3   4   5
how I was presenting myself

26. It felt like time stopped   1   2   3   4   5
while I was performing

27. The experience left me feeling great   1   2   3   4
5

28. The challenge and my skills   1   2   3   4
5
 were at an equally high level

29. I did things spontaneously and   1   2   3   4   5
automatically without having to think

30. My goals were clearly defined.   1   2   3   4   5

31. I could tell by the way I was   1   2   3   4   5
performing how well I was doing

32. I was completely focused   1   2   3   4   5
on the task at hand

33. I felt in total control of my body   1   2   3   4   5

34. I was not worried about what   1   2   3   4   5
others may have been thinking of me.

35. At times, it almost seemed like   1   2   3   4   5
things were happening in slow motion

36. I found the experience   1   2   3   4   5
extremely rewarding.

Balance of Challenge and Skills Measure (Waterman et al., 2003) (Part of Reminiscing Exercise, and Weekly Diary)

Please answer the following questions in relation to your experience in the event you were asked to reminisce about. These questions relate to the thoughts and feelings you may have experienced during the event. There are no right or wrong answers. Think about how you felt during the event and answer the questions using the rating scale below. Circle the number that best matches your experience from the options to the right of each question.

1. How skillful did you feel in what you were doing?

    1   2   3   4   5   6   7

Not at all   Very

 skillful   skillful

2. How challenged did you feel by what you were doing?"

    1   2   3   4   5   6   7

 Not at all   Very

challenged   challenged

Time Spent on Project (Part of Weekly Diary)

How much time did you spend on your term paper this week (in hours) _____?

Demographics (Part of Initial Questionnaire)

1. How old are you? _____

2. What is your gender?
   - ☐ Male
   - ☐ Female

3. What is your school classification?
   - ☐ Freshman
   - ☐ Sophomore
   - ☐ Junior
   - ☐ Senior

4. Which race or ethnicity do you most identify with?
   - ☐ White or Caucasian
   - ☐ Black or African American
   - ☐ Asian American
   - ☐ Hispanic
   - ☐ American Indian or Alaskan Native
   - ☐ Other_____

5. Do you consider yourself to be a(n):
   - ☐ Extremely above average student
   - ☐ Moderately above average student
   - ☐ Slightly above average student
   - ☐ Average student
   - ☐ Slightly below average student
   - ☐ Moderately below average student
   - ☐ Extremely below average student

6. What date is your current term paper due?
   _____

7. What class is your current term paper for (please list instructors' name as well)?

   _____