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The Effects of Expected Task Difficulty on Procrastination Behaviour

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There are occasions when delaying a task is advantageous and appropriate (such as when prioritizing tasks). However, according to Ferrari (1991a), procrastination, which is defined as compulsively failing to complete intended tasks to the point of experiencing anxiety, may be viewed as pathological. This problem is experienced by many people in many different facets of life, but tends to be very prominent in the life of a student. According to a study by Solomon and Rothblum (1984), 95% of all college and university students procrastinate to some degree on academic tasks. The study included the responses of 342 college and university students who admitted to procrastinating on tasks such as: writing term papers, studying for exams and completing weekly reading assignments. Research such as this, that has been done mainly on students and their tendency to procrastinate, has prompted the creation of the term academic procrastination, defined as "the self-reported tendency (a) to nearly always or always put off academic tasks and (b) to nearly always or always experience problematic levels of anxiety associated with this procrastination" (Rothblum, Solomon & Murakami, 1986, p.387).

Although the study of academic procrastination has included aspects such as frequency of assignments being handed in on time (Rothblum, Solomon & Murakami, 1986), study habits (Green 1982) and measurement of the time elapsed between assignment and completion of the task (Lay 1986; Milgram, Dangour & Raviv, 1992) little research has been done on how expected difficulty of the task may affect the degree of procrastination behaviour in which a subject may engage. The purpose of this paper is to answer certain questions that may arise in the attempt to research this particular area.

The Dependent Variable: Procrastination Behaviour

This section will expand on the major questions researched regarding procrastination and academic procrastination. The literature has used these two terms interchangeably.

Why?

According to the research data, the first question of procrastination behaviour that generally arises (as well as the most difficult one to answer) is: Why?. Why do students procrastinate on doing school assignments? Where does procrastination behaviour stem from? Most of the research on procrastination has been performed to specifically address this question. The

consensus is: students procrastinate for different reasons at different times.

One of the most common theories of why students procrastinate appearing in the literature is they posses a fragile or vulnerable self-esteem. In their study, Beswick, Rothblum and Mann (1988), found a strong correlation between procrastination behaviour and fragile self-esteem. They theorized that students' procrastination may "act as a buffer for their shaky sense of self-worth" (p. 209). This self-handicapping strategy perpetuates the student's belief that failure is inevitable due to their lack of ability and therefore any attempts they make to complete the task would be ineffectual (Ferrari, Johnson and McCown, 1995).

Ferrari (1991b) found similar results. In his study, procrastinators and non-procrastinators were given the choice of creating a hypothetical task that was easy or difficult, with possible feedback on performance. He found that procrastinators tended to choose to create easy, nondiagnostic tasks more often then non-procrastinators. From this, Ferrari (1991b) theorized procrastinators were protecting their vulnerable self-esteem by avoiding diagnostic information. However, he speculated that the

procrastinators convinced themselves the reason they did not choose the difficult tasks was because it was an effortful, "useless" task that was not worth their time (p. 627). Ferrari also found in his study that procrastinators, more than nonprocrastinators, felt that their self-worth is based solely on their performance of a certain task. Therefore, if they do not perform the task, they believe they can avoid the judgement of others (1991b).

According to Lay (1986), the two most common reasons for people to procrastinate on certain tasks are lack of proper time management skills and an unwillingness to act on unpleasant or difficult tasks. Lay (1986) states that procrastinators do not adequately organize their time, and tend to underestimate the amount of time it will take them to complete a task. For example, procrastinators often attempt to complete three tasks in the amount of time it takes to complete one. Lay (1986) also asserts that even though most people dread unpleasant tasks, procrastinators tend to amplify this feeling within themselves by putting off performance of such tasks until the very last minute. Not surprisingly, according to Boice (1989), someone who procrastinates regularly on different projects often tends to not hand

in assignments at all, rather than rush to finish them by the deadline.

Some other major reasons given by students to describe their procrastination behaviour and listed by Solomon and Rothblum (1984) include:

-perceived aversiveness to the task
-evaluation anxiety (fear over being evaluated)
-test anxiety (fear over being unsure of the answers to a test)
-rebellion against the control of others
-lack of confidence in one's own abilities
-lack of assertion
-fear of the consequences of failure or success
-perfectionist standards of their own competency
-claims of being overburdened with tasks
-irrational beliefs of what is expected of them

What does Academic Procrastination affect?

A common battle cry for the avid procrastinator is "I don't procrastinate, I just work well under pressure" (beginning to work the night before to reach a next-day deadline). Unfortunately, most procrastinators do not fathom that if they achieve good grades when they are working at the last minute, they would probably achieve even better grades if they started on the project earlier. Surprisingly enough, there is little data available on the specific effects of procrastination behaviour to support this notion. The only evidence this researcher found came from Solomon and Rothblum (1984) who, quoting from Semb, Glick and Spencer (1979) state that academic

procrastination results in poor grades, course withdrawal and the tendency to be in school for a longer length of time. However, most of the articles reviewed seemed to assume (without empirical evidence) that academic procrastination has a negative impact on scholastic performance. Perhaps this assumption was based on Semb, Glick & Spencer's (1979) evidence, since it is not stated in any of the other articles where this assumption was generated.

Other detrimental effects associated with academic procrastination, stated by Ferrari (1991a) are diminished self-esteem (although it cannot be determined whether students procrastinate because they already have low self-esteem or whether they have low self-esteem because they procrastinate), high public self-consciousness and high social anxiety.

Differences between High and Low Procrastinators - Students

The three studies that looked at differences between high and low procrastinators used only students to make this determination. This section will touch on only the major differences stated by Lay (1986), Rothblum, Solomon & Murakami (1986) and Milgram, Dangour & Raviv (1992).

Lay (1986), who developed much of the research on the differences between high and low procrastination in students, found that contrary to popular belief, high procrastinators are no more irresponsible than low procrastinators. This information was based on the fact that when given the Personal Projects Analysis questionnaire (after the administration of the General Procrastination Scale) 22 of the 119 subjects, 12 high and 10 low procrastinators, took the $3.00 offered with the questionnaire and were never heard from again. He also found that high and low procrastinators attend classes equally and spend approximately the same amount of time writing exams. Where the differences lie is in how much time each spends on studying for exams and writing papers and how their time is spent away from school. The major difference between high and low procrastinators is that high procrastinators spend less time on school projects, and the time that is spent on the project is not spent productively. High and low procrastinators did not differ as greatly on any other dimension. High procrastinators reported a greater tendency to take more breaks during work sessions, being less focused on the task, and being more susceptible to distraction (for example: a higher tendency to accept an invitation to a movie the night

before an assignment is due) than low procrastinators. Other areas in which a difference was found were:

a) The more stressful the project, the less likely it was for the high procrastinators to complete it. Stress was unrelated to the likelihood of completion for the low procrastinators.

b) High procrastinators tended to spend more time on projects they considered enjoyable. For the low procrastinators, the relationship between enjoyment and time spent was negligible.

c) High procrastinators appeared to be more sensitive to the visibility of their projects, yet were less willing to integrate the views of others into their work.

d) For the low procrastinators, stress was correlated positively with dimensions such as challenge and time spent. For the high procrastinators, the correlations of these dimensions were negative or negligible.

Rothblum, Solomon & Murakami (1986) found in their study the major difference between low and high procrastinators is stress level. Results from their administration of the Procrastination Assessment Scale for Students to 379 university students state that low procrastinators report very low levels of anxiety, whereas high procrastinators report gradually

increasing levels of anxiety, as the deadline approaches. They also found differences in anxiety levels due to gender. Women tended to report higher levels of anxiety than men and suffered from more physical symptoms due to this anxiety.

Milgram, Dangour & Raviv (1992), state when given the choice of three different task-completion time periods, high procrastinators tend to gravitate toward the last time period whereas low procrastinators often choose the first time slot available. They also found that those who were assigned task-completion time periods procrastinated the least regardless of whether they were high or low procrastinators. In fact, low procrastinators became even more prompt in completing the task when under lenient conditions, believing the extra time to be a luxury they did not need. However, a criticism of this particular study is that only female students were used as subjects.

Therapy for Procrastination

In their chapter dealing with treatments, Ferrari, Johnson and McCown (1995) list three possible treatments for procrastination and three possible structures for this treatment. However, before listing these, they stressed that procrastination is not believed by some to be a dilemma that requires or

responds to treatment, as it is considered to be based on individual differences. Therefore, few who suffer from this may seek treatment as they may not receive financial compensation from medical insurance and/or may fear the stigma. Ferrari, Johnson and McCown (1995) also stressed the importance of completing an assessment and history of the subject before attempting treatment, due to the individual-differences aspect of procrastination behaviour.

The three treatments listed for procrastination are:

1) changing cognitive misconceptions:
Distorted cognitions involve two groups of thoughts - a general lack of self-efficacy (e.g. "I'm not smart enough to do this task") and action to reduce anxiety (e.g. "I'll do it tonight, so I don't have to worry"). The key to this strategy is to challenge these cognitive distortions in procrastinators in both groups of thought.

2) modifying cognitive distortions and reducing anxiety:
Used in tandem with changing cognitive misconceptions, this therapy involves the use of relaxation techniques as well as possible use of benzodiazepines, in the most extreme cases, to calm the anxious subject.

3) cognitive interventions for the low - conscientious procrastinator:
The key to this strategy is introducing a little anxiety into this underaroused group. The therapist may remind the subject of self-set goals as they come due, or of the importance of completing upcoming assignments for their future goals.

All of these treatments present differing degrees of altering beliefs such as the time required to complete tasks, expected perfectionist standards of oneself, and the rewards and punishments associated with completing and not completing the tasks at hand.

Two articles provided in-depth summaries of other possible treatments. Green (1982) states the secret to avoiding procrastination behaviour is self-control and self-reward. In his study, he found students completed more work and achieved higher grades when monitoring the time they spent on pleasant versus adverse tasks, and by rewarding themselves when the tasks were complete.

Boice (1989) found that including others in one's plans not to procrastinate increased the likelihood of the task being completed, especially if the procrastinators asked someone else to consistently check up on their work progress.

The three possible structures for treatment, stated by Ferrari, Johnson and McCown (1995) in order of effectiveness, are:

1) a 10-session group therapy:
Subjects meet for 20-30 minute sessions and are asked to complete homework assignments and questionnaires on their procrastination behaviour.

2) individual therapy

Generally used for subjects with a concurrent DSM-III-R Axis 1 or Axis 2 disorder which must be addressed before treatment begins, this therapy also follows the 10-session therapy schemata. This therapy is considered to be not as effective as group therapy as it lacks the camaraderie and peer influence of group therapy.

3) a two-session intervention:

Two 80 - 90 minute lectures with a self-scored procrastination scale are used to identify procrastination in oneself. Students break into groups in the second session and discuss their procrastination behaviour. Although this method is time conservative, it does not delve as deeply into the individual's procrastination behaviour.

According to Ferrari, Johnson and McCown (1995), at this time, additional research into the effectiveness of the shorter and longer models of treatment is being examined, as well as specific techniques designed to increase the effect size.

Scales Measuring Procrastination

In reviewing the literature of existing self-report scales of procrastination behaviour, Ferrari, Johnson and McCown (1995) found there are seven commonly used scales. Three of these scales measured academic procrastination. The other four scales measured everyday procrastination. This section will briefly describe each of the academic procrastination scales, as this is the topic under investigation in this paper.

The Procrastination Assessment Scale - Students (PASS) is the most widely used scale to explore procrastination on academic tasks. Developed by Solomon and Rothblum in 1984, this scale is split into three sections. The first section assesses the frequency and reasons for procrastination in six academic areas, as well as the desire for change in these areas. On three five-point scales, respondents report their tendency to procrastinate and the problem they experience from procrastinating, in these areas. They also indicate their desire to change this behaviour. Scores are summed across all six areas.

The second section of the PASS presents the respondents with a scenario of writing a term paper and asks for a five-point rating of 13 reasons for their procrastination on this task.

The third section of the PASS asks respondents to indicate their interest in decreasing their procrastination behaviour through classes and programs.

The PASS has been found to have high reliability and validity in measuring procrastination.

The Aitken Procrastination Inventory (API), developed by Aitken in 1982, was designed to differentiate between chronic procrastinators and nonprocrastinators in a college setting. Respondents

rate on a five-point scale 52 items, 19 of which deal with procrastination, between False and True. The API has high validity. No evaluations of temporal stability have been performed on it to determine reliability.

The Tuckman (1991) Procrastination Scale (TPS) was developed to determine whether undergraduates tend to procrastinate at completing college requirements. The TPS consists of 16 items embedded in 35 items concerning academic behaviours. The scale provides a general index of academic procrastination resulting from a student's ability to control task schedules. The scale has adequate validity. No assessment of test-retest stability has been performed.

Briefly, those scales that measure procrastination in everyday life, using non-students as respondents, are: Lay's (1986) General Procrastination Scale (GP), Mann's (1982) Decisional Procrastination Scale (DP), McCown and Johnson's (1989) Adult Inventory of Procrastination (AIP), and Sroloff's (1983) Tel-Aviv Procrastination Inventory (TAP). The most commonly used of these scales is the GP, followed by the AIP, DP and TAP.

The Independent Variable: Expected Task Difficulty

Most of the researchers of task difficulty state though the concepts of task and difficulty are distinctive and self-explanatory on their own, little empirical data has been done on the effects of these two terms linked together. According to Surber (1981), the perceived difficulty of a certain task is based mainly on past experiences of the subject, their knowledge and preparedness of the task at hand and the judgements and assumptions of others who have performed the task before them. She concludes from these observations that task difficulty is a subjective term and is therefore very difficult to manipulate. Other researchers have disagreed, however, having successfully completed research on how task difficulty affects physiological arousal (Gellatly & Meyer, 1992; Huber, 1985), psychomotor performance (De Moja 1991) and the choices one makes in which tasks they will perform depending upon their gender, culture and level of motivation (Slade & Rush, 1991; Singh & Bhargava, 1985). The major research in this area has centred upon how task difficulty affects goal setting, most often in the workplace (Gellatly & Meyer, 1992). It has been found in repeated studies that subjects perform

best on difficult tasks when they set their own deadlines and goals (Gellatly & Meyer, 1992; Huber, 1985; Surber, 1981). An interesting point made by Huber (1985) in the study of task difficulty and goal setting is that at some level of task difficulty, the imposition of a goal may erode rather than increase performance of the task. If true, it is hypothesized that this finding may have detrimental effects on the study at hand, as those being asked to perform a difficult task in this study of procrastination behaviour may feel that the effort is not worth the goal or reward. A possible solution to this problem may be to have their mark in this study count toward their total class mark.

After reviewing the information on procrastination, it seems that many of the authors were only concerned with why, when and how much students procrastinate. There are still, however, various areas of procrastination behaviour that should be researched, such as empirical data to support the notion that less procrastination behaviour may have a positive impact on academic grades, gender effects of this behaviour and further treatment programs for the relentless procrastinator. Research need also be done on exactly

what students are procrastinating on and what aspects of these assignments affect procrastination behaviour, such as how the expected degree of difficulty impacts on the student's attitude toward approaching the task. A sufficient awareness of this cognitive/behavioral dilemma has not yet been achieved within the public, educational or psychological community and research in these areas would contribute to a clearer understanding of this problem.

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Final paper submitted to Jack Dunning and Dr. Linda Sorensen as partial fulfilment of the Honours Psychology Thesis program.

ABSTRACT

The Procrastination Assessment Scale for Students (PASS) was administered to three university introductory psychology classes and two college abnormal psychology classes. One week later 79 volunteers from these classes were asked to complete three sets of computer tasks, each one containing easy, moderate and difficult anagrams. A 10-day period was allowed to complete all the tasks. The subjects chose the order in which to solve the differing levels of anagrams, but were required to wait 24 hours between each of the sets. Twenty-seven subjects met the criteria of completing the PASS and the computer tasks. It was hypothesised that the higher subjects scored on the PASS, the more likely they were to consistently perform the difficult tasks last. It was also hypothesised that high procrastinators would perform the tasks at the last possible time more frequently than low or medium procrastinators. Contradictory results show the hypotheses were not supported.

The Effects of Expected Task Difficulty on Procrastination Behaviour

There are occasions when delaying a task is advantageous and appropriate, such as when prioritizing tasks. However, according to Ferrari (1991a), procrastination, which is defined as compulsively delaying or failing to complete intended tasks to the point of experiencing anxiety, may be viewed as pathological. Although this problem is experienced by many people in various facets of life, it is very prominent in the life of a student. Procrastination in a student's life involves doing assignments just before they need to be handed in, postponing writing papers and doing other things while preparing for examinations (Schouwenburg and Lay, 1995). Previous research has examined possible reasons for procrastination such as protecting a vulnerable or low self-esteem, poor organizational and time management skills, fear of the consequences of failure or success, evaluation anxiety and difficulty in making decisions (Beswick, Rothblum and Mann, 1988; Lay, 1986; Solomon and Rothblum, 1984).

Although the assumption that the perceived difficulty of a task affects procrastination behaviour was evident in previous research, there is little documented evidence that it has been tested for. In a

related study, Ferrari (1991b) found that when given the choice of creating a hypothetical task to be completed, of which they might receive feedback on their performance, procrastinators chose items from the easy, nondiagnostic category while non-procrastinators chose items from the easy, diagnostic category. Ferrari theorized that procrastinators were protecting their vulnerable self-esteem by avoiding diagnostic material and effortful difficult tasks.

Past research on task difficulty has centred upon how task difficulty affects goal setting. It has been found in repeated studies that subjects perform best on difficult tasks when they set their own deadlines and goals (Gellatly and Meyer, 1992; Huber, 1985; Surber, 1981). According to Surber (1981), the perceived difficulty of a task is based mainly on past experiences of the subject, their knowledge and preparedness of the task and the judgements and assumptions of others who have previously performed the task.

The purpose of the present study was to examine how the expectation of how difficult a task will be affects the procrastination behaviour of three levels of procrastinators.

Three hypotheses were tested for:

(1) All three types of procrastinators (high, medium and low) will choose later times for performing the difficult task over the simple and moderate tasks.

(2a) High procrastinators will consistently choose later times to perform the tasks than low and medium procrastinators.

(2b) Medium procrastinators will consistently choose later times to perform the tasks than low procrastinators.

(3) High procrastinators will consistently choose to perform a difficult task in the latest time period available, more often than low or medium procrastinators.

To determine the levels of low, medium and high procrastinators, the Procrastination Assessment Scale - Students, developed by Solomon and Rothblum (1984), was used. This scale is the most widely used for exploring procrastination on academically related tasks. It has been found to have adequate test-retest reliability and validity. The scale consists of three sections. The first section assesses the frequency and reasons for procrastination in six academic areas, as well as the desire for change in these areas. The second section presents the respondents with a scenario of writing a

term paper and asks them to rate possible reasons for procrastination on this assignment. The third section inquires about interest in changing their procrastination behaviour through classes and programs (Ferrari, Johnson and McCown, 1995).

Method

Design:

A 3x3 factorial design was used to examine the behaviour of high, medium and low procrastinators on expected easy, moderate and difficult computer tasks.

Subjects:

The present study involved approximately 30 subjects from three Algoma University introductory psychology classes, and approximately 49 Sault College psychology students, volunteering for course credit.

Apparatus:

This study employed the use of the Procrastination Assessment Scale - Students (PASS). This scale consists of three sections, however, for the purpose of this study, only the first section was used. This section assesses the occurrence of procrastination behaviour in six areas of academic performance: (a) writing a term paper, (b) studying for exams, (c) keeping up with weekly reading assignments, (d) performing

administrative task, (e) attending meetings and (f) performing academic tasks in general. Subjects were asked to indicate on a 5-point scale the degree to which they procrastinate on the task and the degree to which procrastination is a problem. In addition, subjects were asked to indicate the degree to which they wish to decrease their procrastination behaviour on each academic task. Scores were obtained by assigning a number value of one to 'never procrastinate' up to five for 'always procrastinate.' Scores were then tallied for the first two questions in each of the six areas of procrastination. Theoretically, scores could range between 12 and 60.

The levels of procrastination were obtained by dividing the total number of completed PASS scales, arranged in rank order, into three relatively equal groups. Seventy of those subjects who had volunteered to take disks had completed the PASS scale. From this number, eight were eliminated due to faulty computer disks. Therefore, 62 scales were divided into the three levels. The scores for low procrastinators ranged between 17 and 28 (19 subjects), medium, between 29 and 34 (21 subjects) and high, between 35 and 46 (22 subjects).

This study also employed the use of pre-programmed computer disks containing a series of anagrams determined to be easy, moderate and difficult. Anagrams are words that have had their letters scrambled. The object is to decipher the word. The disks were programmed to invisibly log the date and time of day at which each subject started and finished each difficulty category, the order they chose to complete each category, the time in minutes spent each session they log in, and the number of times the subject accessed each category.

Procedure:

The Procrastination Assessment Scale for Students (PASS) developed by Solomon and Rothblum (1984) was administered to all students during one of their scheduled classes, without the experimenter present and without the students being told it was part of an experiment. The PASS was administered at the same time as two other scales - the State-Trait Anxiety Scale and the Test Anxiety Scale. The rationale behind this approach was to draw attention away from the PASS, so that future volunteers may not have expectancies of being tested for procrastination.

One week after the administration of the PASS, the experimenter entered the classrooms during a scheduled class and asked for volunteers for a experiment in what they believe to be on 'task difficulty'. These volunteers were given a disk containing the tasks to be completed. They were told the program contained tasks that were difficult, moderate and easy. They were not told the tasks to be performed were anagrams. Subjects were told to only perform the tasks on the school computers. This request was made in order to control for subjects having unequal access to computer facilities as some may have home computers. It was also done to control for possible time differences on the clocks of the home computers. The subjects were also told to complete the task on their own, without the aid of others. The subjects were told they had 10 days in which to complete the tasks on the disks and return the disk to their school library.

The results from the PASS for those who did not volunteer were discarded.

The task to be completed was a series of three levels of anagram difficulty. Once the subject accessed the program and entered their student number, they were asked to choose between three levels of anagrams - difficult anagrams, containing nine letters, moderate

anagrams, containing seven letters or easy anagrams, containing five letters. Each level contained five anagrams to solve, which were randomly selected, by the computer program from a database of sixty words per level. The database for the difficult and moderate words was created by the experimenter. The easy words were taken from a study by Tresselt and Mayzner of normative solution times for five letter anagrams (1966).

The subject could choose to perform the levels in any order they wished. However, once they chose a difficulty level to work on, they had to complete that level before choosing another. There were hints to the solution of the words available to the subject, if they wished. However, the subjects were warned they lose points for every hint they take. The subjects were told that each anagram was worth 300 points if solved without hints. The first hint cost them 15 points, the second hint costs them 30 points, the third hint, 45 points and so on. This was done to prevent subjects from simply taking the hints without trying to solve the anagrams themselves. At no time was their point score important to the study, except in determining those subjects who may take the hints without actually trying to solve the anagrams.

Three levels of difficulty with five anagrams each solved equalled one cycle. Once the subject had completed one cycle, they were instructed to wait at least 24 hours and begin another cycle. Once the second cycle had been completed, they were instructed to wait another 24 hours and begin a third cycle. The program did not prevent them from accessing before the 24 hours had elapsed, however, because the date was being recorded, the experimenter would know if they did not wait the 24 hours. Once they had completed the third cycle, the subjects were asked to return the disk to the library as soon as they could and complete a questionnaire, asking them whether they found the anagrams to be easy, moderate and difficult. The purpose of the questionnaire was to obtain the date in which they returned the disk. The library staff was asked to confirm the date on each questionnaire. The questionnaire was also administered in order to determine that the subjects did have an expectancy of difficulty or ease when they chose the order of difficulty level. The questionnaire also asked if they had difficulty gaining access to the school computers, as this may have affected when they could perform the cycles.

The program recorded the time measures used to determine the subjects' procrastination behaviour. These measures were:

- the number of days between when they received the disk and when they began work on it (eg. Did they wait until three days before the deadline to begin their first cycle?)
- the order they choose to complete the categories within each cycle
- the time and date at which they began each category
- whether they completed the entire task
- the number of days elapsed between cycles (eg. Did they go back 24 hours later or was it longer?)
- the number of days it took for them to return the disk to the library after completing the task

These measures were compared to the subjects' scores on the PASS to determine that high procrastinators are more likely to complete the difficult anagrams in the last available time slot and will wait to the last moment to return their disk, more so than low or medium procrastinators.

Results:

Before reporting the results, it is important to note that for various reasons, data analysis could only

be performed on 27 of the 79 disks handed out. Of the other disks, nine of the volunteers had not completed the PASS scale. Due to unexplained technical problems, eight subjects were not able to access the program on their disks. Five subjects only completed part of the program. Four subjects reported having problems using their school computers. One subject completed all three cycles in one day. Four subjects returned the disks without attempting the tasks on them. And after repeated phone calls, twenty-one subjects had still not returned their disks a week after the due date, when it was imperative that data analysis must begin. Of the 27 who did return their disks with the tasks completed, nine were low procrastinators, seven medium and twelve high.

Hypothesis 1: Frequency of Order of Selection:

This study hypothesized that all procrastinators would choose to do the difficult task last, more often then the easy or moderate tasks. To determine this, the total number of times that each category was performed last over the three cycles was tabulated. As shown in Figure 1, the difficult tasks were chosen to be performed last (55) more often than the easy (25) or

moderate (1) tasks. Thus the hypothesis is supported.

Hypothesis 2 and 3: Choosing Later Times

It was hypothesized that high procrastinators would consistently choose later times to perform all tasks than low or medium procrastinators and would choose to perform the difficult tasks in the last possible time, more often than low or medium procrastinators. In order to determine this, a one-way ANOVA was performed on 'Level' (of procrastinator) and the intervals between picking up the disks and beginning to perform the tasks, between cycles, and between finishing the tasks and returning the disk to the school library.

The mean number of days between when the disk was picked up and when the subjects first began the program was 4.33 (SD = 2.69) for low procrastinators, 1.71 (SD = 1.11) for medium procrastinators and 4.00 (SD = 3.03) for high procrastinators. There was no significant effect found, [F (2, 24) = 2.39, p > 0.05].

There was no significant effect found between Level and time in days between completion of the first cycle and start of the second. Means for low, medium and high procrastinators were 2.11 (SD = 1.83), 3.42 (SD = 1.27) and 1.72 (SD = 1.48),

[F (2, 24) = 2.62, p > 0.05], respectively.

There was no significant effect between Level and time in days between the second and third cycle. Means for low, medium and high procrastinators were 2.66 (SD = 1.68), 2.00 (SD = 1.00), and 2.36 (SD = 2.33), [F (2, 24) = 0.25, p > 0.05], respectively.

There was no significant effect found between Level and time in days between completion of the third cycle and the day the disk was dropped off. Means for low, medium and high procrastinators were 1.22 (SD = 2.27), 0.14 (SD = 0.3), and 0.00 (SD = 0.00), [F (2, 24) = 2.34, p > 0.05], respectively.

There was a significant effect found between Level of procrastinator and the total number of days between subjects receiving and returning the disks. On average, the low procrastinators kept the disks for 10.33 days (SD = 2.59), the medium procrastinators kept the disks for 7.28 days (SD = 2.05) and the high procrastinators for 8.09 days (SD = 1.18), [F (2, 24) = 4.48, p < 0.05]. (See Figure 2).

There was also a significant effect found between the drop off date and the due date. On average, the low procrastinators returned their disks 1.33 days late (SD = 2.59), medium procrastinators returned their disks 1.71 days early (SD = 2.05) and the high

procrastinators returned their disks 0.90 days early (SD = 1.81), [F (2, 24) = 4.48, p < 0.05]. (See Figure 3).

A one-way ANOVA was also performed to determine if high procrastinator chose to perform the difficult task last more often than low or medium procrastinators. There was no significant effect found. The mean for low procrastinators was 2.00 (SD = 1.32), for medium procrastinators, 1.28 (SD = 1.11) and for high procrastinators, 2.54 (SD = 0.82), [F (2, 24) = 2.90, p > 0.05].

Discussion:

Based on these findings, the behavioural measures of procrastination behaviour in this study (i.e. the time intervals) did not correspond with the self-report pen-and-paper measure employed (the PASS scale). As seen in Figure 2 and 3, the findings of this study show that, on average, those subjects who scored low on the PASS scale took the most amount of time to complete the tasks and returned the disks later than medium or high procrastinators. This is contradictory to what was hypothesized would occur. Speculation on why this may have occurred has produced some possible reasons.

As subjects did not know at the time of filling out the PASS that they were participating in an experiment, they may not have reported their procrastination behaviour truthfully. According to Dalton, Rothblum and Solomon, as quoted by Beswick, Rothblum and Mann (1988), there is evidence that scores on the PASS are not affected by social desirability responses. In other words, subjects were not responding falsely because they wished to create a positive impression of themselves. However, it is possible that some subjects in this study did not answer truthfully because they did not take the scale seriously and filled it out as a joke. For example, one subject stated he/she rarely procrastinated and that procrastination was not a problem. However, he/she consistently stated that he/she definitely wanted to decrease his/her tendency to procrastinate. Inconsistent responses similar to this appeared intermittently in other scales as well.

Another possible reason for the contradictory results of this study could be that those who report themselves higher on the PASS are more aware of their tendency to procrastinate and therefore may take more steps to prevent this behaviour than those who reported themselves lower.

These results could also have occurred due to different levels of motivation in subjects. Those volunteers from the university classes were required by their instructors to participate in experiments on campus in order to receive course credit. Volunteers from the college classes were not required to participate, but received extra course credit if they did. Therefore, the university students may be perceived as having a higher degree of motivation to complete and return the disks, as they would be losing something if they did not. Also, those subjects who needed or wanted the extra credit may be perceived as having a higher degree of motivation than those who did not need the extra credit to increase their class mark.

Another possibility may have been that, because the tasks being performed in this experiment were not part of the volunteers' regular school course load, and may have been perceived as being more enjoyable to complete then writing a paper or reading an assignment, procrastinators in all levels may have procrastinated on their other school projects in order to complete this experiment.

Suggestions for further research in this area may involve using a different measure of determining

procrastination level, as well as employing a task which has scholastic relevance to the subjects.

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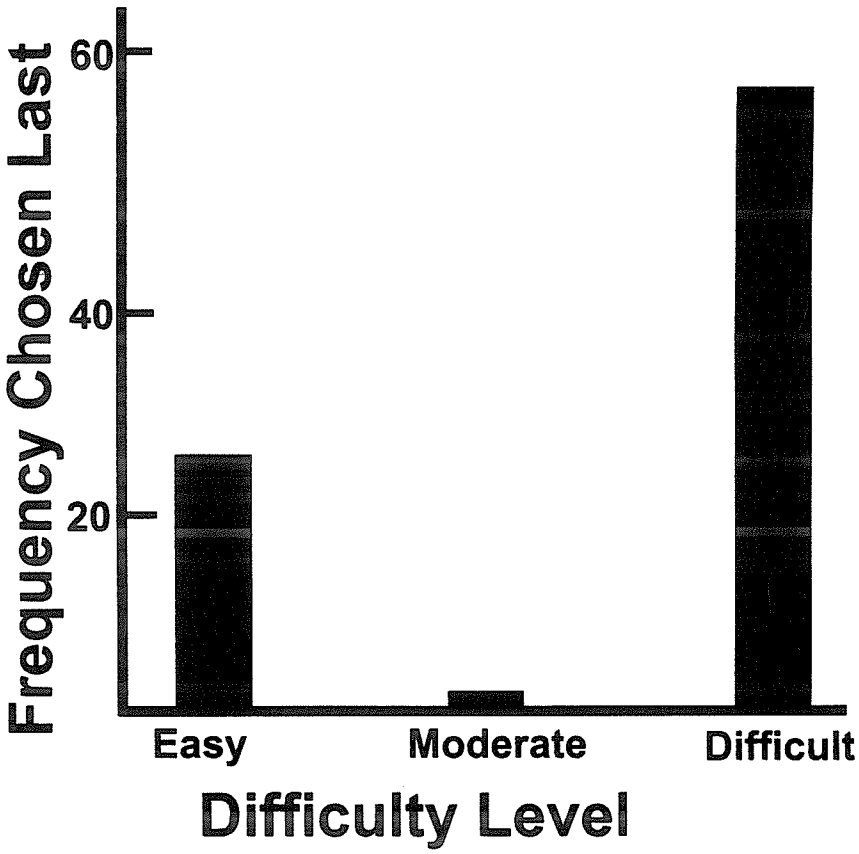
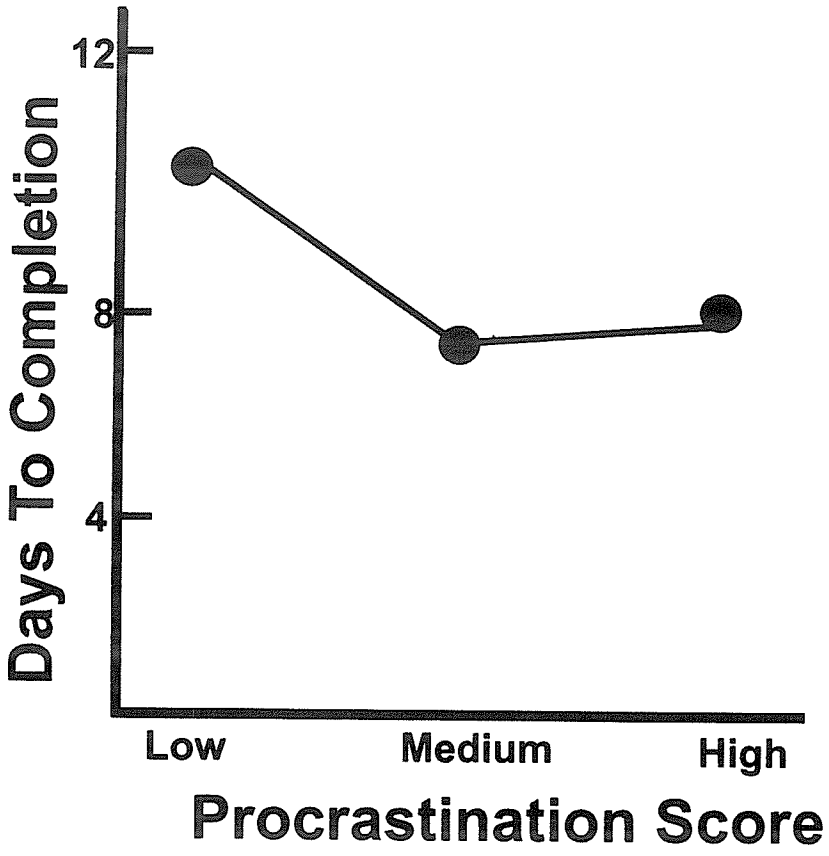
Figure Caption

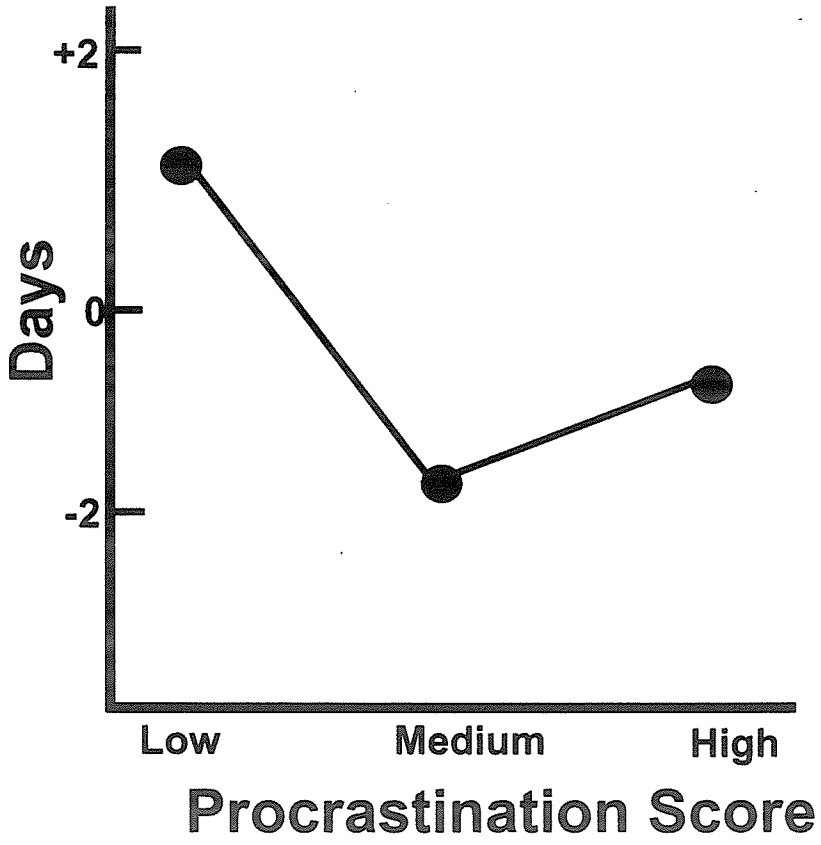
Figure 1. Frequency of difficulty level chosen to be performed last by all procrastinators, over three cycles.

Figure 2. Mean number of days between computer disk pick-up and drop-off for each level of procrastinators.

Figure 3. Mean number of days between due date and drop-off date for each level of procrastinators.


Frequency Chosen Last
60
40
20
Easy
Moderate
Difficult
Difficulty Level


12
8
4
Days To Completion
Low
Medium
High
Procrastination Score


+2
0
-2
Days
Low
Medium
High
Procrastination Score