Student Procrastination: A clarification and longitudinal analysis of its relationship to perfectionism, locus of control, and stress in university students.

A research project presented in partial fulfillment of the requirements for the degree of Master of Arts in Psychology at Massey University, Palmerston North, New Zealand.

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2000

ABSTRACT

The current study sought to clarify the conflicting relationships between student procrastination and three academically related measures of personality: perfectionism, locus of control, and perceived stress. The study also examined the nature of these relationships in a longitudinal assessment over the course of a university semester. 213 first year undergraduate students (146 females and 67 males) completed the Aitken Procrastination Inventory, the Multidimensional Perfectionism Scale, the Academic Locus of Control Scale, and the Perceived Stress scale within the first four weeks of a university semester, and again one week before the end of semester examination period. High procrastination at both the start and the end of the semester was related to an external academic locus of control and low levels of self-oriented perfectionism. Stress and socially prescribed perfectionism had little relationship to levels of procrastination at both the start and the end of the semester. Only academic locus of control was elevated at the end of semester as compared with the start of semester. The only significant predictor of end of semester stress levels was a high level of socially prescribed perfectionism at the start of the semester. The results were discussed with regard to the personalizing of academic control, the retraining of maladaptive causal attributions, the procrastinators 'last minute rush' theory, and the implications of these factors for future procrastination intervention strategies.

ACKNOWLEDGEMENTS

First and foremost, much thanks and praise is required for my supervisor Dr Ross Flett (H.G.B) who at the very least deserves both a knighthood and a generous Lotto win for the patience, guidance, and strength of character he demonstrated when dealing with a 'statistically uninformed' Masters thesis student prone to illusions of adequacy. Thank-you for your incisive sense of humour and your unflagging interest in the frequently ridiculous predicaments that have characterized my personal life over the past few years. Thank-you also for the grapefruit!!

Secondly, thank-you to my girlfriend Renée for her love and laughter even in times when we were both harassed and overwhelmed by the continual demand of a Masters thesis, coupled with the need to find money from somewhere to pay the rent. Your constant drive to get this thing done, and your unfailing support were a blessing. I love you and I am looking forward to meeting your mother soon!

My appreciation must be expressed to the rest of the Masters thesis 'giggly' group. Niall, Simon, and Anita, cheers for the group drinks, complaints, support, and gossip sessions. I believe they were beneficial beyond belief for the sanity of us all. Good luck guys!

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Procrastination: A Historical Account of the Concept

Procrastination:

> "..the tendency to postpone that which is necessary to reach some goal"
>
> (Lay, 1986, p475)

The Procrastinator:

> "..someone who knows what he or she wants to do, in some sense can do it, is trying to do it, yet doesn't do it"
>
> (Sabini & Silver, 1982, p126)

The phenomenon of procrastination has been recognized for centuries; the term itself derived from the Latin verb *procrastinare*, which means "..to put off or postpone until another day", (Ferrari, Johnson, and McCown, 1995: p4). However, the general meaning of, and connotations associated with, the concept has changed over time. As noted by Ferrari, Johnson, and McCown (1995) in their discussion on the origins of procrastination, at the time of the Egyptian Empire, the culture's language contained two verbs, which roughly translated into procrastination. The first verb represented the *practical* exercise of avoiding needless work and effort, while the second verb represented the *detrimental* exercise of needlessly delaying the completion of a duty essential for survival. The Latin translation of procrastination as postponing until another day also reflects the use of the term in Roman warfare. The concept denoted an opposition to impulsive action, reflecting patience and the wise tendency to defer pending judgement and essentially wait the enemy out. However, the modern concept of procrastination is considered far-removed from a 'wise tendency' and may be seen in most instances as a by-product of industrialised societies. As a society's technology advances, so time management and adherence to

schedules becomes paramount. As such, people who now express behaviours that detract from efficient task completion, in a world where efficient task completion and achievement are valued as primary goals, may be regarded as lazy and slothful, as opposed to having wisely delayed judgement.

Milgram (1991) offered one of the most clear and incisive definitions of the *modern* concept of procrastination to date. He notes that for a comprehensive 'diagnosis' of procrastination to be made there needs to be (1) an inefficient behavioural sequence of scheduling and aborting action, (2) which results in a substandard behavioural product, (3) on a task or assignment the procrastinator perceives as important, and (4) resulting in significant emotional upset.

The Current State of Procrastination Research

The modern phenomena of procrastination and chronic task-avoidant behaviours are an all-too-familiar occurrence for many people. However, despite the prevalence of such behaviours it has only been within the last 15 years that the area of procrastination has received anywhere near an extensive level of investigation (Milgram, Mey-Tal, & Levison, 1998). Much of the research to date has focussed on university students, whom, while being a convenient sample for psychologists to use in terms of availability in numbers, are also at an age - entering their early twenties - where procrastination and dilatory behaviour is said to plateau (McCown & Roberts, 1994). Also, as compared to the rest of the population, students tend to report greater instances of procrastination, a trend that tends to increase during higher education (Aitken, 1982).

Current estimates of the prevalence of procrastinatory behaviour in the student population are widely variable, indicating that despite the recent surge in research the area of student procrastination still lacks a certain amount of precision and consistency in both the definition and measurement of procrastinatory behaviour. Prevalence rates have been put at over 70% (Ellis & Knaus, 1977) and some even quote estimates as high as 95% (Solomon & Rothblum, 1984), while Flett, Blankstein, and Martin (1995) state that "..25% of [university] students suffer from *severe* levels of procrastination" (p137). Solomon and Rothblum (1984) studied the frequency of student procrastination and the reasons for this behaviour. They found that not only did a high percentage of students report having problems with procrastination, but also that procrastination in an academic setting may be task dependant. Of the students surveyed "..46% of subjects reported that they nearly always or always procrastinate on writing a term paper, 27.6% procrastinate on studying for exams, and 30.1% procrastinate on reading weekly assignments" (p505). These results were partly instrumental in revealing that the concept of student procrastination, previously considered merely a quirky and annoying habit of the lazy and inept, was actually a complex and inconsistent phenomenon much in need of further investigation and precise definition.

While the initial focus of much of the procrastination research was on the measurement of student study habits, and variability between internally taught campus courses and time taken to complete self-paced courses, researchers eventually found that procrastination was much more than a product of poorly

developed study skills and ineffectual time management (Rothblum, 1990; Solomon & Rothblum, 1984). The possible reasons researched for this pattern of behaviour are extensive; including fear of failure (Flett, Blankstein, Hewitt, & Koledin, 1992; Solomon & Rothblum, 1984), evaluation anxiety (Burka & Yuen, 1983; Lay & Silverman, 1996), self-handicapping (Ferrari, 1991, 1994), proneness to boredom (Blunt and Pychyl, 2000), lack of confidence (Lay, 1986), irrational thinking (Ellis & Knaus, 1977; Bridges & Roig, 1997), lack of conscientiousness (Schouwenburg & Lay, 1995; Lay, Kovacs, & Danto, 1998), perfectionism (Mandel & Marcus, 1988; Flett, Blankstein, Hewitt, & Koledin, 1992), locus of control (Jannsen & Carton, 1999;Taylor, 1979; Powers, 1985: cited in Ferrari, Johnson, & McCown, 1995), and test anxiety (Beswick, Rothblum, and Mann, 1988; Milgram, Dangour, and Raviv, 1992; Rothblum, Solomon, and Murakami, 1986; Saddler and Buley, 1999).

Theories of Procrastination

Psychoanalytic Theories

Specific task avoidance behaviour was an intense topic of discussion between Freud and his followers, and the defining role of anxiety in task avoidance behaviours was elucidated by Freud in *Inhibitions, Symptoms, and Anxiety* (1953, cited in Ferrari, Johnson, & McCown, 1995). The general theory was that the anxiety involved in task avoidance acted as a warning signal to the ego, signifying that the situation the individual was in was promoting repressed unconscious material that had the potential to be distressing to that individuals sense of self. As soon as the ego detects the existence of anxiety it implements a number of defences. Thus, the concept promoted by Freudian theorists was that the ego promotes the use of

defences, such as avoidance behaviours, because many uncomplicated tasks actually represent a threat to the integrity of ones ego, and as such must be avoided.

Despite the fact that many scientists have criticized psychoanalytic theories as being extremely difficult to test, if not scientifically impossible, some of the original research into procrastination was actually conducted by psychoanalytically oriented researchers. One of the most overtly psychoanalytic procrastination theories originated from field research. Blatt and Quinlan (1967) decided to test whether high and low procrastinators differed on a number of academic and extracurricular variables. The researchers used the time taken in a semester for students in an undergraduate class to fulfil their course requirements as an operational definition of high and low procrastination. The two groups did not differ significantly on variables such as college grade point average, area of academic major, scores on the Scholastic Aptitude Test (SAT), vocabulary or information subtest scale scores of the Wechsler Adult Intelligence Scale (WAIS), or the number of extracurricular activities undertaken. However, there were significant differences between the groups in terms of their time perception. The high procrastinators had lower overall scores than low procrastinators on a sub-test of the WAIS dealing with picture arrangement. Blatt and Quinlan interpreted this finding as indicating that procrastinating students had an inherent reduction in their ability to foresee future events. In addition, these students also narrated significantly more 'present oriented' stories when presented with TAT-like story stems, as opposed to the low procrastinators who narrated stories that tended to have more 'future-oriented' themes. Death and related themes were also produced more often in the story stems of the procrastinating students. The

researchers interpreted the themes of time perception and death from the traditional psychoanalytic viewpoint, which contends that habitual delay and lateness is subconsciously connected to the fear of death. Thus, procrastination according to Blatt and Quinlan is an unconscious endeavour to keep the reality of ones mortality at bay by expressing a disregard for the boundaries of both clock and calendar.

Psychodynamic Theories

Although both schools of thought favour aspects of Freudian theory, psychodynamic theories vary significantly from those of the psychoanalytic school in that they discard Freud's stringent structure of analysis, but support various other aspects of his human behaviour model. For example, psychodynamic theorists promote early childhood experiences as paramount in future personality development, as well as "..the belief that emotions from one period may be symbolically expressed through methods other than direct expression" (Ferrari, Johnson, & McCown, 1995: p23). Compliant with this theoretical undertone Missildine (1964) offered an explanation of procrastinatory behaviour based around what he terms a persistent *procrastination syndrome*. He believed that deficient childrearing practices were the reason behind the existence of this syndrome and especially the "slow, daydreaming paralysis" (Missildine, 1964: p102), which is the final symptom of the syndrome. Missildine stated that the parents of the procrastinating child presented with a number of specific *faulty* parenting traits. These traits generally came in the form of the setting of unrealistic, unobtainable goals for the child, an excessive pressure to achieve, and a 'conditional-love' relationship where by the love, support and approval of parents was a direct

consequence of the child's ability to achieve. As a result, any child nurtured in such an environment develops feelings of intense anxiety and worthlessness when faced with the possibility of failure.

Missildine believed that procrastination resulted from a re-enactment of these feelings when, later in life, the adult is challenged by a situation which calls into play the use of their skills and, thus, the risk of an evaluation of their ability and worth. As a direct result, the person begins to stall and delay meeting the demands of the task imposed upon them. Hence, the adult that formerly functioned efficiently and effectively now lapses into instances of procrastination.

Another exponent of the psychodynamic explanation of procrastination is MacIntyre (1964), who not only promoted overly harsh parenting as a cause for the appearance of procrastination, but also highlighted the potential of permissive parenting styles as a cause. MacIntyre stated that harsh, authoritarian parenting – reminiscent of Missildine's overly coercive parenting style - prompted the development of a child who is both underachieving and angry. This child flaunts their autonomy from parental figures and authority by continually disregarding the constraints of the clock. However, the child of permissive parents is more likely to develop into a person of nervous disposition, who is chronically underachieving, and who later in life simply becomes too apprehensive to complete given tasks within a self-imposed time frame.

A third psychodynamic theory of the development of procrastinatory behaviour comes from Spock (1971, cited in Ferrari, Johnson, & McCown, 1995).

Spock states that it is actually the unconscious expression of anger by the parents, when a child fails to complete a task set by the parents, that is the key to future procrastination. Children recognise this expression of anger in their parents, and so respond by postponing action related to possible goal-attainment, in an attempt to minimize the likelihood of further arousing parental anger. When raised in such an environment, an adult responds to possible goal-attainment situations by recalling the parental anger. The individual finds that "..they respond to this unconscious memory and subsequent resentment by attempting to thwart the wishes of the parental figure who is imposing the achievement-oriented task" (Ferrari, Johnson, & McCown, 1995: p25). Thus, the result is a recurring inability to complete given tasks, which is evocative of the original conflicting behaviour expressed in childhood.

While explanations originating from both the psychoanalytic and psychodynamic perspectives have definitely found great popularity in current popular literature and social circles, there are a number of shortcomings inherent in the concepts and arguments that limit their usefulness as explanations of procrastination. Firstly, while the research by Blatt and Quinlan (1967) was pioneering in the field of procrastination, the conclusions that they present as to the reasons for procrastination are unconvincing. The focus upon death and the endeavour to 'keep ones mortality at bay' as reasons for student procrastination were inferences made by the researchers based on their 'clinical judgement'. There is no empirical support for the notion that the procrastinating student is focussed more upon their imminent demise and means of staving off such an end, as opposed to

merely delaying study-time (for whatever reason). The assumption that the procrastinating student is consumed with 'death contemplation' represents an enormous conceptual leap given the lack of empirical support.

In relation to the psychodynamic theories for procrastination, while attempting to define an archetypal pattern of parenting resulting in a highly procrastinating child the theorists have subsumed the entire continuum of parenting, from overly permissive and relaxed to overly coercive and angry. This then greatly limits the explanatory power of parenting style as a 'cause' of procrastination. Both psychoanalytic and psychodynamic theories are extremely subsumptive and overly presumptive in their explanations for the existence of procrastination given the lack of any empirical evidence. This has forced the scientific community to look to other schools of research for more readily testable theories as possible explanations for procrastinatory behaviour.

Behavioural Theories

One prominent behavioural theory regarding the aetiology of procrastination is that of specious – or erroneous - rewards, presented by Ainslie (1975). The theory posits that people often have an innate tendency to select a short-term goal or immediate reward as opposed to a delayed, long-term goal, if the short-term goal is instantly gratifying. In this way the individual forfeits the attainment of the originally desired goal for an easily accessible but ultimately hollow, or specious, reward. Procrastination, therefore, can be seen as the habitual desire for the attainment of the specious reward over the desire for long-term goal attainment. For example, every

time the procrastinator gives in to the demand for leisure over the desire to complete a given task, further completion of that task is accorded more feelings of anxiety. In this way an avoidant feedback pattern develops, which dictates that the greater the level of anxiety associated with the given task, the greater the likelihood of the individual choosing to pursue the pleasurable short-term reward (and the avoidance of anxiety), which in-turn accords even greater feelings of anxiety towards the completion of the task.

The general concept of procrastination acting as an avoidant or escape response to stimuli is an idea that has generated some research. The completion of a specified task, given the potentially high levels of anxiety associated with it – noting that anxiety is argued to be one of the most prominent discriminative cues for avoidant behaviour (Solomon & Rothblum, 1984) – may pose a significant threat to the psychological and emotional well-being of the individual. As such, the act of procrastination can itself act as either an escape response – whereby the completion of the task is entirely negated – or as an avoidance response – whereby the completion of the task is merely postponed until a time the individual feels they are better equipped to deal with it. The hypothesis, that procrastination was an avoidant response used to postpone the eventual completion of a task, was used as the basis for a study by McCown and Johnson (1989, cited in Ferrari, Johnson, & McCown, 1995) into the effects of student anxiety on hours spent studying. College students were assessed twice daily, for a period of fourteen days leading up to an exam period, for levels of anxiety and number of hours spent studying. The researchers found that anxiety peaked early in the period and then declined, which followed the

pattern of hours spent studying. However, anxiety then rose sharply days before the exam period, a rise so abrupt that the students could not merely avoid it by deferring their study. Thus, in response to this anxiety, the level of hours spent studying rose dramatically in a pattern resembling the traditional 'last minute rush', which is a trait common to many procrastinators. This pattern illustrated the tendency for some students to use procrastinatory behaviours in response to the discriminative cue of anxiety, albeit unsuccessfully, in an attempt to avoid this anxiety.

The major critique of behavioural theories is that they fail to predict or explain the instances of individual differences and variation in behaviour. Simply expressed, some people procrastinate and some do not, and some people procrastinate only on certain types of tasks but efficiently complete others. Such inconsistent and unpredictable behaviour defies many of the major principles underpinning behavioural theories regarding unity of response and the continuity of behaviour over time.

Cognitive-Behavioural Theories

By far the most promising theoretical developments can be found in the emergence of the cognitive-behavioural theories of procrastination.

One of the most noted cognitive-behavioural theories of procrastination was that of 'Irrational Beliefs' developed by Ellis and Knaus (1977). These researchers argued that procrastination was related to irrational beliefs and self-criticism. They stated that procrastinators possess irrational belief structures, which promote a

concern over their ability to complete given tasks, and thus they delay executing action on the task in question. The basis for such irrational beliefs usually can be seen to reside in the perfectionistic nature of many procrastinators. Ellis and Knaus claim that these procrastinators inevitably lead themselves to the point of failure by setting excessively high standards, which are impossible to obtain. In turn, so as to avoid facing the reality of failure, the individual delays commencing action on the task until a time when successful completion of the task is impossible. Thus, as the procrastinator does not *consciously* desire failure they can conveniently lay the blame for task failure squarely at the feet of his or her avoidant behaviour, rather than admitting they possess an inability to attain such high standards. Research conducted by Solomon and Rothblum (1984) and Flett, Blankstein, Hewitt, and Koledin (1992) supports this irrational tendency theory. Both studies found that students who rated as having high levels of procrastination also scored highly on a *fear of failure* scale.

Cognitive Trait Correlates with Procrastination

As has been so clearly and eloquently stated by Lay and Silverman (1996), "..Trait procrastination is to dilatory [procrastinatory] behaviour as trait anxiety is to state anxiety" (p61). This definition allows us to view trait procrastination and procrastinatory behaviour not as one and the same, but as two separate, yet interconnected, concepts. While much research has been conducted on the concept of procrastination, it is generally the *instances* of actual procrastinatory behaviour and not trait procrastination that this research examines, as it is commonly assumed that procrastinatory behaviour is representative of an underlying procrastinatory trait.

This argument raises the point that while trait procrastination may undoubtedly be viewed as a main cause of dilatory or procrastinatory behaviour, this does not negate the possibility of 'third' variables playing a part in this behaviour, as actual instances of procrastinatory behaviour may be more than a function of a single source variable (Schouwenburg, 1992). Accordingly, research involving procrastination can be viewed as an extensive search for the primary sources of procrastinatory behaviour, and a hunt for the correlates of procrastination as a whole. Three proposed sources of procrastinatory behaviour are the concepts of (1) perfectionism, (2) locus of control, and (3) stress. All three concepts and their hypothetical links to procrastination are reviewed below.

(1) Perfectionism

Burns (1980) characterized perfectionism as a personalized cognitive pattern of expectations consisting of: (a) the setting of improbable standards and patterns, (b) the setting of rigid performance adherence standards, and (c) the attainment of self-image and self-worth through such performance.

As stated by Flett, Hewitt and Martin (1995), in establishing the link between procrastination and perfectionism, "A common belief about the nature of procrastination is that it stems from excessively high standard setting behaviour" (p113). This notion is supported by Burka et al (1983) who, while discussing the concept of general and specific procrastination, presented the concept of the *'Procrastinators Code'*. They stated that the impractical, unrealistic assumptions which procrastinators often live by and internalise, could be considered as coming

under the banner of the *'Procrastinators Code'*. Many of these assumptions, such as " *I must be perfect at everything I undertake*", are based around the concept of perfectionistic standards. Perfectionistic standard setting is counterproductive to academic-task performance in a goal-directed setting, and it promotes underachievement, and lack of goal focussed effort, which are traits common to procrastinators (Arthur & Hayward, 1997; Hollender, 1965; Mandel & Marcus, 1988).

While procrastination and perfectionism are two separate and distinct concepts, there are many similarities between the two; one of which, as mentioned previously, is the finding that procrastinators tend to display similar cognitive characteristics to those displayed by perfectionists, such as a tendency to place great emphasis on the notion of continual success (Burka et al, 1983). Both perfectionism and procrastination are related to an elevated endorsement of irrational beliefs, such as the ever-popular self-defeating life philosophy *'I must do well at everything I attempt'* (Beswick, Rothblum, & Mann, 1988; Ellis & Knaus, 1977; Flett, Hewitt, Blankstein, & Koledin, 1991). A third similarity is that while both procrastination and perfectionism are characterised by a drive for success, both are also associated with an extreme fear of failure (Flett, Hewitt, Blankstein, & Koledin, 1992; Flett, Hewitt, Blankstein, & Mosher, 1991; Solomon & Rothblum, 1984).

One aspect of research with perfectionism that has come to light in recent years is the multi-dimensionality of the concept. Hewitt and Flett (1990) defined three aspects of perfectionism: self-oriented, other-oriented, and socially prescribed. Self-oriented perfectionism was described as encompassing the personal aspects of

perfectionism in that it is characterised by a fervent desire to succeed, the setting of excessively high personal standards, and an *'all-or-nothing'* performance directed mindset. Other-oriented perfectionism, on the other hand, was defined as encompassing the interpersonal dimensions of perfectionism and revolves around the beliefs and subsequent expectations that one imposes on others through the setting of unrealistic standards. Other-oriented perfectionism is also characterised by the placing of paramount importance on whether others succeed in terms of reaching these goals, and rewarding them dependant upon the attainment of said goals. Finally, socially prescribed perfectionism is characterised by the subjective perception of ones inability to attain the standards and goals one feels are being imposed by important others.

Subsequent research into the relationship between procrastination and the dimensions of perfectionism has revealed a variable pattern. A clear finding in a number of studies is that, of the three dimensions of perfectionism, it is only socially prescribed perfectionism, the perception that others are imposing excessively high standards for you to attain, that is significantly related to greater levels of procrastination. For instance, Flett, Blankstein, Hewitt, and Koledin (1992) found that socially prescribed perfectionism correlated significantly positively with 4 of the 6 dimensions of the procrastination measure used in the study, while self-oriented perfectionism had no significant relationship to procrastination. The observed relationship between socially prescribed perfectionism and procrastination has subsequently been replicated a number of times in procrastination research indicating that, in general, a student rating themselves as high in socially prescribed

perfectionism may be more inclined to feel pressure from significant others to complete work to an exceptionally high standard, and, this pressure in turn will more likely lead to an avoidance of the task at hand through greater procrastination (Flett, Hewitt, & Martin, 1995; Martin, Flett, & Hewitt, 1993: cited in Flett, Hewitt, & Martin, 1995; Saddler & Sacks, 1993).

However, despite the frequency of the finding that there is a relationship only between socially prescribed perfectionism and procrastination, two studies have also found a correlation between self-oriented perfectionism and procrastination. Saddler and Buley (1999) undertook a study to assess possible predictors of academic procrastination, and found that, while there was a significant relationship between procrastination and socially prescribed perfectionism, the two best predictors of high student procrastination were actually high test-anxiety and low scores on the self-oriented subscale of the Multidimensional Perfectionism Scale (Hewitt & Flett, 1991). Martin, Flett, and Hewitt (1993: cited in Flett, Hewitt, & Martin, 1995), in an unpublished study assessing the link between perfectionism, self-expectancies and procrastination, and using the same measure of perfectionism but a different measure of procrastination, also found significant relationships for both socially oriented and self-oriented perfectionism with procrastination. Both perfectionism subscales were also found to be significant predictors of procrastination. A comparison of the studies presenting no significant relationship between self-oriented perfectionism and procrastination, and those studies presenting significant relationships, reveals a small number of differences between the two groups that may have influenced the findings.

While there appear to be very few significant differences between most of the studies in question, it is the comparison between the studies by Saddler and Sacks (1993) and Saddler and Buley (1999) that may potentially hold the key to the variation in reported relationships. Both the studies, Saddler and Sacks (1993) and Saddler and Buley (1999), utilised the Aitken Procrastination Inventory (1982) and the Multidimensional Perfectionism Scale (Hewitt & Flett, 1989,1991), yet the former found no significant relationship between self-oriented perfectionism and procrastination, while the latter did. Both studies used university students as participants, and were conducted within the first half of a university semester. However, while Saddler and Buley used 104 participants (38 men and 66 women) and Saddler and Sacks used 150 participants (50 men and 100 women), the point to note is that of this 150 students used by Saddler and Sacks, 108 were postgraduate students and had a mean age of 32.5 years, as compared to Saddler and Buley's undergraduate students whose mean age was 21.3 years. In this respect, the variance in the results between the two studies may be accounted for by the substantial variance in participant age, a hypothesis partially supported by Saddler and Sacks whose study also revealed that self-oriented perfectionism, but not socially prescribed perfectionism, was significantly negatively correlated with participant age, indicating that the younger participants in the study had greater levels of self-oriented perfectionism than the older participants. Thus, while there was no effect for self-oriented perfectionism on procrastination in their study, it may have been a result of the disproportionate number of older students to younger – greater than 2/1 – concealing the effect of what may be an age related relationship between self-oriented perfectionism and procrastination.

In this respect, age may be seen as a factor in the relationship between self-oriented perfectionism and procrastination. However, while the hypothesis that participant age is a possible explanation exposing the inconsistency in the reported relationships between procrastination and self-oriented perfectionism, this possibility still fails to acknowledge that the concepts of self-oriented perfectionism and student procrastination should, by virtue of the complimentary characteristics inherent in the respective concepts as outlined below, have a long-established relationship.

The main point of debate concerning the relationship between procrastination and self-oriented perfectionism is that this relationship has been much less consistent in studies than has that between socially prescribed perfectionism and procrastination. The relationship between procrastination and socially oriented perfectionism could hypothetically be accounted for by observing that the excessive social pressures to excel, where personal desire is lacking, could possibly force a student to withdraw effort merely due to hostile reaction to externally enforced goals. However, it is the fact that while this relationship is for the most part consistent, there are only two prior studies that note a relationship between procrastination and self-oriented perfectionism where one should at least hypothetically exist. An examination of the concepts of procrastination and self-oriented perfectionism illustrates the potential for a relationship.

The self-oriented perfectionist by definition embodies the personal aspects of the concept of perfectionism and of personal control to the utmost extreme, given the characteristic setting of seemingly impossible, high standards of achievement, and

consistent emphasis and focus on attaining those standards. In saying that, students with low personal levels of self-oriented perfectionism, by definition, are the polar opposite to the high self-oriented perfectionist, and thus should by all means lack that intense sense of personal control, and indeed the desire for personal control, necessary to attain personally derived goals. If this is the case, there should be a significantly negative relationship between academic procrastination and self-oriented perfectionism due to the fact that those students high on self-oriented perfectionism would be extremely focussed, motivated, and goal driven, thus being significantly less likely to procrastinate than their less focussed counterparts.

In this respect, the relationship between self-oriented perfectionism and student procrastination should also be more significant and of greater magnitude than that between socially prescribed perfectionism and student procrastination. Socially prescribed perfectionism can merely be seen as a level of how susceptible an individual is to social pressures to perform. In this regard, only high levels of socially prescribed perfectionism should be related to student procrastination, as low levels of this type of perfectionism do not entail a greater work ethic, merely a lower susceptibility to social pressure. However, self-oriented perfectionism can in be viewed as a personal continuum of self-motivated perfectionism, and as such there should logically be a relationship between both extremes of the self-oriented perfectionism subscale and student procrastination given that those at one extreme are by definition very motivated and goal driven and should procrastinate less, and those at the opposite extreme are very unmotivated and lack such a drive, and should therefore procrastinate more.

The current state of debate over the relationship of self-oriented and socially prescribed perfectionism to student procrastination leads to at least two areas that warrant further exploration. Firstly, of the studies reporting inconsistent results in the relationships between procrastination and the subscales of perfectionism, the only observed difference was the substantial disparity between the mean age of the participants used, and the finding that self-oriented perfectionism was significantly positively related to student age, which indicates that high levels of self-oriented perfectionism may be age dependant and an effect for this variable on procrastination will only be present given a 'traditionally' aged university student sample, as opposed to a non-traditional 'mature' student sample. Secondly, while there is no consistent relationship present, the complementary characteristics of the concepts of procrastination and self-oriented perfectionism dictate that a consistent relationship *should* be evident, and that the relationship between self-oriented perfectionism and procrastination should be more significant than that between procrastination and socially oriented perfectionism.

(2) Locus of Control

As previously mentioned, the second variable linked to levels of student procrastination is the concept of locus of control. Taylor (1979) conducted some of the original studies on procrastination in an attempt to find cognitive and personality correlates, and one of the concepts Taylor singled out was locus of control. Locus of control is based upon the premise that an individual's personality type can be observed as being either *internally* or *externally* focused. On a continuum of locus of control, those individuals scoring low on the continuum are classified as *internally*

focussed, or as having an internal locus of control, and feel that they are directly responsible for the influence of any event that affects their lives. Conversely, those scoring high on the continuum are classified as *externally* focussed, or as having an external locus of control, and feel that the result of any life affecting event is an occurrence beyond their control, and is thus governed by external forces (Rotter, 1954, 1975).

The original hypothesis presented by Taylor (1979) was that procrastinators, by virtue of their seeming lack of intrinsic motivation, must in some way lack a sense of personal control over their ability to accomplish a task. This lack of intrinsic motivation would then translate into the possession of an external locus of control, which is characterised by a sense of a lack of situational control. The flip side of the coin being that those low in procrastinatory tendencies would possess greater intrinsic motivation, which would translate into an internal locus of control. This theory is supported by research conducted by Onwuegbuzie and Daley (1998) and Jones, Slate, Perez, and Marini (1993, cited in Onwuegbuzie et al, 1998) who found that an internal locus of control was the best predictor of increased study skills in both undergraduate and graduate students.

The majority of research to date with the locus of control concept and its perceived relationship to procrastination has, however, revealed mixed findings. Briordy (1980) found that there was no significant relationship between three independent locus of control scales and a self-report procrastination measure. Likewise, Aitken (1982) found that there was no significant relationship between

Rotters locus of control scale and her own measure of procrastination. However, Powers (1985, cited in Ferrari, Johnson, & McCown, 1995) found that non-procrastinators were significantly more likely to have an internal locus of control. These studies, though, all used general measures of locus of control, and research into the area of academic procrastination and associated academic locus of control would benefit from the inclusion of academic specific measures (Jannsen and Carton, 1999; Trice and Milton, 1987). Specifically, Social Learning Theory argues that an individuals behaviour in any given situation is relative to the *specific* expectancies which are a function of that situation or domain, rather than being a function of *generalised* expectancies (Kaplan & Cowles, 1978; Rotter, 1982).

Research utilising academic specific measures, however, has presented a similar pattern of mixed results. Ferrari, Parker, and Ware (1992) using the Procrastination Assessment Scale-Students (PASS) found that there was no significant relationship between academic procrastination and academic locus of control. However, Trice et al (1987) found that adults in a correspondence course who handed their completed course work in late – this being used as a behavioural measure of procrastination - were higher on the external scale of an academic locus of control measure then were students handing in assignments on time. This finding has also been supported by results from research on college students by Jannsen et al (1999). Jannsen and Carton found that college students with external locus of control expectancies not only delayed beginning work on assignments, but also completed and handed assignments in later than those students with internal locus of control expectancies. Also, in related research into student attributions for success or failure,

Rothblum, Solomon, and Murakami (1986) found that attributions of success on examinations and course work for students high in procrastination were more likely to be on external factors, as opposed to students low in procrastination who indicated internal factors, indicating that those students attributing success to external factors may have been more likely to have possessed an external locus of control.

The perceived lack of a stable relationship between procrastination and locus of control seems an oddity given the seemingly complimentary nature of the internal and external locus of control dimensions for low and high procrastinators. Firstly, as proposed by Taylor (1979), students with greater procrastinatory tendencies would seem to lack an intrinsic sense of motivation to accomplish a given task, and in this sense must in some way lack a sense of personal control over their academic outcome. In this instance, the procrastinating student should present with an external academic locus of control, as the successful completion of the task at hand is divorced from personal control and in effect reliant on some form of external power such as chance or luck. In contrast, the students with lower procrastinatory tendencies would be characterised by a great sense internal motivation to complete a given task, and must possess a great sense of personal control over their academic affairs. As such, these students should present with an internal academic locus of control which itself is characterised by a desire to be directly responsible for the influence of any event that affects their academic career.

Another area of support for an established relationship between academic locus of control levels and student procrastination is the parallel between these

proposed relationships and the relationships between procrastination and the subscales of perfectionism. While it is in no way presumed that academic locus of control should have a relationship with student procrastination simply through its relation to the subscales of perfectionism, it is the similarity between the characteristics of these subscales and internal and external academic locus of control that calls into question the lack of a relationship. Both self-oriented perfectionism and internal locus of control are characterised as primarily self-directed traits, with great self-motivation and a desire for personal control over academic outcomes. Socially prescribed perfectionism and external locus of control on the other hand are both characterised by a lack of motivation and a release of personal control over academic outcome. Hewitt and Flett (1991) found that the subscale of socially prescribed perfectionism was significantly correlated with an external locus of control in students, while Flett, Blankstein, and Hewitt (cited in Ferrari, Johnson, & McCown, 1995) found that self-oriented perfectionists were more likely to have an internal rather than an external locus of control. In this instance, it may be stated that for procrastination to have such an inconsistent relationship with levels of academic locus of control, which for the most part reflects characteristics found in self-oriented and socially prescribed perfectionists which themselves have been shown to possess some relationship to procrastination, seems illogical at best.

Taking into account the lack of research utilising specific academic locus of control measures, the existing lack of a stable association between student procrastination and levels of academic locus of control *may* be accounted for by reviewing the previous research in the area and highlighting certain inconsistencies

present. To begin with, a comparison between the studies by Ferrari, Parker, and Ware (1992) and Trice and Milton (1987) draws attention to the initial inconsistency in the current research. Though both studies utilised Trice's (1985) Academic Locus of Control Scale, the former found that procrastination and academic locus of control were unrelated, and the latter that an external academic locus of control was predictive of student procrastination. The defining point of comparison between the two studies is that Ferrari, Parker, and Ware (1992) studied traditional aged college students, with a mean age of 18.2 years, whilst the study by Trice and Milton (1987) utilised 'mature' returning students – no age given by the authors. In this respect, as underlined by Trice and Milton (1987), the disparity in findings may be due to the reality that 'mature' students may differ from 'traditionally' aged students in levels of motivation. However, studies by Rothblum, Solomon, and Murakami (1986) and Jannsen and Carton (1999) focussed on undergraduate students, mean ages of 22.2 and 19.7 years respectively, and found that students with an internal academic locus of control consistently had better study skills, as measured by researcher-developed measures, and started work on assignments and projects earlier, than students with an external academic locus of control.

Two points to note emerge from the analysis of these four studies. Firstly, while the studies by Rothblum, Solomon, and Murakami (1986) and Jannsen and Carton (1999) found an effect for internal academic locus of control on student procrastination, both these studies utilised self-designed behavioural measures of procrastination. Thus, while measuring the behavioural component of procrastination they failed to measure the extent to which the students possessed a procrastinatory

personality trait, which somewhat distorts the comparison between these studies and those by Ferrari, Parker, and Ware (1992) and Trice and Milton (1987). Secondly, controlling for the variance in the measures used in the four studies, the subtle trend emerging concerning the relationship between procrastination and academic locus of control is: when age of the student is taken into account, an internal academic locus of control tends to be more useful at differentiating between younger 'traditionally' aged student procrastinators, whereas an external academic locus of control tends to be more useful at differentiating between 'mature' student procrastinators.

This analysis brings to the fore a number of points in need of further exploration. Firstly, an investigation is needed to assess whether student procrastination actually is related to levels of academic locus of control at all, and if so whether high student procrastination is directly related to an external academic locus of control, and low student procrastination to an internal locus of control. Secondly, if a relationship is shown to exist between student procrastination and academic locus of control, the effect of student age must be examined for the predicted effect that an external academic locus of control will be superior at differentiating between 'mature' aged high and low procrastinators, and that an internal academic locus of control will be superior at differentiating between 'traditional' aged high and low procrastinators. Thirdly, this investigation requires the utilization of reliable academic procrastination and academic locus of control scales with an established research history, as opposed to researcher-derived measures with unknown psychometric properties.

(3) Stress

The third variable linked to levels of student procrastination is the concept of student stress. For many university students stress is a facet of everyday life. Course readings, group projects, personal assignments and, in particular, end of semester examinations are all key sources of pronounced stress for students. The influence of test anxiety and associated stress on the well-being of students has generated considerable research, much of this showing that test anxiety has a profound negative influence on the lives of the student and their families, including such consequences as a marked decrease in sexual activity, and an increase in nightmares, sudden mood alterations and superstitious behaviours (Albas & Albas, 1984; Mechanic, 1978).

A number of studies have highlighted the existence of a link between procrastination and subsequent stress and test anxiety. Rothblum, Solomon, and Murakami (1986) found that in a study of academic procrastination and related academic trait measures, high procrastinating university students experienced greater and more stable levels of test anxiety and general stress over a period of three weeks than did low procrastinators. Likewise, Beswick, Rothblum, and Mann (1988) and Saddler and Buley (1999) found that high student general anxiety and test anxiety correlated significantly with self-report measures of procrastination. Milgram, Dangour, and Raviv (1992) used a behavioural measure of procrastination and concluded that a high level of test anxiety motivates students to post-pone starting academic assignments and revision. Flett, Blankstein, & Martin (1995) assert that a link between procrastination and stress should be a matter of logical deduction given

the procrastinators innate lack of sense of self-control and the preoccupation with failure, which, in-turn, should directly translate into greater levels of perceived academic and life stress. They report the findings of research conducted in their laboratory to test this procrastination-stress relationship. The researchers gave a sample of 135 college students a variety of measures including Lay's (1986) General Procrastination Scale, and a measure of daily hassles, life events, and perceived stress. The researchers found a highly significant relationship between high levels of procrastination and levels of daily hassles, negative life events, and perceived stress.

In addition to this evidence illustrating the direct link between procrastination and stress, there is partial evidence to suggest that factors related to stress might not merely have a 'static' relationship, but that these relationships may fluctuate over time dependant on the varying levels of stress. Fisher (1994) investigated the link between student mental health and examination stress, and found that as the reported levels of student stress increased in the months prior to the examination, this was mirrored by an increase in student scores on depression. Also, Tice and Baumeister (1997) undertook a longitudinal study to examine student procrastination and its relationship to stress, health, and academic performance over the period of a university semester. They divided the sample into high procrastinating students and low procrastinating students, dependant upon scores on a general measure of procrastination, who they referred to as *procrastinators* and *non-procrastinators*. The researchers found that while over the course of a semester there was a significant relationship between procrastination and stress, this varied depending upon the proximity of the exam period. Earlier in the semester, procrastinators

reported lower stress and illness scores than did non-procrastinators, but by the end of the semester both the stress and illness scores of procrastinators had exceeded those of the non-procrastinators. This is contrasted by the results of Solomon, Rothblum, and Murakami's (1986) study who presented results indicating that, despite the fact that student procrastinators experienced greater levels of stress over a three week period leading up to midterm examinations, there was no effect for week on level of procrastination, and as a result, procrastination was high but continually stable across the three weeks. However, the contrast between the two studies is that while Solomon, Rothblum, and Murakami (1986) found no variation in stress over a three-week period before examinations, the study undertaken by Tice and Baumeister (1997) covered an entire semester, indicating that the effect of stress on procrastination may take place over a longer period of time than three weeks before an examination period. Also, while stress levels during this three-week period may be consistently high, the stress levels at the start of the semester may actually be significantly lower for procrastinators than the peak at the end of the semester.

While this research fuels further debate over the relationship between procrastination and the proposed variance in levels of stress over the course of the university semester, it also raises the question of the influence of stress on the levels of student perfectionism and academic locus of control, the other key variables related to procrastination, over the same course of time given the following hypothesised links between student stress and perfectionism and academic locus of control. As outlined by Flett, Blankstein, and Martin (1995) stress may arise out of pressure to attain unrealistic social expectations, and as such it would seem to have

at least a plausible link to socially prescribed perfectionism given that, by virtue of the characteristics inherent in the trait, socially prescribed perfectionists have a considerable predisposition to attend to external/social demands. Flett, Blankstein, and Martin (1995) also proposed that a correlation between external academic locus of control scores and stress scores may be hypothetically stated given that stress involves low controllability over aversive stimuli and those students with an external academic locus of control inherently suffer from low levels of controllability. Also, concerning the finding by Tice and Baumeister (1997) that stress scores increase over the course of a semester, Wang and Jentsch (1998) found that academic locus of control scores emulate this pattern, in that academic locus of control scores also increase, and as a result are more external at the end of the semester than at the start.

The review of the research into student procrastination and its relationship to stress clearly reveals that the effect of high student procrastination coupled with high stress is a stable 'static' relationship at each observed point in time. However, despite the fact the nature of the university semester dictates that student stress should naturally rise in a linear fashion from the start of the semester to the point of final examinations - given the increasing pressure placed on the student to complete set course work and study for finals - there is a scarcity of comprehensive longitudinal studies detailing the potential effects this elevation in student stress may have upon levels of procrastination over the course of the semester. It is unclear whether increased stress would result in subsequent increased procrastination, or whether this raising stress state would prompt the procrastinating student to stop delaying study. Also, given the hypothesized links between stress and levels of

perfectionism and academic locus of control, as well as their proposed links to student procrastination, a longitudinal study detailing the relationships between student procrastination, perfectionism, academic locus of control, and student stress over the course of a university semester is warranted.

Statement of Research Questions and Hypotheses

The first group of hypotheses were derived from the conflicting research findings presented by Saddler and Sacks (1993) and Saddler and Buley (1999). They considered the replicability of the documented relationships between procrastination and the self-oriented and socially prescribed subscales of Hewitt and Flett's (1989, 1991) Multidimensional Perfectionism Scale. They also considered the potential effects of student age on the relationship between student procrastination and self-oriented perfectionism.

I. Hypothesis *I* was that, corresponding to the findings of Saddler and Sacks (1993), there would be an association between student procrastination and socially prescribed perfectionism only for 'mature' aged, or older, students.

II. Hypothesis *II* was that, corresponding to the findings of Saddler and Buley (1999), there would be an association between student procrastination and self-oriented perfectionism only for 'traditional' aged, or younger, students.

The third hypothesis involved the strength of the relationships between the subscales of perfectionism and procrastination. It was hypothesized that the defining characteristics of the concepts of procrastination and self-oriented perfectionism indicate that a consistent relationship between the two *should* be evident, and that the

relationship between self-oriented perfectionism and procrastination should be more significant than the relationship between procrastination and socially oriented perfectionism.

III. Hypothesis *III* was that the relationship between self-oriented perfectionism and procrastination would be stronger than that between socially prescribed perfectionism and procrastination at both the start and the end of the semester.

The next group of hypotheses sought to assess the claim of a link between procrastination and locus of control made by Taylor (1979) and Trice and Milton (1987), and to examine whether the perceived lack of a consistent relationship between procrastination and academic locus of control was a function of student age.

IV. Hypothesis *IV* was that, corresponding to the findings by Trice and Milton (1987), there would be an association between student procrastination and an external locus of control only for 'mature' aged students.

V. Hypothesis *V* was that, corresponding to the findings by Rothblum, Solomon, and Murakami (1986) and Jannsen and Carton (1999), there would be an association between student procrastination and an internal locus of control only for 'traditional' aged students.

The next hypothesis dealing with basic correlations with procrastination sought to consider the link with stress, as found by Flett, Blankstein, & Martin (1995), that procrastination was positively related to stress.

VI. Hypothesis *VI* was that high levels of procrastination would be associated with high levels of perceived stress.

The seventh through to eleventh hypotheses in the current study sought to define the inter-relationships between the dimensions of stress, perfectionism, and locus of control. As proposed by Flett, Blankstein, and Martin (1995) stress may arise out of pressure to attain unrealistic social expectations; therefore, socially prescribed perfectionists should present with high levels of stress, given a predisposition to social pressure to achieve. As such, hypothesis *VII* was that:

VII. High levels of perceived stress would be associated with high levels of socially prescribed perfectionism.

Given the relationship proposed between stress and academic locus of control by Flett, Blankstein, and Martin (1995), specifically that stress involves low controllability over aversive stimuli and individuals with an external locus of control by definition feel they have little personal control over a given situation, hypothesis *VIII* was:

VIII. High levels of perceived stress would be associated with high levels of locus of control, and thus positively related to an external locus of control and negatively related to an internal locus of control.

The next hypotheses sought to replicate the finding by Hewitt and Flett (1991) that the subscales of perfectionism were related to an internal and an external academic locus of control.

IX. Hypothesis *IX* was that high levels of socially prescribed perfectionism would be associated with high levels of locus of control, and thus positively related to an external locus of control.

X. Hypothesis *X* was that high levels of self-oriented perfectionism would be associated with low levels of locus of control, and thus positively related to an internal locus of control.

Hypothesis *XI* was the last hypothesis concerning the cross-sectional relationships at the start and the end of the semester, and proposed that the relationships found by previous researchers were stable relationships across time. As such hypothesis *XI* was that:

XI. All the aforementioned hypothetical relationships between variables would be present both at the start and the end of the semester.

The last set of hypotheses were based upon the cross-sectional relationships established by Flett, Blankstein, and Martin (1995) between levels of stress and procrastination, stress and socially prescribed perfectionism, and stress and locus of control, and, on the findings by Tice and Baumeister (1997) and Wang and Jentsch (1998) of longitudinal changes in stress and academic locus of control scores for students across the university semester. The current research sought to assess not only the possibility of longitudinal variation of personality traits, but also the unexplored significance of the longitudinal relationships between these personality traits. The nature of these hypothesized longitudinal relationships are depicted in figure 1 below for procrastination.

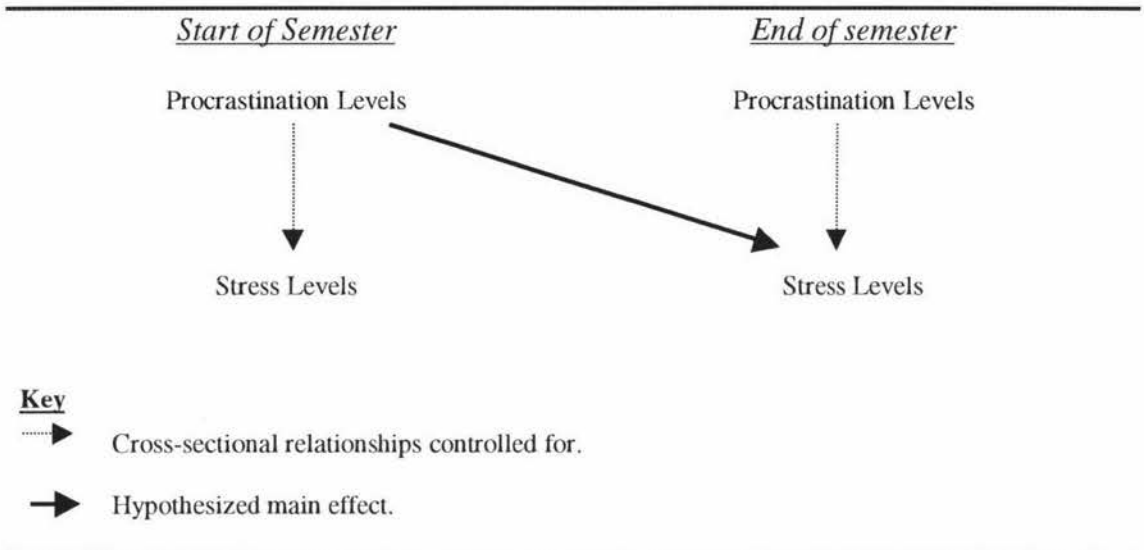

Figure 1: The hypothesized main effect of the levels of procrastination at the start of semester upon the levels of stress at the end of the semester, controlling for associated cross-sectional relationships.

XII. Hypothesis *XII* was that, controlling for the cross-sectional associations between procrastination and stress at both the beginning and the end of the semester, high levels of procrastination at the beginning of the semester would be significantly associated with high levels of stress at the end of the semester.

XIII. Hypothesis *XIII* was that given the predisposition to experience social pressure to achieve, and controlling for the cross-sectional associations between socially prescribed perfectionism and stress at both the beginning and the end of the semester, high levels of socially oriented perfectionism at the beginning of the semester would be significantly associated with high levels of stress at the end of the semester.

XIV. Hypothesis *XIV* was that, controlling for the cross-sectional associations between academic locus of control and stress at both the beginning and the end of the semester, an external locus of control at the start of the semester would be significantly associated with high levels of stress at the end of the semester.

XV. Hypothesis *XV* was that, in relation to the finding by Tice and Baumeister (1997) and Wang and Jentsch (1998) that student stress and locus of control levels increased over the course of a semester, it is proposed that student levels of stress and locus of control will increase over the course of the semester, and, due to their hypothesized relationships to levels of procrastination, self-oriented and socially prescribed perfectionism, these variable scores will also be higher at the end of the semester than at the start of the semester.

METHOD

Participants

The participants in this study were 213 undergraduate university students (146 females and 67 males). The sample was comprised of students enrolled in two introductory psychology courses, and two streams of an introductory accounting course at Massey University, Palmerston North, New Zealand. The ages of the participants ranged from 17 to 51, with a mean age of 22.

Measures

Procrastination. The students completed the Aitken (1982) Procrastination Inventory (*API*) as a measure of academic procrastination. Aitken developed the *API* as a measure to discriminate between chronic undergraduate college student procrastinators and their non-procrastinating counterparts. The *API* is a 19-item scale that was originally proposed to be imbedded in a larger 'dummy' questionnaire, so as to disguise the 'true' nature of the inventory and decrease the potential for response bias. However, as noted by McCown (1986) the original 'dummy' questionnaire used by Aitken modelled the procrastination items almost directly, and Aitken presented no information to confirm the validity of using the 'dummy' questionnaire. Consequently, subsequent procrastination research utilising Aitken's measure has simply used the 19-item scale as a stand-alone measure without the 'dummy' questionnaire. Each of the 19-items are scored on a 5-point likert scale

ranging from *False* (1) to *True* (5), and 10 of the items are reversed scored, so that higher overall scale scores are associated with greater procrastination[1].

Aitken (1982) provided initial internal reliability results that indicated an alpha coefficient of .82 for the sample of 120 freshman and sophomore college students (62% women and 38% men). However, as stated by Ferrari, Johnson and McCown (1995) there have been no appraisals of the temporal stability of the *API.* Johnson and McCown (1988, cited in McCown, Johnson & Petzel, 1989) concluded that the API had good construct validity given the .72 correlation with the Adult Inventory of Procrastination.

Perfectionism. The students completed the Multidimensional Perfectionism Scale (*MPS*; Hewitt & Flett, 1989, 1991). The *MPS* is a 45-item measure of self-oriented, other-oriented and socially prescribed perfectionism scored on a 7-point likert scale. Each subscale was comprised of 15 items, and a higher score on each subscale represented greater levels of each form of perfectionism[2].

The *MPS* scale construction and the determination of the scale properties have involved a number of studies using both clinical and college student populations, (Hewitt & Flett, 1989, 1991; Hewitt, Flett, & Blankstein, 1991; Hewitt, Flett, Turnbull-Donovan, & Mikail, 1991). A comprehensive analysis of the *MPS* has shown the scale contains three empirically distinct dimensions, and the initial

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[1] See Appendix B for a copy of the Aitken (1982) Procrastination Inventory.
[2] See Appendix C for a copy of Hewitt and Flett's (1989, 1991) Multidimensional Perfectionism Scale.

testing of the scale on a student sample revealed means and standard deviations for all three subscales as follows: self-oriented perfectionism (m=68, sd=14.95), other-oriented perfectionism (m=57.94, sd=11.74), and socially prescribed perfectionism (m=53.62, sd=13.35) (Hewitt & Flett, 1991). The analysis also showed that the three subscales have good temporal stability over a period of three months (with the test-retest reliabilities .88 for self-oriented perfectionism, .85 for other-oriented perfectionism, and .75 for socially prescribed perfectionism), and the *MPS* itself possesses good construct validity in reference to perfectionism scales such as the Burns Perfectionism Scale and the Frost Multidimensional Perfectionism Scale, and good convergent validity as contrasted with a number of personality measures.

Locus of Control. The locus of control measure used in the current study was Trice's (1985) uni-dimensional Academic Locus of Control Scale (*ALC*). The *ALC* is a 28-item True-False format test designed to gauge student locus of control with respect to academic performance. Higher scores indicated less internality and greater externality, and lower scores greater internality and less externality[3]

Trice (1985) reported that the *ALC* had an adequate internal consistency score of .70, and evidence of temporal stability over a 5-week period (test-retest r = .92). Also, as evidence of construct validity Trice, Ogden, Stevens, and Booth (1987) found that the *ALC* correlated in 'predicted' directions with academic achievement, homework completion, and class participation, all academic characteristics that have been linked to levels of locus of control. Further evidence of

[3] See Appendix D for a copy of Trice's (1985) Academic Locus of Control Scale.

the construct validity of the *ALC* is witnessed by both Trice and Milton (1987) and Trice, Ogden et al (1987) who found that the *ALC* correlated well with Rotter's (1966) generalized I-E scale, and the Rotter Internal-External Control Scale, (r = .52, and r = .50 respectively). Trice and Milton (1987) report a mean scale score for adult students of 10.8 (SD = 3.83) while Janssen and Carton (1999) report for undergraduate students, with a mean age of 19.7, a mean scale score of 9.64 (SD= 3.81).

The current study employed a 5-point likert response format as opposed to the traditional True/False. In relation to this decision to change from a dual-response format to a multiple-response format, it has been noted by Wanous, Reichers, and Hudy (1997), in a meta-analysis of single-item response measures, that "..for more complex psychological constructs (e.g., personality), it is usually recommended that scales with multiple items be used" (p247). In line with this argument, Halpin, Halpin, and Arbet (1994) found that changing a True/False response format to a multiple likert-scale format significantly increased the internal consistency reliability score of the scale in use. Also, Ferrari, Parker and Ware (1992) used Trice's *ALC* scale with a 5-point likert response format when assessing personality correlates with academic procrastination, and no information was displayed to indicate that there were any significant, statistical anomalies present in the scale data through use of the likert scale response.

Perceived Stress. The perceived stress measure used in the present study was Cohen, Kamarck, and Mermelstein's (1983) Perceived Stress Scale (*PPS*). This scale

was used as an appraisal of how stressful individuals perceived situations in their lives to be. There are a number of different versions of this scale – ranging from a 4 to a 14-item scale – but the consensus among leading stress researchers is for the use of the 10-item scale, given the superior psychometric properties inherent in the scale and the level of validity and reliability of the psychometric data gained from the scale use, (Monroe & Kelley, 1995). Each item asks about feelings of stress the respondents may have faced in the last month, and asks them to rate the extent to which they agree they have felt this way on a 5-point likert scale ranging from *0* (Never) to *4* (Very often). Perceived stress scores are computed by reverse scoring the seven positively worded items, and summing the scores across all the scale items. Higher perceived stress scores reflected greater perceived stress in the month past[4].

Cohen, Kamarck and Mermelstein (1983) report mean scale scores of 19.62 for an American adult national probability sample, 23.18 and 23.67 for two independent college-student samples, and 25.00 for a sample comprised of smoking cessation program participants. Coefficient alpha statistics ranged from .75 to .86 for the four samples. The authors also report two-week test-retest reliability coefficients of .55 and .64 for two independent samples. Cole (1999) specifically assessed the differential item functioning of the *PPS-10* scale items, and found negligible item variance to such variables as sex, race and education, supporting the proposed widespread use of the scale. The *PSS* has been utilised in a variety of studies concerning such areas as smoking cessation, exercise uptake, and student perfectionism and adjustment, (Baussel and Damrosch, 1989; Chang & Rand, 2000;

[4] See Appendix E for a copy of Cohen, Kamarck, and Mermelstein's (1983) Perceived Stress Scale.

Cohen & Williamson, 1988; Towers, 1999). Also, the *PSS* has been shown to significantly correlate with scores on measures of depression, utilization of health services, physical symptomatology, and stressful life events (Norvell, Walden, Gettleman, & Murrin, 1993).

Procedure

The current research project consisted of two stages. For the first stage, the researcher was granted access to one lecture in the first four weeks for each of the two introductory psychology courses, and both streams of the introductory accounting course. In all four lectures, the researcher was introduced to the class at the beginning of the lecture, at which point the researcher was invited to outline the research project for the class. The class was informed that this research primarily involved an analysis of procrastination and study habits in students, how procrastination and study habits may be influenced by a number of personality traits, and an assessment of how these factors are influenced by stress over the course of a semester. The decision as to inform the students that the study entailed an analysis of procrastination was undertaken acknowledging the potential for demand characteristics that may arise. However, in the interests of informed consent, and the fact that the subject of procrastination is popular with students and would naturally facilitate the process of collecting participants, it was decided that informing the students of the key variable of the study would be in the best interests of both participants and researcher alike. When the researcher had finished explaining the research project, the lecturer informed the class that the researcher would be waiting at the end of class near the exit to the lecture theatre with the questionnaires ready

for anyone wanting to participate. As the students exited the lecture theatre, those wanting to participate accepted a questionnaire to take away and complete, and a freepost envelope to return the completed questionnaire in.

Each questionnaire was comprised of an introductory page explaining the nature of the study, their rights as participants, and contact details of the principal researcher and the researchers supervisor[5]. An instruction page detailing the requirements for filling in the questionnaire was followed by questions assessing the general demographic nature of the sample. The four psychological measures then followed, the order being: MPS, API, ALC, and PSS.

Each questionnaire contained a consent form containing space for the participants name, address, signature and date, and instructions indicating that if the details on the page were completed, then the participants were expressing a willingness to proceed with the project, and were willing to complete a second questionnaire later in the semester.

The second stage of the project involved sending the same questionnaire, in the final week of classes in the semester before exam leave, to every participant that consented to complete a second questionnaire. The returned questionnaires used in the current study were those returned before the final day of examinations, as returns after the fact may have unduly been influenced by the completion of exams, which may influence perceptions of all the traits associated with the study.

The last page of all the questionnaires contained a feedback consent form. This form indicated that those participants desiring feedback about the study, including an overview of the research proposal and final results, should complete this consent form detailing participant name and future mailing address and feedback would be provided after the completion of the study.

[5] See appendix A for a copy of the introductory, instruction, and demographic pages of the questionnaire.

RESULTS

Start of Semester Cross-Sectional Relationships:

Means and standard deviation scores for scale scores at the start of the semester for the entire sample, and the sample as defined by 'Traditional' and 'Mature' age groups, are presented in Table 1 below, which also includes scale reliability coefficients (Cronbach's alpha). 'Traditional' and 'Mature' aged participants were defined as those students under the age of 25 and those 25 years and over respectively, with regards to the New Zealand Ministry of Education's policy defining the maximum student age limit for financial dependence upon parents as 24-years-of-age, after which point the Government legally recognizes the individual as an adult-student financially independent from ones parents, and therefore 'mature'.

Table 1.
Means and Standard Deviation Scores at the start of the semester for the entire sample, and sample as defined by 'Traditional' and 'Mature' aged participants.

		Whole Sample		Traditional Age		Mature Age	
	alpha	M	SD	M	SD	M	SD
Self-Oriented Perfectionism	.88 N=205	67.18	15.05	66.29	15.44	71.51	12.27
Socially Prescribed Perfectionism	.84 N=204	51.97	13.30	55.22	13.49	50.67	12.37
Procrastination	.85 N=208	51.31	12.10	52.19	11.42	47.27	14.31
Locus of Control	.80 N=200	75.52	13.08	77.47	12.54	66.31	11.75
Perceived Stress	.89 N=209	16.72	7.02	16.97	7.05	15.68	6.86

All scale reliability alpha coefficients were acceptable according to standard psychometric criteria. While no normative data exists in the literature at present with which to compare the mean academic locus of control scale score, the mean procrastination scale scores in the current study are compatible with those presented

by Saddler and Sacks (1993) who describe a mean of 49, and standard deviation of 16.76 for 150 undergraduate and graduate students at a private Southern Californian university. The mean scale scores of the self-oriented and socially prescribed perfectionism subscales correspond closely to American student population normative means, m=68, sd=14.95, and m=53.62, sd=13.35 respectively; as presented by Hewitt & Flett (1991). However, the current means for the perceived stress scale are significantly lower than those of two American college-student samples at 23.18 and 23.67 respectively, which may indicate a generally lower level of perceived stress for this sample of New Zealand university students than for their American counterparts at the start of their respective semesters.

The inter-correlations between the scale scores for the start of the semester are presented in Table 2 below. The greatest correlation involving student procrastination scores was between procrastination and academic locus of control, $r = .58$, $p<0.01$; which indicated that students reporting high levels of procrastination also tended to present with an external locus of control.

Table 2.
Inter-correlations between participant age, the two subscales of Perfectionism, Procrastination, Academic Locus of Control and Stress Measures at the Start of the Semester.

	1	2	3	4	5	6
1. 'Traditional' and 'Mature' age	-					
2. Self-Oriented Perfectionism	.08	-				
3. Socially Prescribed Perfectionism	-.03	.25**	-			
4. Procrastination	-.12	-.37**	.17*	-		
5. Locus of Control	-.29**	-.41**	.26*	.58**	-	
6. Perceived Stress	-.01	-.05	.32**	.23**	.37**	-

* $p< 0.05$ ** $p< 0.01$ (all p values are 2 tailed)

The correlations also indicate that high procrastination was significantly linked to high socially prescribed perfectionism, high levels of perceived stress, and

low self-oriented perfectionism. Interestingly, self-oriented perfectionism and academic locus of control were significantly negatively correlated, supporting the hypothesis that high levels of self-oriented perfectionism are associated with an internal locus of control. The only significant correlation involving 'traditional' and 'mature' student age groups was a negative correlation with academic locus of control, which disconfirms the hypothesis that 'mature' students tend to have an external locus of control (high levels of locus of control), and indicates instead that 'traditional' students tend to have an external academic locus of control and 'mature' students have an internal academic locus of control.

The results in Table 2 also reveal that perceived stress scores were significantly correlated with socially prescribed perfectionism scores and academic locus of control scores, indicating that, as hypothesized, high levels of perceived stress were associated with high socially oriented perfectionism and an external locus of control.

Multiple Regression Analysis for Start of Semester Data:

Prior to the analysis, all the variables used in the regression were screened for assumptions of statistical analysis. Results indicted that the data at the start of the semester was free of significant skewness, kurtosis, and univariate outliers with an alpha level of $p<.001$ as recommended by Tabachnik and Fidell (2001). No multivariate outliers were identified through Mahalanobis distance with $p< .001$.

Concerning the primary hypotheses in the current study, it was predicted that levels of self-oriented perfectionism, socially prescribed perfectionism, academic locus of control, and perceived stress would all be significantly associated with levels of student procrastination. However, it was also predicted that the association between all the variables and procrastination, but excluding stress, would be a function of student age. In this respect a multiple regression was undertaken to assess whether any effect was present for self-oriented perfectionism, socially prescribed perfectionism, academic locus of control and perceived stress over and above the demographics of student age or gender at the start of the semester. The results are presented in Table 3 below.

Table 3.
Multiple Regression of Self-Oriented, and Socially Prescribed Perfectionism, Academic Locus of Control, Perceived Stress, and Student Demographics on Procrastination showing standardized regression coefficients, R, R^2, adjusted R^2, and R^2 change for the start of the semester.

Predictor	Step 1	Step 2
	beta	*beta*
'Traditional' and 'Mature' Age	-.15*	.01
Student Gender	.12	.13*
Self-Oriented Perfectionism	-	-.20**
Socially Prescribed Perfectionism	-	.08
Academic Locus of Control	-	.46***
Perceived Stress	-	.03
R	.19*	.61***
R^2	.04*	.37***
Adjusted R^2	.02*	.35***
R^2 Change	.04*	.33***

* p< .05, ** p < .01, *** p < .001, N=181 (all p values are 2 tailed)

The results presented in Table 3 disconfirm the hypothesis that any significant association between the variables tested and procrastination would be a function of student age, with both age and gender sharing no significant association

with procrastination. The results also indicate that of all the variables tested, only self-oriented perfectionism (b= -.20, p<.01) and academic locus of control (b= .46, p<.001) were significantly associated with procrastination. This suggests that the higher a students self-oriented perfectionism the *less* likely that student is to procrastinate, and, the more external a students academic locus of control the *more* likely that student is to procrastinate. It is evident from the lack of a significant effect for 'traditional and mature' student age on levels of procrastination in the second step of the regression, after having a significant effect in the first step, that the initial significant association was a product of age's strong association with academic locus of control, which is controlled for in the second step. It is also evident from the results that the variable of student gender, which shows a significant effect on procrastination in the second step but not the first, is showing a suppression effect (Smith, Ager & Williams, 1992), which makes interpretation of gender effects somewhat difficult in this instance.

The results from Table 3 reveal the nature of the relationships that socially prescribed perfectionism and perceived stress have with procrastination. While both variables were significantly correlated with procrastination, as shown in Table 2, neither socially prescribed perfectionism nor perceived stress have any significant association with procrastination when the inter-correlations between all variables are controlled for. This indicates that the lack of significant association of both socially prescribed perfectionism and perceived stress with procrastination in the regression may be a function of the strength of the relationships of these variables with academic locus of control and/or self-oriented perfectionism, and the fact that in the regression analyses these relationships are being controlled for.

End of Semester Cross-Sectional Relationships:

Means and standard deviation scores for scale scores at the end of the semester for the entire sample, and the sample as defined by 'Traditional' and 'Mature' age groups, are presented in Table 4 below, which also includes scale reliability coefficients (Cronbach's alpha).

Table 4.
Means and Standard Deviation Scores at the end of the semester for the entire sample, and sample as defined by 'Traditional' and 'Mature' aged participants.

		Whole Sample		Traditional Age		Mature Age	
	alpha	M	SD	M	SD	M	SD
Self-Oriented Perfectionism	.91 N=137	67.32	14.85	66.58	15.37	70.74	12.01
Socially Prescribed Perfectionism	.88 N=135	52.13	13.99	52.09	14.79	52.32	9.05
Procrastination	.81 N=134	52.07	6.93	52.34	6.69	50.83	7.96
Locus of Control	.76 N=134	79.42	11.42	80.82	11.18	72.48	10.15
Perceived Stress	.90 N=135	17.84	7.12	18.29	6.95	15.55	7.69

All scale reliability alpha coefficients were acceptable according to standard psychometric criteria. As was the case with the normative data at the start of the semester, the means procrastination scores correspond closely to the Southern Californian university students presented by Saddler and Sacks (1993), and, both the self-oriented and socially prescribed perfectionism subscales closely approximate the American student means presented by Hewitt & Flett (1991). However, as was the case with the start of the semester data, the perceived stress scale means are significantly lower than American student norms, which again indicate that this sample of New Zealand university students may perceive less stress in their academic environment than their American counterparts.

The correlations between the scale scores on all measures for the second stage of the project are presented in Table 5 below. As compared to the correlations at the start of the semester, of the variables in the study at this stage of testing only self-oriented perfectionism and locus of control are correlated at all with procrastination, $r = -.29$, $p < .01$; and $r = .38$, $p < .01$, respectively. This indicates that at the end of the semester high student procrastination is only associated with low levels of self-oriented perfectionism and an external academic locus of control. As was the case at the start of the semester, the only significant correlation involving student age was a negative correlation with academic locus of control, indicating that 'traditional' aged students tend to have an external locus of control and 'mature' students have an internal academic locus of control, both at the start and at the end of the university semester.

Table 5.
Inter-correlations between participant age, the two subscales of Perfectionism, Procrastination, Academic Locus of Control and Stress Measures at the End of the Semester.

	1	2	3	4	5	6
1. "Traditional' and 'Mature' age	-					
2. Self-Oriented Perfectionism	.02	-				
3. Socially Prescribed Perfectionism	.01	.33**	-			
4. Procrastination	-.09	-.29**	.08	-		
5. Locus of control	-.23**	-.35**	.30**	.38**	-	
6. Perceived Stress	-.12	.03	.43**	.15	.47**	-

** $p < 0.01$ (all p values are 2 tailed)

The results in Table 5 also indicate that procrastination was not significantly associated with perceived stress at the end of the semester, but that perceived stress was still associated with high socially prescribed perfectionism and an external academic locus of control in students.

Multiple Regression Analysis for End of Semester Data:

Prior to the analysis, all the variables used in the regression were screened for assumptions of statistical analysis. As was the case with the start of semester data, results indicted that the data at the start of the semester was free of significant skewness, kurtosis, and univariate outliers with an alpha level of $p<.001$ as recommended by Tabachnik and Fidell (2001). No multivariate outliers were identified through Mahalanobis distance with $p< .001$.

Concerning the primary hypotheses in the current study, it was predicted that at both the start and the end of the semester levels of self-oriented perfectionism, socially prescribed perfectionism, academic locus of control, and perceived stress would all be significantly associated with levels of student procrastination. However, it was also predicted that the association between all the variables and procrastination, but excluding stress, would be a function of student age. In this respect a multiple regression was undertaken to assess whether any effect was present for self-oriented perfectionism, socially prescribed perfectionism, academic locus of control and perceived stress over and above the demographics of student age or gender at the end of the semester. The results are presented in Table 6 below.

These results indicated that of all the variables at the second stage of testing, as was the case in the first stage, only self-oriented perfectionism ($b = -.26$, $p< .05$) and locus of control ($b = .27$, $p< .05$) were significantly associated with levels of procrastination. This suggests that at the end of the semester the higher a students self-oriented perfectionism the *less* likely that student is to procrastinate, and, the more external a students academic locus of control the *more* likely that student is to

procrastinate. These results coupled with the results found at the start of the semester suggest that these relationships between self-oriented perfectionism, academic locus of control and procrastination might be relatively stable across the course of the semester. No association with procrastination was found for either perceived stress or socially prescribed perfectionism at the end of the semester, disconfirming the original hypothesis that procrastination would be associated with high levels of perceived stress and high socially prescribed perfectionism at the end of the semester.

Table 6.
Multiple Regression of Self-Oriented, and Socially Prescribed Perfectionism, Academic Locus of Control, Perceived Stress, and Student Demographics on Procrastination showing standardized regression coefficients, R, R^2, adjusted R^2, and R^2 change for the end of the semester.

Predictor	Step 1 *beta*	Step 2 *beta*
'Traditional' and 'Mature' Age	-.12	-.02
Student Gender	.08	.10
Self-Oriented Perfectionism	-	-.26*
Socially Prescribed Perfectionism	-	.09
Academic Locus of Control	-	.27*
Perceived Stress	-	.03
R	.16	.45**
R^2	.02	.22**
Adjusted R^2	.01	.17**
R^2 Change	.02	.19**

* $p < .05$, ** $p < .001$, N = 114 (all p values are 2 tailed)

Longitudinal relationships between Start and End of Semester Data:

In relation to the hypotheses that all the end of semester scale scores would be significantly higher than the start of semester scale scores, given the trend found by Tice and Baumeister (1997) of an increase in stress between the start and the end

of a semester, Paired-Samples T-Tests were undertaken to evaluate whether there was any significant difference between the scale scores at the start and the end of semester. The results of these T-Tests are presented in Table 7 below.

Table 7.
Paired-Samples T-Tests evaluating significant differences between Procrastination, Self-oriented and Socially Prescribed Perfectionism, Academic Locus of Control, and Perceived Stress Mean Scale Scores at the start and at the end of the semester.

	t	*df*
Procrastination (1) vs. Procrastination (2)	-.51	129
Self-oriented Perfectionism (1) vs. Self-oriented Perfectionism (2)	.62	131
Socially Prescribed Perfectionism (1) vs. Socially Prescribed Perfectionism (2)	-.10	130
Academic Locus of Control (1) vs. Academic Locus of Control (2)	-4.98*	129
Perceived Stress (1) vs. Perceived Stress (2)	-1.87	131

* $p < .001$ (all p values are 2 tailed)
Note: (1) Start of semester mean scale score; (2) End of semester mean scale score.

The results show that of all the mean scale score comparisons, only academic locus of control was significantly different to its start of semester counterpart, $t = -4.98$, $df = 129$, $p < .001$; indicating that student academic locus of control scores at the end of the university semester (M = 79.42, SD = 11.42) were significantly more external than scores at the start of semester (M = 75.52, SD = 13.08).

The second set of hypothesized longitudinal relationships were concerned with whether initial levels of procrastination, socially prescribed perfectionism, and academic locus of control were predictive of end of semester perceived stress levels (See page 35 for a schematic representation of these relationships). Table 8 presents the results of a multiple regression undertaken to assess whether start of semester levels of procrastination were predictive of high student stress at the end of semester when controlling for stress at the beginning of the semester and procrastination at the end of the semester.

Table 8.
Multiple Regression of Start of Semester levels of Procrastination on End of Semester levels of Perceived Stress controlling for relevant cross-sectional variable associations.

Predictor	Step 1 *beta*	Step 2 *beta*
Stress (1)	.52*	.50*
Procrastination (2)	.15	.08
Procrastination (1)	-	.11
R	.54*	.54
R^2	.30*	.30
R^2 change	.28*	.28
Adjusted R^2	.29*	.01

* p< .001 (all p values are 2 tailed)
Note: (1) Start of semester variable, (2) End of semester variable.

The results in Table 8 show that despite controlling for the relevant cross-sectional associations, start of semester levels of procrastination were not predictive of perceived stress levels at the end of the semester.

Table 9 below presents the results of a multiple regression undertaken to assess whether start of semester levels of socially prescribed perfectionism were predictive of high student stress at the end of semester when controlling for stress at the start of the semester and socially prescribed perfectionism at the end of the semester.

Table 9.
Multiple Regression of Start of Semester levels of Socially Prescribed Perfectionism on End of Semester levels of Perceived Stress controlling for relevant cross-sectional variable associations.

Predictor	Step 1 *beta*	Step 2 *beta*
Stress (1)	.43**	.42**
Socially Prescribed Perfectionism (2)	.37**	.58**
Socially Prescribed Perfectionism (1)	-	-.28*
R	.62**	.65*
R^2	.39**	.42*
R^2 change	.38**	.40*
Adjusted R^2	.39**	.03*

* p< .05, ** p< .001 (all p values are 2 tailed)
Note: (1) Start of semester variable, (2) End of semester variable.

The results in Table 9 show that start of the semester levels of socially prescribed perfectionism were predictive of perceived stress levels at the end of the semester, over and above the relevant cross-sectional associations. This indicates that students with high levels of socially prescribed perfectionism at the start of the semester are more likely to have high levels of perceived stress at the end of the semester.

Table 10 below presents the results of a multiple regression undertaken to assess whether start of semester levels of academic locus of control were predictive of high student stress at the end of semester when controlling for stress at the start of the semester and academic locus of control at the end of the semester.

Table 10.
Multiple Regression of Start of Semester levels of Academic Locus of Control on End of Semester levels of Perceived Stress controlling for relevant cross-sectional variable associations.

Predictor	Step 1 *beta*	Step 2 *beta*
Stress (1)	.39*	.40*
Academic Locus of Control (2)	.35*	.40*
Academic Locus of Control (1)	-	-.07
R	.61*	.61
R^2	.37*	.37
R^2 change	.36*	.35
Adjusted R^2	.37*	.00

* p< .001 (all p values are 2 tailed)
Note: (1) Start of semester variable, (2) End of semester variable.

The results in Table 10 show that, controlling for the relevant cross-sectional associations, start of semester levels of academic locus of control were not predictive of perceived stress levels at the end of the semester. This result was not initially expected given the high correlations academic locus of control had with perceived stress both at the start and the end of the semester. Simple correlations between start

of semester academic locus of control levels and the end of semester perceived stress levels also indicate a significant association, $r = .40$, $p < .01$. However, the answer was revealed when partial correlations between start of semester academic locus of control and end of semester perceived stress were undertaken, while controlling for end of semester academic locus of control levels (which were highly associated with start of semester academic locus of control, $r = .79$, $p < .01$). The partial correlation revealed no significant correlation between start of semester academic locus of control and end of semester perceived stress, $r = .04$, $p < .70$. This indicates that any predictive effect of start of semester academic locus of control levels on end of semester perceived stress was concealed when the high level of association that exists between the start and the end of semester academic locus of control was controlled for.

DISCUSSION

The present study sought to confirm the relationships between student procrastination and perfectionism (Saddler & Sacks, 1993; Saddler & Buley, 1999), academic locus of control (Trice and Milton, 1987), and stress (Flett, Blankstein, & Martin, 1995). In addition, the study tested two longitudinal hypotheses. The first hypothesis, derived from the findings of Tice and Baumeister (1997) and Wang and Jentsch (1998), was that procrastination, perfectionism, academic locus of control, and stress scores would increase from the start to the end of the semester. The second hypothesis proposed that predictors of end of semester stress would be high levels of procrastination, socially prescribed perfectionism, and academic locus of control at the start of the semester.

Procrastination and Perfectionism

The primary hypothesis, based on the findings presented by Saddler and Sacks (1993) and Saddler and Buley (1999), was that high levels of procrastination in students would be associated with high levels of socially prescribed perfectionism and low levels of self-oriented perfectionism, at both data collection points. This hypothesis was supported in that high procrastination was related to low levels of self-oriented perfectionism at both the beginning and the end of the semester, and was related to high levels of socially prescribed perfectionism, but only at the start of the semester.

This result supports the isolated findings presented by both Saddler and Buley (1999) and Martin, Flett, and Hewitt (1993: cited in Flett, Hewitt, & Martin,

1995) in that *both* subscales of perfectionism were found, at least at the start of the semester, to correlate significantly with levels of procrastination. In addition, this result is inconsistent with the *majority* of previous research concerning the relationship between procrastination and the perfectionism subscales, which has found an effect for only socially prescribed perfectionism on procrastination.

In regards to the nature of the present findings, this study serves to draw attention to the fact that the relationships previously established between perfectionism and procrastination, on the basis of past cross-sectional research, may not be as stable as was once presumed and may actually vary over the course of a university semester. This is significant in that it indicates that previous research in this area may have had too restricted a focus in that the participant groups may have been too similar across studies and failed to incorporate a full range of students. This may, in turn, have restricted the ability of these studies to uncover relationships that may actually be evident in, and across, a range of student populations.

In summarizing this result, while high levels of procrastination are still associated with high susceptibility to social expectations and parental criticism (Flett, Blankstein, Hewitt, & Koledin, 1992) this relationship is not stable over time. However, the findings indicate that students' who present with low standards of personal achievement, or low self-oriented perfectionism, procrastinate to a greater degree (Saddler and Buley, 1999), and this is a stable relationship over time. Consequently, the current study provides strong empirical support for a newly emerging relationship between perfectionism and procrastination found by Saddler

and Buley (1999) and Martin, Flett, and Hewitt (1993: cited in Flett, Hewitt, & Martin, 1995). The present study also serves to extend these findings with regards to the little explored strength of the relationships between procrastination and the subscales of perfectionism. Explicitly, this study has found that low standards of personal achievement in students have a stronger and more resilient relationship over time with high levels of procrastination than does susceptibility to social expectation or parental criticism. This finding has direct implications for a number of organizations dealing with student health and well-being, none more so than institutions concerned with the modification of maladaptive student study habits.

The current findings, concerning the relationships between perfectionism and procrastination, may serve as a guide for student learning centers and associated professionals in re-evaluating the current emphasis of interventions concerned with the prevention of student procrastination. A number of student study and self-help guides regard socially prescribed perfectionistic characteristics as the one of the major roots of procrastination in students (Antony & Swinson, 1998; Knaus, 1973); specifically, procrastinating students are considered to view the world as too demanding for their current skills and are consumed by seemingly unrealistic social expectations. Recent research (Dean, Range, & Goggin, 1996; Donaldson, Spirito, & Farnett, 2000; Flett, Hewitt, Blankstein, & Pickering, 1998; Joiner & Schmidt, 1995; Mills & Blankstein, 2000) also highlights the maladaptive nature of socially prescribed perfectionism and its detrimental effects on student mental health, linking it to increased anxiety and self criticism, a reduced likelihood of help-seeking, increased feelings of hopelessness, the development of learned helplessness,

decreased motivation to achieve, and increased instances of depression and suicidal ideation. However, recent investigation (Accordino, Accordino, & Slaney, 2000; Mills & Blankstein, 2000) into the academic and mental health correlates with self-oriented perfectionism indicates that this form of perfectionism has a number of positive and adaptive mental health benefits. For instance, self-oriented perfectionism and personal standard setting have been associated with greater student motivation to achieve, adaptive metacognitive and cognitive learning strategies, increased self-efficacy and self-esteem, effective resource management, decreased depression, and are considered significant predictors of academic achievement.

In respect to these findings, it is not the researchers intention to de-emphasize the role of socially prescribed perfectionistic characteristics in promoting procrastinatory behaviour, but merely to highlight that there is currently a broad lack of acknowledgement of the significance that self-oriented perfectionist characteristics may have in the reduction of procrastinatory behaviour. In this respect, educators, study habit advocates, and student learning professionals would be advised to promote, or focus upon instilling, high personal standards of achievement in students *in tandem* with targeting student's unrealistic social expectations in an effort to increase personal motivation to achieve and decrease the maladaptive and detrimental mental health effects of a socially prescribed perfectionistic outlook.

The secondary hypothesis concerning procrastination and its relationship to the subscales of perfectionism was based on the conflicting findings presented by Saddler and Sacks (1993) and Saddler and Buley (1999). Specifically, the former presented results indicating that in a sample of younger students there was no relationship evident between procrastination and self-oriented perfectionism, but the findings of the latter study suggested that there was a relationship between procrastination and self-oriented perfectionism in 'adult' students. As the difference in mean participant age between the studies was greater than ten years, and there were little if any subsequent major differences between the two studies, it was proposed that the conflicting findings were actually a product of participant age and that participant age may in fact influence the relationship between self-oriented perfectionism and procrastination. Thus, the hypothesis in the current study was that there would be no relationship between having a high level of self-oriented perfectionism and levels of procrastination for 'mature', or older, students. However, there would be an association between level of procrastination and having a high level of self-oriented perfectionism for 'traditional', or younger, students.

Results from both the start and the end of the semester did not support this hypothesis. Neither the perfectionism subscales nor procrastination were associated with student age. While this result serves to clarify that the relationship between perfectionism and procrastination was not in any way dependant upon student age, it fails to clarify the inconsistencies in the relationships reported by Saddler and Sacks (1993) and Saddler and Buley (1999) other than to indicate that they may not be age related.

Procrastination and Academic Locus of Control

The primary hypothesis was that, based on the claim by Taylor (1979) and the findings of Trice and Milton (1987) and Janssen and Carton (1999), high levels of procrastination in students would be associated with an external locus of control, and conversely, that low levels of procrastination in students would be associated with an internal locus of control. This hypothesis was supported in that academic locus of control was highly correlated with procrastination at both the start and the end of the semester, indicating that high levels of procrastination were related to an external locus of control, and low levels of procrastination were related to an internal locus of control.

This result supports the findings of Trice and Milton (1987) and Janssen and Carton (1999), and indicates that academic locus of control appears to be a significant predictor of student procrastination. This result also extends the findings of Trice and Milton (1987) and Janssen and Carton (1999) in that the association between academic locus of control and procrastination was evident across the course of the semester, and thus, it was a relatively stable relationship. This finding has direct implications for student counselors and other such professionals in assessing interventions for student procrastinators, in that it indicates that the tendency to procrastinate resides to a great degree in the internal or external nature of students' causal attributions.

The current finding, of a strong and stable relationship between procrastination and academic locus of control, draws attention to the relationship that exists between performance outcomes and the internal or external nature of student's

locus of control, or in other words, their causal attributions for success or failure. Recent research (Colquitt, LePine, & Noe, 2000; Landine & Stewart, 1998; Wilhite, 1990; Wong, 2000) has shown the importance of causal attributions on academic outcome in that internal locus of control scores have been positively associated with academic commitment, academic and general motivation, increased self-efficacy, and academic averages, and is predictive of academic course achievement. In addition, an external locus of control has been associated with a lack of confidence, academic instability, an inability to self-evaluate cognitions, poor self-management, and a lack of academic motivation (Douglas & Powers, 1982; Landine & Stewart, 1998; Wilhite, 1990).

In respect to the importance of causal attributions, interventions aimed at decreasing detrimental study habits in students have shown it both possible and effective. Ho and McMurtrie (1991) succeeded in retraining the negative attributions of underachieving high school students so that they reattributed their success or failure either to their effort or lack of effort on a task (an internal attribution), as opposed to an external causal factor such as luck. Further studies reporting the use of causal attribution retraining for academic success, sporting success, and social skills training provide support for the efficacy of its use (Dodds, 1994; Hudley, Britsch, Wakefield, Smith, Demorat, & Cho, 1998; Sinnott & Biddle, 1998; Ziegler & Heller, 2000). Thus, in regards to the relationship found in the present study between procrastination and academic locus of control, the prevailing observation that is that student counselors and professionals concerned with the detrimental influence of

maladaptive study habits should tailor interventions aimed at retraining the maladaptive causal attributions in student procrastinators.

The secondary hypotheses concerning the relationship between procrastination and academic locus of control was based on the conflicting results presented by Ferrari, Parker, and Ware (1992) and Trice and Milton (1987), and, on additional research by Rothblum, Solomon, and Murakami (1986) and Jannsen and Carton (1999). Specifically, Ferrari et al (1992) presented results indicating that in a sample of younger students there was no relationship evident between procrastination and an external locus of control, but the findings of the Trice and Milton (1987) suggested that there was a relationship between procrastination and an external locus of control in a sample of adult students. As the only major difference between the two studies was the age of the participants it was proposed that the conflicting findings were actually a product of participant age and that participant age may in fact influence the relationship between academic locus of control and procrastination. In addition, Rothblum, Solomon, and Murakami (1986) and Jannsen and Carton (1999) both studied younger aged students and found that these students tended to present with an internal locus of control, and that locus of control in these students was related to procrastination. Thus, the hypothesis in the current study was that there would be an association between level of procrastination and having an external academic locus of control for older students. In addition, there would also be a relationship between having an internal academic locus of control and levels of procrastination but only for younger students.

The results of the current study disconfirm these hypotheses. Regression analysis at both the start and the end of the semester showed that academic locus of control was predictive of levels of procrastination over and above the effects of student age. This finding disconfirms the proposal that conflicting findings in previous studies (Ferrari, Parker, & Ware, 1992; Jannsen & Carton, 1999; Rothblum, Solomon, & Murakami, 1986; Trice and Milton, 1987) may have been a result of age differences in the samples under study.

Despite the lack of age-related effect on the relationship between procrastination and academic locus of control, the current nature of the relationship between academic locus of control and student age also seemed to differ as compared to the aforementioned studies. While academic locus of control in the current study was related to student age throughout the semester, this relationship differed to the relationship proposed by Trice and Milton (1987) and Janssen and Carton (1999). In the current study the younger students were more likely to have an external academic locus of control and the older students were more likely to have an internal academic locus of control, whereas the studies by Trice and Milton (1987) and Janssen and Carton (1999) indicated that older students had more of an external locus than an internal locus, and that younger students had more of an internal locus than an external locus. An analysis of the literature concerning age-related differences in locus of control reveals that the trend in the current study is compatible with general research findings. Both Houts and Warland (1989) and Lumpkin (1986) studied age-related differences in locus of control in participants whose age range was from early 20's to in excess of 80 years of age, and found that

internal locus of control beliefs increased until approximately 60 years of age after which point they declined. Thus, middle-aged adults had a more internal locus of control than younger adults. This was also validated by Lao (1975), who found that middle-aged parents of college students were significantly more internal than their children, and thus, internality increased from early-adulthood into mid-adulthood. Lao (1974) interprets this finding as being consistent with the developmental trend of the internality and externality concept, in that the parents were in their forties and were thus at their peak of their sense of personal and professional competence and mastery.

Thus, 'mature' students in the current study may have had more of an internal locus of control than 'traditional' aged students because, as outlined by Lao (1974), their greater 'worldly experience and time in general spent in the work force had increased their sense of personal and professional mastery and self-competence, and therefore, may have given them a stronger belief in their personal abilities to achieve.

Procrastination and Stress

The primary hypothesis deriving from the findings of Flett, Blankstein, and Martin (1995) was that high procrastination would be associated with greater levels of perceived stress both at the first and second stages of testing. This hypothesis was partially supported in that stress was correlated with procrastination at the start of the semester but not at the end of the semester. However, while stress was correlated with procrastination at the start of the semester, a multiple regression analysis

indicated that this relationship might have been influenced by a third factor. Specifically, when the levels of academic locus of control were controlled for in a regression analysis on the predictors of procrastination, the results showed that stress was no longer associated with procrastination. This indicates that stress was not *directly* associated with procrastination, but that the relationship between stress and procrastination may be mediated by whether the student had an internal or external locus of control. In this regard, levels of self-control may be the regulating factor between perceived situational stress and the extent of subsequent procrastination. Recent research has found direct evidence to support this claim. Tice, Bratslavsky, and Baumeister (2001) studied the effects of impulse control and regulation of procrastination in times of distress, and found that those individuals low in internal impulse control were more likely to procrastinate during times of high emotional distress. A similar impulse control/regulation effect has also been found in a number of unrelated studies concerning research into chronic disorders and predictors of relapse. For instance, Brownell, Marlatt, Lichenstein, and Wilson (1986) highlight that in times of high emotional distress one of the predictors of relapse in such disorders as alcoholism, smoking, and obesity is an externally focused motivation to change.

Therefore, in respect to the current finding that the relationship between stress and procrastination may be regulated by levels of internal or external self-control, these findings lend support to the proposition by Tice, Bratslavsky, and Baumeister (2001) that levels of self-control "..constitute an important link between emotional distress and regulatory failure" (p63).

While this may serve to clarify the relationship between stress and procrastination found at the start of the semester, it does little to explain the lack of relationship evident between the stress and procrastination at the end of the semester, and thus, why the relationship is not stable over time. Concerning the lack of a stable relationship between stress and procrastination at the end of the semester, it is the researchers contention that the reason there was no effect for stress on levels of procrastination at the *end* of the semester was because the students high on procrastination had reached a point that had triggered what has been termed the procrastinators 'last minute rush'. The 'last minute rush' trend has been noted by a number of researchers (McCown & Johnson, 1989: cited in Ferrari, Johnson, & McCown, 1995; Rothblum, Solomon, & Murakami, 1986; Steel, Brothen, and Wambach, 2001) and suggests that high procrastinators may be motivated to *increase* their work output and performance, and thus decrease their procrastination, when faced with a critical peak of stress and anxiety induced by a looming deadline.

In regards to this study, the high procrastinators may have reached, and most probably passed, the critical period at which the stress, test anxiety, and worry was at its peak given that the second stage of questionnaires were distributed at the start of exam preparation week which is a highly stressful time for many students. Thus, the proximity of the exams may have already prompted a sharp increase in work output, the procrastinators 'last minute rush', which effectively reduced the effect of stress on procrastination for there previously high procrastinators. This was because while these students were still the most highly stressed, they could not procrastinate any longer for fear of failing the course, and thus they increased their study. A graphical

analysis of the levels of procrastination compared to levels of stress at both the beginning and the end of the semester tends to support this end of semester 'last minute rush' theory[6] as a reason for the current findings concerning high procrastinators. It was observed that while highly stressed students at the start of the semester also tended to procrastinate highly, at the end of semester the highest levels of procrastination were actually observed in the *moderately* stressed students, and there was an observable *decrease* in procrastination when stress levels changed from moderate to high. This indicates that, despite the fact that the students with high levels of stress procrastinated highly at the start of the semester, these same highly stressed students procrastinated significantly less than *moderately* stressed students, possibly in an attempt to complete the work previously set aside during the semester.

Perfectionism, Locus of Control and Stress

The primary hypotheses regarding the relationship between perfectionism and academic locus of control were derived from the findings by Hewitt and Flett (1991). The hypotheses were confirmed in that high socially prescribed perfectionism was correlated with high academic locus of control scores (and thus an external locus of control), and that high self-oriented perfectionism was correlated with low academic locus of control scores (and thus an internal locus of control). These relationships were observed at both data collection points. These results both support and extend the findings of Hewitt and Flett (1991) in that not only were the relationships found at the start of the semester, they were also evident at the end of the semester indicating that these relationships are stable over time.

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[6] See Appendix F for the graphical analysis of procrastination versus stress for the start and end of

An analysis of the characteristics inherent in high levels self-oriented perfectionism and an internal academic locus of control indicates that the defining feature of the relationship between the two may be the central theme of personal control. In this respect a high degree of personal control over academic achievement would be associated with high personal standards for personal achievement. Conversely, a lack of personal control and a susceptibility to social influence would seem to be the defining features of the relationship between high levels of socially prescribed perfectionism and an external academic locus of control.

The importance of the inter-relationships between levels of perfectionism and locus of control on academic outcome and performance has been underscored in a number of studies in recent years. Mor, Day, Flett, and Hewitt (1995) found that the interaction between high levels of socially prescribed perfectionism and low personal control lead to decreased levels of goal satisfaction, and also related to greater debilitating performance anxiety. In addition, Flett, Hewitt, Blankstein, and Pickering (1998) found that those students high in socially prescribed perfectionism had a pervasive tendency to attribute success or failure to external causes in both their academic and personal lives. Moreover, this attributional trend tended to lead to excessive feelings of learned helplessness in these students. The present results detailing the strength of the relationship between perfectionism and locus of control, coupled with the previous literature documenting the potential academic and social consequences of this relationship, indicate that the attributional focus of socially prescribed and self-oriented perfectionists can have serious detrimental implications

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semester.

for the mental health of those students. In this respect, student counselors and mental health workers would benefit from interventions aimed at retraining the external attributions of these perfectionists in an effort to reduce student anxiety and helplessness.

The primary hypothesis concerning the relationship between stress and academic locus of control was derived from an argument by Flett, Blankstein, and Martin (1995) concerning the complementary nature of these concepts. Specifically, as stress involves low controllability over aversive stimuli and individuals with an external locus of control by definition feel they have little personal control over a given situation, an increase in stress levels in students would be associated with an external locus of control as opposed to an internal locus of control. The hypothesis was confirmed in that at both the beginning and the end of the semester high levels of stress were correlated with an external locus of control. This finding may help to further clarify the nature of student stress in that it may be, in part, a function of a student's difficulty in taking control of their academic course work, and their reliance upon luck or good fortune to help their cause.

The primary hypothesis concerning the subscales of perfectionism and levels of stress was derived from the proposal by Flett, Blankstein, and Martin (1995) that stress may arise out of pressure to attain unrealistic social expectations, and therefore, that socially prescribed perfectionists would present with high levels of stress, given a predisposition to social expectation and criticism. The hypothesis was confirmed in that high levels of socially oriented perfectionism were significantly

correlated with high levels of perceived stress for students, both at the beginning and the end of the semester. This result provides empirical support for the proposal by Flett, Blankstein, and Martin (1995) that highly stressed students are more likely than lowly stressed to also have high levels of socially prescribed perfectionism.

The nature of this finding was not only supportive of the relationship proposed by Flett, Blankstein, and Martin (1995), but has also been effectively interpreted by Holahan, Moos, and Bonin (1997) in their assessment of perfectionism on general psychological adjustment. Holahan et al (1997) found that while individuals with self-oriented perfectionistic characteristics may experience similar levels of stress to socially prescribed perfectionists, they have a tendency to engage in more active and less avoidant coping strategies that may serve to decrease the frequency or duration of that stressor. On the other hand, socially prescribed perfectionists have a disposition toward maladaptive coping styles characterized by avoidance and passivity that may serve to increase the frequency or duration of that stressor. Thus, socially prescribed perfectionists should experience greater levels of stress as compared to self-oriented perfectionists by virtue of the maladaptive and stress-inducing coping techniques they employ.

Concerning this assertion, a number of theorists have also proposed that "..this perfectionism dimension [socially prescribed] represents a nonspecific vulnerability factor to distress" (Dunkley, Blankstein, Halsall, Williams, and Winkworth, 2000, p 438), and furthermore, that this association highlights the existence of a diathesis-stress model of socially prescribed perfectionism, whereby

this type of perfectionism intensifies the aversiveness of subsequent stress responses (Chang & Rand, 2000; Hewitt, Flett, & Ediger, 1996)

Longitudinal Relationships

The current research sought to assess two major sets of longitudinal hypotheses. Firstly, given the finding by Tice and Baumeister (1997) and Wang and Jentsch (1998) of an increase between the start and the end the semester of student stress and academic locus of control scores, and the close links between both stress and locus of control and levels of procrastination and perfectionism, the hypothesis was that all of the variable scores at the end of the semester would be greater than those at the start of the semester. Secondly, given the lack of research exploring *predictors* of future student stress and the significance of the relationships already hypothesized between levels of procrastination, socially prescribed perfectionism, academic locus of control and subsequent stress levels, the proposition was that the initial levels of these variables would predict future stress. Specifically, the hypothesis was that high levels of procrastination, socially prescribed perfectionism, and academic locus of control at the start of the semester would be predictive of high levels of perceived stress at the end of the semester, after controlling for start of semester stress and end of semester procrastination, perfectionism, and locus of control levels.

The hypothesis predicting greater scale scores at the end of semester as compared to the start was only partially supported. Only average academic locus of control scores were significantly higher, indicating a more external locus at the end of the semester. While the results do support the findings by Wang and Jentsch

(1998) that levels of academic locus of control increase across the course of a university semester, they do not support the findings by Tice and Baumeister (1997) that stress increases over the course of the semester.

However, in regards to the change over time for academic locus of control scores, the *rationale* for the result in the current study, but not the nature of the result, differs to that proposed by Wang and Jentsch (1998) for a number of key reasons. Firstly, Wang and Jentsch (1998) utilized a between-groups study design that meant that each participant was only tested at one point in the semester, either the start or the end, so that the start and end of semester data was actually from distinctly different groups. Secondly, the design of the American university system, regarding the makeup of the final course grade, is such that participation in research projects earns the student extra credits. In respect to the study undertaken by Wang and Jentsch (1998) "..typically, students earned the equivalent of 1% of their final course grade in class for each 50 min of research participation" (p213). Thus, the researchers interpreted their finding as indicating that those students at the end of the semester were less work oriented and less motivated (as evidenced by their external locus of control), and as such, this finding suggested that they were more inclined to participate solely for the purpose of earning extra credit for their final course grade.

In contrast, the current study utilized a within-subjects, repeated measures design in which the start and end of semester data was from the same group. In addition, no 'extra credit' system is currently used in New Zealand university systems for supplying students with incentives to participate in research projects. In

this respect, the interpretation of the *reasons* underlying the effect found by Wang and Jentsch (1998) cannot be applied to the current study. Instead, the current findings suggest that students at the end of the semester may actually rate themselves as having more of an external locus of control than at the start of the semester because their views of their ability to successfully complete the set course work may change as the semester progresses. Specifically, students at the start of the semester are new to the course work and may rate highly their ability to keep pace with and successfully complete the work, and thus, they feel a greater sense of personal control over their final course grade. However, as the semester progresses, students may find that their initial expectations were overly optimistic and that the course work, or keeping pace with the course work, was more difficult than previously presumed, which is reflected in their indications that they feel less personal control over their final course grade.

Recent research has found that levels of locus of control are directly related to a student's academic self-efficacy, or, their belief in their ability to complete academic course work to an adequate degree, and that this relationship in turn was predictive of perceived academic performance and outcome. Cassidy and Eachus (2000) found that perceived academic proficiency was negatively related to an external locus of control, and as such, the more external a student was the lower they perceived their academic proficiency to be. Douglas and Powers (1982) found that the more external a students locus of control was, the less their confidence in completing academic course work became. Also, grade expectancy and academic confidence increased for students with less of an external, and more of an internal,

locus of control. Lastly, Kirsch (1986) found that levels of locus of control directly influenced student self-efficacy scores, which in turn predicted subsequent persistence at academic tasks, and future performance levels, in that an external locus of control was associated with lower levels of self-efficacy, and this relationship led to less persistence at academic tasks and lower subsequent performance levels.

In relating the studies by Cassidy and Eachus (2000), Douglas and Powers (1982), and Kirsch (1986) directly to the current findings, they provide support for the notion that locus of control beliefs impact upon beliefs concerning ones ability to successfully complete academic tasks to an adequate degree, and subsequently influence perceived academic proficiency. Furthermore, the relationships established in those studies combined with the findings of an unexplained longitudinal change in levels of academic locus of control, leads this researcher to *tentatively* propose that the elevation in locus of control across the semester in the current study may be the result of a 'negative feedback pattern' established through the course of the semester. Explicitly, the initial levels of externality in students may have led to a low level of self-efficacy, and subsequently, to a decrease in perceived academic proficiency, which, as the semester progressed and the work load increased, may have resulted in the student depending more upon luck and chance ability to complete the course work than their perceived ability. This in turn may have triggered the re-evaluation of their perceived efficacy, and so, the feedback pattern developed.

Despite the potential of this theory as an explanation for the increase in academic locus of control scores across the semester, it must be stressed that it is only a *tentative* theory as no measures of self-efficacy or perceived academic ability were used in this study, and therefore, no empirical evidence exists to support this theory.

Regarding the finding that stress and procrastination levels did not significantly change between the start and the end of the semester, it is the researchers contention that this may not be so much an indication of the stability of the traits as a function of the 'last minute rush' scenario. As has been mentioned previously, levels of procrastination and stress at the end of the semester were not associated with each other at all, despite procrastination and stress being correlated at the start of the semester, and the relationship may have been due to a 'last minute rush' (as discussed earlier on p72). Essentially, the lack of a difference between the start and the end of semester average procrastination scores was attributed to the fact that the end of semester testing took place at a time when the group that had initially been the greatest procrastinators were now rushing to complete their work for the exam period. Thus, no difference between the start and end of semester scores was evident because the sample population was tested at a time when a decrease in procrastination was taking place. In addition to this, the same scenario may have also lead to the lack of difference in mean scale scores between the start of semester and the end of semester testing for procrastination and stress.

Concerning possible evidence for the 'last minute rush' phenomena, Steel, Brothen, and Wambach (2001) suggest that procrastination reflects an extreme discrepancy between the intention to work and actually turning that intention into actions. Therefore, while intentions to work are evident the throughout the semester it is not until the end of semester deadline looms that work intentions actually develop into work actions (hence the last minute rush). One of the major implications of this argument is that procrastinators are characterized by faulty time management skills, and past research provides evidence to support this claim. Lay (1988) found that student procrastination was associated with an overestimation of time to complete academic essays, whereas Lay and Schouwenburg (1993) found that both trait and behavioural measures of procrastination were related to ineffectual time management skills in students. Likewise, Vodanovich and Seib (1997) found that trait procrastination in students was related to ineffectual time management practices.

In regard to the argument that the 'last minute rush' found by procrastinators in the current study may be a result of ineffectual time management skills, this indicates that procrastinators may be characterized by a susceptibility to what has been termed a *Planning Fallacy*, or, a pervasive tendency to overestimate time predictions for successful task completion, (Beuhler, Griffen, & Ross, 1994; Kahneman & Tversky, 1979). As a result of this overestimation, the procrastinator delays starting the work ahead, or completes smalls amounts at various times, with the result that as the deadline looms it is evident that too little work has been

undertaken previously to successfully complete the work before the deadline, and thus, the 'last minute rush' occurs.

Concerning the lack of significant difference between the start and end of semester levels of self-oriented and socially prescribed perfectionism, it may be the case that perfectionism as measured in the current study is more a trait rather than a state variable, and hence not so prone to variance across the semester. This contention is supported by Flett, Hewitt, Blankstein and Grey (1998) who stated that most existing measures of perfectionism focus globally on the degree of trait rather than state perfectionism.

In regards to the second set of longitudinal hypotheses, that start of semester levels of procrastination, socially prescribed perfectionism, and academic locus of control would be predictive of levels of stress at the end of semester, the current study only provided partial support. The only significant predictor of end of semester levels of stress in students was a high level of socially prescribed perfectionism at the start of the semester. This finding indicates that, while controlling for stress at the start and socially prescribed perfectionism at the end of the semester, those students presenting with high levels of socially prescribed perfectionism at the start of the semester were significantly more likely than other students to experience greater levels of stress at the end of the semester.

This result also provides direct empirical support for the relationship between socially prescribed perfectionism and stress described by Dunkley, Blankstein,

Halsall, Williams, and Winkworth (2000), whereby high levels of socially prescribed perfectionism act as a general vulnerability factor to distress. The confirmation of this relationship serves to extend the nature of perfectionism and stress research, in that, it promotes the use of the diathesis-stress model of perfectionism in assessing the possible implications that it may have for further defining the nature and potential predictors of such perfectionism related disorders as depression and suicide. Also, this result is valuable in defining the predictors of stress in students, and points towards the characteristics of socially prescribed perfectionism, namely a susceptibility to social expectation and parental criticism, that student learning professionals should target as areas to challenge and assess when dealing with students suffering from severe distress.

LIMITATIONS OF THE CURRENT STUDY

While the current study has been effective in further defining the nature of student procrastination, perfectionism, academic locus of control, and stress, there are a number of limitations inherent to the study that must be acknowledged.

Noting that the study by Martin, Flett, and Hewitt (1993: cited in Flett, Hewitt, & Martin, 1995), concerning the relationship between procrastination and perfectionism, was actually an unpublished study, the distinctive pattern of results concerning procrastination and perfectionism in the present study has been found in only one other *published* study, that of Saddler and Buley (1999). Regarding this observation, it must be noted that both this study and that of Saddler and Buley (1999) utilized the same measures of procrastination and perfectionism. In this

respect the procrastination/perfectionism relationship observed in the two studies may be measure specific. Previous studies have utilized various other procrastination scales in combination with Hewitt and Flett's (1989, 1991) Multidimensional Perfectionism Scale and have found vastly differing results. Moreover, researchers have also highlighted the fact that a number of studies have used both self-report scales and behavioural measures to assess personality states and traits in general, and some research has indicated that there is little concord between the two types of measurement strategy (Hare, 1985). Thus, the strategy for measuring procrastination may be the pivotal source of discrepancy between the findings of previous studies and those of Saddler and Buley (1999) and the current study.

In relation to the dichotomization of the age variable from a previously continuous variable to 'traditional' and 'mature' age groups, for the purpose of studying age related effects in the current study, current theory suggests that this categorization is actually more detrimental to the statistical stability of the results than it is helpful. Allison, Gorman, and Primavera (1993) state that while there is a persistent belief in the appropriateness of dichotomization, there at least four key factors underlying why a researcher should *not* categorize a continuous variable. First, the authors note that previous research has found drastically lowered statistical power for both independent and dependant variables after dichotomization. For instance, Cohen (1983: cited in Allison, Gorman, & Primavera, 1993) found a loss of statistical power that was equivalent to eliminating up to 38% of the subjects in the study, after dichotomizing only one variable. Second, dichotomization based on such techniques as median split, mean value, or an unorthodox rule of thumb creates great

variability between studies in the definition of *high* and *low* groups on the designated variable. Therefore, comparison of such results between studies is less simple. Third, treatment of dichotomized variables as independent variables in such statistical analyses as an ANOVA (Analysis of Variance) creates a nonorthoganal design. Consequently, if there is significant correlation between the predictor variables, the ANOVA cell sizes (which should be equal) will now be unequal, and this will create difficulties in interpretation of associations such as main effects which can no longer merely be added together. Finally, in a study encompassing multiple predictor variables, the dichotomization of these predictors can both confound and distort subsequent interaction effects among the variables. Also, the type and degree of distortion among the predictor variables in different studies will vary as a result of arbitrary *cut-off* points.

The end result of this analysis of the statistical shortcomings of dichotomizing continuous variables is that it highlights the potential effects that this procedure may have had in the interpretation of the age-related effects on procrastination in the current study. While no relation was found between age and procrastination throughout the study, the fact that the analysis was undertaken with a dichotomized age variable entails that there may have been some confounding or distortion of relations inherent in the analysis, and as such, the resulting findings cannot be considered flawless.

In regards to the current lack of difference found between start of semester and end of semester stress levels, when previous research has found an increase, it is

the researchers contention that this was a 'time of testing' result. Perhaps if the questionnaires had been distributed a fortnight earlier the procrastinators would have been sampled *nearer* their peak time of stress and most probably at the peak point of their dilatory behaviour, and before the last minute rush began. In this respect, the design of the current study failed to incorporate a measure of the stress levels during the middle of the semester, and as such failed to detail the potential increase in stress across that semester and the eventual decline at the end of the semester as a result of the 'last minute rush'.

SUGGESTED FUTURE RESEARCH DIRECTIONS

In respect to the possibility that the current relationship established between procrastination and the subscales of perfectionism are a result of different procrastination measures used, and the research already disclosed indicating that there may actually be little concordance between self-report and behavioural measures of personality, further analysis of this relationship would benefit by assessing procrastination with a number of varying measures. Future research would benefit from incorporating both the current measure used and also at least one other well-respected measure of student procrastination and a behavioural measure of procrastination, such as course work hand in dates, as a form of concurrent validity. Such a strategy might help clarify whether the current ambiguity concerning the relationship between procrastination and perfectionism was a product of the measures used. Recent research (Steel, Brothen, and Wambach, 2001) utilizing this multiple-measurement approach to procrastination, already tentatively indicates that there may be a discrepancy in the relationship reported between procrastination and

other personality measures and that this discrepancy is dependant upon whether self-report or behavioural measures of procrastination were used.

The strength of the current findings concerning the relationship between procrastination and academic locus of control indicates that the internal or external focus of causal attributions for success or failure, and the possibility that these attributions can be retrained in students, warrants further research. While previous research has revealed that internal and external causal attributions are associated with levels of academic related motivation, self-efficacy, confidence, and achievement (Colquitt, LePine, & Noe, 2000; Landine & Stewart, 1998; Wilhite, 1990; Wong, 2000), and research has shown attributional retraining to be effective in retraining negative attributions for sporting success and social skills (Dodds, 1994; Hudley, Britsch, Wakefield, Smith, Demorat, & Cho, 1998; Sinnott & Biddle, 1998; Ziegler & Heller, 2000), no research as yet has been undertaken to assess whether attributional retraining would be effective in reducing levels of academic procrastination. Therefore, it is recommended that future research exploring the relationship between procrastination and academic locus of control focus upon the effectiveness of attributional retraining in reducing the influence of external locus beliefs on student study delay, especially in the 25% of *severe* chronic procrastinators whose levels of procrastination have the most impact upon their academic achievement (Flett, Blankstein, and Martin, 1995).

Regarding the proposed 'last minute rush' effect for high procrastinators in the current study, and the relationship between procrastination and poor time

management (Lay, 1988; Lay and Schouwenburg, 1993; Vodanovich and Seib (1997), a proposed future research direction for procrastination researchers is the exploration of whether procrastinators in general possess a *Planning Fallacy* (Beuhler, Griffen, & Ross, 1994; Kahneman & Tversky, 1979), or, a pervasive tendency to overestimate time predictions for successful task completion. Furthermore, if a relationship is shown to exist between procrastination and a tendency to overestimate task completion times, the efficacy of using interventions aimed at redressing faulty task-time estimation in student procrastinators should be explored. Initial research in this area by Koole & Spijker (2000) has shown that the formation of implementation intentions concerning completion times in students led to greater instances of actual goal completion and a subsequent increase in optimistic completion predictions in students in general. In this respect, the research shows that a planning fallacy can be redressed.

CONCLUSION

While this study seems to have raised just as many questions as it has attempted to answer, it has nonetheless provided some valuable and enlightening information as to the nature and determinants of procrastination and stress in students over the period of one university semester.

In essence, the current findings emphasize that high levels of student procrastination are related to a *depersonalization* of academic work and outcome, in that procrastination tends to be highest in those students who lack personal control

over their academic affairs. In the same respect, the findings concerning student stress indicate that the primary predictor is a cognitive focus reflecting concern over external evaluation, and a divorce of personal control over academic achievement, which also indicates a *depersonalization* effect.

In conclusion, the current findings serve to promote a potential paradigm shift for professionals involved in the area of procrastination reduction and deficient study habits. This paradigm shift entails two phases. Primarily, it requires a transfer from concentrating on trying to provide motivation to complete course work and challenging unrealistic social expectations, to, attempting to *personalize* the students academic outcome by instilling a sense of personal control over academic achievement and encouraging the setting of high personal standards of achievement. Secondly, in reference to the pervasive tendency of self-help guides and student counselors to focus on reducing *negative* and detrimental study habits, these professionals should also work towards instilling and enhancing factors such as academic confidence and self-regulation in an attempt to enhance study through the focus upon *positive* study habits as well.

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I.D#

APPENDIX A:

PROCRASTINATION RESEARCH

INFORMATION SHEET

Please read this information sheet before proceeding with the questionnaire.

1. ***What is this study about and who is doing it?***

This study looks at university student study habits, their attitudes towards study, and the degree to which these habits and attitudes are influenced by a number of commonplace personality traits, particularly procrastination. This study will also look at whether these habits, traits and attitudes change over the course of a semester.

My name is Andy Towers, I am a postgraduate student at Massey University, and I am the principle investigator in the current research project. This research is being undertaken as part of my Master of Arts degree in Psychology. My supervisor for this research is the esteemed Dr Ross Flett, Senior Lecturer in the school of Psychology at Massey University, and all-round good bloke. We may be contacted as follows:

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Please do not hesitate to contact either of us if you have any queries or concerns at all regarding this research.

2. ***What will I be asked to do?***

This study has 2 parts. The first part is the enclosed questionnaire. It will take approximately 10-15 minutes to complete this questionnaire. You will be asked a number of questions regarding your current study habits, possible study delaying habits, and feelings regarding studying and your life in general. The second part of the study is a follow up questionnaire, which we will send out later on in the semester, looking at how or whether these factors have changed over time.

So, we would like you to:

a) Fill in this questionnaire,
b) Fill in your name and address on the separate coloured sheet so that we can mail you a second questionnaire (with a free post reply envelope) later in the semester,
c) Fill in and return the second questionnaire later in the semester. The questionnaires will be free post sent to Dr Ross Flett, who will remove all identifiers – names and addresses – and the unidentified questionnaires will then be forwarded to Andy Towers.

3. ***What are my rights as a participant in this study?***

- You are welcome to decline to participate in this study, to refuse to answer any question(s), or to withdraw from the study at any time. You may

complete the first questionnaire and then decide not to complete the second questionnaire.

- You are welcome to contact the researchers at any time during the study to discuss any aspect of the study you wish.

- You provide information on the understanding that it is in complete confidence to the researchers, to be used only for the purpose of this research.

- You are welcome to fill in the request for feedback form to receive a summary of the results of the study upon its completion.

4. ***What can I expect from the researchers?***

We will treat your responses with total confidentiality and assure you of complete anonymity. No one who knows you will ever see your answers, as all completed questionnaires are strictly confidential. If we decide to publish any results these will only be in summary form. The questionnaires will be destroyed upon the completion of the study. At no time will anyone other than Dr Ross Flett and myself have access to completed questionnaires. While we ask that you write your name on the questionnaire, this is only for the benefit of the researchers so that they can link the results from your first and second questionnaires. As soon as the second questionnaire is completed – at the end of the semester – and this is placed with your first completed questionnaire, your name will be deleted so that not even the researchers will know who completed each set of questionnaires. Thus we ensure your anonymity.

INSTRUCTIONS

Please read the following instructions carefully before proceeding with the questionnaire.

(a) Please write your name, and your address clearly. This is only used to link your first and second questionnaires, and this information will later be destroyed.

(b) Remember that all information given by your-self is confidential to the researchers.

(c) Please remember that there are no right or wrong, or good or bad answers. Answer as best you can and if you feel undecided go with your gut instincts!

(d) The researchers have attempted to make the questions as easily understandable as possible. If there are questions or problems you have with any of the questions or answering systems, please do not hesitate to contact us and ask for clarification.

(e) The final page of the questionnaire is a request form for the researchers to send a summary of the results of the study. If you would like to be sent a copy of the final results please fill out the final page. This will be separated from the questionnaire by the researchers and held separately.

Thanks for your time.

Please Complete the Following in Clear Printing:

NAME: _____

FIRST **LAST**

ADDRESS: _____

_____

_____

_____

By signing below I consent to allow the researchers to send me a follow-up questionnaire at a time near the end of this semester. By signing below I am also aware that I have the right to pull out of the study at any given time, I have the right not to answer any questions I feel I do not want to, I can contact the researchers at any given time for clarification of my rights as a participant in this study, and all the information contained within my completed questionnaires is confidential, will only be viewed by the researchers for reference to the study, and I am assured of complete and total anonymity.

(Sign here) _____

(Date)_____

In accordance with the Privacy Act (1993) this information will not be released to any other individual or organization, or used for anything other than the stated purpose.

AGE: _____Years

GENDER: Male / Female (Please circle one)

MAJOR: _____
(Please specify eg. B.A Psychology, BSc Microbiology...etc)

YEAR OF STUDY: _____
(eg. First year of degree, or, 1)

APPENDIX B:

Aitken Procrastination Inventory

		FALSE				TRUE
1.	I delay starting things until the last minute.....	1	2	3	4	5
2.*	I'm careful to return library books on time.....	1	2	3	4	5
3.	Even when I know a job needs to be done, I never want to start it right away.....	1	2	3	4	5
4.*	I keep my assignments up to date by doing my work regularly from day to day.....	1	2	3	4	5
5.	If there were a workshop offered that would help me learn not to put off starting my work, I would go.....	1	2	3	4	5
6.	I am often late for my appointments and meetings.....	1	2	3	4	5
7.*	I use the vacant hours between classes to get started on my evenings work.....	1	2	3	4	5
8.	I delay starting things so long I don't get them done by the deadline....	1	2	3	4	5
9.	I am often frantically rushing to meet deadlines.....	1	2	3	4	5
10.	It often takes me a long time to get started on something.....	1	2	3	4	5
11.*	I don't delay when I know I really need to get the job done.....	1	2	3	4	5
12.*	If I had an important project to do, I'd get started on it as quickly as possible.....	1	2	3	4	5
13.	When I have a test scheduled soon, I often find myself working on other jobs when the test deadline is near.....	1	2	3	4	5
14.*	I often finish my work before it is due.....	1	2	3	4	5
15.*	I get right to work at jobs that need to be done.....	1	2	3	4	5
16.*	If I have an important appointment, I make sure the clothes I want to wear are ready the day before.....	1	2	3	4	5
17.*	I arrive at college appointments with plenty of time to spare.....	1	2	3	4	5
18.*	I generally arrive on time to class.....	1	2	3	4	5
19.	I overestimate the amount of work that I can do in a given amount of time.....	1	2	3	4	5

* Indicates the items to be reversed scored.

APPENDIX C:

The Multidimensional Perfectionism Scale

		Disagree Agree
1.	When I am working on something, I cannot relax until it is perfect.....	1 2 3 4 5 6 7
2.*	I am not likely to criticize someone for giving up too easily.....	1 2 3 4 5 6 7
3.*	It is important that the people close to me are successful.....	1 2 3 4 5 6 7
4.*	I seldom criticize my friends for accepting second best.....	1 2 3 4 5 6 7
5.	I find it difficult to meet others' expectations of me.....	1 2 3 4 5 6 7
6.	One of my goals is to be perfect in everything I do.....	1 2 3 4 5 6 7
7.	Everything that others do must be of top-notch quality.....	1 2 3 4 5 6 7
8.*	I never aim for perfection in my work.....	1 2 3 4 5 6 7
9.*	Those around me can readily accept that I can make mistakes too.....	1 2 3 4 5 6 7
10.*	It does not matter to me when someone close to me does not do their absolute best.....	1 2 3 4 5 6 7
11.	The better I do, the better I am expected to do.....	1 2 3 4 5 6 7
12.*	I seldom feel the need to be perfect.....	1 2 3 4 5 6 7
13.	Anything I do that is less than excellent will be seen as poor work by those around me.....	1 2 3 4 5 6 7
14.	I strive to be as perfect as I can be.....	1 2 3 4 5 6 7
15.	It is very important that I am perfect in everything I attempt.....	1 2 3 4 5 6 7
16.	I have high expectations for the people who are important to me.....	1 2 3 4 5 6 7
17.	I strive to be the best at everything I do.....	1 2 3 4 5 6 7
18.	The people around me expect me to succeed at everything I do.....	1 2 3 4 5 6 7
19.*	I do not have very high standards for those around me.....	1 2 3 4 5 6 7
20.	I demand nothing less than perfection of myself.....	1 2 3 4 5 6 7
21.*	Others will like me even if I don't excel at everything.....	1 2 3 4 5 6 7
22.	I can't be bothered with people who won't strive to better themselves.....	1 2 3 4 5 6 7
23.	It makes me uneasy to see an error in my work.....	1 2 3 4 5 6 7
24.*	I do not expect a lot from my friends.....	1 2 3 4 5 6 7

		Disagree						Agree
25.	Success means that I must work even harder to please others.....	1	2	3	4	5	6	7
26.	If I ask someone to do something, I expect it to be done flawlessly.....	1	2	3	4	5	6	7
27.	I cannot stand to see people close to me make mistakes.....	1	2	3	4	5	6	7
28.	I am perfectionistic in setting my goals.....	1	2	3	4	5	6	7
29.	The people who matter to me should never let me down.....	1	2	3	4	5	6	7
30.*	Others think I am okay, even when I do not succeed.....	1	2	3	4	5	6	7
31.	I feel that people are too demanding of me.....	1	2	3	4	5	6	7
32.	I must work to my full potential at all times.....	1	2	3	4	5	6	7
33.	Although they may not show it, other people get very upset with me when I slip up.....	1	2	3	4	5	6	7
34.*	I do not have to be the best at whatever I am doing.....	1	2	3	4	5	6	7
35.	My family expects me to be perfect.....	1	2	3	4	5	6	7
36.*	I do not have very high goals for myself.....	1	2	3	4	5	6	7
37.*	My parents rarely expect me to excel in all aspects of my life.....	1	2	3	4	5	6	7
38.*	I respect people who are average.....	1	2	3	4	5	6	7
39.	People expect nothing less than perfection from me.....	1	2	3	4	5	6	7
40.	I set very high standards for myself.....	1	2	3	4	5	6	7
41.	People expect more from me than I am capable of giving.....	1	2	3	4	5	6	7
42.	I must always be successful at school or work.....	1	2	3	4	5	6	7
43.*	It does not matter to me when a close friend does not try their hardest.....	1	2	3	4	5	6	7
44.*	People around me think I am still competent even if I make a mistake.....	1	2	3	4	5	6	7
45.*	I seldom expect others to excel at whatever they do.....	1	2	3	4	5	6	7

* Indicates the items to be reversed scored.

APPENDIX D:

The Academic Locus of Control Scale

		FALSE				TRUE
1.*	University grades most often reflect the effort you put into class.....	1	2	3	4	5
2.	I came to university because it was expected of me.....	1	2	3	4	5
3.*	I have largely determined my own career goals.....	1	2	3	4	5
4.	Some people have a knack for writing, while others will never write well no matter how hard they try.....	1	2	3	4	5
5.	I have taken a course because it was an easy good grade at least once.....	1	2	3	4	5
6.	Lecturers sometimes make an early impression of you and then no matter what you do, you cannot change that impression.....	1	2	3	4	5
7.	There are some subjects in which I could never do well.....	1	2	3	4	5
8.	Some students, such as student leaders and athletes, get free rides in college classes.....	1	2	3	4	5
9.	I sometimes feel that there is nothing I can do to improve my situation.....	1	2	3	4	5
10.*	I never feel really helpless – there is always something I can do to improve my situation.....	1	2	3	4	5
11.*	I would never allow social activities to affect my studies.....	1	2	3	4	5
12.	There are many more important things for me than getting good grades.....	1	2	3	4	5
13.*	Studying everyday is important.....	1	2	3	4	5
14.	For some courses it is not important to go to class.....	1	2	3	4	5
15.*	I consider myself highly motivated to achieve success in life.....	1	2	3	4	5
16.*	I am a good writer.....	1	2	3	4	5
17.*	Doing work on time is always important to me.....	1	2	3	4	5
18.	What I learn is more determined by university and course requirements than by what I want to learn.....	1	2	3	4	5
19.*	I have been known to spend a lot of time making decisions which others do not take seriously.	1	2	3	4	5
20.	I am easily distracted.....	1	2	3	4	5
21.	I can be easily talked out of studying.....	1	2	3	4	5
22.	I get depressed sometimes and then there is no way I can accomplish what I know I should be doing.....	1	2	3	4	5
23.	Things will probably go wrong for me sometime in the near future...	1	2	3	4	5
24.	I keep changing my mind about my career goals.....	1	2	3	4	5

		FALSE				TRUE
25.*	I feel that someday I will make a real contribution to the world if I work hard at it.....	1	2	3	4	5
26.	There has been at least one instance at university where social activity impaired my academic performance.....	1	2	3	4	5
27.	I would like to graduate from university, but there are more important things in my life.....	1	2	3	4	5
28.*	I plan well and I stick to my plans.....	1	2	3	4	5

* Indicates the items to be reversed scored.

APPENDIX E:

The Perceived Stress Scale

		Never	Almost Never	Some -times	Fairly Often	Very Often
1.	In the last month, how often have you been upset because of something that happened unexpectedly?.....	0	1	2	3	4
2.	In the last month, how often have you felt that you were unable to control the important things in your life?.....	0	1	2	3	4
3.	In the last month, how often have you felt nervous and "stressed"?.....	0	1	2	3	4
4.*	In the last month, how often have you felt confident in your ability to handle your personal problems?.....	0	1	2	3	4
5.*	In the last month, how often have you felt that things were going your way?.....	0	1	2	3	4
6.	In the last month, how often have you found that you could not cope with all the things that you had to do?.....	0	1	2	3	4
7.*	In the last month, how often have you been able to control irritations in your life?.....	0	1	2	3	4
8.*	In the last month, how often have you felt that you were on top of things?.....	0	1	2	3	4
9.	In the last month, how often have you been angered because of things that happened that were outside of your control?.....	0	1	2	3	4
10.	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?.....	0	1	2	3	4

* Indicates the items to be reversed scored.

APPENDIX F:

The graph in figure 2 below is a graphical depiction of the trend of student procrastination versus levels of stress both at the start and at the end of the semester. The line of best fit (shown as the smooth line in both graphs) can be seen to illustrate the marked decrease in procrastination for the students high on stress at the end of semester, as opposed to the marked increase for the same students at the start of the semester.

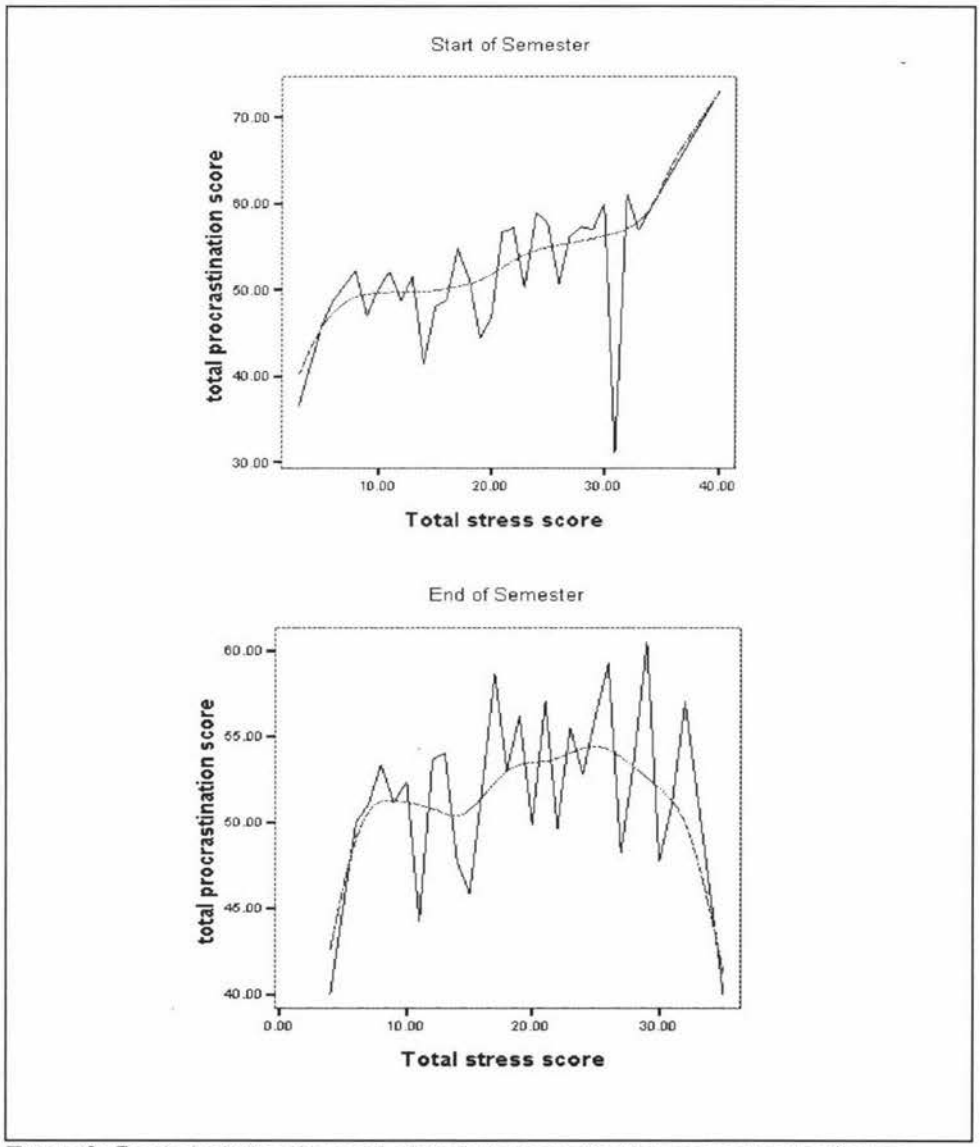

Figure 2: Graph depicting the trend of student procrastination versus levels of stress both at the start and at the end of the semester.