

**Procrastination and
Relating Components of
Cognition and Perceived Stress**

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ABSTRACT

The purpose of this study was to explore the relationship between procrastination, perceived stress and cognitive components of motivation and learning strategies. Participants included 81 undergraduate students in Dublin Business School. Students responded to self report measures including General Procrastination Scale, Motivated Strategies of Learning Questionnaire and Perceived Stress Scale. Pearson correlation revealed a significant positive relationship between procrastination and perceived stress as hypothesized. There was also significant positive correlation with Multiple regression indicated motivation and learning strategy factors were weak predictors of procrastination levels, with the exception of motivational sub-scale self-efficacy. Perceived stress was also found to have a significant positive relationship with test anxiety and a significant negative relationship with organization.

INTRODUCTION

Procrastination has been described as unnecessarily putting off, or delaying, of activities that one ultimately intends to complete, especially when done to the point of creating emotional discomfort (Lay, 1993; Solomon & Rothblum, 1984). A study by Harriott & Ferrari (1996) found that 15% - 20% of adults in the general population procrastinate on a day to day basis. Particularly, academic procrastination is a prevalent and increasing phenomena throughout society today, with up to 90% of students delaying essay writing, exam study, course reading and assignments during the course of their semesters (Schouwenburg, 1995). It is further posited that up to 50% of college students chronically procrastinate (Day, Mensink, & O'Sullivan, 2000), reflecting multiple negative consequences including lost time, increased stress, lower grades, poorer health, decreased long-term learning and lower self-esteem (Hoover, 2005). Procrastination is a multi-dimensional construct that appears to have behavioural, cognitive and affective components. It has been extensively researched resulting in many theories as to its cause, with evidence linking it to negative personality traits, self regulation failure, temporal discounting and individual differences (Ferrari, 1992; Steel, 2007) as well as impulse control and avoidant coping styles (Sirois, Melia-Gordon, & Pychyl, 2003).

Despite a rise in recognition and prominence in recent years, there is still debate as to the exact nature of procrastination. Some researchers have labeled procrastination as a discrepancy between intent and behavior (Lay, 1994). Schraw, Wadkins & Olafson, (2007) posited that the greater the discrepancy between intent and behavior, the greater the procrastination with the result that what an individual intends to do is entirely different from what an individual actually does. The irrational, voluntary delay expecting to be worse off for the delay (Steel, 2007) is a viewpoint consistent with our neurobiology. Long-term intentions made primarily in the prefrontal cortex is superseded by impulses generated by our limbic system, which in turn is particularly sensitive to

concrete stimuli indicative of immediate gratification (McClure, Ericson, Laibson, Loewenstein, & Cohen, 2007). The result is that we intend to work but put it off when the moment comes, finding that our preferences suddenly change as we pursue more readily enjoyable temptations. (Steel, 2007). Meta-analysis by Steel (2007) has supported the notion that procrastination is relatively stable across an individual's lifetime.

Solomon and Rothblum (1984) were the first to address academic procrastination. They created the Procrastination Assessment Scale Students (PASS), assessing how frequently students procrastinate and the factors behind the procrastination. A study of 342 university students reported a significant positive correlation between self reported procrastination and clinical traits, such as irrational cognitions, anxiety and depression, as well as significant negative correlation between self reported procrastination and self esteem (Solomon & Rothblum, 1984). In a factor analysis of why students procrastinated, fear of failure accounted for 49% of the variance. This factor was determined by evaluation anxiety, low self-esteem and perfectionism. Task aversiveness was another central issue in their findings, with 18% of variance accounted for.

Ferrari and Tice (2000) noted that task aversion is likely if the task involved is subject to evaluation or requires heavy cognitive demand. In an experiment involving two groups of participants, the researchers noted that when an activity was identified as an important cognitive task, procrastinators spent more time on a pleasurable activity, even with the knowledge they were to be evaluated, suggesting that procrastination may occur as a behavioural handicap. Self handicapping is a dysfunctional, emotion-focused form of self regulation, whereby the procrastinator impedes their own performance. Both self-handicapping and task avoidance may be used by procrastinators who prefer to use a lack of time or effort as an excuse for a potential future failure. Furthermore, Ferrari (1992) stated that this low self esteem and self efficacy reported in

procrastinators may emerge- or result- from the cycle of self sabotaging behaviour that leads to degradation or shame due to subsequent low academic performance and grades. While the fear of failure theory of procrastination has received support, other findings contradict the importance of fear of failure as a central variable to predicting procrastination. A meta-analysis study of the effect of fear of failure on procrastination was by conducted by Steel (2007) resulting in no statistically relevant relationship being reported, although weakly related were procrastination and perfectionism. Perfectionism and its association with procrastination, fear of failure and task aversiveness was investigated in a study of 131 undergraduate students by Flett et. al (1992) with findings that socially prescribed perfectionism was positively correlated with scores on the Lay procrastination scale as well as being associated with fear of failure, though not task aversiveness.

Motivation theories

Some researchers believe that procrastination can be explained by motivational theories. More recently there has been an increase of the convergence of theories in the causes of procrastination. One such theory developed to conceptualize procrastination is the Temporal Motivation Theory (Steel & Konig, 2006). This was formulated to incorporate central aspects of the core theories of procrastination, including expectancy theory, hyperbolic discounting (discounting the value of a later reward), need theory and cumulative prospect theory.

Expectancy theory states that before engaging in an activity, an individual will make two considerations: what is the probability that an outcome would be achieved, and how much is the expected outcome valued. In short, the motivation of the behavior selection is determined by the desirability of the outcome. Expectancy can often be interpreted as self-efficacy, that is one's judgment about one's own competence (Bandura, 1997). Value, in turn, is closely associated with need for achievement (McClelland, 1985). As expected, both self-efficacy and need for

achievement show strong negative correlations with procrastination. Also, this motivational model is consistent with the observation that procrastination increases with the aversiveness of tasks (Steel, 2007). Hyperbolic discounting is a theory developed by Ainslie and Haslam (1992) stating that when propositioned by multiple rewarding activities, people tend to undervalue future events. Thus procrastination becomes likely as tasks leading to distant but valuable goals are put off in favour of the more immediate but lesser rewards. Hyperbolic discounting, like expectancy theory, maintains a Value term, and is also consistent with findings regarding need for achievement and task aversiveness. Schouwenburg and Groenewoud (2001) conducted a study in which undergraduates were asked to rate their motivation to study in the face of five kinds of temptation. It was reported that respondents would delay study and would take part in the pleasurable activity or social temptations more when the exams were remote than when they were near. As they expected, Schouwenburg and Groenewoud found that procrastinators discounted the future reward to a larger extent than did non-procrastinators and moderately punctual students. Nevertheless, time-related increases in both study motivation and resistance to social temptation did not differ as a function of trait procrastination. This suggested that procrastinators do not have motivational deficits, and may not have more troubles resisting social temptations than others. Rather, the core of the problem might be situated in their problem in enacting their intentions (Steel et al., 2001).

Situation-driven, academic procrastination may be a function of task-related motivation or a combination of a stable orientation and a lack of motivation toward the activity at hand (Brownlow & Reasinger, 2000). It has been found that there is an inverse relation between motivation and procrastination (Senecal, Koestner, & Vallerand, 1995). That is, as motivation level decreases, tendency for procrastination increases. Motivation is the force which drives a person to engage in a task. Researchers have identified two types of motivation: intrinsic and extrinsic; both were found

to be negatively related to academic procrastination. Intrinsic motivation refers to motivation that results from an internal drive of enjoyment in the task itself, and exists within the individual rather than relying on external pressures. Students who are intrinsically motivated are more likely to engage in the task willingly as well as work to improve their skills, which will increase their capabilities. Extrinsic motivation refers to motivation that is the result of external factors. These external factors such as evaluation by others, deadlines, monetary rewards or competition (Washcull & Kernis, 1996; Harackiewicz & Elliot, 1993) may minimize the importance of the original internal drive by focusing on the conditions of the extrinsic motivation. Thus, behaviour will be determined by the rewards of environmental factors, resulting in unstable motivation toward academic tasks due to dependence on external rewards for the effort (Brownlow & Reasinger, 2000).

Self regulation and learning strategies

Recent research maintains that self regulatory variables are good predictors of academic procrastination. Self-regulated learning has defined by Pintrich (2000, p. 453) as the “active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behaviour, guided by and constrained by their goals and the contextual features in the environment”. Failure to self-regulate results in failure of ability to exert control over thoughts, emotions, impulses, and task performance in regards to preferred standards (Vohs & Baumeister, 2004). Successful self regulatory behaviour can be characterized by the use of cognitive motivated learning skills, where an individual uses metacognition in an academic context - using strategies that allow successful learning, evaluation, revision, planning and checking. Learning strategies can be defined as methods and techniques purposefully applied to specific tasks and task conditions (McKeachie, 1988). Unlike tactics, methods, or discrete study skills, strategies are an assortment of intentional behaviors, cognitions, or beliefs directed toward an academic goal or outcome. The larger and more extensive the individual’s strategy repertoire, the more accomplished they are at engaging in a strategic cognitive

process. The individual selects and implements the learning process. Methods such as rehearsal, elaboration and organization are fundamental tools. It has been established that the use of cognitive learning strategies play an significant role in academic performance (Zimmerman, 1990). Prior research supports the belief that learners who use more cognitive and metacognitive learning strategies tend to show higher levels of performance and academic achievement than those who don't (Alexander, Graham, & Harris, 1998; Pressley, Borkowski, & Schneider, 1987).

However the nature of learning strategies are effortful and time consuming, thus it may be predicted that those who are relatively unmotivated toward distant tasks may resort to the use of such strategies less often. In support of this theory, Schouwenburg (2004) reported that procrastination is inversely correlated with adoption of a disciplined and systematic approach to academic tasks and with the management and planning of time, suggestive of poor organization. In a study by Wolters (2003), students with high self report procrastination scores were found to apply less cognitive learning strategies in their studies. Although research that explicitly examines procrastination and the use of metacognitive and cognitive learning strategies is scarce, existing literature indicates an inverse relationship between the two constructs. Most salient are the findings regarding procrastinators' use of planning and time management strategies, which can be conceptualized as metacognitive strategies (Wolters, 2003). Procrastination is inversely correlated with planning strategies and managing one's time (Schouwenburg et al., 2004). More specifically, procrastinators demonstrate a weak ability to set goals for successful task completion and a deficit in accurately estimating time needed to complete tasks (Ferrari, 2001; Schouwenburg et al., 2004). Howell and Watson (2007) found procrastination to be related to less use of metacognitive strategies such as planning, monitoring, and regulating. In general, procrastinators show an inability to plan their academic endeavors, which in and of itself is an effective strategy (Van Eerde, 2000). In terms of cognitive learning strategies, studies have found the use of strategies such as rehearsal,

elaboration, and organization to be inversely related to procrastination (Howell & Watson, 2007; Schouwenburg et al., 2004). Procrastination is also inversely related to self-efficacy (Chu & Choi, 2005; Ferrari et al., 1992; Tuckman, 1991), a construct that is positively related to the use of deep-level regulatory strategies (Wolters, 2003).

While procrastination in general may have negative connotations, not all procrastinating behaviour leads to negative consequences. There has been research conducted exploring the more adaptive aspects of procrastination. Some studies reported that students who who procrastinate are also more likely to cram before an exam (Vacha & McBride, 1993) and may outperform noncrammers due to the use of a greater variety of learning strategies to achieve maximum study efficiency. This was supported in a study by Brinthaupt and Shin (2011) whose research reported that crammers reported higher levels of 'flow' than noncrammers resulting in better performance on tests. 'Flow' is a term coined by Csikszentmihalyi (1990) referring to the state of total involvement in an activity that consumes one's full attention. Similar to these studies, an investigation conducted by Chu & Choi (2005) suggest that procrastination can be differentiated into two components of passive and active. Their study surveyed 230 undergraduates about their time usage, likelihood of procrastination, stress levels and academic performance. Passive procrastinators reported higher levels of stress, lower GPA scores and lower overall life satisfaction than active procrastinators. They displayed reluctance to study, poor time management and a failure to complete assignments on time. While active procrastinators showed the same task delay behaviour, they reported it as a conscious decision, purposefully starting their tasks at a later time. Active procrastinators were found to be more similar to non-procrastinators in their use and control of time, reporting higher self efficacy of belief, productive use of learning, adaptive coping styles and academic performance outcomes. It was found that the preference of active procrastinators to work within one block of time as opposed to smaller more numerous blocks of time encouraged the student to procrastinate

(Schraw, Wadkins, & Olafson, 2007). It would appear that in order to successfully procrastinate, a high level of motivated cognitive strategies and self-regulation would need to be applied. Further investigations by Choi and Moran (2009) elaborated on this theory, developing and validating an expanded measure of active procrastination that reliably assess the four dimensions of preference for pressure, intentional decision to procrastination, ability to meet deadlines and outcomes. There has been little research studying procrastination in relation to self regulated and motivational learning strategies. Self regulation has been defined as “self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals” (Zimmerman, 2000, p. 14). Typically, those students who are aware- and make use- of these strategies display adaptive motivational attitudes and beliefs that include high levels of self efficacy and an orientation toward goal attainment (Pintrich, 2000b).

Research indicates that students with high self efficacy tend to perform better academically due to their ability to engage in tasks more persistently, using more deep level and regulatory strategies than those students with lower self efficacy (Bandura, 1997). In this light, self regulation, cognitive- and motivational factors appear to be significant variables when investigating academic procrastination.

The stress factor

Empirical studies have found that correlations between traits of the five-factor model are implicative of procrastination. A self-discipline scale (Costa & McCrae, 1992) found overlap with conscientiousness, including conformity, reliability, thoroughness, morality, cautiousness, achievement orientation and organization. Within the broader construct of Conscientiousness, Industriousness (Roberts et al., 2005) and Responsibility (Parish, 2004) were found to have had strong associations with academic performance. Neuroticism correlates strongly with anxiety,

negative affect and worry, suggesting if anxiety was a factor to predict procrastination, then stress or worry may encourage the behaviour (Ellis & Knaus, 1977). In a longitudinal study of undergraduate students, Tice & Baumeister (1997) found that while procrastination at the beginning of a semester did lower stress levels in some cases, when tested again later in the semester, the same students reported higher levels of stress and negative affect, as well as proneness to illness. Students showing procrastinating behaviour also receives lower grades in addition to higher stress than non-procrastinating students. This was further supported by Flett, Gehrman & Keinan (1992). One of the aims of the current project was to examine perceived stress as a variable correlating with procrastination. Stress is difficult to measure. Selye (1956) defined stress as the non-specific response of the body to any demand placed upon it. Stress has further been defined as an imbalance between those demands and our ability to cope, with symptoms of stress exhibiting either physically or psychologically. McGrath (1976) conceptualized stress as an interaction between perceived demand, perceived ability to cope, and the perception of the importance of being able to cope with the demand. Unlike many previous definitions of stress, this hypothesis integrates the transactional process believed to be central to current cognitive appraisal theories. As such it can be noted that perhaps it is the individual perception of stress and the desire or motivation an individual experiences to meet demand placed upon them that should be investigated as a predictor of procrastination. It is hypothesized that this study will find a significant positive correlation between high procrastination scores and perceived stress scores.

While studies have been conducted regarding self regulatory behaviour and procrastination (Wolters, 2003), this study proposes to concentrate on the relationship between procrastination, cognitive factors predicting procrastination and the relationship of a perceived stress factor. Such research may provide opportunities for improvement of academic procrastination. If students had better understanding and awareness of these strategies that may reduce stress and negative affect,

levels of cognitive motivational learning associated with successful self regulated learning may increase, thereby decreasing the perceived stress factor. It is expected that procrastinators may be characterized by a lack of these four sub-scales of both motivation and learning strategies. It is thought that motivational sub-scales of self-efficacy, test anxiety, intrinsic goals and task value will predict procrastination levels of students. It is further believed that sub-scales of learning strategies rehearsal, elaboration, organization and self regulation will influence procrastination levels. The second hypothesis proposes a significant negative correlation between procrastination scores and predictors of motivated strategies for learning scores. As levels of motivated strategies of learning decrease, it is proposed that levels of procrastination will increase.

METHOD

Participants

The present study included a convenience sample of eighty-one participants, all undergraduate part- and full time students at Dublin Business School, Dublin, Ireland. Of the total sample of participants 18.5% were male ($N= 15$) and 81.5% were female ($N= 66$) ranging in age from seventeen to fifty-five years ($M = 27.72$, $SD = 8.74$). No credits or incentives were given for participation.

Design

The current study used correlational design to explore the relationship between procrastination, perceived stress and the cognitive and behavioural characteristics of self-regulated learners. components of strategic cognition and perceived stress. Specifically, this research investigated the degree to which procrastination is related to sub-scales of multiple motivational and cognitive learning strategies and perceived stress.

This is a cross-sectional study, using quantitative data collection of three appropriate measures. The criterion variable is procrastination levels as measured by Lay's General Procrastination Scale (1986). The predictor variables are perceived stress as measured by the Perceived Stress Scale (Cohen et. al., 1983) and sub-scales of the Motivated Strategies of Learning Questionnaire (Pintrich, et al., 1991). These sub-scale variables include self-efficacy, test anxiety, intrinsic goals, task value, rehearsal, elaboration, self-regulation and organization.

Materials

Three different measures were used in the current study. First, the General Procrastination Scale (Lay, 1986) will be discussed followed by Motivated Strategies of Learning Questionnaire (Pintrich, 1991) and finally scales measuring Perceived Stress (Cohen, et al., 1983).

The General Procrastination Scale (GPS; Lay, C., 1986) is a 20-item scale examining procrastination as a behavioural trait, both in academic and in other everyday situations along a 5-point scale. The measure includes general procrastination scales (e.g., 20. I usually take care of all the tasks I have to do before I settle down and relax for the evening) to academic related scales (e.g., 12. In preparing for some deadline, I often waste time by doing other things). Written instruction was as follows: "Please use the following statements to describe yourself. For each statement, decide whether the statement is characteristic or uncharacteristic of you using the following 5 point scale. The students then responded appropriately on a five-point likert scale (1 = Extremely uncharacteristic to 5 = Extremely characteristic). There are ten reverse scores in the GPS, numbers 3, 4, 6, 8, 11, 13, 14, 15, 18 and 20, which are recoded (1 = 5, 2 = 4, 3 = 3). Total scores are then summed with higher scores characterizing higher levels of procrastination. This scale demonstrates good internal consistency, reporting Cronbachs alpha of 0.82 (Lay, 1986; Schouwenburg, 1994) and good stability with a test-retest reliability of 0.8 (Lay, 1986; Ferrari, 1989). Cronbachs coefficient alpha for the scale in the present sample was .74. This measure is provided in appendice A.

The Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, P., Smith, D., Garcia, T., & McKeachie, W., 1991) is an 81-item, self-report instrument consisting of six motivation sub-scales and nine learning strategies scales. It has been extensively used to assess college students' motivational orientations and their use of different learning strategies. Items were

adapted from various instruments assessing student motivation, cognitive strategy use, and metacognition (e.g., Eccles, 1983). It has been found that components of the MSLQ are correlated with many aspects of metacognitive strategies, measuring critical thinking, motivation for conceptual change, self-efficacy, beliefs about knowledge, intrinsic and extrinsic motivation, integrated metacognitive instruction, adolescent help-seeking in math classes, and goal orientation. In the present study, a previously edited 44-item version of the MSLQ was used, using less subsets - excluding items measuring external goal orientation, time and study environments, peer learning and help seeking. The motivation subset consisted of 22 of the 44 items, consisting of value components, which included task value items (e.g., 4. It is important for me to learn the course material in this class), expectancy components, including self efficacy for learning and performance items (e.g., 18. Compared with the other students in this class I think I know a great deal about this subject) and affective components including test anxiety items (e.g., 3. I am so nervous during a test that I cannot remember facts I have learned). The learning strategies subset included rehearsal components (e.g., 34. When I study for a test I practice saying the important facts over and over again), elaboration components (e.g., 40. When reading I try to connect the things I am reading about with what I already know), organization components (e.g., 42. I outline the chapters in my book to help me study), meta-cognitive self-regulation (e.g., 32. I work on practice exercises and answer end of chapter questions even when I don't have to). Scores of the edited MSLQ were obtained by reversing the scores (e.g., 1 = 7, 2 = 6, 3 = 5, 4 = 4) of items numbered 26, 27, 37 and 38 (e.g., 38. I find that when the teacher is talking I think of other things and don't really listen to what is being said) - all of which lie within the learning strategies section - and summing all the items in each sub-scale (This subsequently identifies motivation variables of intrinsic goals, self efficacy in learning and performance, task value and test anxiety. Learning strategies variables were specified as rehearsal, elaboration, organization and self-regulation). Written instruction to respondents were as follows: "Please rate the following items by circling the number that best

describes your behaviour this year so far". They were requested to respond using by a 7-point Likert scale (1 = not at all true of me and 7 = very true of me). The MSLQ has undergone extensive psychometric development, and maintains adequate overall internal consistency, with a Cronbach alpha reported at .78 for overall motivation scales and .71 for learning strategies (Pintrich et al., 1991). The present study reported Cronbach alpha at .72 for motivation scales and .89 for learning strategies. Within motivation sub-scales, Cronbach alpha was reported for intrinsic goals (4 items; $\alpha = .7$), self efficacy (9 items; $\alpha = .6$), task value (5 items; $\alpha = .88$) and test anxiety as (4 items; $\alpha = .87$). Within learning strategies, Cronbach alpha was reported for rehearsal (5 items; $\alpha = .72$), elaboration (4 items; $\alpha = .73$), organization as (4 items; $\alpha = .6$), and self regulation (9 items; $\alpha = .74$). This measure is presented in appendice B.

The Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) is a widely used 10-item scale requiring respondents to indicate the degree to which situations in one's life are appraised as stressful using a 5-point likert scale. Psychological stress has been defined as the extent to which persons perceives that their demands exceed their ability to cope (Cohen et. al, 1983). The instrument's items were designed to test for how unpredictable, uncontrollable, and overloaded respondents find their lives. Item examples include "In the last month how often have you been upset because of something that happened unexpectedly?" and "In the last month how often have you felt confident in your ability to handle your personal problems?". Written instructions required the participant to consider their feelings and thoughts during the last month. In each case, they were asked to indicate along a 5-point likert scale (0 = Never to 4 = Fairly often) how often they felt or thought a certain way, by circling the appropriate number. Scores for this scale were obtained by recoding the positively stated items of 4, 5, 7, and 8 into reverse responses (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 & 4 = 0). All scores were then summed across the scale items. Scores range from 0 to 40, with

higher scores indicating greater stress. This scale appears to have reasonable internal validity with a coefficient alpha of .78. In the current study Cronbach alpha was reported at .7. This measure is provided in appendice C.

Procedure

The participants were notified of the study as they entered the classroom. The questionnaire booklets were handed out to each student by the author. Participants were told the study was to investigate procrastination and its relationship to perceived stress and components of cognition, before being asked to respond to the self report survey which included the three above-mentioned measures of seventy-seven items in total. The booklet began with a brief outlined introduction to the study, including the authors contact details as well as those of the supervisor should there be any queries. Ethical considerations included a box in which participants were asked to tick, giving consent to use their questionnaire in the study. Further, it was stated that participation was anonymous. The order of the measures remained consistent throughout questionnaires administered to participants beginning with three demographic questions asking age, gender and course name. Lay's Procrastination Scale was the first of the measures, followed by the Motivated Strategies of Learning Questionnaire (edited version) and ending with the Perceived Stress Scale. Although the survey had been estimated for completion at eight to ten minutes, some participants took as long as fifteen minutes. Once completed, respondents raised their hands and the booklets were collected. Participants were thanked again.

RESULTS

Results were analyzed using SPSS 19 for Windows. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. Inspection of the normal Q-Q Plots and histograms suggested normal distribution.

Descriptive Statistics

Means, standard deviations and alpha for the General Procrastination Scale, Perceived Stress and composite Motivated Strategies of Learning sub-scales including self-efficacy, test anxiety, intrinsic goals, task value, rehearsal, elaboration, self-regulation and organization are presented below in Table 1.

Table 1: *Descriptives for General Procrastination Scale, Perceived Stress Scale and Motivated Strategies of Learning Sub-scales*

	<i>M</i>	<i>SD</i>	<i>α</i>	<i>N</i>
Procrastination	71.3	7.96	.74	81
Perceived Stress	23.48	4.95	.7	81
Motivation	109.8	7.96	.72	81
<i>Self-efficacy</i>	44.96	11.36	.6	81
<i>Test Anxiety</i>	16.27	5.99	.87	81
<i>Intrinsic Goals</i>	15.14	2.98	.7	81
<i>Task Value</i>	28.04	4.86	.88	81
Learning Strategy Sub-scales	110.81	15.81	.89	81
<i>Rehearsal</i>	25.85	4.86	.72	81
<i>Elaboration</i>	20.88	3.58	.73	81
<i>Self-regulation</i>	38.85	5.82	.74	81
<i>Organization</i>	20.13	3.67	.6	81

Inferential Statistics

The first aim of the study was to examine the relationship between procrastination levels and perceived stress. It was hypothesized that there would be a significant positive relationship between procrastination levels and perceived stress. The mean score for Procrastination was 71.3 (SD = 7.96) and for Perceived Stress was 23.48 (SD = 4.95). Examination of descriptives and histograms for each variable indicated no extreme deviations from normality. Inspection of scatter-plots supported the assumption that relationships between variables were linear.

A Pearson correlation coefficient calculated that there was a strong positive significant relationship between Procrastination and Perceived Stress ($r(79) = .301, p = .006$), indicating that 79% of the variance in the two scales is shared. Therefore the null hypothesis is rejected. Correlations of procrastination levels and perceived stress is presented below in Table 2.

Table 2: *Intercorrelations between General Procrastination Scale, Perceived Stress Scale and MSLQ sub-scales*

		Procrastination	Self Efficacy	Test Anxiety	Intrinsic Goal	Task Value	Rehearsal	Elaboration	Self Regulation	Organization	Perceived Stress
Procrastination	Pearson Correlation										
Self Efficacy	Pearson Correlation	-.267*									
Test Anxiety	Pearson Correlation	.271*	-.287**								
Intrinsic Goal	Pearson Correlation	-.048	.538**	-.228*							
Task Value	Pearson Correlation	.022	.487**	-.156	.724**						
Rehearsal	Pearson Correlation	.084	.163	.179	.214	.311**					
Elaboration	Pearson Correlation	.030	.299**	-.258*	.546**	.664**	.501**				
Self-Regulation	Pearson Correlation	-.091	.300**	-.277*	.469**	.493**	.454**	.682**			
Organization	Pearson Correlation	-.025	.299**	-.110	.453**	.497**	.554**	.704**	.743**		
Perceived Stress	Pearson Correlation	.301**	-.203	-.366**	-.206	-.125	-.053	-.148	-.062	-.227*	

Note: * p significant at .05 level.

** p significant at .01 level.

The second aim of the study was to investigate whether motivational factors and cognitive learning strategies accounts for variance in levels of procrastination. The hypothesis maintained that there would be a significant negative relationship between procrastination levels and both motivational factors and strategies of learning, i.e., high levels of motivation and cognitive strategies would predict low levels of procrastination. Before a multiple regression was conducted, assumptions of normality, linearity and homoscedasticity were met. Additionally, inspection of the

residuals scatterplot and Normal Probability Plot suggested no violation of the assumptions.

First, a direct multiple regression was used to explore whether four sub-scales of motivation (self-efficacy, test anxiety, intrinsic goal and task value) were predictors of procrastination levels. The results of the regression indicated that the four motivation predictors explained .10% of the variance in procrastination levels ($R^2 = .145$, $F(4, 76) = 3.223$, $p < .05$). It was found that self-efficacy significantly predicted procrastination levels ($\beta = .314$, $p = .019$, 95% CI = $-.402 - .038$) with the strongest unique contribution, followed by test anxiety ($\beta = .219$), task value ($\beta = .178$) and intrinsic goals ($\beta = .042$). Table 3 is presented below with summarized results of this regression.

Table 3: *Standard multiple regression of motivation sub-scales on procrastination scales*

	<i>B</i>	β	<i>t</i>	<i>p</i>	95% CI for B
Constant	66.59		10.67	0	[54.155 – 79.017]
Self-efficacy	-.220	-.314	-2.40	0.02	[-.402 -.038]
Test anxiety	.290	.219	1.97	.053	[-.004 - .585]
Intrinsic Goals	.42	.22	.30	0.8	[-.750 - .975]
Task value	0.29	0.18	0.26	0.26	[-.217 - .800]

$R = .381$

$R^2 = .145$

Adjusted $R^2 = .100$

Note: $n = 81$

The second direct multiple regression was conducted to test whether four subsets of strategic learning (rehearsal, elaboration, self-regulation and organization) were predictors of procrastination levels. The four learning strategy predictors explained .03% of the variance ($R^2 = .032$, $F(4, 75) = .628$, $p > .05$). There was no significant predictor found. None of the predictor variables alone significantly contributed to the equation, however, self-regulation showed the strongest unique contribution of the four predictor variables ($\beta = -.207$). Table 4 is presented below with summarized results of this regression.

Table 4: *Standard multiple regression of learning strategy sub-scales on procrastination scales*

	<i>B</i>	β	<i>t</i>	<i>p</i>	95% CI for B
Constant	72.13		10.91	0	[58.968 – 85.300]
Rehearsal	.274	0.17	1.17	0.25	[-.192 - .740]
Elaboration	.309	.139	0.79	.432	[-.470 – 1. 087]
Self-regulation	-0.3	-0.21	-1.11	0.27	[-.830 - .235]
Organization	0.29	0.18	0.26	0.72	[-.931 - .647]

$R = .180$
 $R^2 = .032$
Adjusted $R^2 = -.019$

Note: $n = 81$

Procrastination was found to be significantly positively correlated with perceived stress ($r = .301, p = .006$) as was expected. The self-efficacy sub-scale was found to have a significant negative relationship with procrastination ($r = -.267, p = .016$). Also negatively correlated, though not significantly was intrinsic goals ($r = -.048, p = .673$). Positively correlated with significant findings was test anxiety, ($r = .271, p = .014$). Perceived stress and test anxiety were reported as having a strong significant correlation ($r = .366, p = .001$). It had been hypothesized that there would be a significant relationship between motivational factors and procrastination. Multiple regression produced little significant results when testing for predictor strength of motivation sub-scales on procrastination. The motivation sub-scale 'self-efficacy' alone reported significant correlation.

Perceived stress was also found to have a moderate negative relationship with the learning strategy sub-scale 'organization' ($r = -.227, p = .042$), suggesting lower organization skills lead to higher stress. The Pearson coefficient found no significant correlation between sub-scales of learning strategies and procrastination. Further, multiple regression did not discover any significant interaction between procrastination and learning strategy factors. It was noted that both organization and self-regulation sub-scales revealed negative relationship, though not significant.

DISCUSSION

A goal of this study was to increase understanding of procrastination. However, results did not reveal any consistent evidence of associations between motivation and learning strategies and levels of procrastination that has been previously reported in literature (Brownlow, & Reasinger, 2000; Wouters, 2003). The relationship between procrastination and perceived stress was investigated using Pearson product-moment correlation coefficient. There was a strong, positive correlation between the two variables with high levels of procrastination associated with higher levels of perceived stress. This was unsurprising as increased levels of stress have been documented to result in maladaptive coping strategies and behaviour (Flett, Gehrman & Keinan, 1992).

Within the motivation sub-scales, self-efficacy was found to have a strong negative relationship with procrastination. These findings are consistent with previous research associating students' effort and persistence in academic tasks to perceived self-efficacy (Bandura, 1997; Steel, 2007). Bandura (1986) argues that weak self-efficacy reduces expectancy of success, thereby damaging motivation, and hindering task initiation and persistence resulting in procrastination. This is linked to fear of failure (Ellis & Knaus, 1977). Specifically, people suffering from irrational beliefs may doubt their ability to do well and believe that any failure to perform to standard suggests inadequacy as a person (Steel, 2007). Previous literature has implied that fear of failure, self-efficacy and self-esteem are correlated with procrastination. This appears to be supported in this study where test anxiety reported significant positive correlation with procrastination levels. Researchers have investigated evaluation anxiety or test anxiety with a wide range of measures. This is linked to previous research outlining levels of procrastination and fear of failure (Solomon, & Rothblum, 1984). As previously mentioned, this is further supported by Tice and Ferrari (2000) who found that task aversion and procrastination is likely if the task involved is subject to evaluation. Intrinsic goals indicated a negative relationship to procrastination as was expected and

supported by previous research (Senecal, Koestner, & Vallerand, 1995), although in this study findings were not significant. Organization was found to be negatively correlated with procrastination, though not significantly. This is supported by previous research lower levels of organization increases procrastination indicating that those students who can set solid goals and keep a schedule will procrastinate less (Steel, 2007).

The lack of findings between procrastination and measures of motivation and learning strategies is surprising. However, this may be explained by a number of issues within this particular study. Initial issues may lie with data collection and the time in which the respondents took part in the study. Measures were collected at different times in the semester. While some respondents participated at the end of the first semester, when stress levels may have been high due to exams and looming deadlines of unfinished assignments, the majority of respondents participated in the beginning of the following semester after a long break and before many assignments had been given out. This may have influenced responses especially on the perceived stress scale. Another issue considers the participants interest in the study. Most often, participants were not aware they were to be asked to full in a survey, and may have felt obliged to do so, but having no interest to do so, resulting in the possibility that some studies were conducted more carefully than others. This may have biased responses. Additionally at that particular time of the year, many final year students were requesting class participation for a variety of end of year studies. This resulted in an influx of requests to partake in numerous studies where incentives like course credits were not available. This may have lowered conscientiousness on the part of the respondents while answering the self report questions. Additionally, the present study was completed using college students solely within the population of Dublin Business School, and it is posited that further research is needed to determine whether findings generalize to other student populations.

Further limitations may have been the measures themselves. The lack of findings between procrastination and motivation and learning variables maybe due to the general nature of the edited version of the MSLQ used within the study. None of the learning strategy sub-scales showed any prediction strength nor significant correlation with procrastination levels, although did indicate directional correlation. Motivation sub-scales self-efficacy and test anxiety did show significant correlation, however as with learning strategies related poorly in regression calculation. As mentioned, a previously edited version of the MSLQ was used, which may need to be addressed.

The General Procrastination Scale (Lay, 1986) was used in its original form, and as such the response to certain questions may have been unclear. Original questions are consistent with present communication and technology for e.g. Item 5 states 'a letter may sit for days after I write it before mailing it' potentially needs updating to 'emails may sit in my inbox unanswered for days before I respond to them'. These changes may control for the common use of email and texting as a form of communication.

The findings of this study are not wholly consistent with previous literature that motivation and learning strategies offer some prediction of procrastination levels. However, some sub-scales have proved to be more central to predicting procrastination than full constructs of motivation and learning strategies. It is apparent that the potential of relevant, self-regulatory learning strategy use by students will increase motivation and further develop self-regulatory patterns to decrease procrastination, perceived stress levels and negative affect among the student population. This research indicates that further studies are needed to examine the affective implications of academic procrastination and its causes as well as its outcomes.

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APPENDICES

APPENDIX A

General Procrastination Scale (Lay, 1986)

INSTRUCTIONS

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

Extremely Uncharacteristic	Moderately Uncharacteristic	Neutral	Moderately Characteristic	Extremely Characteristic
1	2	3	4	5
1. I often find myself performing tasks that I had intended to do days before.....	1	2	3	4 5
2. I often miss concerts, sporting events, or the like because I don't get around to buying tickets on time	1	2	3	4 5
3. When planning a party, I make the necessary arrangements well in advance. .	1	2	3	4 5
4. When it is time to get up in the morning, I most often get right out of bed.....	1	2	3	4 5
5. A letter may sit for days after I write it before mailing it.....	1	2	3	4 5
6. I generally return phone calls promptly.....	1	2	3	4 5
7. Even with jobs that require little else except sitting down and doing them, I find they seldom get done for days.....	1	2	3	4 5
8. I usually make decisions as soon as possible.....	1	2	3	4 5
9. I generally delay before starting on work I have to do.....	1	2	3	4 5
10. When traveling, I usually have to rush in preparing to arrive at the airport or station at the appropriate time.....	1	2	3	4 5
11. When preparing to go out, I am seldom caught having to do something at the last minute.....	1	2	3	4 5
12. In preparing for some deadline, I often waste time by doing other things.....	1	2	3	4 5
13. If a bill for a small amount comes, I pay it right away.....	1	2	3	4 5
14. I usually return an RVSP request very shortly after receiving the invitation. .	1	2	3	4 5
15. I often have a task finished sooner than necessary.....	1	2	3	4 5
16. I always seem to end up shopping for birthday or Christmas gifts at the last minute.....	1	2	3	4 5
17. I usually buy even an essential item at the last minute.....	1	2	3	4 5

18. I usually accomplish all the things I plan to do in a day.....1 2 3 4 5
19. I am continually saying I'll do it tomorrow.....1 2 3 4 5
20. I usually take care of all the tasks I have to do before I settle down
and relax for the evening..... 1 2 3 4 5

APPENDIX B

Motivated Strategies of Learning Questionnaire

Please rate the following items by circling the number that best describes your behaviour this year so far. Your rating should be on a 7-point scale where

1 = not at all true of me to 7 = very true of me.

1. I prefer class work that is challenging so I can learn new things.....1 2 3 4 5 6 7
2. Compared with other students in this class I expect to do well.....1 2 3 4 5 6 7
3. I am so nervous during a test that I cannot remember facts
have learned 1 2 3 4 5 6 7
4. It is important for me to learn what is being taught in this class1 2 3 4 5 6 7
5. I like what I am learning in this class..... 1 2 3 4 5 6 7
6. I'm certain I can understand the ideas taught in this course1 2 3 4 5 6 7
7. I think I 'll be able to use what I learn in this class in other classes1 2 3 4 5 6 7
8. I expect to do very well in this class1 2 3 4 5 6 7
9. Compared with others in this class, I think I'm a good student 1 2 3 4 5 6 7
10. I often choose paper topics I will learn something from even if
they require more work1 2 3 4 5 6 7
11. I am sure I can do an excellent job on the problems and tasks
assigned for this class 1 2 3 4 5 6 7
12. I have an uneasy, upset feeling when I take a test 1 2 3 4 5 6 7
13. I think I will receive a good grade in this class 1 2 3 4 5 6 7
14. Even when I do poorly on a test I try to learn from my mistakes1 2 3 4 5 6 7
15. I think that what I am learning in this class is useful for me to know1 2 3 4 5 6 7
16. My study skills are excellent compared with others in this class1 2 3 4 5 6 7
17. I think that what we are learning in this class is interesting1 2 3 4 5 6 7
18. Compared with other students in this class I think I know
a great deal about the subject1 2 3 4 5 6 7
19. I know that I will be able to learn the material for this class1 2 3 4 5 6 7
20. I worry a great deal about tests 1 2 3 4 5 6 7
21. Understanding this subject is important to me1 2 3 4 5 6 7

22. When I take a test I think about how poorly I am doing1 2 3 4 5 6 7
23. When I study for a test, I try to put together the information from class
and from the book1 2 3 4 5 6 7
24. When I do homework, I try to remember what the teacher said in
class so I can answer the questions correctly1 2 3 4 5 6 7
25. I ask myself questions to make sure I know the material I have
been studying1 2 3 4 5 6 7
26. It is hard for me to decide what the main ideas are in what I read1 2 3 4 5 6 7
27. When work is hard I either give up or study only the easy parts1 2 3 4 5 6 7
28. When I study I put important ideas into my own words1 2 3 4 5 6 7
29. I always try to understand what the teacher is saying even
if it doesn't make sense.....1 2 3 4 5 6 7
30. When I study for a test I try to remember as many facts as I can1 2 3 4 5 6 7
31. When studying, I copy my notes over to help me remember material.....1 2 3 4 5 6 7
32. I work on practice exercises and answer end of chapter questions
even when I don't have to1 2 3 4 5 6 7
33. Even when study materials are dull and uninteresting, I keep working
until I finish1 2 3 4 5 6 7
34. When I study for a test I practice saying the important facts over
and over to myself1 2 3 4 5 6 7
35. Before I begin studying I think about the things I will need to do to learn...1 2 3 4 5 6 7
36. I use what I have learned from old homework assignments and
the textbook to do new assignments1 2 3 4 5 6 7
37. I often find that I have been reading for class but don't know what
it is all about.....1 2 3 4 5 6 7
38. I find that when the teacher is talking I think of other things
and don't really listen to what is being said1 2 3 4 5 6 7
39. When I am studying a topic, I try to make everything fit together1 2 3 4 5 6 7
40. When I'm reading I stop once in a while and go over what I have read1 2 3 4 5 6 7
41. When I read materials for this class, I say the words over and over
to myself to help me remember1 2 3 4 5 6 7
42. I outline the chapters in my book to help me study1 2 3 4 5 6 7
43. I work hard to get a good grade even when I don't like a class1 2 3 4 5 6 7
44. When reading I try to connect the things I am reading about with
what I already know.....1 2 3 4 5 6 7

APPENDICE C

Perceived Stress Scale

For each question, please indicate by circling how often you felt or thought a certain way in the last month.

	Never	Almost Never	Sometimes	Fairly Often	Very Often
	0	1	2	3	4
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 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 you on top of things?.....	0	1	2	3	4
9. In the last month, how often have you been angered because of things that were out of your control?.....	0	1	2	3	4
10. In the last month, how often have you felt difficulties were piling up so high you could not overcome them?.....	0	1	2	3	4