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The Role of Self-Concept Content, Certainty and Stability in Academic Procrastination

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BA (Hons)

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Abstract

Academic procrastination has been associated with a variety of negative outcomes. While theorists have proposed that those with an unstable self-concept engage in procrastination due to the fear that they will be unable to meet the required standard, a systematic review conducted as part of the present study (Chapter 2) revealed that all research pertaining to the self-concept in academic procrastination has been correlational, thereby limiting the validity of such theories. As such, the present study employed an experimental design to investigate the self-concept of academic procrastinators (Chapter 3). Ninety-nine undergraduate students completed trait, symptom and academic procrastination inventories as well as measures of state-based affect and cognition, and self-concept content, certainty and stability before and after receiving feedback for a writing task. Compared to low procrastinators, high procrastinators described a self-concept characterised by a greater number of negative and procrastination-related attributes, higher levels of fear of negative evaluation, lower levels of self-concept clarity, self-efficacy and self-esteem and more severe symptoms of depression, anxiety and stress. Furthermore, both the content and certainty associated with procrastinators' self-concept descriptions changed significantly as a result of receiving randomly allocated feedback for a writing task. While high procrastinators reported significant improvements to their self-concept after receiving a positive evaluation, low procrastinators showed a more positive self-concept which did not change after feedback. These results provide the first empirical evidence for the presence of an unstable self-concept in academic procrastinators, providing support for the aforementioned theory and emphasising the importance of addressing self-concept stability in the psychological treatment of academic procrastination. Further research may investigate mindfulness-based interventions.

Keywords: academic procrastination, self-concept, self-concept certainty, irrational beliefs, self-esteem, self-efficacy

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Statement of Originality

This thesis is submitted to the University of Sydney in partial fulfilment of the requirements of the degree of Doctor of Clinical Psychology/Master of Science (DCP/MSc). The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in full or in part, for a degree at this or any other institution.

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Bianca Petrie Date

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Chapter 1: Overview of Academic Procrastination

1.1 Definition, Prevalence and Correlates of Procrastination

While most people engage in occasional task delay, for some, procrastination is a problem that significantly impacts upon their wellbeing and daily functioning. In this case, procrastination can be defined as an irrational tendency to postpone tasks that require completion (Burka & Yuen, 1983, 2008; Ellis & Knaus, 1977; Lay, 1986; Silver & Sabini, 1981), to the point where the individual experiences subjective discomfort (Solomon & Rothblum, 1984). In fact, a growing body of research indicates that chronic procrastination has been associated with a variety of negative emotional, cognitive, physical, financial and performance correlates (Steel, 2007). While the prevalence of this problematic form of procrastination has been estimated at 15-25% in the general population (Harriott & Ferrari, 1996; McCown & Johnson, 1989), estimates generated from both clinical experience (e.g., Ellis & Knaus, 1977) and self-report measures (e.g., Potts, 1987), indicate that academic procrastination may affect over 70% of the student population. Within this group, between 40 and 50% of students report chronic and problematic procrastination (Day, Mensink, & O'Sullivan, 2000; Haycock, 1993; Micek, 1982; Onwuegbuzie, 2000; Onwuegbuzie, 2004; Solomon & Rothblum, 1984), and up to 95% wish to reduce the extent to which they procrastinate (O'Brien, 2002). Furthermore, those at higher levels of education tend to report more frequent procrastination (Hill, Hill, Chabot & Barrall, 1976) indicating that problematic procrastination is more prevalent in highly educated students.

Procrastinators have been found to exhibit more severe symptoms of depression (Beswick, Rothblum & Mann, 1988; Chu & Choi, 2005; Dangas, Abbott & Burgdorf, 2014; Lay, 1992; Steel, Brothen & Wambach, 2001), anxiety (Milgram & Naaman, 1996; Rothblum, Solomon & Murakami, 1986), stress (Tice & Baumeister, 1997), worry (Stöber & Joorman, 2001), guilt (Pychyl, Lee, Thibodeau & Blunt, 2000), obsessive compulsive tendencies,

phobias, substance abuse (Johnson, 1992), and even suicide proneness (Klibert, Langhinrichson-Rohling, Luna & Robichaux, 2011) than non-procrastinators. There is also evidence that procrastination may in fact exacerbate psychopathology, as within a psychiatric outpatient facility, those with higher scores on a measure of trait procrastination waited longer to seek treatment, and had more severe symptoms than those with low scores (Johnson, 1992). Indeed, more generally, studies have linked procrastination with stress, illness symptoms and visits to healthcare professionals (Tice & Baumeister, 1997), a lack of self-efficacy to perform health related behaviours (Sirios, 2004), treatment delay, perceived stress, fewer wellness behaviours, and poorer overall health in both students (Sirios, Melia-Gordon & Pychyl, 2003) and the general community (Sirios, 2007). Task delay can also have a financial cost, with researchers finding a significant negative relationship between procrastination and financial well being (r =-.42; Elliot, 2002), and career/financial success (r = -.26; Mehrabian, 2000).

1.2 Models of Procrastination

Clinical observation of the frequency with which patients who procrastinated presented to treatment for associated cognitive and emotional difficulties led researchers to recognise the importance of problematic procrastination as a target for clinical intervention (Ferrari, Johnson & McCown, 1996). Based on their clinical observations, Ellis and Knaus (1977) developed one of the first cognitive behavioural theories to account for the causes and maintaining factors involved in this seemingly irrational behaviour. Based on the principles of Rational Emotive Behaviour Therapy (REBT; Ellis, 1957), which posits that certain types of irrational beliefs may underlie many emotional and behavioural problems, Ellis and Knaus proposed three main factors contributing to procrastination: frustration intolerance, “self-downing” and hostility.

Frustration intolerance, which Ellis and Knaus propose as the "main and most direct cause of procrastination" (1977, p. 19), refers to beliefs associated with the expected aversiveness of a given task, and one's inability to tolerate the negative affect associated with performing the task. Specifically, Ellis and Knaus suggest that procrastinators believe that they cannot tolerate immediate pain for future gain, which leads to overgeneralisations such as "I won't be able to enjoy any part of the task", therefore "I will feel extreme discomfort throughout the entire process", and "I cannot possibly tolerate that feeling". In response to these beliefs it is proposed that procrastinators begin to feel intense feelings of anxiety whenever they even contemplate the idea of the task. This anxiety is then thought to result in task avoidance, which may relieve anxiety in the short term, but which often results in greater demands being placed on the individual in the increasingly reduced period of time left to complete the task. As such, if and when the procrastinator comes to attempt the task, it does require a disproportionate amount of work, thus reinforcing the procrastinator's original beliefs and perpetuating the cycle of procrastination. The second factor, "self-downing", or critical self-appraisal, is proposed to result from what is generally now termed perfectionism; an absolutist attitude to achievement in all areas of life, and the connection of this achievement to approval from others as well as one's self-worth. This self-downing, and, in Ellis and Knaus's words, resultant feelings of "turdhood", occurs when one inevitably fails to achieve these impossible standards, which in turn, results in reduced confidence in being able to complete the next task, and perpetuates the cycle of procrastination. The final factor described by Ellis and Knaus is hostility, which is proposed as both a contributor to, and justification for, procrastination. As a causative factor, it is suggested that people may use procrastination as a way to express their anger toward others for imposing an aversive task, when it would be inappropriate to express this anger directly. Contributing to this proposed hostility is the just world hypothesis (Lerner, 1980); the tendency for individuals to believe

that what happens to people is generally proportionate to what they deserve. So, to the extent that procrastinators see themselves as deserving of good things, or not deserving of bad things, procrastination may serve to restore balance to the world by counteracting the obligation which is seen as unfairly imposed. More likely, however, according to Ellis and Knaus, hostility is used as a rationalisation for one's procrastination, originally motivated by feelings of inadequacy and/or low frustration tolerance.

Burka and Yuen (1983, 2008) extended Ellis and Knaus's (1977) theory to emphasise the character-level features underlying problematic procrastination. They conceptualised the procrastinator as an individual with a vulnerable sense of self, who therefore placed exaggerated emphasis on achievement to maintain their self-worth. This vulnerability was theorised to be driven by a variety of underlying conflicts, such as fear of failure or success, separation or attachment, or autonomy or control, based on the early experiences of the individual. The procrastinator's insecurity is proposed to result in irrational beliefs about their capacity to achieve the required standard, and this belief, combined with the associated attributions to their worth as a person, is thought to generate extreme anxiety which is relieved in the short term by task delay. For those with a vulnerable sense of self, procrastination would also serve an ego-defensive function by allowing the individual to attribute failure to a lack of time to complete the task, rather than to a lack of ability. Thus, Burka and Yuen emphasise a vulnerable sense of self, coupled with inflated standards for achievement and poor self-efficacy as key maintaining factors in procrastination behaviour.

While Ellis and Knaus (1977) and Burka and Yuen (1983, 2008) proposed theories about the characteristics of problematic procrastinators based on clinical experience, Solomon and Rothblum (1984) were the first to attempt to gather empirical evidence for the types of tasks that resulted in the most procrastination, and the reasons behind this task delay. It is not surprising that a sample of undergraduate students and clinical psychology faculty

staff cited academic tasks as the most problematic areas for procrastination, and indeed academic procrastination has since been recognised as a specific area of procrastination research in its own right (Ferrari et al., 1995). Using an open ended response format, Solomon and Rothblum first asked a sample of staff and students to identify the reasons that they procrastinated on academic tasks. The most commonly cited responses were used to develop one part of the Procrastination Assessment Scale- Students (Solomon & Rothblum, 1984), which asks respondents to indicate their reasons for procrastinating the last time that they wrote an essay "at the last minute". The second part of the PASS measures the frequency, associated distress, and extent to which individuals wish to decrease their procrastination on a variety of academic performance and administrative tasks. When administered to a separate sample of undergraduate students (n = 342), factor analysis revealed that students endorsed two main factors for their procrastination; one comprising items related to fear of failure (evaluation anxiety, perfectionism, and lack of self-confidence), and one related to task aversiveness (e.g., "there are more interesting things to do", "I was too lazy").

Fear of failure was the strongest independent factor, accounting for 49% of the variance in total self-reported PASS procrastination scores, while task aversiveness accounted for 18% of the variance. Importantly however, while fear of failure was the strongest predictor, it was endorsed by a relatively small group of procrastinators (6-14%) whereas the task aversiveness factor was endorsed by far more participants (19-47%). This indicates that although task aversiveness was a commonly cited reason for procrastination, it was only one of a number of different factors that students believed contributed to their procrastination. In contrast, procrastinators citing reasons pertaining to fear of failure endorsed these beliefs much more consistently, and largely to the exclusion of other factors. In support of this distinction, fear of failure was significantly correlated with depression (r = .41), irrational cognitions (r =.30), anxiety (r =.23), low self-esteem (r =.26) and, to a lesser extent, lack of

assertiveness (r =.12). Task aversiveness was also significantly correlated with depression (r =.36) and irrational cognitions (r =.23), but was correlated much more highly with a lack of punctuality and organised study habits (r =.53), less so, although still statistically significantly, with low self-esteem (r =.13), and not at all with anxiety or lack of assertiveness. These findings suggest that academic procrastination is regarded by students to result from a variety of cognitive, affective and behavioural variables, but, for certain groups of procrastinators, is correlated with self-report measures of psychopathology. More specifically, students who see their procrastination as motivated by fear of failure also report greater psychopathology, and are distinguished from those motivated by task aversiveness by the presence of anxiety and low self-esteem.

Given the evident clinical significance of task delay behaviour, Solomon and Rothblum's (1984) study precipitated a large body of research that has examined procrastination from demographic, task, trait, symptom, temporal and outcome perspectives, which were reviewed in Steel's (2007) meta-analysis. Based on the results, Steel proposed that procrastination could be accounted for by Temporal Motivation Theory (Steel & Konig, 2006), also known as the "procrastination equation" (Steel, 2011). Temporal Motivation Theory proposes that procrastination can be predicted by the relationship between four main factors: the importance an individual places on the outcome of a task, combined with the perceived likelihood of a positive outcome, balanced against the individual's level of impulsiveness and the deadline for task completion. That is, one is more likely to procrastinate on tasks that are perceived as being less important and having less potential for a positive outcome, and procrastination is further exacerbated if the deadline is distant and the person is impulsive.

Some aspects of Steel's (2007) meta-analysis and resultant procrastination theory, however, run counter to the research findings and clinical experience of leading

procrastination researchers and clinicians (Ferrari, Pychyl and Tuckman), most notably in the areas of perfectionism, self-esteem and anxiety (Ravn, 2007). Firstly, while Steel found an average correlation of r = -.27 from 33 studies between procrastination and self-esteem, this key aspect of the self-concept is not included in Temporal Motivation Theory. Secondly, Steel's meta-analysis revealed no relationship between procrastination, anxiety and perfectionism, which are widely observed correlates within the clinical literature on procrastination.

It is possible, however, that these conflicting results may be an artefact of the different conceptualisations of procrastination and the methodology necessary for meta-analysis. While meta-analysis is often considered the most reliable representation of the evidence on a particular topic, its reliability is dependent on the quality and specificity of the included research, and often, as in the case of Steel's meta-analysis, involves aggregating different but related measures to condense results and reduce redundancy. In the case of procrastination, it is possible that this methodology could have masked the intricacies of more specific subgroups of procrastinators, such as general versus academic, or procrastinators with different motivations for their behaviour. In fact, a growing body of research has distinguished individuals who experience problematic academic procrastination from those who simply delay completion of tasks (e.g., Chu & Choi, 2005; DeWitte & Schouwenburg, 1992; Milgram et al., 1993; Milgram & Naaman, 1996; Strunk, Cho, Steele & Bridges, 2013), suggesting that more specific analyses and theories may be required in order to develop targeted interventions for different types of procrastinators.

Finally, a recent theory has been developed which attempts to broaden our understanding of procrastination by evaluating not only the different potential motives of those who delay academic tasks, but also those who commence and complete tasks in a timely manner (Strunk et al., 2013). This 2 x 2 model of procrastination and timely

engagement proposes that procrastination can be viewed as a behaviour influenced by either approach (e.g., purposefully delaying in order to gain more information) or avoidance motivations (e.g., delaying intended work due to feeling overwhelmed by the task) and proposes that engagement in a task can be viewed from the same perspective. That is, people may engage in a task for reasons related to approach (e.g., to give themselves enough time to do a good job) or avoidance (e.g., because they find tasks difficult to complete on time). Strunk et al. (2013) developed a scale to measure these constructs and found convergent and divergent validity when the items were correlated with the GPS-Student (Lay, 1986) and the Achievement Goal Questionnaire (Elliot & Murayama, 2008). Scores on the GPS- Student were correlated with "procrastination-approach" and "procrastination-avoidance", and structural equation modelling indicated that including the subtypes of procrastination rather than the general type measured by the GPS-S provided a better fit for their data. Based on their definitions, however, it appears that Strunk et al. have simply separated true procrastinators (which they have termed "avoidance oriented") from those who delay strategically (termed "approach oriented"). While the classification of an "approach oriented" procrastinator highlights the need to specify motivation for delay when measuring procrastination, the fact that their delay is strategic and without accompanying distress precludes them from being considered true procrastinators.

1.3 Evidence for the Psychological Factors Contributing to Procrastination

1.3.1 Frustration Intolerance/Task Aversiveness

The "main and most direct cause of procrastination" proposed by Ellis and Knaus (1977, p. 19), frustration intolerance, has found consistent support in the literature, with Steel (2007) finding a mean correlation of r =.40 (n = 8) between procrastination and the related construct of task aversiveness across domains of procrastination. In fact, Harrington (2005a) found that items which were originally termed "task aversiveness" by Solomon and

Rothblum (1984) on the PASS, related more closely to frustration intolerance beliefs than to task-related beliefs when analysed using stricter factor analytical techniques. Using the Frustration Discomfort Scale (FDS, Harrington 2005b*)* which is based on the different types of irrational beliefs described in the REBT literature (Dryden & Gordon, 1993), Harrington found that those who reported problematic procrastination on the PASS (high procrastination plus associated distress) reported significantly higher discomfort intolerance beliefs than other students, with average scores similar to clinical population norms for self-control problems such as overspending, comfort eating, problematic alcohol consumption and misuse of prescription medication (Harrington, 2005c). Furthermore, the relationship between procrastination and discomfort intolerance remained significant even after controlling for task aversiveness, indicating that it is not just the perceived aversiveness of the task that accounts for the effect of discomfort intolerance on procrastination.

Taken together, these results suggest that individuals who believe they will be unable to tolerate the discomfort of persisting on a task, generally do not attempt to do so, thereby precluding experiences which might disconfirm such expectations, and perpetuating the cycle of procrastination. To the extent that task achievement is important to the procrastinator's self-concept, as proposed by theory and suggested by research (Ferrari & Diaz-Morales, 2007), the act of continual task delay is likely to maintain these negative self beliefs, and increase the risk of associated psychopathology.

1.3.2 Fear of Failure

The attributions for academic procrastination most strongly endorsed by participants in Solomon and Rothblum's (1984) study were a combination of perfectionism, low self-confidence and evaluation anxiety, which the authors collectively termed fear of failure, and which appear conceptually similar to the role of fragile, or performance-contingent self-esteem proposed by Ellis and Knaus (1977) and Burka and Yuen (1983, 2008). While this

construct seems to fit well with theory, and has been replicated in subsequent studies employing the PASS (e.g., Brownlow & Reasinger, 2000; Onwuegbuzie & Collins, 2001; Rothblum et al., 1986; Schouwenburg, 1992), overall, research has demonstrated only a modest relationship between self-reported procrastination and fear of failure as a trait, or as an attribution for procrastination.

For example, Schouwenburg (1992) found only a small significant relationship between the fear of failure scale on the PASS (β =.19) and self-reported behavioural delay on academic tasks as measured by his inventory, The Procrastination Checklist Study Tasks, as well as between fear of failure and general procrastination as traits (r =.14, $p < .05$). Furthermore, both Brownlow and Reasinger (2000) and Rothblum et al. (1986), found that high and low procrastinators were equally as likely to report fear of failure as a reason for procrastination, with Rothblum et al. also finding that all students, regardless of their levels of procrastination, perceived fear of failure as less hindering to task completion as the semester progressed. Finally, a meta-analysis by Steel (2007) found a non-significant average effect size of r =.18 between procrastination and self-reported fear of failure.

The reason for this modest association may lie in methodological flaws, however, as each study used a different measure of procrastination with which to correlate associated fear of failure. Brownlow and Reasinger (2000) used the total PASS score, comprised of procrastination scores related to both academic tasks (writing an essay, studying for an exam, keeping up with weekly readings) and academic administrative tasks (administration, attending meetings and performing academic tasks in general), and the degree of associated distress, while Solomon et al. (1986) used only the exam related question on the PASS, and measured how this item was impacted by fear of failure over time. Schouwenberg (1992) used the Procrastination Checklist Study Tasks, which focuses mainly on the action-intention

gap on administrative tasks, lecture attendance and exam study, and the General Procrastination Scale (Lay, 1986) which measures general trait procrastination.

As it is likely that procrastination may be influenced by different motivations depending on the task, it is possible that the impact of fear of failure on academic performance tasks may have been somewhat masked by the inclusion of questions pertaining to administrative activities or lecture attendance in the aforementioned studies. Indeed it appears possible that fear of failure, if present, may in fact result in less procrastination on administrative tasks in order to reduce the likelihood of additional academic stress, or while procrastinating on more demanding tasks such as assignments or study. In fact, research indicates that academic procrastinators who set excessively high standards for themselves do procrastinate less than other students on academic administrative tasks (Park & Kwon, 1998), suggesting that the inclusion of administrative and non-evaluative tasks in the procrastination scale may have obscured the relationship between procrastination and fear of failure on academic performance tasks. Furthermore, it is also less likely that a fear of failure scale from an academic performance item will be as highly predictive of general trait procrastination as it would be of academic procrastination specifically. Supporting this distinction, Harrington (2005a) found a much stronger relationship between procrastination and fear of failure when considering only the academic performance tasks on the PASS (r =.43, p < .001). Finally, grouping academic and general procrastination as well as fear of failure, evaluation anxiety, socially prescribed perfectionism and self consciousness for the purposes of meta-analysis (Steel, 2007) may not have achieved the level of specificity required to understand how fear of failure might influence academic procrastination.

In addition, recent research indicates that a moderating effect may account for some of the inconsistencies seen in research on fear of failure and procrastination. Investigating academic procrastination specifically, Haghbin, McCaffrey & Pychyl (2012) found that the

positive relationship between an irrational fear of failure and procrastination was strengthened when individuals perceived themselves as lacking competence (akin to self efficacy; $\beta = .35$, $p < .01$), but that the direction of this relationship changed ($\beta = -.24$, $p < .05$) when competence was perceived as high, suggesting a strong moderating influence for self-efficacy.

1.3.3 Perfectionism

One component of the fear of failure construct, and key to both Ellis and Knaus's (1977) and Burka and Yuen's (1983, 2008) conceptualisations of the procrastinator, is perfectionism. Early studies (e.g., Beswick et al., 1988) found a small but significant relationship between perfectionistic beliefs and self-reported procrastination ($r = .20$); however this relationship was not replicated on a behavioural measure of procrastination (submission of assignments). More recent research highlighting the multi-dimensional nature of perfectionism, however (e.g., Frost, Marten, Lahart & Rosenblate, 1990; Hewitt & Flett, 1989), has provided greater clarification of the ways in which perfectionism may influence procrastination. Consistent with research supporting the concept of both public and private aspects of the self (e.g., Cheek & Briggs, 1982; Fenigstein, Scheier, & Buss, 1975; Greenwald & Breckler, 1985; Schlenker, 1980), Hewitt and Flett (1989) proposed that perfectionism could be considered from a both personal and social perspective, suggesting that the defining aspect of these constructs was not the perfectionistic beliefs and behaviours themselves, but to whom they were directed. As such, they defined three aspects of perfectionism: self-oriented, characterised by setting excessively high standards for oneself; other-oriented, where these standards are expected of others; and socially prescribed, in which perfectionistic standards are attributed to others, and the individual believes that they will not be accepted unless these standards are met. To assess these constructs they developed the Multidimensional Perfectionism Scale (MPS) and demonstrated that the various

orientations of perfectionism were differentially associated with certain distinct psychological difficulties (Hewitt & Flett, 1989).

Socially prescribed perfectionism appears most closely related to the beliefs of the procrastinator proposed by Ellis and Knaus (1977) and Burka and Yuen (1983, 2008); that the individual places excessive importance on achieving perfectionistic standards in order to gain the approval of others, upon which they then base their self-worth, and the pressure this causes leads to procrastination to relieve the associated anxiety. Several studies (e.g., Dangas et al., 2014; Flett et al., 1992; Onwuegbuzie, 2000; Park & Kwon, 1998; Saddler & Buley, 1999; Saddler & Sacks, 1993) have found evidence for this relationship, however, as noted, only a modest effect size (r =.18) was obtained in a meta-analysis of all types of procrastination when grouped with similar constructs (Steel, 2007). In support of maintaining specificity when examining these variables, Flett et al. (1992) found that socially prescribed perfectionism was a particularly important influence on academic procrastination for individuals who also reported fear of failure (r =.40, p < .01) and distress associated with procrastination (r =.28, p < .01), while it was less influential for individuals who simply delayed academic tasks without associated distress (r =.21, p < .05).

These relationships have also been supported by experimental evidence, with Ferrari (1991a) finding that procrastinators were more likely to choose a less desirable task on which they expected to perform more poorly, when they expected evaluation, than when they did not. This suggests that procrastinators may believe that others have higher expectations for them (i.e., that they must choose the more difficult task), and choose to conform to these standards despite expecting to perform more poorly than if they had chosen a more desirable task.

The relationship between self-oriented perfectionism and procrastination appears more complex, with the majority of researchers finding either no relationship (e.g., Flett et al., 1992; Onwuegbuzie, 2000; Saddler & Sacks, 1993; Steel, 2007) or a significant negative relationship (e.g., Frost et al., 1990; Park & Kwon, 1998; Saddler & Buley, 1999), suggesting that setting excessively high standards for oneself may motivate task-directed action to alleviate the anxiety associated with potentially failing to meet such standards. Indeed, as already noted, there is evidence to suggest that self-oriented perfectionism is a negative predictor of procrastination on academic administrative tasks (Park & Kwon, 1998). With respect to academic performance tasks, however, there is evidence to suggest that the impact of self-oriented perfectionism on procrastination is mediated by self-efficacy (Seo, 2008). That is, self-oriented perfectionism only seems to result in task directed behaviour in those who believe they have the capacity to meet the required standard. Indeed, a lack of self-efficacy has shown one of the strongest and most consistent relationships with procrastination across studies, with an average correlation of r =.38 from 39 studies (Steel, 2007).

1.3.4 Self-Esteem

Related to self-efficacy, and key to the aforementioned theories of procrastination, including the fear of failure construct identified by Solomon and Rothblum (1984), is the concept of low self-esteem, or an unstable self-esteem which is based on task performance (Burka & Yuen, 1983, 2008; Ellis & Knaus, 1977). Research investigating self-esteem in procrastinators has shown a consistent negative relationship, with an average negative correlation of r = -.27 from 33 studies (Steel, 2007). Furthermore, several studies have demonstrated that low self-esteem makes a unique contribution to the prediction of self-reported procrastination, after controlling for related concepts such as fear of failure (Harrington, 2005a) and irrational beliefs (Beswick et al., 1988).

Experimental evidence supports this self-report data, with Ferrari (1991a) finding that self-identified procrastinators, who reported significantly lower levels of self-esteem, were more likely than non-procrastinators to choose a self-handicap (distracting noise) when completing an experimental task. Ferrari interprets these results as indicative of attempts by high procrastinators to protect their self-esteem by providing themselves with an excuse for their (expected) poor performance. Furthermore, Ferrari and Tice (2000) found that procrastinators delayed practicing for a task when it was described as evaluative of their intelligence, but not when the same task was described as non-evaluative and fun. The fact that procrastination only occurred under conditions of ego threat indicates that procrastination may result from the activation of fear of failure due to low self-esteem, or conversely, act as a strategy to protect the self-esteem of the procrastinator should they turn out to perform poorly on the task. On the other hand, it is also plausible that procrastinators, who may be more intolerant of expected discomfort (e.g., Harrington, 2005a), are simply more likely to procrastinate on tasks they expect to be aversive, and less likely to procrastinate on tasks they expect to be fun (even if they are, in fact, the same task), though the consistent relationship found between procrastination and other cognitive and affective symptomatology suggests a more complex relationship.

1.3.5 Evaluation Anxiety

In order to investigate whether procrastination on performance tasks can be explained purely from a discomfort intolerance perspective, it is necessary to examine whether procrastination varies on aversive tasks as a function of expected evaluation. In fact, Senecal, Lavoie and Koestner (1997) found that high trait procrastinators took significantly more time to commence a boring, difficult activity when they expected their performance to be evaluated, compared to when they did not, indicating that it was the threat of evaluation itself which caused the procrastination, rather than the aversiveness of the task per se. Low trait

procrastinators, on the other hand, commenced work at the same time, and before high trait procrastinators, whether or not they expected to be evaluated. Moreover, in a performance-based academic writing task in a laboratory setting (Dangas et al., 2014), procrastinators were found to experience higher levels of task anxiety, perceived threat and self-doubt than non-procrastinators, regardless of whether the expected standard was described as low or high. It seems that the knowledge that their work was going to be evaluated was enough to trigger procrastinators' anxiety, regardless of the expected standard presented to them by the examiner. This suggests that procrastinators tend to infer high standards under conditions of task evaluation irrespective of the instructions they are given, which is indicative of socially prescribed perfectionism. In Dangas et al.'s study, procrastinators also delayed commencing writing (behavioural procrastination) and spent less time in task directed activity (writing), than low procrastinators, despite taking longer overall to complete the task. Interestingly, when rated by an independent evaluator, the actual quality of procrastinators' work was judged to be of a higher standard than the non-procrastinators' work, indicating that their self-doubt was not related to objectively poorer performance. Taken together, these findings suggest that when procrastinators expect to be evaluated on performance-based tasks, regardless of externally imposed standards, they experience higher levels of anxiety, engage in greater behavioural delay, and believe that they will perform more poorly than their peers, despite evidence to suggest that they are capable of producing work of an objectively higher standard than non-procrastinators.

1.3.6 Hostility

The final factor proposed by Ellis and Knaus (1977), hostility, has found little support in the available literature. For example, no relationship has been found between procrastination and entitlement beliefs such as "I can't stand having to give in to other people's demands" as measured by the FDS (Harrington, 2005a), nor with beliefs about

revenge such as “revenge can have positive consequences” (Ferrari & Emmons, 1993, study 2). Furthermore, Ferrari and Emmons found a negative relationship between just world beliefs and procrastination, suggesting that the more likely one is to believe that the world is a fair place and people get what they deserve; the less likely it is that they will procrastinate. It seems that for these students, the belief that one will probably get what they deserve motivates them to work toward their goals, rather than to procrastinate as rebellion against the tasks imposed upon them. Furthermore, in a study examining beliefs about procrastination and its deserved outcomes (Ferrari, 1992), procrastinators were found to evaluate another procrastinator more critically and recommend harsher penalties than non-procrastinators, demonstrating disapproval rather than approval of the behaviour. These studies suggest that if hostility is, in fact, a motivation for procrastinators, they may be less likely to be aware of it, or at least, less likely to admit to it, than to other more socially acceptable accounts. Future research may therefore need to employ alternative methods of investigating the role of hostility to account for these issues. Nevertheless, to the extent that self-report accounts are accepted as valid measures of one’s true motives, hostility does not appear to constitute a significant motivation for problematic academic procrastination.

1.4 The Relationship between Procrastination and the Self-Concept

1.4.1 Content and Structure of the Self-Concept

The self-concept can be defined as an organised knowledge structure or cognitive schema that contains all known information about the self, including past experiences, current knowledge, feelings, beliefs and self-evaluations (Markus, 1977). While the self-concept was once conceptualised as a stable, generalised view of the self, it is now viewed as a dynamic and multifaceted structure, which influences areas as diverse as self-regulation, goal setting, information processing, affect regulation, motivation, social perception, situation and partner choice, interaction strategies, and reactions to feedback (see Markus & Wurf, 1987 for a

review). This dynamic conceptualisation allowed for the observation that an individual's self-concept could alter based on their currently accessible thoughts, attitudes and beliefs, which may be influenced by factors such as their current motivational state or social surroundings (Markus & Wurf, 1987). As a consequence, the measurement of the self-concept expanded to include not only general trait self-concept measures such as the Rosenberg Self-Esteem Scale (Rosenberg, 1965) or the Adult Sources of Self-Esteem Scale (ASSES; Fleming & Elovson, 1989, 2008) , but measures which examined the self-concept from a state perspective (e.g., the State Self-Esteem Scale; Heatherton & Polivy, 1991), with researchers finding that the self-concept could be altered as a result of positive or negative feedback, both when this feedback was genuine (Heatherton & Polivy, 1991) and randomly allocated (Greenberg & Pyszczynski, 1985).

It was also observed that there were individual differences in the extent to which one's self-concept could be modified by outside influences, with Campbell (1990) finding that while individuals with high self-esteem (i.e., a positive evaluation of the content of their self-concept) tended to hold more stable and well-defined beliefs about themselves, those with low self-esteem tended to have self-concepts characterised by relatively high levels of uncertainty, instability and inconsistency, thus a distinction was drawn between the content and structure of the self-concept. Broadly defined as "self-concept clarity", this area of research investigates the way in which the content of the self-concept is organised; that is, the extent to which the content is "clearly defined, internally consistent and temporally stable" (Campbell & Lavallee, 1993, p. 141). Researchers have used both direct (e.g., asking participants to indicate their certainty about their self-concept judgements on a Likert scale; Baumgardner, 1990, experiments 1 and 2; Campbell, 1990, study 1; Wilson & Rapee, 2006, study 1) and indirect (e.g., measuring response latency to endorsement of self-concept items; Baumgardner, 1990, experiment 3; Wilson & Rapee, 2006, study 2) measurements of self-

concept clarity, with studies which used both direct and indirect measures finding consistency between the two methods (e.g., Baumgardner, 1990; Wilson & Rapee, 2006).

1.4.2 Procrastination and Self-Concept Clarity

In support of the potential role of self-concept clarity in procrastination, a lack of self-concept clarity has been associated with greater levels of neuroticism (Campbell et al., 1996), social anxiety (Wilson & Rapee, 2006), socially prescribed perfectionism (Campbell & Di Paula, 2002), depression, anxiety and stress (Smith, Wethington & Zhan, 1996); all characteristics shared by procrastinators. Most importantly, low self-concept stability has been found to predict engagement in more passive coping strategies such as behavioural disengagement; the essence of procrastination (Smith et al., 1996). The one study which has directly investigated the self-concept of procrastinators using a general procrastination scale (Ferrari & Diaz-Morales, 2007), found that these individuals do possess a more negative self-view than non-procrastinators. Using the Six Factor Self-Concept Scale (SFSCS; Stake, 1994), which measures cognitive self-perceptions across a variety of dimensions including task accomplishment, morality, vulnerability, power, giftedness and likeability, Ferrari and Diaz-Morales found that the self-concept of the procrastinator was characterised by strong negative beliefs about their reliability and capacity to accomplish tasks, as well as more negative beliefs about how pleasant and enjoyable they were to be around. Combined with findings which suggest that procrastinators use self-esteem protective strategies such as engaging in distraction tasks (Ferrari & Tice, 2000), failing to prepare for a task (Senecal et al., 1997), and electing a distracting environment in which to complete a task under conditions of evaluation (Ferrari, 1991a), in addition to holding a self-concept dominated by issues related to task accomplishment (Ferrari & Diaz-Morales, 2007), it appears possible that procrastinators may indeed possess an unstable self-concept, which would therefore be highly susceptible to external performance feedback.

1.5 Summary of Existing Research

The aforementioned evidence suggests that procrastinators may delay tasks for a variety of reasons, including low frustration tolerance, task aversiveness, fear of failure, socially prescribed perfectionism, low self-esteem and evaluation anxiety. It also suggests the potential role of an unstable self-concept, which would provide additional support for the profile described by Ellis and Knaus (1977) and Burka and Yuen (1983, 2008); an insecure individual who, despite possessing the knowledge and skills to perform well, perceives them self as incapable of meeting the required standard, which negatively impacts their self-worth and results in procrastination. It is this group of procrastinators who are the focus of the present thesis, as they are most likely to experience associated psychopathology and present for treatment of their procrastination. Interestingly, despite forming one of the key premises of these prominent procrastination theories, very few researchers have examined the entire self-concept of the academic procrastinator directly, and none have investigated the effect of feedback on the procrastinator's self-concept experimentally.

1.6 Introduction to the Present Thesis

The main aims of the present study were to extend the existing procrastination literature by a) investigating the existing self-concept content, certainty and stability of a sample of students who identified as problematic academic procrastinators, and b) using an experimental design to investigate the self-concept certainty and stability of academic procrastinators by measuring the change in self-concept content and certainty after receiving randomly allocated feedback for an academic writing task completed during the study. The study also sought to replicate previous findings on the types of personality characteristics and levels of psychological symptomatology associated with problematic academic procrastination. Finally, in addition to trait-based measures, the study sought to investigate these symptoms and attributes in real time via state-based measurements prior to the task,

after the task and after receiving feedback for their performance. These measures included state-based test anxiety and state-based cognitive constructs (self-efficacy, self-appraisal and probability and consequences of poor performance).

In order to ensure that the most relevant variables were investigated and the most valid measurement instruments were employed, a systematic review of all published journal articles which have investigated the self-concept of the academic procrastinator was completed, and is presented in Chapter 2. The design and results of the present study are presented in Chapter 3, and a general discussion of the main findings in terms of the existing literature, as well as clinical and research implications, is presented in Chapter 4.

Chapter 2: The Self-Concept of the Academic Procrastinator: A Systematic Literature Review

2.1 Overview of Procrastination

2.1.1 Definition and Theories of Procrastination

Procrastination can be defined as the delay of an intended course of action despite the expectation of being worse off for having done so (Steel, 2007). Procrastination can be defined in terms of process (behavioural versus decisional) or context (general versus academic; Van Eerde, 2003), with prevalence varying considerably across contexts. Generalised procrastination has been estimated to affect 15-25% of the population (Harriott & Ferrari, 1996; McCown & Johnson, 1989), whereas the prevalence of academic procrastination has been found to be much higher, with up to 50% of students reporting chronic and problematic academic procrastination (Onwuegbuzie, 2004; Solomon & Rothblum, 1984). These academic procrastinators report significantly higher levels of anxiety (Flett, Blankstein & Hewitt, 1992; Milgram & Naaman, 1996; Park & Sperling, 2012; Rothblum et al., 1986), depression (Beswick et al., 1988; Chu & Choi, 2005; Lay, 1992; Steel et al., 2001), worry (Stöber & Joorman, 2001), stress, illness symptoms and visits to healthcare professionals (Tice & Baumeister, 1997) than their non-procrastinating peers.

The first cognitive behavioural formulations of procrastination were based on the clinical observations of Ellis and Knaus (1977) who proposed three potential causative factors: “self-downing”, frustration intolerance, and hostility. Self-downing, or critical self-appraisal, was proposed to result in procrastination by increasing one’s estimation of the probability of failure. Those influenced by frustration intolerance were thought to delay tasks because of a belief that they would be unable to tolerate the associated distress of performing the task. Finally, another smaller group was proposed to procrastinate due to hostility, that is, as a passive-aggressive response to those imposing the aversive task.

Burka and Yuen (1983, 2008) extended Ellis and Knaus's (1977) theory by conceptualising the procrastinator as an individual with a vulnerable sense of self, who therefore places exaggerated emphasis on achievement to maintain their self-worth. The procrastinator's insecurity is proposed to result in irrational beliefs about their capacity to achieve the required standard, and this belief, combined with the associated attributions to their worth as a person, is thought to generate extreme anxiety under conditions of overt or perceived evaluation, which is relieved in the short term by task delay. For those with a vulnerable sense of self, procrastination also holds the secondary gain of allowing the procrastinator to protect their self-esteem by attributing failure to a lack of time to complete the task, rather than to a lack of ability.

Based on these clinical observations, Solomon and Rothblum (1983, cited in Rothblum, 1990) were the first to develop a model of procrastination based on an empirical investigation of academic procrastinators' self-reported attributions for their behaviour (Solomon & Rothblum, 1984). Possible reasons investigated were based on the aforementioned theories. Factor analysis of the 13 most commonly proposed reasons for academic procrastination revealed two distinct groups of procrastinators: those described as being motivated by fear of failure (evaluation anxiety, perfectionism, and lack of self-confidence), and those motivated by the aversiveness of the task. Fear of failure accounted for 49% of the variance in procrastination and was associated with depression and anxiety, whereas task aversiveness explained 18%, and was associated only with depression. Solomon and Rothblum's (1983, cited in Rothblum, 1990) avoidance model of academic procrastination proposes that as deadlines approach, fear of failure is activated, resulting in heightened anxiety. Procrastination reduces this anxiety in the short term, therefore negatively reinforcing the behaviour. As resultant performance does not reflect the procrastinator's full effort, they are more likely to attribute good results to external rather

than internal factors, thus preventing procrastinators from developing a sense of self-efficacy and a stable self-concept.

The theory with arguably the strongest evidence base is Steel and Konig's (2006) Temporal Motivation Theory, also known as the "procrastination equation" (Steel, 2011). Based on Steel's (2007) meta-analysis of procrastination, which spanned all published and unpublished literature from the fields of psychology, sociology, political science and economics, Temporal Motivation Theory proposes that procrastination can be predicted by the relationship between four factors: the importance an individual places on the outcome of a task combined with the perceived likelihood of a positive outcome, balanced against the individual's level of impulsiveness and the deadline for task completion. That is, one is more likely to procrastinate on tasks that are perceived as being less important and having less potential for a positive outcome, and procrastination is further exacerbated if the deadline is distant and the person is impulsive.

Some aspects of Steel's (2007) meta-analysis and resultant procrastination theory, however, run counter to the research findings and clinical experience of leading procrastination researchers and clinicians (Ferrari, Pychyl and Tuckman), most notably in the areas of socially prescribed perfectionism, self-esteem and anxiety (Ravn, 2007). Firstly, while Steel found an average correlation between procrastination and self-esteem of r = -.27 from 33 studies, this key aspect of the self-concept was not included in Temporal Motivation Theory. Secondly, Steel's meta-analysis revealed no relationship between procrastination, anxiety and socially prescribed perfectionism, which are widely observed correlates within the clinical literature on procrastination. It is possible, however, that these conflicting results may be an artefact of the different conceptualisations of procrastination and the methodology necessary for meta-analysis. While meta-analysis is often considered the most reliable representation of the evidence on a particular topic, its reliability is dependent on the quality

and specificity of the included research, and often, as in the case of Steel's meta-analysis, involves aggregating different but related measures to condense results and reduce redundancy. In the case of procrastination, it is possible that this methodology could have masked the intricacies of more specific subgroups of procrastinators, such as general versus academic, or procrastinators with different motivations for their behaviour. As a growing body of research has distinguished individuals who experience problematic academic procrastination from those who simply delay completion of tasks (e.g., Chu & Choi, 2005; DeWitte & Schouwenburg, 1992; Milgram et al., 1993; Milgram & Naaman, 1996; Strunk et al., 2013), the present review focuses on the academic procrastinator who fits the profile described by Ellis and Knaus (1977), Burka and Yuen (1983, 2008) and Solomon and Rothblum (1984); an insecure individual who perceives them self as incapable of meeting the required standard, which negatively impacts their self-worth and results in procrastination, as these are the individuals most likely to experience associated psychopathology (e.g., Beswick et al., 1988; Chu & Choi, 2005; Flett et al., 1992; Lay, 1992; Milgram & Naaman, 1996; Park & Sperling, 2012; Rothblum et al., 1986; Steel et al., 2001; Stöber & Joorman, 2001; Tice & Baumeister, 1997) and therefore present to treatment for their procrastination.

2.1.2 Measurement of Academic Procrastination

Academic procrastination is generally measured by self-report questionnaire (e.g., the Procrastination Assessment Scale-Student; PASS, Solomon & Rothblum, 1984) and/or some form of behavioural measurement (e.g., self-paced quizzes, Moon & Illingworth, 2005; Rothblum et al., 1986, study 1 and 2; Solomon & Rothblum, 1984; Steel et al., 2001). As noted by Ferrari, et al. (1995), however, an inappropriate measure of procrastination could lead to erroneous support or rejection of research hypotheses, making it vital to ensure that the studies included in the present review were assessing the same or similar constructs. Given the variability in definitions of procrastination and the variety of instruments available

to measure the behaviour, the relationship between different types of procrastination and their measurement was considered in determining which studies to include in the review.

Although the majority of procrastination studies have been conducted with student samples, many researchers have used a general rather than an academic procrastination inventory, such as the General Procrastination Scale (GPS; Lay, 1986) to classify individuals as procrastinators (e.g., Ferrari, 1991a; Ferrari & Tice, 2000; Klassen, Krawchuck & Rajani, 2008), thus potentially obscuring the relationship between variables specific to academic procrastination. In fact, studies directly comparing self-report measures of trait procrastination and academic procrastination have revealed mixed results. While some studies have reported a positive correlation between the GPS and the PASS (Howell, Watson, Powell & Buro, 2006, r =.62; Shanahan & Pychyl, 2007, r =.57), others have found no relationship at all, or a conflicting relationship between self-reported general procrastination and academic procrastination behaviour. For example, using the GPS to define procrastinators, DeWitte and Schouwenburg (1992) found that high general trait procrastinators actually planned and enacted more hours of study than low trait procrastinators. Furthermore, when students completed an instrument specifically assessing academic procrastination (PASS) and an instrument assessing procrastination in tasks of everyday living which expressly excluded academic-related items (Milgram, 1988), no relationship was found between endorsement of general and academic procrastination items (r = .06 -.07, *ns*), suggesting that one's tendency to procrastinate in one domain does not necessarily predict procrastination in another (Milgram, Batori & Mowrer, 1993). Finally, research which has investigated this hypothesis specifically through factor analysis (Klingseik, 2013), found that frequency of procrastination varied greatly depending on life domain and that a domain specific model of procrastination provided a better fit for their data than a domain general model. In this study, students reported much higher levels of

procrastination in academic, work, everyday routines/obligations and health-related endeavours than in leisure pursuits, family and partnerships and social contact. While this might seem intuitive, it also indicates that different factors are likely to contribute to problematic procrastination in different life domains. As Klingseik (2013, p. 181) suggests, the results of their study "encourage the differentiation between procrastination in different life-domains in the realm of theoretical approaches, diagnostic tools and intervention programs", providing further rationale for reviewing studies which investigate academic procrastination specifically, while excluding those investigating general procrastination.

2.1.3 Academic Procrastination and Self-Concept

The self-concept can be defined as an organised knowledge structure or cognitive schema that contains all known information about the self, including past experiences, current knowledge, feelings, beliefs and self-evaluations (Markus, 1977). The self-concept can be conceptualised in terms of both content and structure, that is, how the person views them self, and how this self-relevant information is organised. Social cognitive researchers have found that people vary in the stability of their self-concept (Campbell et al., 1996), and propose that an unstable self-concept results in greater sensitivity and susceptibility to self-relevant feedback (Campbell, 1990). Experimental research has demonstrated the role of self-relevant feedback in procrastination by showing that self-identified trait procrastinators do not delay the same academic task under all conditions. In one study (Senecal et al., 1997), self-reported trait procrastinators delayed starting a task longer than non-procrastinators only when they expected to be evaluated and when the focus of the evaluation was described as indicative of their ability, rather than their level of enjoyment or interest in the topic. Similarly, Ferrari and Tice (2000) found that trait procrastinators only delayed commencing a task when it was described as indicative of their cognitive ability and relevant to future life experiences, not when the same task was described as being interesting or a fun game. These findings suggest

that in the case of an inherently performance-based evaluative domain such as academic study, evaluation anxiety, and perhaps anticipation of being unable to meet the required standard, do result in procrastination, at least for some individuals. Given that many of the studies using measures of academic procrastination and state or test anxiety specifically have found relationships between perfectionism and procrastination (Dangas, et al., 2014; Flett et al., 1992; Rice, Richardson & Clark, 2012; Saddler & Buley, 1999; Saddler & Sacks, 1993; Seo, 2008) and anxiety and procrastination (Beswick et al., 1988; Milgram & Naaman, 1996; Park & Sperling, 2012; Rothblum et al., 1986), it is possible that factors related to mood and self-concept are only applicable to procrastination in academic settings. As such, the present review sought to provide a systematic analysis of the research investigating the self-concept of academic procrastinators, thereby providing specialised information relevant to directing future research and enhancing evidence-based treatments for this population.

2.2 Method

2.2.1 Search Strategy

The search strategy employed was based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement that were relevant to the review of correlational studies (Liberati, Altman, Tezlaff et al., 2009). Literature searches were performed using PsycInfo and Web of Science electronic databases to ensure articles from both the psychological and educational literature were captured. Given the focus on self-concept, political science and economics databases were not included in the search. All search terms related to either procrastination or self-concept were included, resulting in a search of the following keywords: procrastinate, procrastination, academic procrastination, study, study habits; and self-concept, self, concept, irrational beliefs, self-evaluation, personality, self-efficacy, self-management, self-monitoring, academic self-concept, self-

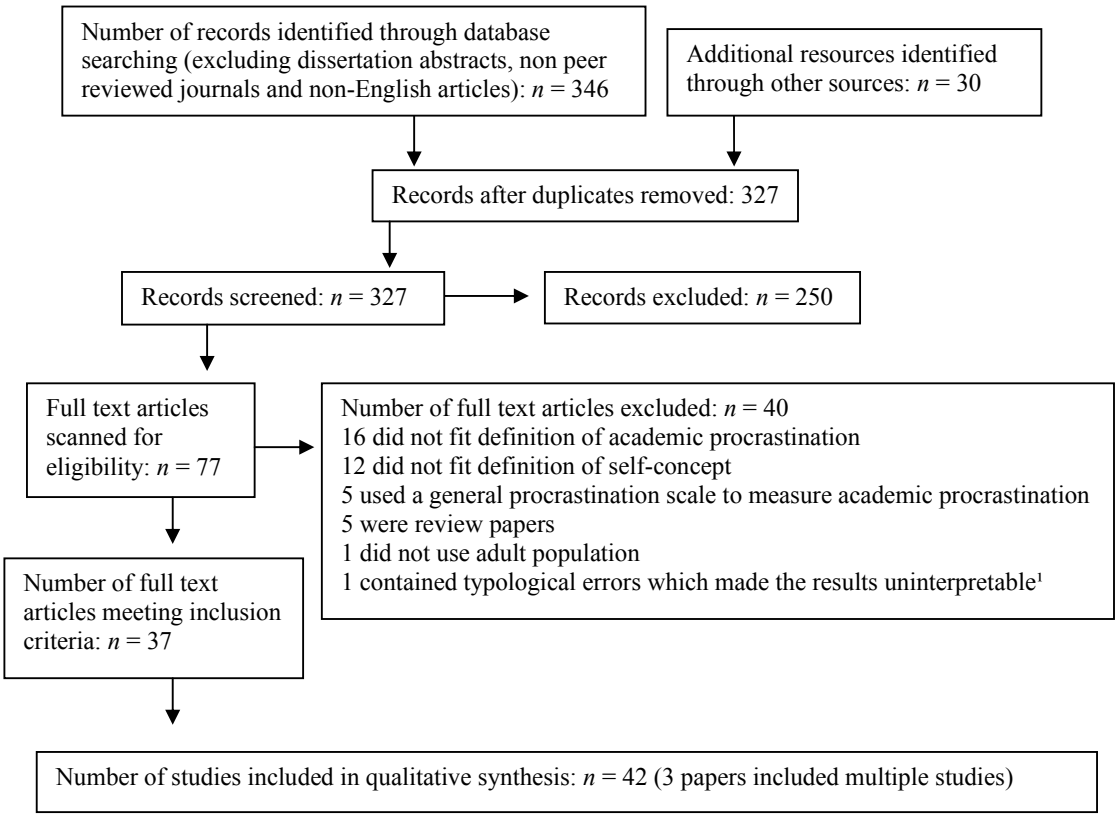
confidence, self-esteem, ego identity and self-perception. Reference lists of included papers and excluded review articles were also manually scanned to identify any additional articles of relevance, and resources such as the Procrastination Research Group bibliography and recent research and publications pages (Pychyl, 2014) were also consulted. Unpublished articles or dissertations, review articles, or book chapters reporting unpublished data were excluded from analyses. No restrictions were put on date range, and the last date searched was 4 March, 2014. The earliest published work identified was Solomon and Rothblum (1984).

2.2.2 Inclusion and Exclusion Criteria

To guard against contamination of results from different domains of procrastination, included studies were restricted to those investigating academic procrastination in an adult university sample. Only those studies that employed a self-report measure specific to academic procrastination and also included a measure of self-concept as broadly defined by the relevant search terms were shortlisted for further review. All abstracts were reviewed by two raters, with 99% inter-rater reliability.

2.2.3 Data Analysis

Studies were evaluated based on the quality of the measures of procrastination and self-concept (standardised versus non-standardised, reliability and validity data, self-report and/or behavioural), the sample size (power) and the study design. The Method and Results of all studies were reviewed by the two raters, and compared with the conclusions drawn by the authors of the included articles to assess for selective reporting of results. The process of study selection is depicted in Figure 1.



[1] Both the author and publisher were approached for clarification but this was not obtained prior to publication of this review.

Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram depicting process of study selection

2.3 Results

2.3.1 General Study Characteristics

The key study characteristics and findings are summarised in Table 2.1. All 42 studies were correlational, and 12 included behavioural as well as self-report measures of academic procrastination. Measures of self-concept fell into four general areas: self-esteem, self-efficacy, irrational beliefs, and personality factors. Twelve studies included measures of symptoms associated with academic procrastination and 13 included a measure of academic performance.

Table 2.1

Study Characteristics

Measures											Results
		Procrastination			Self-Concept						AP Academic Procrastination GP General Procrastination - Negative relationship between self- reported AP and variable + Positive relationship between self-reported AP and variable < Reported less of the variable > Reported more of the variable ≠ No relationship found between the variables All symbols indicate relationships of at least 0.05 level of significance
Study	***n***	**Behavioural**	**Standardardised**	**Non-Standardardised**	**Self-esteem**	**Self-efficacy**	**Irrational Beliefs**	**Personality**	**Academic Performance**	**Symptoms**	
Akça (2012)	263		✓					✓			+ External Locus of Control + Self-Handicapping
Alexander & Onwuegbuzie (2007)	116		✓			✓					- Hope: − Agency scale (sense of successful determination in regard to goals) − Pathways scale (cognitive appraisals of ability to overcome goal-related obstacles)
Beck, Koons & Milgram (2000) Study 1	411	✓	✓					✓	✓	✓	Compared with low AP, high AP: > Delay in exam prep < Total time studying < Exam performance ≠ self-consciousness Behavioural procrastination ≠ exam performance
Beck, Koons & Milgram (2000) Study 2	169	✓	✓		✓			✓	✓		High AP who also scored high on self-handicapping and self-esteem reported greater behavioural procrastination. Effects on exam performance were dependent on ability: Low SAT performed poorly regardless of whether they attended lectures or procrastinate Moderate SAT performed well on the exam if they attended class lectures, regardless of procrastination High SAT performed well on the exam if they attended lectures, or failed to procrastinate, or both. They performed poorly if they procrastinated and failed to attend class.
Beswick, Rothblum & Mann (1988)	245	✓	✓		✓		✓		✓	✓	+ Irrational beliefs - Self-esteem + Anxiety + Depression - Grade Self-reported + behavioural measures of AP Behavioural measure – self-esteem
Bridges & Roig (1997)	195		✓				✓		✓		+ Problem avoidance ≠ Need for approval ≠ Emotional responsibility Compared to low AP, high AP: >Problem avoidance AP +SAT scores
Chu & Choi (2005)	230		✓	✓		✓		✓	✓	✓	Compared to Passive AP, Non-AP and Active AP: + Purposive use of time + Time control + Self-efficacy Compared to Non-AP and Active AP, Passive AP: + Extrinsic motivation + Avoidance-coping style + Stress + Depression - GPA
Day, Mensink & O'Sullivan (2000)	242			✓				✓	✓	✓	General student sample + Depression + Ambivalence/ Independent Mindedness + Social Activity/Optimism + Oppositionality + Dependence Highest + = evaluation anxiety in a treatment seeking group ≠ GPA
DeWitte & Lens (2000) Study 2	47	✓		✓				✓			-Action identities regardless of optimism or pessimism + Specific intentions (higher action identities in their intended actions) ≠ Optimism ≠ Study intentions Behavioural Measure: + Postponement of study -Study -Study intentions enacted

Measures											Results
		Procrastination			Self-Concept						AP Academic Procrastination GP General Procrastination - Negative relationship between self- reported AP and variable + Positive relationship between self-reported AP and variable < Reported less of the variable > Reported more of the variable ≠ No relationship found between the variables
Study	***n***	**Behavioural**	**Standardardised**	**Non-Standardardised**	**Self-esteem**	**Self-efficacy**	**Irrational Beliefs**	**Personality**	**Academic Performance**	**Symptoms**	All symbols indicate relationships of at least 0.05 level of significance
Ferrari, Parker & Ware (1992)	319		✓			✓		✓			- Self-efficacy + Perceptive dimension of Myers Briggs - Judging dimension of Myers Briggs ≠Academic LOC General self-efficacy predicted proc
Ferrari, Wolfe, Wesley, Schoff & Beck (1995)	870		✓					✓			-Less selective schools -Information Orientation ≠ selective and non-selective schools in ratings of AP as problem
Flett et al. (1992)	131		✓				✓				Socially prescribed perfectionism: + Frequency of AP + Extent AP is problem + Fear of failure in academic situations ≠ Self-oriented perfectionism ≠ Other-oriented perfectionism
Haghbin, McCaffrey & Pychyl (2012)	300		✓				✓		✓		+ GP + Fear of experiencing shame + Feat of devaluing one's self estimate + Fear of having an uncertain future + Fear of important others losing interest + Fear of upsetting others - Autonomy - Competence
Hen & Goroshit (2014)	287		✓			✓			✓		- Academic self-efficacy - A lack of academic self-efficacy affects AP in students with learning disabilities to a greater extent than students without learning disabilities ≠ GPA
Howell et al. (2006)	95	✓	✓			✓			✓		Behavioural Measure + Delay in assignment submission - Tendency to carry out verbal promises - Tendency to specify specific study intentions - Grades ≠ perceived academic control (self-efficacy)
Klassen, Krawchuck & Rajani (2008) Study 2	195	✓	✓			✓			✓		25% of AP reported neg influence on academic functioning Compared to 'neutral AP' – those who delay but do not report sig distress, negative APs: + Hours of daily procrastination + Task procrastination -Self-efficacy for self regulation - Predicated class grade and GPA - Actual class grade and GPA Lower GPA, more daily AP and lower self-efficacy for self-regulation predicated the degree of negative impact of procrastination.
Lee, Kelly & Edwards (2005)	310		✓					✓			+ Neuroticism - Conscientiousness Trait conscientiousness is likely to influence trait procrastination, particularly when person lacks persistence and organisation
Lay (1992) Study 1	64		✓			✓				✓	+ Aversiveness of task -Competency +Negative Affect -Positive Affect Relationship between AP, task aversiveness and competency remains when pos and neg affect controlled
Lay (1992) Study 2	71		✓			✓		✓			+ Aversiveness of task -Competency -Autonomy + Pessimism Relationship between AP, task aversiveness and competency remains when pessimism controlled
Lay (1992) Study 3	48		✓			✓					Prior to exam: + Expected aversiveness of studying -Expected competency + Compelled by others to study After completing exam: -Competency + Compelled ≠ Aversiveness Time Management: -Mechanics -Setting goals and priorities -Perceived control of time ≠ Time management and aversiveness, competence or being compelled by others

Study	*n*	Behavioural	Standardardised	Non-Standardardised	Self-esteem	Self-efficacy	Irrational Beliefs	Personality	Academic Performance	Symptoms	AP Academic Procrastination GP General Procrastination - Negative relationship between self- reported AP and variable + Positive relationship between self-reported AP and variable < Reported less of the variable > Reported more of the variable ≠ No relationship found between the variables All symbols indicate relationships of at least 0.05 level of significance
Milgram, Batori & Mowrer (1993)	113	✓	✓	✓							≠ AP and GP + Instructors' ratings Most endorsed reasons by high procrastinators were rated least threatening to self-esteem. Levels of distress ≠ degree to which they were rated as threatening to self-esteem.
Milgram & Naaman (1995)	138			✓				✓		✓	≠ Delay ≠ Concern about delay AP with high levels of concern about delay: + Sensitisation + Pessimism + Ambiguity anxiety
Milgram & Tenne (2000) Study 2	130			✓				✓			- Conscientiousness
Moon & Illingworth (2005)	349	✓	✓					✓	✓		- Conscientiousness + Neuroticism + Behavioural Measure (completion of weekly self-paced tests) ≠ Test performance on 4 of 5 tests (1 weak neg relationship)
Onwuegbuzie (2000)	135		✓				✓				+ Socially prescribed perfectionism ≠ Self-oriented perfectionism ≠ Other-oriented perfectionism
Park & Sperling (2012)	41		✓		✓	✓		✓		✓	Compared to Low AP, High AP: > Self-handicapping > Self-worth protection > Test anxiety < Rehearsal < Time and Study Management < Effort regulation < Self-efficacy < Intrinsic goal orientation
Rice, Richardson & Clark (2012)	357		✓				✓			✓	Maladaptive perfectionism and AP consistently associated with psychological distress at the start, middle and end of semester Procrastination does not mediate the relationship between maladaptive perfectionism and psychological distress High levels of maladaptive perfectionism are associated with psychological distress regardless of AP AP results in psychological distress for non-perfectionists
Rothblum, Solomon & Murakami (1986) Study a	379	✓	✓			✓			✓	✓	Compared to Low AP, High AP: < Self-control < Self-efficacy < Delay of gratification < Self-statements to overcome emotional reactions > Overall test anxiety < Internal and stable attributions of success ≠ Attributions of test failure Behavioural Measure: + Delay on self-paced quizzes -GPA
Rothblum, Solomon & Murakami (1986) Study b (ps subset of study a)	126	✓	✓			✓			✓	✓	Compared to Low AP, High AP: > Weekly state anxiety > Consistent physical sx anxiety Self-report+ Behavioural measure ≠ Self control (self –efficacy was subscale of self control scale) < GPA
Saddler & Buley (1999)	104		✓				✓	✓		✓	+ Socially prescribed perfectionism - Self-oriented perfectionism ≠ Other-oriented perfectionism + Control of learning beliefs - Extrinsic goal orientation + Test anxiety
Saddler & Sacks (1993)	150		✓				✓			✓	+ Socially prescribed perfectionism ≠ Self-oriented perfectionism ≠ Other-oriented perfectionism +Depression
Senecal, Julien & Guay (2003)	292		✓					✓			SEM: - Intrinsic academic and social motivation, mediated by role conflict Path using a direct relationship from intrinsic motivation to AP, and a direct relationship from role conflict to AP provided the same fit to the data
Seo (2008)	692		✓			✓	✓				Negative relationship between self-oriented perfectionism and AP is mediated by self-efficacy

Measures											Results
		Procrastination			Self-Concept						AP Academic Procrastination GP General Procrastination - Negative relationship between self- reported AP and variable + Positive relationship between self-reported AP and variable < Reported less of the variable > Reported more of the variable ≠ No relationship found between the variables All symbols indicate relationships of at least 0.05 level of significance
Study	***n***	**Behavioural**	**Standardardised**	**Non-Standardardised**	**Self-esteem**	**Self-efficacy**	**Irrational Beliefs**	**Personality**	**Academic Performance**	**Symptoms**	
Shanahan & Pychyl (2007)	139		✓					✓			-Achievement (exploration and commitment to identity) + Moratorium (continuing stage of exploration without commitment to an identity) + Diffusion (no tangible exploration/commitment) unstable self-concept + Moratorium and - Achievement values predicted AP
Sirin (2011)	774		✓			✓		✓			+ GP ≠ Academic motivation ≠ Academic self-efficacy
Solomon & Rothblum (1984)	342	✓	✓		✓		✓	✓	✓	✓	+ Distress about procrastinating on writing a paper, studying for exams and weekly readings ≠ Distress about procrastinating on administrative & other school tasks Procrastination on writing and paper, studying for exams and doing weekly readings: + Number of self-paced quizzes taken late in semester ≠ Grades + Depression + Anxiety - Self-esteem - Punctuality - Organised study and study habits + Irrational Cognitions + Behavioural Measure Identified 2 types of AP: Motivated by fear of failure (evaluation anxiety, perfectionism and lack of self-confidence) Motivated by task aversiveness. Fear of Failure motivation = homogeneous + Depression + Irrational beliefs - Punctuality - Organised study habits + Anxiety -Self-Esteem Task Aversiveness: heterogeneous + Depression + Irrational beliefs - Punctuality - Organised study habits
Steel, Brothen & Wambach (2001)	152	✓		✓	✓			✓	✓	✓	≠ Behavioural and self-report measures of irrationality (number of quizzes not completed vs. reports of whether time spent working was enough) ≠ Grade-(effect of postponing work on performance is only evident if the person fails to complete their tasks) + Action-intention gap (less than they intend at the beginning of semester, and more at the end) - Defensiveness (impression management scale) -Self-esteem + Negative mood at all time periods + Extroversion Not spending enough time + anxiety at each time period measured
Strunk et al. (2013)	1496		✓	✓				✓			2 x 2 model: procrastination-timely approach x achievement-mastery orientation + Procrastination approach + Procrastination avoidance - Timely engagement approach - Timely engagement avoidance Timely engagement + mastery approach and mastery avoidance Timely engagement ≠ performance approach or avoidance
Watson (2001)	349		✓					✓			+ Neuroticism - Extroversion - Conscientiousness
Wolters (2003) Study 1	168			✓		✓		✓			- Self-efficacy + Work avoidance orientation ≠ Mastery goal orientation ≠ Performance approach goal orientation
Wolters (2003) Study 2	152			✓		✓		✓			Replicated Study 1 ≠performance avoidance orientation

Given that all included studies employed a correlational design, risk of bias variables such as randomisation, blinding and control conditions were not relevant to this analysis. None of the studies reported a power calculation, although one (Chu & Choi, 2005) justified their median split of active versus "passive procrastinators" based on the need to ensure adequate power, and one (Rice et al., 2012) stated that their sample size would be sufficient to detect medium sized indirect effects or larger direct effects in structural models. Sample sizes ranged from 41 to 1496. Generally speaking, studies with smaller sample sizes investigated fewer variables.

2.3.2 Measures of Procrastination

Self-report. Thirty-four studies used at least one standardised measure of procrastination. The most common scale used was the Procrastination Assessment Scale-Student (PASS; Solomon & Rothblum, 1984), employed in 22 studies. The PASS consists of two sections, the first assessing frequency of procrastination in six academic areas, and the second assessing participants' self-reported reasons for procrastinating. Five studies (Lay, 1992, study 1, 2 and 3; Lee, Kelly & Edwards, 2006; Rice et al., 2012) used a student version of Lay's (1986) General Procrastination Scale, The GPS- Student (Lay, 1988), and three studies (Moon & Illingworth, 2005; Saddler & Buley, 1999; Saddler & Sacks, 1993) used the Aitken Procrastination Inventory (API; Aitken, 1982). Two studies (Flett et al., 1992; Rice et al., 2012) used both the PASS and the GPS-Student, though Rice et al. only used a subset of questions from the GPS that were relevant to academic study. Three studies (Haghbin et al., 2012; Howell et al., 2006; Shanahan & Pychyl, 2007) used standardised measures of both academic (PASS) and general procrastination (Howell et al. used the Tuckman

Procrastination Scale[1]; Tuckman, 1991, and Haghbin et al., 2012 and Shanahan & Pychyl, 2007 used the GPS, Lay, 1986). Two studies (Akça, 2012; Sirin, 2011) used the Academic Procrastination Scale (APS; Çakıcı, 2003). Four studies (Chu & Choi, 2005; Klassen, Krawchuck & Rajani, 2008; Milgram et al., 1993; Strunk et al., 2013) used both standardised and non-standardised measures, and seven used a less common measure, or a measure they developed for their particular study.

Behavioural. Six of the 12 studies which included a behavioural measure of academic procrastination used a "self-report" behavioural measure, that is, they had participants report, for example, their intended hours of study at time one, then their actual hours of study and time spent procrastinating at time two (DeWitte & Lens, 2000, study 2). Klassen et al. (2008) employed a similar measure, calculating a procrastination ratio by asking students to recall time given to complete a given task the previous semester, and the time when they actually began working on it. Howell et al.'s (2006) behavioural measure consisted of asking students to what extent they had submitted assignments for a given course earlier, later, or at the time that they had actually intended; and Beck, Koons and Milgram (2000, study 1 and 2) defined their behavioural measure as the self-reported proportion of study completed in the 24 hours prior to an exam. One study (Milgram et al., 1993) used a slightly more objective self-report behavioural measure; instructors' ratings of students' behaviour, however this only consisted of three questions: how frequently the student prepared for and attended class, and whether their performance improved or deteriorated during the semester.

[1]Although Ferrari, Johnson & McCown include Tuckman's Procrastination Scale as a measure of Academic Procrastination, a review of the scale indicates that only one of the 35 items refers specifically to study. It is therefore considered a general procrastination scale in this review.

The remaining six studies incorporated behavioural measurements of academic procrastination. Beswick et al. (1988) used time taken to submit the outline of a paper, the paper itself, and the research questionnaires, as behavioural measures of procrastination. The remaining five studies used self-paced quizzes as a measure of academic procrastination. Solomon and Rothblum (1984) defined their behavioural measure as the number of quizzes (from a total of 23) students took in the last five weeks of semester. They later refined this criterion in their 1986 studies (Rothblum et al., 1986, study 1 and 2) to the time in the semester that students took quiz number 10, as the previous measure did not differentiate between students' reasons for taking or not taking quizzes in the last five weeks. That is, they may have taken no quizzes because they had procrastinated, or because they had already completed them. Steel et al. (2001) used a similar measure, forming a weighted average score based on the time at which self-paced quizzes were completed, with those completed later in semester given a greater weighting. Moon and Illingworth (2005) took five measures of procrastination from five multiple choice tests administered throughout the semester. Students were given a one week window to complete each test and the time from the test opening until the test being completed by each student was used as a measure of procrastination. Scores ranged from 0 (took the test on the day it opened) to 6 (took the test on the last day available to complete it).

Defining procrastinators. Of the 22 studies that used the PASS, 15 summed the item scores to create a continuous variable which was correlated with self-concept measures. Three studies (Rice et al., 2012; Senecal, Julien & Guay, 2003; Seo, 2008) used structural equation modelling based on the first section of the PASS to investigate the mediating effects of self-concept variables on academic procrastination. Two of the three studies that used both an academic (PASS) and general (GPS) measure of procrastination (Rice et al., 2012; Shanahan & Pychyl, 2007), summed these scores into an aggregate measurement, thus

precluding the examination of their self-concept results with respect to academic procrastinators only. The remaining six studies which used the PASS treated procrastination as a dichotomous variable, separating participants into high and low procrastinators. There was considerable variability in the methods used. Rothblum et al. (1986, study a and b) used the most stringent definition, classifying only those who reported nearly always or always procrastinating on studying for exams, and nearly always or always feeling anxious as a result, as high procrastinators, with the rest of the sample considered low procrastinators. Bridges and Roig (1997) used a frequency distribution of PASS scores to divide the sample into three groups, then classified the top third (with scores of 37 or above) as high procrastinators and the bottom third (with scores of 30 or below) as low procrastinators. Beck et al. (2000, study 1 and 2) and Park and Sperling (2012) used a median split of PASS scores, resulting in those scoring below 34 being classified as low procrastinators, and those scoring 34 and above being classified as high procrastinators.

All studies which employed the GPS-Student, and 11 of the studies which used a less common measure (Akça, 2012; Klassen et al., 2008, study 2; Milgram & Naaman, 1996; Milgram & Tenne, 2000, Onwuegbuzie; 2000; Saddler & Buley, 1999; Saddler & Sacks, 1993; Sirin, 2011; Steel et al., 2001; Wolters, 2003, study 1 and 2) summed scores to create a continuous variable that was then correlated with self-concept measures, while three (Chu & Choi, 2005; Day, Mensink & O'Sullivan, 2000; DeWitte & Lens, 2000, study 2) split participants into high and low procrastinators.

Chu and Choi (2005) hypothesised that academic procrastinators fell into one of two distinct groups, active and passive. They proposed that "active procrastinators" delayed tasks strategically, and would consequently show a similar self-concept profile to non-procrastinators. To identify these groups, they administered standardised measures of academic and decisional procrastination, as well as a newly constructed scale of "active

procrastination". First, they categorised students as procrastinators and non-procrastinators based on their results on the academic procrastination scale, with procrastinators defined by a score of 4 or above on a 7 point scale. They then divided this group by their scores on the "active procrastination" scale, with those scoring in the top half of scores on this scale being classified as "active procrastinators", and those falling in the bottom half being classified as "passive procrastinators". This corresponded to a cut-off of 4.33 on the "active procrastination" scale. The authors note that both cut-off points were selected arbitrarily, in order to maximise power. Day et al. (2000) constructed their own measure of academic procrastination, similar in structure to the PASS, which asked participants first about the degree to which they procrastinated on various academic tasks, second about their beliefs, actions and feelings about academic work, and finally about their reasons for academic procrastination. Procrastination was analysed as both a continuous and dichotomous variable. High procrastinators were defined as those who rated the relevant nine statements about academic work, which represented thoughts, actions and feelings corresponding to the most commonly identified reasons for procrastination, as mostly or definitely true of them. DeWitte and Lens (2000, study 2) used the ten items with the highest loadings on an academic procrastination factor from the VASOV study management skills questionnaire (Depreeuw & Lens, 1998), which were analysed as a continuous variable with respect to behavioural measures of procrastination and trait optimism and pessimism. Finally, Strunk et al. (2013) developed a 2 x 2 model of procrastination comprised of time-related academic behaviour (procrastination versus timely engagement) and motivation (mastery versus performance). Participants were first categorised into 1 of 4 groups based on their results from a time-related academic behaviour scale developed for their study ("procrastination-approach", "procrastination-avoidance", "timely engagement-approach" and "timely engagement-avoidance"). They were then categorised according to their learning motivation

("mastery-approach", "mastery-avoidance", "performance-approach" and "performance-avoidance") to create eight groups of participants, each with a different combination of academic behaviour and motivation. They used the GPS-Student (Lay, 1988) to assess the convergent and divergent validity of the academic behaviour scale.

2.3.3 Measures of Self-Concept

Measures of self-concept could be broadly categorised into those measuring self-esteem, self-efficacy, irrational beliefs, and personality factors. Twelve studies included measures from more than one category, and all studies cited validity data.

Self-esteem. Five studies included a measure of self-esteem, with one (Beck et al., 2000) including two different measures (the Self-Consciousness Scale; Fenigstein, Scheier & Buss, 1975 and the Rosenberg Self-Esteem Scale; Rosenberg, 1965). Both Beswick et al., 1988) and Solomon and Rothblum (1984) also used the Rosenberg Self-Esteem Scale (Rosenberg, 1965), while Park and Sperling (2012) used the Self-Worth Protection Scale (SWPS; Thompson & Dinnel, 2003) and Steel et al. (2001) used the Feelings of Inadequacy Scale (Eagly, 1967).

Self-efficacy. Sixteen studies used a measure of self-efficacy and twelve used a standardised self-efficacy measure, with seven using full scales and five using subscales from other instruments. Both Chu and Choi (2005) and Park and Sperling (2012) used the Generalised Self-Efficacy Scale (Schwarzer & Jerusalem, 1995); Ferrari, Parker and Ware (1992) used Sherer et al.'s (1982) Self-Efficacy Scale; Hen and Goroshit (2014) used the College Academic Self-Efficacy Scale (Owen & Fromen, 1988); Howell et al. (2006) used the Perceived Academic Control Measure (Perry et al., 2001); Seo (2008) used the Korean General Self-Efficacy Scale (Kim & Cha, 1996) and Sirin (2011) used the Turkish adaptation

of the Academic Self-Efficacy Scale by Jerusalem and Schwarzer (1981; Yılmaz, Gurcay & Ekici, 2007).

In terms of standardised subscales, Klassen et al. (2008) used the Self-Efficacy for Self Regulation scale from the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia & McKeachie, 1993); Rothblum et al. (1986) used the self-efficacy scale from the Rosenbaum Self-Control Scale (Rosenbaum, 1980); Wolters (2003, study 1 and 2) used the self-efficacy scale from Midgley et al.'s (1998) Motivational Constructs Inventory and Haghbin et al. (2012) used two subscales from the Basic Psychological Needs Scale (Deci & Ryan, 2000; SDT scales, 2008); those relating to competence and autonomy.

Lay (1992, study 1, 2 and 3) constructed his own scale of task competency, and Alexander & Onwuegbuzie (2007) measured self-efficacy though the construct of hope, using the Adult Hope Scale (Snyder et al., 1991). The scale consisted of agency items which tap the sense of successful determination in regard to goals; and pathways items, the cognitive appraisals of one's ability to overcome goal-related obstacles and reach those goals.

Irrational beliefs. Ten studies included a measure of irrational beliefs. Five (Flett et al.; 1992; Onwuegbuzie, 2000; Saddler & Buley, 1999; Saddler & Sacks, 1993; Seo 2008) used the Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991) and Rice et al. (2012) used the discrepancy subscale of the Almost Perfect Scale-Revised (Slaney et al., 2001). Two studies (Beswick et al., 1988; Solomon & Rothblum, 1984) included the Ellis Scale of Irrational Cognitions (MacDonald & Games, 1972), Bridges and Roig (1997) used the Irrational Beliefs Inventory (Koopmans et al., 1994) and Haghbin et al. (2012) used the Performance Failure Appraisal Inventory (PFAI; Conroy, 2001; Conroy, Willow & Metzler, 2002) and the Basic Need Satisfaction in general scale (Deci & Ryan, 2000; SDT

Questionnaires, 2008) to measure irrational beliefs associated with a fear of failure and satisfaction of needs for autonomy and competence respectively.

Personality. Twenty-three studies included at least one self-report measure of personality. Generally speaking, researchers investigated personality from either a trait (12) or structural (11) perspective, with one study (Park & Sperling, 2012) investigating both. DeWitte and Lens (2000, study 2), Lay (1992, study 2) and Milgram and Naaman (1996) used the Life Orientation Test (LOT; Scheier & Carver, 1985), a measure of optimism and pessimism; Lee et al. (2006) used the Five Factor Inventory (Costa & McCrae, 1991); Moon and Illingworth (2005) used the Mini Markers (Saucier, 1994), a 40-item checklist that measures the five-factor model of personality and Ferrari et al. (1992) used the Myers Briggs Type Indicator (MBTI, Form F; Briggs & Myers, 1976). Park and Sperling used Jones and Rhodewalt's (1982) Self-Handicapping Scale; while Akça (2012) used the Turkish translation. Beck et al. (2000, study 1 and 2) used Strube's (1986) scale of the same name. Milgram and Tenne (2000) used the abbreviated NEO Personality Inventory-Revised (Costa & McCrae, 1992), while Watson (2001) used the full version. Steel et al. (2001) used Eysenck and Eysenck's (1976) EPQ, the dominance scale of the California Personality Inventory (Gough & Bradley, 1996) and Rotter's (1966) Internal-External Locus of Control Scale, while Akça (2011) used the Turkish adaptation (Dag, 1991).

Of the 11 studies that examined personality structure, two (Day et al., 2000; Solomon & Rothblum, 1984) generated broad dimensions through factor analysis of self-reported reasons for procrastination derived from the literature. The remaining studies focused on either Ego Identity, a propensity for task versus emotion focused orientation (Ferrari et al., 1995; Shanahan & Pychyl, 2007), or Goal Orientation, the propensity for extrinsic/ performance versus intrinsic/ mastery motivation for task completion (Saddler & Buley, 1999; Senecal et al. 2003; Strunk et al., 2013; Wolters, 2003, study 1 and 2). Chu and Choi

(2005) and Park and Sperling (2012) investigated both Ego Identity and Mastery Orientation. The Ego Identity scales employed were the Proactive Coping Inventory (Greenglass, Schwarzer & Taubert, 1999; used by Chu & Choi, 2005); the Identity Style Inventory-Revised (Berzonsky, 1992; used by Ferrari et al., 1995) and the Extended version of the Objective Measure of Ego Identity Status (EOMEIS-2; Bennion & Adams, 1986; used by Shanahan & Pychyl, 2007). The scales used to measure Mastery Orientation were the Academic Motivation Scale (AMS; Vallerand, Blais, Briere & Pelletier, 1989), and the Interpersonal Motivation Inventory (IMI; Blais et al., 1994), both used by Senecal et al. (2003); the Academic Motivation Questionnaire (Shia, 1998), used by Chu and Choi (2005) and the items assessing motivational beliefs from Midgley et al., (1998), used by Wolters (2003, study 1 and 2). Park and Sperling (2012) and Saddler and Buley (1999) used the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia & McKeachie, 1991); Sirin (2011) used the Academic Motivation Scale (Bozanoglu, 2004) and Strunk et al. (2013) used the Achievement Goal Questionnaire (Elliot & Murayama, 2008).

2.3.4 Symptom Measures

Twelve studies included a measure of negative affect. Eleven used standardised measures such as the Positive and Negative Affect Scales (PANAS; Watson & Tellegen, 1985; used by Lay, 1992 and Steel et al., 2001) and the Beck Depression Inventory (BDI; Beck & Beamesdorfer, 1978; used by Beswick et al., 1988; Saddler & Sacks and Solomon & Rothblum, 1984), and one (Day et al., 2001) added measures of emotional affectivity to their own scale of procrastination.

2.3.5 Relationship with Academic Performance

Thirteen studies also examined the relationship between procrastination and academic performance. Seven (Beck et al., 2000, study 1 and 2; Beswick et al. 1988; Bridges & Roig,

1997; Howell, 2006; Moon & Illingworth, 2005; Steel et al., 2001) used exam results while six (Akça, 2011; Chu & Choi, 2005; Day et al., 2000; Hen & Goroshit, 2014; Klassen et al., 2008; Rothblum et al., 1986) used a measure of Grade Point Average (GPA). Beck et al. and Bridges and Roig also collected Scholastic Aptitude Test (SAT) scores, a measure of aptitude highly correlated with IQ (Frey & Detterman, 2003).

2.4 Outcomes

2.4.1 Correlation between Self-Report and Behavioural Measures of Academic Procrastination

Of the 12 studies which included both a self-report and behavioural measure of academic procrastination, all found that self-reported procrastinators demonstrated greater procrastination on their behavioural measure. The eight studies which measured procrastination as a continuous variable all found a significant positive relationship, with correlations ranging from r =.19 between the PASS scale for studying for exams and the behavioural measure of number of quizzes taken in the last third of semester (Solomon & Rothblum, 1984) and r =.36 between the total PASS score and the behavioural measure of time of handing in a term paper outline (Beswick et al. 1988). Of the four studies which split procrastination into a dichotomous variable (Beck et al., 2000; DeWitte & Lens, 2000 study 2; Rothblum et al., 1986, study a and b), all found that self-reported high procrastinators procrastinated significantly more than low procrastinators on their behavioural measure (all ps < .05).

2.4.2 Correlation between Academic Procrastination and Self-Concept

Self-esteem. Five of the seven self-esteem measures were significantly correlated with self-reported academic procrastination, with Beck et al. (2000) failing to find a

relationship with public or private self-consciousness as measured by the Self-Consciousness Scale (Fenigstein et al., 1975). Significant correlations ranged from r = -.18 (Steel et al., 2001) to r = -.35 (Beswick et al., 1988). Park and Sperling (2012), who divided participants into high and low procrastinators, found that high procrastinators scored significantly higher on a measure of self-worth protection. Of the studies which used a behavioural measure, Beswick et al. also found a significant negative correlation (r = -.20) with their behavioural measure (time to hand in a term paper), while the correlation on Steel et al.'s behavioural measure was in the same direction, but failed to reach significance (r = -.16, p > .05). While Beck et al. (2000, study 2) found a negative correlation between self-reported academic procrastination and self-esteem (r = -.26), they found a positive main effect of self-esteem on their behavioural measure of academic procrastination (p < .03). This counter-intuitive result was accounted for by a significant interaction between self-esteem and self-handicapping on behavioural procrastination. Specifically, high self-handicappers who also reported high self-esteem showed a greater level of behavioural procrastination, thus highlighting the variation in the profile of the academic procrastinator. Although most procrastinators show lower self-esteem, some- in this case those who show a propensity to self handicap- report higher self-esteem ratings relative to non-procrastinators. In accordance with Burka and Yuen's (1983, 2008) theory, it is possible that these procrastinators possess high, yet unstable self-esteem, which may be vulnerable to external feedback. Unfortunately such inferences cannot be confirmed due to the correlational nature of the study.

Self-efficacy. Of the sixteen studies which investigated self-efficacy, twelve reported a significant negative relationship with self-reported academic procrastination. Significant correlations ranged from r = -.13 (Chu & Choi, 2005) to r = -.71 (Seo, 2008), with an average negative correlation of r = -.36 from 13 data points (Lay, 1992, reported self-efficacy data from 2 time points in studies 2 and 3, while Alexander & Onwuegbuzie, 2007 only

included canonical correlations which were not included in the calculation). The correlation of r = -.13 was reported for the "passive procrastinator", as defined by Chu and Choi (2005), described in the preceding section. In support of distinguishing procrastination from delay, they also found a correlation of r =.34 between "active procrastination" and self-efficacy, indicating that these individuals may indeed be delaying their study strategically, based on the belief that they will be able to accomplish what they need to do closer to the deadline and therefore should not be considered procrastinators. In one of the three studies to conduct meditational analyses, not only did Seo (2008) find the largest negative relationship between self-efficacy and academic procrastination, she also found that self-efficacy completely mediated the relationship between self-oriented perfectionism and academic procrastination. That is, self-oriented perfectionism seemed to lead to reduced feelings of self-efficacy, which in turn appeared to result in higher levels of academic procrastination. Similarly, Haghbin et al. (2012) found a moderating effect of competence on the relationship between fear of failure and procrastination. Fear of failure was only associated with procrastination when the individual perceived them self as having a low level of competence (self-efficacy).

The reason the other four studies did not detect a significant relationship between self-efficacy and academic procrastination may lie in the methods of measurement. Both Howell et al. (2006) and Sirin (2011) used academic rather than general self-efficacy scales and were therefore measuring different constructs to the studies which found a relationship between general self-efficacy and academic procrastination. This finding is supported by the results of Ferrari et al. (1992) which revealed a relationship between general self-efficacy and academic procrastination but not with social self-efficacy or academic locus of control. The measure of self-efficacy used by Rothblum et al. (1986, study b), the Rosenbaum Self-Control Scale (Rosenbaum, 1980) also appears to be tapping a different construct to the other self-efficacy scales. Comprised of three subscales described as self-efficacy, delay of gratification and

perceived control over emotional reactions, the items tend to focus on emotional and cognitive control processes rather than general self-efficacy. As the subscales were not analysed individually, the relationship between academic procrastination and self-efficacy may have been precluded if indeed one existed in this sample.

Finally, given that frequency and outcome scores from the PASS were summed to create a single measure of procrastination in both Howell et al. (2006) and Park and Sperling's (2012) studies, it is possible that the distinction between procrastinators and non-procrastinators was obscured. For example, using this method it is possible to obtain a high score based on high frequency of procrastination with low levels of associated distress. If this was the case, some of the participants who returned high scores may have been delaying their work strategically and therefore should not have been considered procrastinators.

Irrational beliefs. All studies which investigated perfectionism as a multidimensional construct found a significant positive relationship between academic procrastination and socially prescribed perfectionism, with correlations ranging from r =.23 (Saddler & Sacks, 1993) to .40 (Flett et al., 1992). Other-oriented perfectionism was consistently unrelated to procrastination, while a more complex relationship emerged for self-oriented perfectionism. Rice et al. (2012) found a modest, yet consistently positive relationship, with an average correlation of r =.20 from 3 time points, while Flett et al., (1992) found no relationship and Seo (2008) found a significant negative relationship (r = -.22). Seo found, however, that self-oriented perfectionism reduced academic procrastination through an increase in self-efficacy, which may explain inconsistencies in findings for self-oriented perfectionism that did not include measurements of self-efficacy.

Both Beswick et al. (1988) and Solomon and Rothblum (1984) found significant positive correlations between self-report measures of academic procrastination and

MacDonald and Games's (1972) Irrational Beliefs Scale (r =.20 and r =.30 respectively); however Beswick et al. failed to replicate this relationship with their behavioural measure of academic procrastination. Bridges and Roig (1997) found a small, but statistically significant positive correlation between self-reported academic procrastination and the Irrational Beliefs Inventory (r =.14, p = .001), but a stronger significant correlation (r =.32, p < .0001) with the problem avoidance subscale. Results from Haghbin et al. (2012), however, suggest that the variability in results may be explained in part by moderating effects, as they found that the positive relationship between an irrational fear of failure and procrastination was strengthened when individuals perceived themselves as lacking competence (akin to self efficacy; β = .35, p < .001), but that the direction of this relationship changed (β = -.24, p = .01) when competence was perceived as high, suggesting a strong moderating influence for self-efficacy.

Personality. Table 2.2 summarises the results of the correlations between academic procrastination and personality variables. All measures are significantly correlated with self-report academic procrastination unless otherwise specified, with the highest correlations being conscientiousness (average r = -.53; n = 4) and self-handicapping (average r =.52; n = 3). Findings on personality variables were consistent across studies with the exception of trait extroversion, locus of control and intrinsic/extrinsic motivation orientation. Extroversion was found to correlate positively with a behavioural measure of academic procrastination (Steel et al., 2001) and negatively with a self-report measure (Milgram & Tenne, 2000), and a low but significant correlation was found between external locus of control (r =.16) by Akça (2011), but not by Steel et al. (2001; r =.01 for behavioural measure and r =.06 for self-report measure).

Table 2.2

Summary of Correlations between Academic Procrastination and Personality Variables

Personality Variable	**Relationship**	**Average Correlation (*r*)**	**Contributing Studies**
Conscientiousness	Negative	-.53	Lee et al. (2006) Milgram & Tenne (2000) Moon & Illingworth (2005) Watson (2001)
Neuroticism	Positive	.23	Lee et al. (2006) Milgram & Tenne (2000) Moon & Illingworth (2005)
Extroversion	Mixed	.17 (AP, *ns*) .26 (BP) -.28	Steel et al. (2001) Milgram & Tenne (2000)
Openness	Positive	.36	Milgram & Tenne (2000)
Perceptiveness	Positive	.17	Ferrari et al. (1992)
Judgement	Negative	-.16	Ferrari et al. (1992)
Self-handicapping	Positive	.52	Akça (2011) Beck et al. (2000) Park & Sperling (2012)
External Locus of Control	Mixed	.16 .06 (AP, *ns*) .01 (BP, *ns*)	Akça (2011) Steel et al. (2001)
Intrinsic/Mastery Motivation	Mixed	-.35 .10 ACTP (*ns*) -.06 PASP (*ns*) SM and AM .32 mediated by -.16 relationship with RC	Park & Sperling (2012) Chu & Choi (2005) Senecal et al. (2003)
Extrinsic/Performance Motivation	Mixed	.13 (*ns*) -.20 ACTP .01 PASP (*ns*)	Park & Sperling (2012) Chu & Choi (2005)

		-.33 APO .36 AVO	Strunk et al. (2013)
Emotion Orientation	Positive	.34	Ferrari et al. (1995) Wolters (2003 study 1) Wolters (2003 study 2) Shanahan & Pychyl (2007)
Information Orientation	Negative	-.25	Ferrari et al. (1995) Shanahan & Pychyl (2007)
Academic Motivation	None	-.01	Sirin (2011)

Note: AP = academic procrastination, BP = behavioural procrastination, ACTP = "active procrastination", PASP = passive procrastination, SM = social motivation, AM = academic motivation, RC = role conflict, APO = approach orientation, AVO = avoidance orientation

Park and Sperling (2012) found a significant negative relationship between intrinsic motivation and procrastination, while Chu and Choi (2005) found no relationship with either active or passive procrastination. Results from Senecal et al. (2003), however, may clarify these conflicting findings, as their results suggested a negative relationship between intrinsic motivation and procrastination that was mediated by a positive relationship with role conflict. That is, low intrinsic motivation seemed to lead to conflicting priorities and it was this role conflict (e.g., between study and socialising) which appeared to result in academic procrastination, suggesting that differences in conflicting priorities may be one explanation for the inconsistent results obtained by Chu and Choi (2005). Regarding extrinsic/ performance orientation, Chu and Choi (2005) and Park and Sperling (2012) found no relationship, while Strunk et al. (2013) found a significant positive relationship with their "avoidant procrastinator" (r = .36). These inconsistencies may be explained by differences in academic procrastination measures, as all studies used different measures with different levels of direct reference to academic study and associated distress. Given that the procrastination-avoidance scale used by Strunk et al. (2013) made specific reference to the motivations behind procrastination (e.g., "I put off tasks for later because they are too

difficult to complete"), it may be that this relationship only applies to procrastinators with certain specific motivations which were not specified in the scales used by Chu and Choi (2005) and Park and Sperling (2012), further emphasising the importance of specificity in procrastination assessment.

Of the studies investigating procrastination as a dichotomous variable, which are not represented in the table, no differences were found between high and low academic procrastinators on self-reported optimism (DeWitte & Lens, 2000). Academic procrastinators reported higher levels of pessimism if they also reported concern about their procrastination (Milgram & Naaman, 1996), but not if they delayed without concern (DeWitte & Lens, 2000; Milgram & Naaman, 1996).

2.4.3 Correlation between Academic Procrastination and Symptom Measures

On the PANAS both Lay (1992) and Steel et al. (2001) found significant negative correlations between self-reported academic procrastination and the positive affect scale (r = -.37 and r = -.34 respectively), which measures energy and enthusiasm, and significant positive correlations with the negative affect scale (r =.32 and r =.34 respectively), which measures anxiety, guilt and anger. This relationship was not replicated, however, with a behavioural measure of academic procrastination (Steel et al., 2001). Of the studies which separated frequency of procrastination from associated distress (Chu & Choi, 2005; Rothblum et al., 1986; Solomon & Rothblum, 1984), self-reported distress associated with procrastination ranged from 23% to 40%. Finally, Rice et al. (2012) found significant correlations of r =.47, r =.51 and r =.45 between general distress and procrastination at the start, middle and end of semester respectively.

2.4.4 Correlation between Academic Procrastination and Measures of Academic Performance

No consistent relationship was found between academic procrastination and negative academic outcome. While Beswick et al. (1988) found a significant average negative correlation between procrastination and grade (r = -.26 from two measurements), Moon and Illingworth (2005) found only a modest significant relationship (r = -.14) on one of the five academic tests administered and no relationship on the other four (correlations ranged from r = -.07 to r = -.11, *ns*), while Akça (2011), Hen and Goroshit (2014) and Solomon and Rothblum (1984) failed to find any relationship between academic procrastination and academic performance.

These contradictory findings may be clarified somewhat by findings from Beck et al. (2000) and Bridges and Roig (1997), who investigated the characteristics of these procrastinators in more detail. Although Beck et al. (2000) failed to find a relationship between a behavioural measure of academic procrastination and academic performance in study 1, when they investigated procrastination with respect to students' general cognitive capacity and study habits (study 2), they found that adverse academic outcomes of procrastination occurred as a function of students' general ability level and lecture attendance. Specifically, students with lower cognitive capacity performed poorly regardless of lecture attendance or procrastination. Students with moderate cognitive capacity performed well if they attended lectures, regardless of whether they procrastinated, and students of high cognitive capacity performed well if they either attended lectures, failed to procrastinate, or both. Procrastination only affected their performance if they also failed to attend class. The precise effects of procrastination at the individual level cannot be ascertained from these studies however, as neither study compared the behaviour of the same individual at different levels of procrastination.

The theory that the effects of academic procrastination can be buffered in some students by greater levels of general ability is supported by results obtained by Bridges and Roig (1997), who found a positive relationship between procrastination and Scholastic Aptitude Test (SAT) scores, but no relationship with Grade Point Average (GPA). Given that SAT scores are a measure of aptitude while GPA scores reflect course performance, this result indicates that although procrastinators do not necessarily perform more poorly than non-procrastinators, they may be failing to meet their potential. Indeed, when academic procrastination was investigated as a predictor of grade (Wesley, 1994), it was found to account for a significant portion of variance in college performance, over and above ability and high school grades. It therefore appears that although the grades of procrastinators in the aforementioned studies may not have differed from their non procrastinating peers, they may still be impacted negatively relative to the procrastinator's true capabilities.

2.5 Discussion

2.5.1 Summary of Evidence

Procrastination is a transdiagnosic phenomenon with a complex pattern of cognitive and affective correlates. Those who engage in chronic, problematic academic procrastination (approximately 25-45% of self-reported academic procrastinators) are of most clinical interest as, compared with non-procrastinators, these individuals report lower levels of self-esteem and self-efficacy, greater levels of socially prescribed perfectionism, and higher levels of depression, anxiety and stress.

The present systematic review, which focused specifically on the self-concept of academic procrastinators, revealed that the strongest consistently significant negative correlations with academic procrastination were conscientiousness (average r = -.53; n = 4) and self-efficacy ratings (average r = -.36, n = 13), while the strongest consistently

significant positive correlations were with self-handicapping (average r =.52; n = 3), general distress (average r = .48, n = 3), emotion orientation (r =.34, n = 4) and socially prescribed perfectionism ratings (average r =.29; n = 4).

While the correlations found for conscientiousness, self-handicapping and self-efficacy reflect those obtained in Steel's (2007) meta-analysis, the present review also found a consistent and significant association between academic procrastination and socially prescribed perfectionism, which did not emerge in the meta-analysis encompassing a more diverse group of procrastinators (Steel, 2007)[2]. In addition, in the present review, consistent significant correlations were obtained with self-esteem (average r = .23, n = 7) and anxiety (average r = .29, n =3) with both studies that compared high and low procrastinators also finding that high procrastinators reported significantly higher levels of anxiety than low procrastinators (Milgram & Naaman, 1996; Rothblum et al., 1986). Also counter to the results obtained in Steel's meta-analysis, the present study found an inconsistent relationship between procrastination and academic performance, with two of the studies reviewed suggesting that the effect of procrastination on results may be moderated by general intelligence (Beck et al., 2000; Bridges & Roig, 1997)

Taken together, the results of the present review emphasise the importance of specificity when identifying a topic for review and support the position that academic procrastinators form a unique group within the broader population of procrastinators. These individuals appear more likely than general procrastinators to report difficulties related to aspects of their self-concept, such as socially prescribed perfectionism and low self-esteem, are more likely to suffer from symptoms such as anxiety and general distress and are more likely to use emotion-focused coping strategies, of which procrastination appears to be one

[2] Steel (2007) grouped socially prescribed perfectionism together with evaluation anxiety, fear of failure and self-consciousness in the meta-analysis, however, thus precluding the specific evaluation of socially prescribed perfectionism with respect to the broader group of procrastinators.

example. As such, it appears that the factors contributing to academic procrastination are more complex than those specified in Temporal Motivation Theory and appear to encompass more of the psychological characteristics specified by Burka and Yuen (1983, 2008), who propose that those who procrastinate possess a vulnerable sense of self, place a disproportionate degree of emphasis on task accomplishment in order to maintain their self-esteem, and doubt their ability to complete tasks adequately, resulting in avoidance behaviour. Further research may therefore focus on delineating the developmental trajectories that contribute to the formation of an unstable self-concept which is based on external inputs in order to identify targets for early intervention.

2.5.2 Strengths

A major strength of the academic procrastination literature reviewed herein is that it is able to be generalised to the relevant population. While studies of undergraduate students in many fields can be criticised for this reason, investigation of academic procrastination in a student population is not only the most practical, but the most clinically appropriate method. Furthermore, most studies used reliable standardised measures of academic procrastination and self-concept, and many also included behavioural, as well as symptom measures.

2.5.3 Limitations and Directions for Future Research

Despite these strengths, there are some notable limitations to this area of the procrastination literature, the most obvious of which is study design. While the research reviewed has advanced our knowledge of procrastinators' self-reported personality traits, attribution styles and symptoms, and suggests that an unstable self-concept does play a role in academic procrastination, researchers have yet to investigate these factors experimentally, thus precluding causal inferences. Furthermore, although the results of the present review provide some support for Burka and Yuen's (1983, 2008) conceptualisation of the

procrastinator, most variables measured relate solely to the content of the self-concept rather than its structure and stability. The strong negative relationship identified with the variable most closely related to self-concept stability, self-efficacy, suggests that measuring the structure and stability of the self-concept, rather than just its content, may advance our understanding of the factors underlying academic procrastination. Given that those with an unstable self-concept are proposed to be more susceptible to external influence (Campbell, 1990), it is particularly important to investigate variables of interest through an experimental design. As demonstrated by Nisbett and Wilson (1977), people's self-reported attributions of their own cognitive processes are often based on implicit causal theories, or plausible accessible explanations for the responses they are describing. Given that all self-report measures in the studies reviewed presented students with both of these alternatives; it is likely that participants' responses were indeed susceptible to these effects. If academic procrastinators do possess an unstable self-concept, they may have been even more susceptible to these effects than the general population, thus calling into question the validity of the self-report data which has formed the basis of contemporary theories of procrastination.

In addition to improvements in validity of self-concept measures and attributions of procrastination, the definition and measurement of the construct itself deserves attention. While some studies differentiated the behaviour of delay from the associated cognitive and affective correlates, others used a scale which summed these variables into a composite index of academic procrastination. As different profiles have emerged depending on the presence or absence of these associated factors, it is important for researchers to differentiate these populations.

Finally, while academic procrastination as a tendency is of interest from a trait perspective, it is the behaviour itself that causes the distress. In the studies reviewed, the highest correlation between self-report and behavioural measures of academic procrastination

was r =.36 (Beswick et al., 1988). In addition, half of the behavioural measures employed still relied on self-report in some way. In order to gain a true understanding of the variables involved in academic procrastination, and under what conditions they occur and vary, it is necessary to monitor behaviour directly, and under experimental conditions, not simply to rely on self-report data. As such, future research should move beyond the correlational self-report design to include longitudinal designs which monitor cognitive and affective correlates of behavioural measures of academic procrastination proposed by theory, as well as experimental designs which manipulate the conditions under which academic procrastination and its correlates may manifest themselves.

Chapter 3: The Role of Self-Concept Content, Certainty and Stability in Academic Procrastination

3.1 Summary of Research on Procrastination and the Self-Concept

3.1.1 Definition and Correlates of Academic Procrastination

While most people engage in occasional task delay, for some, procrastination is a problem that significantly impacts upon their wellbeing and daily functioning. In this case, procrastination can be defined as an irrational tendency to postpone tasks that require completion (Burka & Yuen, 1983, 2008; Ellis & Knaus, 1977; Lay, 1986; Silver & Sabini, 1981), to the point where the individual experiences subjective discomfort (Solomon & Rothblum, 1984). While the prevalence of this more problematic form of procrastination has been estimated at 15-25% in the general population (Harriott & Ferrari, 1996; McCown & Johnson, 1989), estimates generated from both clinical experience (e.g., Ellis & Knaus, 1977) and self-report measures (e.g., Potts, 1987), indicate that academic procrastination may affect over 70% of the student population. Within this group, between 40 and 50% of students report chronic and problematic procrastination (Day et al., 2000; Haycock, 1993; Micek, 1982; Onwuegbuzie, 2000; Onwuegbuzie, 2004; Solomon & Rothblum, 1984), and up to 95% wish to reduce the extent to which they procrastinate (O'Brien, 2002). Academic procrastination has been associated with higher levels of anxiety (Flett et al., 1992; Milgram & Naaman, 1996; Park & Sperling, 2012; Rothblum et al., 1986), depression (Beswick et al., 1988; Chu & Choi, 2005; Lay, 1992; Steel et al., 2001), worry (Stöber & Joorman, 2001), stress, illness and visits to healthcare professionals (Tice & Baumeister, 1997) as well as a reduction in academic performance relative to ability and prior achievement (Beck et al., 2001; Bridges & Roig, 1997; Wesley, 1994).

3.1.2 Procrastination and Self-Concept

Theorists have proposed that for a certain proportion of individuals, problematic procrastination may be related to a vulnerable self-concept (Burka & Yuen, 1983, 2008). The self-concept is an organised knowledge structure that contains all known information about the self, including past experiences, current knowledge, feelings, beliefs and self-evaluations (Markus, 1977). Self-concept can be conceptualised in terms of both content and structure, with the structure of the self-concept referring to the extent to which the content is clearly defined (clarity), internally consistent (certainty) and temporally stable (stability; Campbell et al., 1996). Burka and Yuen (1983, 2008) emphasise these structural aspects of the self-concept in their theory of procrastination, which proposes that individuals with an unstable self-concept, who base their self-esteem and self-view largely on task performance, tend to doubt their ability to complete a given task adequately, resulting in procrastination to relieve the associated anxiety. Although effective in the short-term, this delay is proposed to result in increased levels of anxiety and stress as the deadline approaches, as well as poorer quality work when procrastinators finally do come to complete the task, thus reinforcing their original beliefs and perpetuating the cycle of procrastination. For those with a vulnerable sense of self, procrastination also holds the secondary gain of allowing the procrastinator to protect their self-esteem by attributing failure to a lack of time to complete the task, for example, rather than to a lack of ability.

A large body of research has investigated the relationship between procrastination and various aspects of the self-concept, and results have revealed associations between procrastination and low levels of self-esteem (e.g., Beswick et al., 1988; Steel et al., 2001), self-efficacy (e.g., Chu & Choi, 2005; Wolters, 2003, study 2), and conscientiousness (e.g., Lee et al., 2006; Milgram & Tenne 2000; Moon & Illingworth, 2005; Watson, 2001), as well as high levels of self-handicapping (e.g., Akça, 2011; Beck et al., 2000; Park & Sperling,

2012) and socially prescribed perfectionism (e.g., Flett et al., 1992; Dangas et al., 2014; Onwuegbuzie, 2000; Saddler & Buley, 1999; Saddler & Sacks, 1993). Furthermore, in the one study which has investigated the relationship between procrastination and a range of self-concept attributes using a specific self-concept measure, Ferrari and Diaz-Morales (2007) found that procrastinators reported possessing more negative self-views than non-procrastinators in two specific areas. Using the Six Factor Self-Concept Scale (SFSCS; Stake, 1994), which measures cognitive self-perceptions across a variety of dimensions including task accomplishment, morality, vulnerability, power, giftedness and likeability, Ferrari and Diaz-Morales (2007) found that procrastinators described a self-concept characterised by strong negative beliefs about their reliability and capacity to accomplish tasks, as well as negative beliefs about how pleasant and enjoyable they were to be around.

In addition to a more negative self-concept, there is correlational evidence from both the procrastination and self-concept literature to suggest that an unstable self-concept plays a role in academic procrastination. For example, Park and Sperling (2012) found that academic procrastinators scored significantly higher than non-procrastinators on a measure of self-worth protection, and Smith et al. (1996) found that poor self-concept clarity was associated most strongly with passive coping strategies such as denial (r = -.46), mental disengagement (r = -.37) and behavioural disengagement (r = -.34); the essence of procrastination (all ps < .01). Experimental research also provides evidence for the relationship between procrastination and an unstable self-concept, with a series of studies conducted by Ferrari and colleagues revealing that self-reported trait procrastinators engaged in a variety of self-esteem protection strategies such as self-handicapping (Ferrari, 1991a), failing to practice for a task (Ferrari & Tice, 2007) and attempting to avoid self-relevant feedback (Ferrari, 1991b). Importantly, these strategies were only used when the tasks were described as being indicative of intelligence or ability, not when the same tasks were described as having no

relationship to ability (e.g., a fun game). Similarly, Senecal, Lavoie and Koestner (1997) found that self-reported trait procrastinators delayed starting a task longer than non-procrastinators only when they expected to be evaluated and the task was described as being indicative of the skills and attributes required for success, not when the same task was described as indicative of their level of enjoyment or interest in the topic. As theorists propose that the more unstable a person's self-concept, the more susceptible they may be to self-relevant feedback (Campbell, 1990; Campbell & Fehr, 1990; Campbell & Lavallee, 1993; Epstein, 1973), these results suggest that procrastinators may be attempting to avoid potentially negative feedback about their intelligence or ability in order to preserve an unstable positive self-concept.

Taken together, these results support the theory proposed by Burka and Yuen (1983, 2008) and suggest that the content and stability of the self-concept may play an important role in promoting and maintaining procrastination for certain individuals. Despite forming one of the key premises of this prominent procrastination theory, however, no previous research has investigated the effect of external feedback on the procrastinator's self-concept experimentally. Furthermore, while the aforementioned experimental studies were conducted with university students, procrastination was defined from a general, trait perspective, did not specifically focus on academic tasks and did not include a measure of associated distress. This means that the relationship between procrastination and self-concept stability may have been underestimated in these studies due to the inclusion of individuals who procrastinate on tasks which are not associated with self-worth to the same degree as academic performance (e.g., tasks of daily living such as doing laundry, answering correspondence, making a medical or dental appointment etc.; Milgram, Marshevsky & Sadeh, 1995) and/or those who do not experience distress associated with their procrastination. Indeed, in studies in which procrastination was defined only as task delay, there was no correlation between distress and

procrastination on routine tasks (Milgram, Gehrman, & Keinan, 1992: $r = .13$, *ns*) and only a weak correlation between distress and procrastination on academic tasks (Milgram et al., 1993: $r = .26$, $p < .05$; Milgram et al., 1995: $r = .25$, $p < .05$), suggesting that it is important to specifically define and assess subtypes of procrastinators and their associated distress when attempting to identify individuals as problematic procrastinators. In fact, a growing body of research which has distinguished individuals who experience problematic academic procrastination from those who simply delay completion of tasks (e.g., Chu & Choi, 2005; DeWitte & Schouwenburg, 1992; Milgram et al., 1993; Milgram & Naaman, 1996; Strunk et al., 2013) confirms that these groups of individuals possess very different characteristics.

Given the varied manifestations of procrastination, it is unlikely that one theory can account for every person's experience. The theory emphasising an unstable self-concept put forward by Burka and Yuen (1983, 2008) focuses on problematic procrastination, that is, the irrational delay of tasks that require completion to the point of subjective discomfort. As academic tasks are inherently associated with a degree of external self-relevant evaluation, it appears likely that the impact of an unstable self-concept may be particularly relevant in academic procrastination. Since problematic academic procrastination is reported by up to 50% of the university population (Day et al., 2000; Haycock, 1993; Micek, 1982; Onwuegbuzie, 2000; Onwuegbuzie, 2004; Solomon & Rothblum, 1984) and up to 95% of students express a desire to reduce the extent to which they procrastinate (O'Brien, 2002), the present study sought to investigate the self-concept content, certainty and stability of problematic academic procrastinators specifically, as this is the group of procrastinators most likely to experience associated psychopathology (e.g., Beswick et al., 1988; Chu & Choi, 2005; Flett et al., 1992; Lay, 1992; Milgram & Naaman, 1996; Park & Sperling, 2012; Rothblum et al., 1986; Steel et al., 2001; Stöber & Joorman, 2001; Tice & Baumeister, 1997) and therefore the group most likely to seek treatment for their procrastination.

3.1.3 Aims of the Study

The main aims of the present study were to extend the existing procrastination literature by a) investigating the existing self-concept content, certainty and stability of a sample of students who identified as problematic academic procrastinators, and b) using an experimental design to investigate the self-concept certainty and stability of academic procrastinators by measuring the change in self-concept content and certainty after receiving randomly allocated feedback for an academic writing task completed during the study. The content of the self-concept was investigated through self-report endorsement of a variety of positive, negative and negative, procrastination-related attributes; certainty was investigated through the time taken to endorse such attributes, and stability was investigated by calculating any difference in the aforementioned measures from baseline to receiving positive, negative, or no feedback on an academic writing task. The study also sought to replicate previous findings on the types of personality characteristics and levels of psychological symptomatology associated with problematic academic procrastination. Finally, in addition to trait-based measures, the study sought to investigate these symptoms and attributes in real time via state-based measurements prior to the task, after the task and after receiving feedback for their performance. These measures included state-based test anxiety and state-based cognitive constructs (self-efficacy, self-appraisal and probability and consequences of poor performance).

3.1.4 Study Hypotheses

Based on the aforementioned theories of problematic procrastination proposed by Burka and Yuen (1983, 2008) and Ellis and Knaus (1977), as well as the empirical evidence reviewed herein, I hypothesised that, compared with non-procrastinators, problematic academic procrastinators would demonstrate the following characteristics:

Prior to completing the academic writing task

1) Endorse significantly more negative and procrastination-related self-concept items, and significantly fewer positive self-concept items as self-descriptive;
2) Demonstrate less certainty in their endorsement of positive, and their rejection of negative and procrastination-related self-concept items, as indicated by longer reaction times when choosing whether these attributes were self-descriptive and
3) Report higher levels of state-based test anxiety and lower levels of state-based self-efficacy.

After receiving positive feedback for the writing task

4) Show a significant increase from their pre-task ratings in the certainty with which they endorse positive attributes and reject negative or procrastination-related attributes, as indicated by faster reaction times when choosing whether these attributes were self-descriptive and
5) Report a greater improvement in levels of state-based test anxiety and self-efficacy from their baseline ratings.

After receiving negative feedback for the writing task

6) Show a significant decrease in the certainty with which they endorsed positive and rejected negative and procrastination-related self-concept attributes, as indicated by longer reaction times when choosing whether these attributes were self-descriptive and
7) Report higher levels of state-based test anxiety and lower levels of state-based self-efficacy.

After receiving no feedback for the writing task

8) Show no difference in the content, certainty or stability of any of their self-concept ratings.

Trait and symptom measures

9) Report higher levels of depressed mood, anxiety, stress, fear of negative evaluation and socially prescribed perfectionism, and lower levels of self-concept clarity and self-esteem.

3.2 Method

3.2.1 Experimental Design

The present study employed a 2 (procrastinator: high or low) x 3 (feedback: positive, negative or none) factorial design to examine whether experimentally manipulated feedback affected the self-concept of high and low academic procrastinators. The dependent variables included self-concept content, certainty and clarity, affective state, evaluation anxiety, perfectionism, self-esteem, self-efficacy, performance appraisal and perceived probability and consequences of poor performance, all of which were measured by self-report questionnaires. Behavioural measures of procrastination, self-concept certainty and self-concept clarity were also included. Procrastination was measured by the time taken to commence a writing task undertaken as part of the study, self-concept certainty was measured by recording participants' reaction times to self-descriptiveness decisions about personality attributes, and self-concept clarity was measured through any differences between the content and certainty measures from baseline to after receiving feedback for the writing task.

3.2.2 Data Analysis

Differences between high and low procrastinators were investigated using *t*-tests to compare the two groups at baseline, ANOVAs to compare differences between the two

groups by condition, and repeated measures ANOVAs to investigate changes in individuals' self-concept ratings over time. Regarding interpretation of the results, due to the relatively small group sizes in the group x condition analyses, results approaching statistical significance were considered potentially meaningful and discussed further if they were seen to be of practical significance (e.g., if they were supported by previous research or theory)[3].

3.2.3 Participants

Participants were first year undergraduate psychology students from the University of Sydney who participated in the study in return for course credit. The full sample consisted of 99 participants (55 high and 44 low procrastinators) who were randomly allocated to receive positive (19 high and 10 low), negative (15 high and 15 low) or no feedback (21 high and 19 low) for a writing task completed during testing. Ages ranged from 17-43 years, with a mean age of 19.5. Of these students 73% were female. There was no significant difference between high and low procrastinators in mean age, t (97) = 1.15, p = .25, gender composition, χ^2 (1, 99) = .83, p = .36, highest qualification attained, χ^2 (2, 99) = 2.10, p = .55, or overall family income, χ^2 (7, 99) = 5.22, p = .63.

The Procrastination Assessment Scale-Students (PASS; Solomon & Rothblum, 1984) was used to classify participants into high and low academic procrastinator groups. Based on the methodology used by the authors of the scale (Rothblum et al., 1986) and in keeping with the definition of problematic academic procrastination (the irrational delay of tasks that require completion to the point of subjective discomfort), both the frequency and problem severity scales were used to identify procrastinators. As our behavioural measure of procrastination involved a writing task, only those who reported *always* or *nearly always*

[3] Aberson (2002) notes that "most psychological research studies are underpowered" (p. 37; e.g., Lipsey & Wilson, 1993; Sedlmeier & Gigerenzer, 1989) and that there is a high probability that underpowered studies will fail to detect effects which are present in the population from which the sample was drawn, making it possible that results with p values greater than .05 still reflect a meaningful difference between groups.

procrastinating on writing an essay and believed it was *always* or *nearly always* a problem for them were classified as high procrastinators. Participants who reported always or nearly always procrastinating but reported lower scores on problem severity were excluded from the analyses. Participants who stated that problematic procrastination occurred *sometimes, almost never* or *never* were classified as low procrastinators. This classification system was used to ensure that our results would not be confounded by responses from those who delay but do not experience distress or those who experience distress but do not procrastinate often, as these individuals have shown different profiles (e.g., Chu & Choi, 2005) to the types of procrastinators of interest in the present study and are unlikely to require psychological treatment to modify their procrastination.

3.2.4 Measures

Trait and symptom measures: Self-report

Procrastination. The Procrastination Assessment Scale-Students (PASS; Solomon & Rothblum, 1984) is a 52-item instrument which is divided into two sections designed to assess a) students' perceptions of how often they procrastinate on a variety of academic tasks, how much of a problem procrastination is for them, and how much they would like to reduce the behaviour; and b) their perceived reasons for procrastination. Only items from section one, which have previously demonstrated relevance to the frequency, distress and desire to reduce procrastination, were included in the present study (Beck et al., 2000; Rothblum et al., 1986). Items were adapted to reflect Australian language use (e.g., "essay or report" instead of "term paper") and included "For each of the following activities, please rate the degree to which you delay or procrastinate (essay, studying for exams, keeping up with weekly readings)", "Now indicate the degree to which you feel procrastination on this task is a problem for you" and "Finally, please indicate the degree to which you would like to decrease your tendency to

procrastinate on each task". Answers are coded from 1 (*never/ not at all a problem/ do not want to decrease)* to 5 (*always/ always a problem/ definitely want to decrease)*. Scores range from 3-15 for each task, with higher scores indicating greater procrastination, distress and desire to decrease the behaviour. Studies investigating the relationship between behavioural and self-reported frequency of procrastination using the PASS have shown a significant relationship when assessed as a dichotomous variable (Beck et al., 2001; Bridges & Roig, 1997; Chu & Choi, 2005; Day et al., 2000; DeWitte & Lens, 2000 study 2; Rothblum et al., 1986, study a and b) and significant correlations ranging from r =.19 to r =.35 when assessed as a continuous variable (Beswick et al., 1988; Solomon & Rothblum, 1984). The coefficients α in the present study were .88 for frequency, .88 for problem severity and .87 for desire to reduce procrastination.

Self-concept clarity. The Self-Concept Clarity Scale (Campbell et al., 1996) is a 12-item instrument which uses a 5-point Likert scale to measure the extent to which participants' self beliefs are "clearly and confidently defined, internally consistent and stable" (p.141). Items include "In general, I have a clear sense of who I am and what I am" and "My beliefs about myself often conflict with one another" (reverse scored). Items are coded from 1 (*strongly disagree*) to 5 (*strongly agree*) and scores range from 5-60, with higher scores indicating greater clarity. The scale has demonstrated good internal consistency (average coefficient α = .86) and test-retest reliability (0.79 after 4 months; Campbell et al., 1996). The coefficient α in the present study was .75.

Affective state. The Depression, Anxiety and Stress Scales (DASS-21; Lovibond & Lovibond, 1995) are comprised of 21-items which use a 4-point Likert scale to rate the frequency and severity of depression, anxiety and stress symptoms over the week prior to completion. Items include "I couldn't seem to experience any positive feeling at all" (depression), "I felt I was close to panic" (anxiety) and "I found it hard to wind down"

(stress). Responses are coded from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time),* and subscale scores range from 0-21, with higher scores indicating greater severity of symptoms. The subscales within the DASS-21 have shown excellent internal consistency (depression α =.94; anxiety α = .87; and stress, α = .91), as well as sufficient concurrent and face validity (Antony et al., 1998), and reliability and validity have been demonstrated in both clinical and non-clinical populations (Crawford & Henry, 2003). The coefficients α in the present study were α= .90 for depression, α = .87 for anxiety and α =.85 for stress.

Evaluation anxiety. The Brief-Fear of Negative Evaluation Scale (B-FNE; Leary, 1983) is a 12-item questionnaire which uses a 5-point Likert scale to rate the extent to which individuals experience anxiety about the way others perceive them. Items include "I worry about what others think of me even when I know it doesn't make a difference" and "I am afraid that others will not approve of me". Responses are coded from 1 (*not at all characteristic of me*) to 5 (*extremely characteristic of me*) and range from 5-60, with higher scores indicating greater fear of negative evaluation. The scale has demonstrated excellent internal consistency (α = .90) and good reliability (α = .80; Duke, Krishnan, Faith & Storch, 2006). The coefficient α in the present study was .75.

Self-esteem. The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) is a 10-item self-report questionnaire which uses a 4-point Likert scale to provide an estimate of an individual's global rating of self-esteem. Items include "I feel that I have a number of good qualities" and "I wish I could have more respect for myself" (reverse scored). Responses are coded from 0 (*strongly disagree*) to 3 (*strongly agree*) and scores range from 0-30, with higher scores indicating higher self-esteem. While there have been conflicting reports about whether to score the positive and negative scales of the RSES separately, a recent meta-analysis of 23 factor analytic studies (Huang & Dong, 2012) suggests that the lack of

empirical distinction between the items in the two scales means that a one-factor solution is a better representation of the construct, and this has been supported by several studies (e.g., Gray-Little, Williams, & Hancock, 1997; McCarthy & Hodge, 1984). For this reason, in the present study, all items in the RSES were summed to create a global measure of self-esteem. The coefficient α in the present study was .90.

Perfectionism. The Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991) is a 45-item questionnaire which uses a 7-point Likert scale to measure three theoretically distinct forms of perfectionism; self-oriented, other-oriented and socially prescribed (the belief that significant others are imposing unrealistic demands on the self). Items include "I strive to be the best at everything I do" (self-oriented), "If I ask someone to do something I expect it to be done flawlessly" (other-oriented), and "The people around me expect me to be the best at everything I do" (socially prescribed). Responses are coded from 1 (*strongly disagree*) to 7 (*strongly agree*) and subscale responses range from 15-105, with higher scores representing greater levels of perfectionism in that subscale. Given the growing evidence-base for the role of socially prescribed perfectionism in academic procrastination (e.g., Dangas et al., 2014; Flett et al., 1992; Onwuegbuzie, 2000; Saddler & Buley, 1999; Saddler & Sacks, 1993), the present study only used the socially prescribed perfectionism scale. The coefficient α in the present study was .71.

Experimental measures: Self-report

Task anxiety. The State Anxiety Rating scale (SAR; Rapee & Abbott, 2007) is an 11-item instrument which uses a 5-point Likert scale to measure the level of apprehension associated with completing a writing task. This questionnaire, originally designed to measure anxiety about public speaking in individuals with social phobia, was modified by Dangas et al. (2014) to assess anxiety about a writing task. Items include "I am anxious about the

summary" and "I am worried that I won't think of anything to write for the task". Responses are coded from 0 (*not at all*) to 4 (*extremely*) and total scores range from 0 to 44, with higher scores indicating greater levels of task-related anxiety. The co-efficient α in the present study was .95.

Self-efficacy. The Ability Questionnaire (AQ; Dangas et al., 2014) is a 12-item instrument which uses a 5-point Likert scale to assess respondents' perceived ability to meet the expected standard for a writing task. Items include "I am worried about not performing well on the task" and "I am confident of my ability to meet the expected standard" (reverse scored). Answers are coded from 0 (*not at all true*) to 4 (*extremely true*) and total scores range from 0-48, with higher scores indicating greater uncertainty (i.e., lower levels of confidence) about meeting the expected standards. The coefficient α in the present study was .80.

Socially prescribed perfectionism. The Expectations Questionnaire (EQ; Dangas et al.; 2014) is a 6-item questionnaire which uses a 5-point Likert scale to assess the anticipated standard by which individuals believe their written work will be evaluated. It was modified slightly for the present study to reflect the task of writing a "summary" rather than an "essay". Items include "The rater expects my summary to be at the level of an experienced writer" and "The rater is marking the summaries to a high standard". Answers are coded from 0 (*not at all true*) to 4 (*extremely true*) and range from 0-24, with higher scores indicating a higher expected standard of evaluation. The coefficient α for the present study was .96.

Appraisal of writing performance. The Writing Performance Questionnaire (WPQ) is a 6-item instrument which uses a 5-point Likert scale to measure the quality of a writing task across a number of dimensions. The scale was modelled after a speech task performance scale used by Rapee and Lim (1992) in social anxiety research. Items, which were modified for the

present study to reflect a writing task, include "My summary will be interesting" and "My summary will use appropriate referencing". Responses are coded from 0 (*not at all true*) to 4 (*extremely true*) and total scores range from 0-24, with higher scores indicating better quality. The scale was used as both a self-rating instrument for participants and an objective rating scale for an independent marker. The coefficient α for the present study was .89.

Probability and consequences of negative performance. The Probability and Consequences Questionnaires (PQ and CQ) are two 11-item instruments, adapted from Rapee and Abbott (2007), which use a 5-point Likert scale to assess individuals' expectations of the likelihood of negative outcomes and their consequences while completing a writing task. The probability items include "You will feel overwhelmed by this task" and "You will fail this task", while the consequences items are the same as the probability items but begin with "How bad would it be if...?", for example, "How bad would it be if you felt overwhelmed by this task?" and "How bad would it be if you failed this task?". Scores range from 0 (*not at all likely/bad*) to 4 (*extremely likely/bad)* for each scale respectively, and total scores range from 0-44, with higher scores indicating greater perceived probability and consequences of negative outcomes. Coefficients α for the present study were .92 for both scales.

Experimental measures: Behavioural

Self-concept. A computer-based self-appraisal reaction time task (RT task) was used as a behavioural measure of self-concept certainty. This measure was chosen as it is an efficient method of measuring the content and structure of the self-concept which is more objective than self-report measures of self-concept certainty and stability. Adapted from methodology and stimuli used by Wilson and Rapee (2006, study 2), the task involves asking participants to respond to a series of personality attributes displayed on a computer screen by pressing a key labelled either "yes" or "no". There are two different conditions (experimental

and control), each comprising 80 words. In the experimental condition, participants are presented with a personality attribute and asked to indicate whether that attribute *is characteristic of them in general,* whereas in the control condition they are asked to indicate whether the attribute is *a desirable characteristic for anyone to have.* Each list contains 35 positive (e.g., caring, generous), 23 negative (e.g., arrogant, nasty) and 22 negative procrastination-related attributes (e.g., idle, unproductive). The experimental list is presented first, followed by the control list, and six practice items precede each list.

Participants are given the following instructions:

> In this task, you will see words on the screen that represent personality characteristics or ways of describing people. I would like you to look at each word and decide whether or not you believe that each characteristic "describes you in general" (experimental condition) or "is a desirable characteristic for anyone to have- in other words, whether it is generally a positive attribute" (control condition)

The words are 1cm in height and presented in capital letters, one at a time, in random order, in the centre of the computer screen. Each word remains on the screen until a response is entered, and the task cannot be completed until a response has been given for each word. There is a delay of 1100ms between the response to a word and the presentation of the next word.

As per Wilson and Rapee's (2006, study 2) methodology, positive and negative items were chosen to represent various aspects of the self-concept (e.g., social, moral, physical and intellectual), and extra items chosen from a review of the procrastination literature (e.g., Burka & Yuen, 1983, 2008; Ellis & Knaus, 1977; Ferrari et al., 1995), were included to allow direct assessment of how high and low procrastinators view themselves with respect to these attributes. Items in each condition were matched on valence (positive, negative or negative-

procrastination), frequency of usage, number of syllables and length using the CELEX Lexical Database (Baayen, Piepenbrock, & Gulikers, 1995), such that the only difference between the experimental and control conditions was the decision the participant was asked to make. As reasoned by Wilson and Rapee, under these conditions, the time taken to perceive a word and decide whether it was a desirable attribute could be considered to be a measure of baseline processing and reaction time, whereas the time taken to perceive a word and decide whether it was self-descriptive could be seen as baseline processing and reaction time plus the time taken to decide whether the attribute was self-descriptive. As such, the difference between the reaction times for the experimental and control conditions was used as a measure of certainty for each self-relevant attribute. The full list of experimental and control attributes can be found in Appendix C.

Procrastination. The time taken to commence a writing task was used as a behavioural measure of procrastination. This measure was chosen as it was an objective manifestation of the delay of an academic task which did not rely on self-reported information. As it was possible that this time could also reflect strategic delay such as planning, or differences in reading and comprehension time, results from this behavioural measure were compared with the results obtained on the self-report measure of academic procrastination (the PASS) to determine whether there was support for using this procedure to measure academic procrastination.

The time taken to commence writing was obtained by activating a macro when the participants commenced the task. Created in AutoHotkey (Mallet et al., 2012), the macro was programmed to record the length of time until the participant started typing, thereby providing a measure of procrastination time for each participant.

For the writing task, all participants received the introduction below, but were given different information about whether or not their work would be evaluated, as indicated in the paragraphs for experimental and control conditions below.

> The next part of this survey requires you to complete a short writing task. You will be given three excerpts which describe empirical research investigating the role of emotion in moral judgments, and you will be asked to compile an original summary of the information, **ensuring that you do not plagiarise any of the content.** You will have 10 minutes to complete the task, after which time...
>
> **Experimental Condition:**
>
> - ...your summary will automatically be sent to a postgraduate psychology tutor for evaluation, and you will move on to the next part of the questionnaire. To ensure unbiased results, this tutor has been employed independently, is not affiliated with the university, and is unaware of the purpose of this study. **The tutor will compare your response to the responses collected from other participants who have completed the study over the past two years, and you will receive feedback on your performance, relative to the other participants, prior to the completion of this survey.**
>
> **Control Condition:**
>
> - ...you will move on to the next part of the questionnaire

As there were equal proportions of participants from differing education levels and cultural backgrounds in each group, measures of delay were not seen as reflecting differences in reading and comprehension abilities.

3.2.5 Procedure

Participants completed the study during a single session. Between one and four participants were tested at a time, each in a separate room, and all measures were administered on a Dell desktop computer. With the exception of the reaction-time (RT) self-concept task, which was administered using Direct RT, version 2008.1.0.13 (Jarvis, 2008), all questionnaire measures were completed through Limesurvey, version 1.91 (LimeSurvey Project Team/Carsten Schmitz, 2012).

Upon arrival, participants were provided with an outline of the study and advised that all responses would be anonymous and confidential. Informed consent was obtained and non-identifying demographic details were collected. Participants completed the trait and symptom measures (DASS-21, BFNE, RSES, MPS, SCCS and PASS) first, followed by the first self-concept measure (RT task). In order to obtain measures of self-concept content, clarity and certainty which were unaffected by potential task-related anxiety, participants were not told that the study involved an academic writing task until after they had finished the trait and symptom questionnaires and baseline self-concept measures.

After being told that an academic writing task would form part of the study, participants completed the SAR, AQ, PQ, CQ, WPQ (and EQ in the experimental condition) in order to obtain state-based measurements associated with anticipated task completion. Questions at this time point referred to participants' ratings of their *anticipated* anxiety, self-efficacy, self-rated performance, probability and consequences of poor performance and, in the experimental condition, expectations about the standard to which they would be judged. Participants then commenced the writing task, at which time the AutoHotkey script was activated to record the number of seconds until the first keystroke.

At this point in the study, the procedure varied for the two groups. The following procedure refers to participants in the *experimental* condition:

After ten minutes, participants were advised that their time was up and their summary had been sent for evaluation. They were then re-administered the SAR, AQ and WPQ, this time with respect to ratings of their anxiety, self-efficacy and performance *during the writing task*. Participants then saw a screen which advised them that the tutor had evaluated their summary and was ready to provide them with feedback on their work. They were asked to notify the experimenter, who arranged for a confederate postgraduate student to introduce themself, advise the participant that they had evaluated the summary, and provide them with written feedback (see Appendix E for the positive and negative versions of feedback provided). Participants were left to read their evaluation and they were then asked to rate how positive it had been as a manipulation check for the positive and negative conditions. The self-concept RT task was then re-administered to determine whether there had been any change in self-concept measures or certainty after receiving feedback for their academic work. Finally, participants completed the SAR, AQ and WPQ a third time in order to investigate whether their ratings of anxiety, self-efficacy and performance had changed as a result of receiving external feedback. Questions at this point referred to how they were feeling *about having completed the task.* They were then debriefed and thanked for their participation, and as a final manipulation check, asked how much they had believed the feedback had been based on a genuine evaluation of their work.

The following procedure refers to participants in the *control* condition:

After ten minutes had passed during the writing task, participants were told that their time was up and were simply asked to continue with the rest of the questionnaire. They also completed the SAR, AQ and WPQ with respect to ratings of their anxiety, self-efficacy and

performance *during the writing task,* followed by the second self-concept RT task. They were then debriefed. All aspects of the present study received ethical approval from the University of Sydney Human Research Ethics Committee (Protocol No: 13829).

3.3 Results

3.3.1 Trait and Symptom Measures

Table 3.1

Mean Scores and Standard Deviations on Symptom Measures for High and Low Procrastinators, Including t-values and Significance Levels for Comparison of Groups

Symptom Measure	Group		*t*
	High Procrastinators (*n* = 55)	Low Procrastinators (*n* = 44)	
DASS Depression	13.0 (11.0)	5.3 (5.3)	4.3***
DASS Anxiety	10.4 (10.3)	4.2 (4.6)	3.7***
DASS Stress	15.8 (10.5)	11.2 (7.8)	2.4*
Brief Fear of Negative Evaluation	25.6 (9.2)	21.5 (7.5)	2.4*
Socially Prescribed Perfectionism	58.1 (14.1)	56.3 (15.6)	.6
Rosenberg Self-Esteem Scale	16.7 (5.5)	21.7 (4.8)	4.8***

* $p < .05$ *** $p < .001$

Table 3.1 presents mean scores, standard deviations and *t*-values for comparisons between high and low procrastinators on scores for depression, anxiety, stress, fear of negative evaluation, socially prescribed perfectionism and self-esteem. Independent samples *t*-tests revealed that high procrastinators reported significantly poorer scores on all trait measures (all *p*s < .05) with the exception of socially prescribed perfectionism (the results of both groups fell within the clinical range; Hewitt et al., 1991).

3.3.2 Behavioural Measure of Procrastination: Writing Task

A series of independent samples *t*-tests were conducted to investigate the relationship between the self-report and behavioural measures of procrastination. In keeping with hypotheses and evidence for comparable patterns of responding for self-report and behavioural indices of academic procrastination (e.g., Beck et al., 2000; Beswick et al. 1988; DeWitte & Lens, 2000 study 2; Rothblum et al., 1986, study a and b; Solomon & Rothblum, 1984), one-tailed *t*-tests were conducted for these comparisons. These analyses revealed that high procrastinators (M = 150.2 sec, SD= 82.2 sec) delayed commencing the writing task longer than low procrastinators (M =125.8 sec, SD = 60.7 sec), though this difference failed to reach statistical significance, t (97) = 1.6, p = .05, and wrote significantly fewer words (M = 98.8, SD= 40.7) than low procrastinators (M = 113.4, SD= 43.0) within a fixed timeframe of 10 minutes, t (97) = 1.7, $p < .05$. Anticipation of receiving feedback did not affect behavioural delay, total words written or the objective rating for high or low procrastinators (all ps > .05).

3.3.3 Experimental Manipulation Checks

Two manipulation checks were included in order to determine whether 1) participants perceived the writing task feedback as positive or negative as intended and 2) participants believed that their summary had, in fact, been evaluated by a postgraduate student and that the feedback was genuine. An independent samples *t*-test revealed a significant difference between participants in the positive and negative feedback conditions on measures of positivity, t (56) = 16.5, $p < .001$. Participants in the positive feedback condition rated their feedback as significantly more positive (M = 9.4, SD = 1.0) than participants in the negative feedback condition (M = 2.2, SD = 2.1), indicating that the manipulation had been successful.

A one-way ANOVA was conducted to investigate the believability of the feedback for high and low procrastinators by feedback condition. This analysis revealed a significant main effect of group, F (1, 54) = 10.3, $p < .005$, such that high procrastinators (M = 6.2, SD = 2.6) were more likely than low procrastinators (M = 3.7, SD = 2.9) to believe that the feedback was genuine. This main effect was qualified by a two-way condition x group interaction, F (1, 54) = 5.0, $p < .05$, which revealed that while high procrastinators were equally likely to believe the positive (M = 5.9, SD = 2.4) and negative feedback (M = 6.6, SD = 2.7; $p > .05$), low procrastinators were more likely to believe the positive (M = 5.2, SD = 3.6) than the negative feedback (M = 2.7, SD = 1.8), t (23) = 2.9, $p < .05$.

3.3.4 Self-Concept Measures

As described in the Method section, the content and structure of the self-concept was investigated via a number of self-report and behavioural measures. Content was investigated through self-report endorsement of a variety of positive, negative and negative, procrastination-related attributes, before and after completing the writing task and receiving feedback, and stability was investigated by calculating any difference in self-concept content from baseline to post-feedback. The index of self-concept certainty was the difference between median reaction times for self-descriptiveness decisions minus median reaction times for general desirability decisions, which was reasoned to generate an estimate of certainty associated with self-descriptiveness decisions independent of general decision making and reaction time (Wilson & Rapee, 2006). Positive reaction times indicate that self-appraisal for a particular attribute took longer than making a general decision, while negative values indicate that self-appraisal took less time than making a general decision. That is, higher positive values indicate greater uncertainty, while lower positive values and higher negative values indicate greater certainty.

The data from the baseline reaction time task showed that overall, participants endorsed the majority of positive attributes as self-descriptive (74%) and rejected the majority of negative and procrastination attributes as non-descriptive (81% and 78% respectively). As the task used a forced choice format, the proportion of endorsed/rejected attributes were directly comparable, and therefore, as per previous research (Wilson & Rapee, 2006), and in order to reduce redundancy, statistics are only reported from the groups containing the largest number of responses, that is, endorsement of positive attributes and rejection of negative and procrastination-related attributes[4]. Mean endorsement and rejection scores, standard deviations and median reaction times for endorsement (positive) and rejection of attributes (negative and procrastination) at baseline and after feedback, by condition, are presented in Table 3.2.

Self-concept content.

Self-report. Independent samples *t*-tests revealed that compared to low procrastinators, high procrastinators endorsed a significantly greater number of negative, $t\ (97) = 2.5$, $p < .05$, and procrastination-related attributes at baseline, $t\ (97) = 3.2$, $p < .01$, while there was no difference between the two groups in the number of positive attributes endorsed ($p > .05$). Similarly, a two-way ANOVA conducted on post-feedback responses revealed a main effect of group for negative, $F\ (1, 91) = 4.27$, $p < .05$, and procrastination-related items, $F\ (1, 91) = 8.01$, $p < .01$, and a group x condition interaction for endorsement of positive attributes which approached statistical significance, $F\ (2, 92) = 3.1$, $p = .05$. There were no group x condition interactions for negative or procrastination-related items (*p*s > .05). Averaging across conditions, high procrastinators rejected fewer negative and procrastination-related attributes than low procrastinators, while simple effects analyses revealed that high procrastinators

[4] Given the small number of data points available for the other groups (rejection of positive attributes and endorsement of negative and procrastination attributes), statistical analyses with these data were not appropriate, as was the case in previous research employing this method (e.g., Wilson & Rapee, 2006).

endorsed significantly more positive attributes after positive feedback than after negative or no feedback (all *p*s < .05). There were no significant differences in endorsement of positive attributes for low procrastinators regardless of the type of feedback they received.

Self-concept stability.

Self-report. An independent samples *t*-test revealed a significant difference between high and low procrastinators on the trait measure of self-concept clarity at baseline. High procrastinators reported significantly lower levels of self-concept clarity than low procrastinators, $t\ (97) = 3.2$, $p < .005$.

Behavioural measure. In order to measure self-concept stability experimentally, a series of repeated-measures ANOVAs were conducted to determine whether the degree of change in endorsement of positive, negative and procrastination-related attributes from pre- to post- feedback differed between high and low procrastinators. Post hoc tests employed a Bonferroni correction using an adjusted alpha level of 0.5/3 = .017 to maintain the familywise error rate at .05.

Table 3.2.

Mean Scores and Standard Deviations for Comparisons Between High and Low Procrastinators at Baseline and by Condition, on Endorsement of Self-Concept Measures, and Median Reaction times for Endorsement or Rejection of Attributes after Feedback

		Baseline (n = 98)		Positive (n = 29)		Negative (n = 30)		Control (n = 38)	
		Procrastinator Group							
Attributes		High	Low	High	Low	High	Low	High	Low
Positive	Attributes Endorsed	26.3	25.6	28.2	24.7	20.6	25.3	23.1	26.7
	SD	(5.8)	(5.7)	(3.7)	(7.9)	(6.3)	(7.5)	(7.6)	(5.8)
	RT (ms)	180.4	111.8	342.7	655.8	875.5	520.1	406.4	419.7
	SD	(440.4)	(262.1)	(369.6)	(626.9)	(867.3)	(595.4)	(377.6)	(302.4)
Negative	Attributes Rejected	17.8	19.6	20.3	19.9	16.3	19.2	17.7	20.0
	SD	(4.0)	(3.2)	(2.2)	(4.2)	(4.7)	(3.9)	(4.0)	(3.2)
	RT (ms)	168.0	32.3	-32.3	217.3	-92.9	208.7	220.8	212.7
	SD	(337.2)	(252.8)	(544.1)	(794.0)	(420.2)	(708.7)	(364.4)	(278.7)
Procrastination	Attributes Rejected	16.0	18.7	18.5	18.8	13.2	16.6	15.8	19.8
	SD	(4.5)	(3.6)	(2.2)	(5.5)	(5.1)	(5.8)	(5.7)	(2.3)
	RT (ms)	175.3	-15.3	-1.0	227.0	58.74	81.1	77.0	46.0
	SD	(461.2)	(263.0)	(616.4)	(528.7)	(592.6)	(601.8)	(275.7)	(374.7)

Positive attributes. For endorsement of positive attributes, a main effect of time approached significance, F (1, 92) = 3.2, p = .08, and was qualified by a three-way time x group x condition interaction which again approached significance, F (2, 92) = 2.7, p = .07. There was an overall trend for participants to report possessing more positive attributes before the task than after the task. Simple effects analyses investigating the marginally non-significant three-way interaction revealed significant main effects of time, F (1, 52) = 4.5, p < .05, and condition, F (2, 52) = 4.7, p < .05, for high procrastinators. Averaged across feedback conditions, high procrastinators endorsed significantly more positive attributes before the writing task than after the writing task, t (54) = 2.0, p = .05, and after the task, high procrastinators who received positive feedback endorsed a significantly greater number of positive attributes than high procrastinators who received negative feedback or no feedback, ps < .05. There were no significant main effects or interactions for low procrastinators (all ps > .05), indicating that there was no difference in the way low procrastinators viewed their positive attributes, regardless of the type of feedback they received.

Negative attributes. For endorsement of negative attributes, a main effect of group, F (1, 92) = 7.1, p < .05, a main effect of condition which approached significance, F (2, 92) = 3.0, p = .06, and a significant time x group x condition interaction, F (2, 92) = 3.5, p < .05, were found. Inspection of means indicated that overall, high procrastinators rejected fewer negative attributes than low procrastinators, that is, high procrastinators endorsed a greater number of negative attributes as self-descriptive. Post hoc analyses revealed that the main effect of condition was accounted for by a significant difference in the number of negative attributes rejected in the positive versus negative feedback conditions. Averaged across groups, participants who received positive feedback rejected more negative attributes than participants who received negative feedback, p < .05.

A series of simple effects analyses were conducted to investigate the time x group x condition interaction. Analyses revealed a main effect of condition for high procrastinators, F (2, 52) = 4.7, $p < .05$, and a time x condition interaction which approached significance, F (2, 52) = 2.7, $p < .08$. High procrastinators who received positive feedback rejected significantly more negative attributes than those who received negative feedback ($p < .01$), while no significant effects were found for high procrastinators who received no feedback. Further simple effects analyses investigating the marginally significant time x condition interaction revealed that there was a trend for high procrastinators to reject significantly more negative attributes after receiving positive feedback than they did before completing the task, F (1, 18) = 4.0, $p = .06$. There were no significant changes in endorsement patterns of negative attributes for low procrastinators and no other interactions, all ps > .05

Procrastination-related attributes. For endorsement of procrastination-related attributes, the repeated measures ANOVA revealed main effects of group, F (1, 92) = 10.4, $p < .005$, and condition, F (2, 92) = 4.3, $p < .05$, as well as a time x condition interaction which approached significance, F (2, 92) = 3.0, $p = .06$. There were no significant group interactions, all ps > .05. Overall, high procrastinators rejected significantly fewer procrastination-related attributes than low procrastinators and post hoc tests for condition revealed that, overall, participants in the positive and control conditions rejected more procrastination-related attributes than participants in the negative condition, all $ps < .05$. The change over time, by condition, also approached significance, such that overall, there was a trend for participants to reject significantly fewer procrastination-related attributes after receiving negative feedback than they did before the task, t (34) = 1.9, $p < .07$. There were no significant changes in the number of procrastination-related attributes rejected by participants who received positive or no feedback, ps > .05.

Self-concept certainty.

Behavioural measures.

Self-concept certainty was measured in two ways: first, by reaction times to endorsement and rejection of positive, negative and procrastination-related attributes at baseline, and second, by measuring the change in reaction times from pre- to post-feedback as a function of the type of feedback received. Data from baseline and the change from baseline to post-feedback are presented for each set of attributes (see Table 3.2).

Positive attributes. An independent samples *t*-test revealed no significant differences between reaction times of high and low procrastinators when endorsing positive attributes at baseline ($p > .05$). After feedback, however, a repeated measures ANOVA revealed a main effect of time, $F(1, 92) = 28.3$, $p < .001$ and a group x condition interaction which approached significance, $F(1, 92) = 2.8$, $p < .07$. There were no other significant main effects or interactions (all ps > .05). Across group and condition, participants were more certain about endorsement of positive attributes before the task than after the task and simple effects analyses revealed a significant difference between high and low procrastinators in the certainty with which they endorsed positive attributes in each condition. High procrastinators took significantly longer to endorse positive attributes after receiving negative feedback, than after receiving no feedback ($p < .05$), or positive feedback ($p < .005$), while there were no differences in the time taken by low procrastinators to endorse positive attributes in the positive, negative or control conditions, all ps > .05.

Negative attributes. An independent samples *t*-test showed that at baseline, high procrastinators took significantly longer than low procrastinators to reject negative attributes, $t(97) = 2.2$, $p < .05$ indicating greater general uncertainty about rejecting negative attributes as self-descriptive. From pre- to post-feedback, a repeated measures ANOVA revealed a time

x group interaction, F (1, 92) = 7.4, $p < .05$, but no other interactions or main effects (all ps > .05). Simple effects analyses revealed that this interaction was accounted for by a significant change in reaction times from pre- to post-feedback for low procrastinators, t (47) = 2.0, $p < .05$, while there were no significant differences in reaction times from pre- to post-feedback for high procrastinators ($p > .05$). Across feedback conditions, low procrastinators took significantly longer to reject negative self-attributions after completing the task than they did before the task.

Procrastination-related attributes. At baseline, high procrastinators took significantly longer than low procrastinators to reject procrastination-related items as self-descriptive, t (96) = 2.4, $p < .05$, however after feedback, a repeated measures ANOVA revealed a time x group interaction, F (1, 91) = 4.8, $p < .05$, which indicated that, averaging across conditions, high procrastinators tended to take less time to reject procrastination-related items after completing the task, while low procrastinators tended to take longer to reject such attributes after completing the task.

3.3.5 State-Based Measures

As described in the Method section, state-based measures were taken at three time points for participants in the experimental conditions (before the task, after the task and after feedback) and twice for participants in the control condition (before and after the task). A series of independent samples t-tests were conducted to investigate differences between high and low procrastinators on state measures before and after completing the writing task, and a series of repeated measures ANOVAs were conducted to investigate any changes in state-based measures from pre-task to post-feedback for high and low procrastinators in the experimental conditions, and from pre- to post-task for participants in the control condition.

Table 3.3

Mean Scores and Standard Deviations for State Measures, Including t-values and Significance Levels for Comparisons between High and Low Procrastinators Before and After Completion of the Writing Task

	Before Task			After Task		
Measure	High Proc	Low Proc	*t*	High Proc	Low Proc	*t*
SAR	18.7 (12.5)	13.6 (10.7)	2.2***	22.0 (13.1)	13.7 (11.1)	3.4***
AQ	24.3 (10.1)	15.8 (7.8)	4.6***	30.0 (11.2)	20.1 (11.4)	3.9***
WPQ	6.5 (4.3)	9.6 (4.7)	3.4***	4.0 (4.5)	8.5 (5.9)	4.3***
WPQ-OB	14.3 (6.0)	16.1 (5.0)	1.7			
EQ	8.9 (7.2)	8.7 (6.3)	1.0			
PQ	18.6 (10.3)	12.7 (8.8)	3.0***			
CQ	19.4 (8.8)	14.3 (8.0)	3.0***			

*** $p < .001$. Note: SAR= State Anxiety Questionnaire, AQ= Ability Questionnaire (higher scores indicate lower self-efficacy), WPQ = Writing Performance Questionnaire, WPQ-OB = Writing Performance Questionnaire Objective Rating, EQ= Expectations Questionnaire, PQ = Probability Questionnaire, CQ = Consequences Questionnaire

Baseline and post-task. Mean scores, standard deviations and *t*-values for comparisons between high and low procrastinators on baseline and post-task, state-based measures are presented in Table 3.3. With the exception of socially prescribed perfectionism (EQ), there were significant differences between high and low procrastinators on all state measures (all *p*s < .001). High procrastinators reported higher levels of state-based test anxiety and lower levels of self-efficacy than low procrastinators, before and after completing the writing task. High procrastinators thought there was a greater probability that they would perform poorly and experience distress while completing the task, and perceived themselves as having less capacity than low procrastinators to cope with such experiences. When asked

to anticipate the quality of their writing on various dimensions before the task and then rate the actual quality of their performance after the task, high procrastinators reported expecting to perform at a significantly lower standard than low procrastinators both before completing the task and thereafter when rating their actual performance. While there was a tendency for low procrastinators to receive a better mark than high procrastinators from an independent marker ($p < .10$), a repeated measures ANOVA revealed that all participants significantly underestimated their performance relative to the evaluation given by the objective marker, regardless of whether they were high or low procrastinators, $F(1, 97) = 179.2$, $p < .001$.

Post-feedback. Table 3.4 presents results from a series of 2 (group) x 3 (condition) repeated measures ANOVAs, which were undertaken to assess whether feedback (positive, negative or none) resulted in significant changes to self-reported levels of state-based test anxiety, self-efficacy and self-assessment of task performance for high and low procrastinators.

Table 3.4

Mean Scores and Standard Deviations of State Measures for High and Low Procrastinators before the Task and After the Task in each Feedback Condition

		Feedback Condition			
Measure	Procrastinator	Baseline	Positive	Negative	Control
SAR	High	19.2 (12.7)	6.8 (6.4)	31.0 (13.3)	20.4 (13.8)
	Low	12.6 (10.2)	2.7 (2.5)	16.8 (10.2)	13.5 (11.1)
AQ	High	23.8 (10.4)	11.5 (6.7)	40.4 (5.9)	28.9 (13.5)
	Low	15.4 (7.9)	12.4 (8.5)	25.9 (14.1)	21.7 (12.9)
WPQ	High	6.5 (4.3)	8.8 (4.4)	1.2 (1.7)	5.1 (5.2)
	Low	9.6 (4.7)	9.8 (6.7)	4.8 (6.0)	9.6 (5.4)

Note: SAR= State Anxiety Questionnaire, AQ= Ability Questionnaire (higher scores indicate lower self-efficacy), WPQ = Writing Performance Questionnaire

Test anxiety (SAR). The repeated measures ANOVA revealed significant main effects of group, F (1, 93) = 13.8, $p < .001$, and condition, F (2, 93) = 16.9, $p < .001$, as well as a significant time x condition interaction, F (2, 93) = 5.1, $p < .01$, on levels of state-based test anxiety (SAR). There were no other significant main effects or interactions. Examination of means indicated that across time and condition, high procrastinators reported higher levels of state-based test anxiety than low procrastinators and post hoc tests examining the significant main effect of condition revealed significant differences in levels of state-based test anxiety in each condition. Participants in the negative feedback condition reported significantly higher levels of anxiety than those in the control condition, who, in turn, reported significantly higher levels of anxiety than those in the positive feedback condition (all ps $< .05$). Simple effects analyses investigating the significant time x condition interaction revealed that overall, participants who received positive feedback reported a significant reduction in state- based test anxiety from their baseline ratings, t (28) = 4.0, $p < .001$, while there were no significant changes in levels of anxiety for participants who received negative or no feedback (ps $> .05$).

Self-efficacy (AQ[5]). With respect to self-efficacy (AQ), a repeated measures ANOVA revealed significant main effects of group, F (1, 93) = 20.9, $p < .001$, condition F (2, 93) = 20.3, $p < .001$, and time, F (1, 93) = 11.5, $p < .001$, as well as a time x condition interaction, F (1, 93) = 13.3, $p < .001$, and a group x condition interaction which approached significance, F (2, 93) = 206, $p < .08$. No three-way interaction was found. Inspection of means indicated that high procrastinators reported poorer overall levels of self-efficacy than low procrastinators and post hoc tests revealed significant differences between levels of self-efficacy in each condition. Overall, participants in the positive feedback condition reported significantly better levels of self-efficacy than those in the control group, who, in turn,

[5] Higher scores indicate lower self-efficacy

reported significantly better levels than those in the negative feedback condition (all *p*s < .05). The main effect of time indicated that averaging across groups and conditions**,** participants reported better levels of self-efficacy before completing the task than after completing the task, t (98) = 2.9, $p < .01$. This main effect was qualified by the significant time x condition interaction, F (2, 93) = 13.3, $p < .001$, which simple effects analyses revealed to be indicative of a significant improvement in self-efficacy from baseline to post-feedback for participants in the positive condition, t (28) = 3.0, $p < .01$ and a significant decline in self-efficacy from baseline to post-feedback for participants in the negative, t (32) = 4.5, $p < .001$, and control conditions, t (44) = 2.2, $p < .05$. A series of simple effects analyses conducted to investigate the marginally non-significant group x condition interaction revealed significant differences in self-efficacy for high procrastinators in each condition and significant differences between self-efficacy scores in the positive condition, versus the negative and control conditions for low procrastinators. High procrastinators who received positive feedback reported significantly better levels of self-efficacy than those who received no feedback ($p < .001$), who in turn, reported significantly better levels than those who received negative feedback ($p < .001$). In contrast, while low procrastinators who received positive feedback reported significantly better levels of self-efficacy than participants who received no feedback or positive feedback (*p*s < .05), there were no differences in levels of self-efficacy reported by low procrastinators who received negative or no feedback ($p > .05$).

Self-appraisal of writing performance (WPQ). Similarly, with respect to self-appraisal of writing performance, a repeated measures ANOVA revealed significant main effects of group, F (1, 93) = 11.9, $p < .001$, condition, F (2, 93) = 5.4, $p < .005$, and time F (1, 93) = 11.8, $p < .001$, as well as a significant time x condition interaction, F (2, 93) = 12.4, $p < .001$. No significant interactions by group were found. Across time and condition, high procrastinators rated their work as being of poorer quality than low procrastinators, and post

hoc tests revealed that there were significant differences in self-evaluations by condition. Overall, participants in the negative feedback condition evaluated their performance more poorly than those in the positive feedback condition, (ps < .05), and the control condition (p < .06), but no differences were found between the self-evaluations of participants in the positive and control conditions (p > .05). Finally, a one-way ANOVA examining the discrepancy between self- and objective-evaluations of writing performance revealed a significant main effect of condition, but no significant main effect of group or group x condition interaction. Post hoc analyses revealed that, averaged across groups, there was a significantly greater discrepancy between self- and objective ratings for participants who received negative feedback than for participants who received positive feedback (p < .001) or no feedback (p < .005), while there were no differences in the discrepancies between self- and objective ratings for participants who received positive feedback or no feedback (p > .05). This supports the aforementioned results which suggest that negative feedback had the biggest impact on self-ratings of performance for both high and low procrastinators.

3.4 Discussion

3.4.1 Summary of Findings

The main objectives of the present study were first, to examine the self-concept content, certainty and stability of a sample of students who identified as problematic academic procrastinators and second, to experimentally investigate the structure of the self-concept by determining whether there were any changes in measures of self-concept or state-based affective or cognitive constructs after receiving randomly allocated feedback for an academic writing task, thereby providing an empirical investigation of Burka & Yuen's (1983, 2008) theory, which emphasises an unstable self-concept as contributing to procrastination behaviour. The study also sought to replicate previous research that has found associations

between problematic academic procrastination and a variety of personality traits and psychological symptoms. Results were largely in keeping with theoretical explanations of problematic academic procrastination and provide preliminary evidence for differences in the positive and negative self-concept held by problematic academic procrastinators compared to those who do not procrastinate.

Baseline measures. Consistent with hypotheses and previous research, at baseline, high procrastinators reported a self-concept characterised by a greater number of negative and procrastination-related attributes (Ferrari & Diaz-Morales, 2007), lower levels of self-esteem (Beck et al., 2000; Beswick et al., 1988; Park & Sperling, 2012; Steel et al., 2001), higher levels of fear of negative evaluation (Dangas et al., 2014) and more severe symptoms of depression (Beswick et al., 1988; Chu & Choi, 2005; Lay, 1992; Steel et al., 2001), anxiety (Flett et al., 1992; Milgram & Naaman, 1996; Park & Sperling, 2012; Rothblum et al., 1986) and stress (Tice & Baumeister, 1997) in the week preceding the study. High procrastinators also reported lower levels of self-concept clarity and less certainty about rejecting negative and procrastination-related items as self-descriptive, two constructs directly related to Burka and Yuen's theory and unique to the present study of academic procrastinators. This lack of self-concept clarity may help to explain previous research which has shown that procrastinators tend to engage in behaviours designed to protect their self-concept when they believe they will be receiving an evaluation indicative of their intellectual abilities (e.g., Ferrari, 1991a; Ferrari, 1991b; Ferrari & Tice, 2007), perhaps due to a fear of negative evaluation (e.g., Dangas et al., 2014) and the perceived impact on their self-concept. Contrary to hypotheses and previous research, however, (Dangas et al., 2014; Flett et al., 1992; Onwuegbuzie, 2000; Saddler & Buley, 1999; Saddler & Sacks, 1993), both high and low procrastinators reported levels of socially prescribed perfectionism which fell within the clinical range (Hewitt et al., 1991). This unexpected result may be explained by findings from

an unpublished study which suggests that socially prescribed perfectionism may mediate the relationship between fear of negative evaluation, self-worth contingency or low self-esteem and academic procrastination (Wernicke, 1999). It is therefore possible that the effect of these anticipated high standards may have influenced high and low procrastinators in different ways. For high procrastinators, the expectation of high standards of evaluation may have increased their anxiety due to their fear of negative evaluation combined with low levels of self-efficacy and self-esteem, thereby further reducing their perceived ability to complete the task and resulting in procrastination. These same expectations, however, may have resulted in a greater degree of task-directed activity for low procrastinators, due to their higher levels of self-esteem and self-efficacy combined with lower levels of fear of negative evaluation. Further studies investigating the meditational effects of these self-concept attributes are therefore needed to clarify the present results.

With respect to the behavioural measure of procrastination, individuals classified as high procrastinators delayed commencing the writing task longer than individuals classified as low procrastinators ($p = .05$), thereby providing further support for the use of the PASS (Solomon & Rothblum, 1984) in identifying problematic academic procrastinators. In terms of completing the writing task, high procrastinators reported higher levels of test anxiety and lower levels of self-efficacy than low procrastinators, anticipated performing more poorly on the task and reported a lower capacity to cope with potential poor performance than low procrastinators. These findings contribute to a large body of research which has found that high procrastinators possess low levels of self-efficacy (e.g., Seo, 2008), and is also consistent with research showing that procrastinators will try to avoid self-relevant feedback that is indicative of their performance or ability, perhaps because of a perception they will be unable to cope with the perceived negative consequences of such feedback (e.g., Ferrari, 1991b).

Post-feedback measures. While high and low procrastinators responded to academic performance feedback in similar ways on state-based cognitive and affective measures, there were significant differences in the ways in which such feedback impacted upon their broader self-concept. In contrast to low procrastinators, whose self-concept content did not change regardless of whether they received positive, negative or no feedback for the writing task, both the content and certainty of high procrastinators' self-concepts changed as a result of the feedback they were given. High procrastinators who received negative feedback took significantly longer than those who received positive feedback to endorse positive attributes as being self-descriptive; indicating that negative academic feedback may result in changes to the certainty with which high procrastinators hold their positive beliefs about themselves. Conversely, positive feedback resulted in improvements to the content, as well as the certainty, of the self-concept of high procrastinators. High procrastinators who received a positive evaluation of their academic performance reported a significantly less negative self-concept than those who received a negative evaluation and there was a nonsignificant trend for them to change their minds about the negative attributes they reported possessing after receiving positive feedback ($p = .06$). That is, high procrastinators rejected negative attributes that they had originally reported possessing, after receiving positive feedback for their academic work. Interestingly, the content of high procrastinators' negative self-beliefs only appeared to be open to influence from positive feedback, suggesting that negative feedback may have been seen as confirmation of existing negative self-beliefs. These findings support previous research which has found a consistent relationship between academic procrastination and low self-esteem (Beck et al., 2000; Beswick et al., 1988; Park & Sperling, 2012; Steel et al., 2001) and is also in line with research which has shown that people with low self-esteem tend to report self-evaluations characterised by high levels of uncertainty, instability and inconsistency (Baumgardner, 1990; Campbell, 1990; Campbell & Fehr, 1990;

Campbell, Chew & Scratchley, 1991; Campbell et al., 1996). In the case of high procrastinators in our sample, the results suggest that procrastinators' negative self-beliefs may be improved, at least temporarily, by positive academic performance feedback; however they also indicate that these improvements are unlikely to be retained in the absence of continual positive reinforcement. By comparison, the self-concept of low procrastinators seems to be more temporally stable and less amenable to external feedback of any valence.

3.4.2 Theoretical Implications

The findings of the present study contribute to theories of academic procrastination by providing the first experimental evidence in support of the model proposed by Burka and Yuen (1983, 2008), for academic procrastinators. Burka and Yuen conceptualise the procrastinator as an individual with a vulnerable sense of self, who therefore places exaggerated emphasis on achievement to maintain their self-worth. The procrastinator's insecurity is proposed to result in irrational beliefs about their capacity to achieve the required standard, and this belief, combined with the associated attributions to their worth as a person, is thought to generate extreme anxiety under conditions of overt or perceived evaluation, which is relieved in the short term by task delay. In support of this theory, the present study found evidence for the presence of an unstable self-concept, significant fears of negative evaluation, low levels of self-esteem and self-efficacy, high levels of test anxiety and anticipation of poor academic performance in high procrastinators. While the direction of the relationship between these variables cannot be inferred from the results of the present study, there is tentative support for the trajectory of events described by Burka and Yuen in research which suggests that the evaluative component of the self forms relatively early in development and remains fairly constant over time (Epstein, 1983; Mortimer, Finch & Kumka, 1982; O'Malley & Bachman, 1983). Furthermore, results from the present study extend Burka and Yuen's theory by suggesting that feedback from others could significantly

impact the way in which self-concept instability manifests itself. Our results indicate that negative academic performance feedback reduced high procrastinators' certainty in the positive aspects of their self-concept, while positive feedback appeared to result in improvements to the content of both positive and negative aspects of the self-concept.

3.4.3 Clinical Implications

Current cognitive behavioural interventions for academic procrastination focus on cognitive challenging and distress tolerance, as well as practical skills such as time management, prioritisation and reminders (Saulsman & Nathan, 2008). These interventions are not effective for all individuals, however (Ferrari et al., 1995), suggesting that alternative or additional interventions may improve the effectiveness of psychological treatments for academic procrastination. Combined with Burka and Yuen's (1983, 2008) procrastination theory, the results of the present study suggest it is possible that for some, an academic performance situation may activate a level of uncertainty in the self which may perpetuate behavioural avoidance, perhaps through the desire to escape unpleasant emotions, resulting in the individual failing to access and apply the types of interventions which form the basis of CBT interventions. The intensity of distress and severity of avoidance may therefore warrant the inclusion of additional approaches or strategies separately or in combination with existing CBT approaches. As studies have shown that procrastination is associated with avoidance of unpleasant thoughts, emotions and actions (Sirois, 2004; Tice et al., 2001) and lower scores on measures of mindfulness (Sirios & Tosti, 2012), as well as the fact that mindful awareness has been associated with enhanced executive control and emotion regulation (see Teper, Segal & Inzlicht, 2013 for a review), mindfulness-based interventions may assist the procrastinator by increasing their sense of self-concept stability, or by helping them to accept its instability, as well as by reducing both unpleasant emotions and the desire to escape such emotions through procrastination. Procrastinators may then be better equipped to consider the

alternative thoughts and behaviours proposed by existing cognitive behavioural treatments, including grading behaviours that approach, rather than avoid, constructive feedback.

Interventions which focus on broadening high procrastinators' perceptions of self-worth may also be helpful in stabilising the self-concept, thereby reducing the chance that academic feedback will impact upon their ability to complete future tasks in a timely manner. Finally, as results of the present study emphasise the importance of positive feedback, clinicians should be mindful of the importance of providing and eliciting genuine positive regard, as well as providing a therapeutic relationship in which procrastinators' fears about the consequences of negative evaluation can be addressed within a supportive environment.

3.4.4 Strengths

The present study had a number of strengths. The study design was based on both an established theoretical model and a systematic review of the factors proposed by the model to influence academic procrastination. It was designed to address the limitations identified in the literature and is, to the best of my knowledge, the first study to investigate the content, certainty and stability of the self-concept of academic procrastinators using an experimental design. The study used a standardised and well validated instrument to measure academic procrastination and specifically identified problematic academic procrastinators. Behavioural as well as self-report measures of academic procrastination (writing task), self-concept certainty (reaction time task) and self-concept stability (change in self-concept measures as a result of feedback) were used, and the participants were drawn from the population of interest, meaning that the results are likely to generalise well to individuals presenting to treatment for academic procrastination in clinical practice.

3.4.5 Limitations

Despite these strengths, there are some limitations which should be considered when interpreting the results of the present study. Firstly, the sample size was relatively small, given the number of conditions in the study (10-21 participants per condition, with an average of $n = 15$). It is therefore possible that some significant effects were obscured due to a lack of power to detect the relevant effect size, which might be one explanation for the number of results which approached, but did not reach, statistical significance. Alternatively, significant or marginally significant results may have been found in the present sample which would not be observed with a larger sample size. It is therefore important that the results of the present study by interpreted conservatively, and that this study be replicated with a larger sample size before firm conclusions about the results are drawn.

Secondly, the academic task completed in the present study may not have triggered the cognitive schemata or levels of anxiety associated with completing an actual class assignment, potentially limiting the extent to which results can be generalised. As a number of significant effects emerged, however, including changes to self-efficacy and test anxiety, it appears likely that the task and feedback were at least sufficient for investigating the variables of interest and may, in fact, have underestimated effects.

A potentially more significant limitation is the inconsistency in the extent to which participants reported believing the feedback they were given for the writing task. Low procrastinators reported low levels of believability for the negative feedback in particular, meaning that it may be possible that they would have demonstrated similar levels of uncertainty and instability in their self-concept measures if they had been more certain that the feedback was genuine. This interpretation appears less likely, however, given that low procrastinators did report differences in task accomplishment attributes, test anxiety, self-

efficacy and self-evaluation of performance as a result of receiving negative feedback. An alternative explanation is that low procrastinators expressed a lack of confidence in the negative feedback they received because it conflicted with their self-concept to the extent that they were sure it was not genuine. This interpretation is supported by research which has found that people with high self-esteem will only accept information that is consistent with their self-concept (i.e., predominantly positive information) whereas those with low self-esteem tend to believe both positive and negative information (Brockner, 1984). Given that low procrastinators in the present sample reported high levels of self-esteem, this may be a plausible explanation for their response to negative feedback. Low procrastinators with moderate levels of self-esteem and self-efficacy may show varying results.

3.4.6 Conclusions and Future Directions

The findings of the present study indicated that, compared to low procrastinators, high procrastinators reported a more negative self-concept which was less clearly defined, internally consistent, and temporally stable. While academic feedback resulted in similar changes to high and low procrastinators' views about their task completion capabilities, high procrastinators seemed to show a tendency to generalise the academic feedback they were given to their broader self-concept. Positive feedback had the strongest impact on high procrastinators' self-concepts, suggesting that interventions which address negative attentional biases and self-views, while enhancing the stability of positive self-views may improve outcomes for individuals who have not responded fully to existing evidence-based treatments for academic procrastination. Further research is needed to determine whether the findings of the present study extend to treatment-seeking populations and whether interventions directed at improving self-concept stability will enhance existing treatments for academic procrastination.

Chapter 4: General Discussion

This chapter begins with a brief review of the literature which influenced the development and design of the present thesis, followed by a summary of the results of the systematic review. A detailed discussion of the key findings of the empirical study, including strengths and limitations, is then provided in terms of previous research. Finally, the theoretical and clinical implications of the findings, as well as directions for future research are considered.

4.1 Thesis Aims

Theorists have proposed that an unstable self-concept may underlie problematic procrastination for some individuals. Although a large body of research has provided correlational support for the role of various aspects of the self-concept in academic procrastination, no study has empirically investigated the content and structure of the self-concept and how it may be affected by external academic performance feedback. Given that up to 50% of students report chronic and problematic procrastination (e.g., Solomon & Rothblum, 1984), which is associated with a variety of negative cognitive, affective and performance correlates (e.g., Beswick et al., 1988; Chu & Choi, 2005; Lay, 1992; Milgram & Naaman, 1996; Park & Sperling, 2012; Rothblum et al., 1986; Saddler & Sacks, 1993; Steel et al., 2001), the present thesis sought to develop a comprehensive understanding of the ways in which the content and stability of the self-concept may impact upon academic procrastination, in order to advance theoretical models and to contribute to improving evidence-based treatment for this population. The main aims of the present thesis were first, to critically evaluate and synthesise the current literature on the self-concept attributes contributing to academic procrastination, second, to systematically review all published research investigating aspects of the self-concept in academic procrastinators, and third, to empirically investigate the self-concept stability of academic procrastinators by measuring

self-concept content and certainty before an academic writing task and how these characteristics of the self-concept might change as a result of receiving positive, negative or no performance feedback.

4.2 Summary of Findings from the Systematic Review

Chapter 2 presented a systematic review of all published studies which have investigated aspects of the self-concept in academic procrastinators. Forty-two studies met inclusion criteria and all were correlational in design. Analysis of included studies indicated that the strongest negative correlations with academic procrastination were conscientiousness (average r = -.53; n = 4) and self-efficacy ratings (average r = -.36, n = 13), and the strongest positive correlations were with self-handicapping (average r =.52; n = 3), general distress (average r = .48, n = 3), emotion orientation (r =.34, n = 4) and socially prescribed perfectionism ratings (average r =.29; n = 4). The twelve studies which included a behavioural measure of academic procrastination found a significant relationship with self-report measures and studies which measured associated symptomatology found that students only experienced negative affective outcomes if they viewed their procrastination as problematic.

While the research analysed advances our knowledge of the self-reported personality traits, attribution styles and symptoms associated with academic procrastination, the results of the systematic review highlighted some important limitations in the literature and these limitations were used to guide the development of the empirical study reported in Chapter 3. Most notably, none of the studies employed an experimental design to the study of the self-concept and most studies relied on self-report data for all the variables investigated, including classification of participants as high or low academic procrastinators. Furthermore, many studies failed to include a measure of distress associated with academic procrastination, which is essential to differentiating problematic procrastinators from those who simply delay,

or delay strategically (Chu & Choi, 2005; Strunk et al., 2013). These individuals have been shown to exhibit different self-concept profiles to problematic academic procrastinators and experience lower levels of psychological symptomatology, making them less likely to seek treatment for their procrastination and therefore of less relevance to clinical research. The study presented in Chapter 3 sought to provide the first empirical investigation of the content and structure of the self-concept of problematic academic procrastinators using both behavioural and self-report data and to compare their profiles to a group of low procrastinators across different contexts.

4.3 Summary of Findings from the Empirical Research

Chapter 3 reported the results of an empirical study designed to address the limitations in the literature investigating the self-concept of academic procrastinators, as identified in the systematic review. The main objectives of the study were first, to investigate the existing self-concept content, certainty and stability of a sample of students who identified as problematic academic procrastinators and second, to employ an experimental approach to investigating the structure of the self-concept by determining whether there were any changes in measures of self-concept or state-based affective or cognitive constructs after receiving randomly allocated feedback for an academic writing task. The study also sought to replicate previous research which has found associations between problematic academic procrastination and a variety of personality traits and psychological symptoms.

This study contributes to the literature by providing the first direct experimental evidence that the content, certainty and clarity of the self-concept of academic procrastinators can be modified by external academic performance feedback, even when this feedback is objectively unrelated to the quality of their performance, thereby providing support for Burka & Yuen's (1983, 2008) theory, which emphasises the role of an unstable self-concept in

procrastination. On the whole, responses on self-concept measures for low procrastinators were less susceptible to external feedback influences.

4.3.1 Self-Concept Content, Certainty and Stability

In support of our hypotheses, low procrastinators reported possessing significantly fewer negative and procrastination-related attributes than high procrastinators and demonstrated no significant changes in the content of their wider self-concept as a result of receiving feedback on their academic performance. In contrast, high procrastinators reported possessing a self-concept characterised by a greater number of negative attributes, both in general terms, as well as in the domain of procrastination/task accomplishment, thereby supporting previous self-concept research which found that procrastination was most highly correlated with negative beliefs about one's ability to accomplish tasks, as well as lower scores on self-perceptions of likeability (Ferrari & Diaz-Morales, 2007). Furthermore, not only did high procrastinators describe a more negative self-concept than low procrastinators, they were also less certain about rejecting such beliefs as self-descriptive; that is, even when reporting that a given negative or procrastination-related attribute was uncharacteristic of them, high procrastinators took significantly longer than low procrastinators to decide that this was the case. This suggests that not only do high procrastinators seem to possess a more negative self-concept than low procrastinators; they also find it more difficult than low procrastinators to reject any given negative or procrastination-related attribute as self-descriptive.

In fact, the results of the present study extend the aforementioned evidence base by providing the first direct experimental evidence that the content of the self-concept of high procrastinators may change, at least for brief periods of time, based on the nature of the performance feedback they receive. Not only did high procrastinators who received a positive evaluation of their academic performance report a significantly less negative self-concept

than those who received a negative evaluation, after receiving positive feedback there was a nonsignificant trend for them to change their minds about the negative attributes they reported possessing (p = .06). That is, high procrastinators rejected negative attributes that they had originally reported possessing, after receiving positive feedback for their academic work. These results indicate that rather than simply feeling more or less certain in their negative beliefs about themselves as predicted, high procrastinators actually saw themselves in a significantly different way based on the feedback they received, a finding which was supported by their lower self-reported levels of trait self-concept clarity. Interestingly, the content of high procrastinators' negative self-beliefs only appeared to be open to influence from positive feedback, as there were no significant changes in negative self-beliefs for high procrastinators who received negative feedback or no feedback. So while there seems to have been enough instability in high procrastinators' negative beliefs to result in improvements in their self-concept after a positive evaluation, the lack of change after negative or self-evaluation suggests that negative feedback may have been seen as confirmation of existing negative self-beliefs.

Taken together, these findings support previous research which has found a consistent relationship between academic procrastination and low self-esteem (Beck et al., 2000; Beswick et al., 1988; Park & Sperling, 2012; Steel et al., 2001) and research which has shown that people with low self-esteem tend to report self-evaluations characterised by high levels of uncertainty, instability and inconsistency (Baumgardner, 1990; Campbell, 1990; Campbell & Fehr, 1990; Campbell et al., 1991; Campbell et al., 1996). In the case of high procrastinators in our sample, the results suggest that procrastinators' negative self-beliefs may be improved, at least temporarily, by positive academic performance feedback; however they also indicate that these improvements are unlikely to be retained in the absence of

continual positive reinforcement. Further empirical data is necessary to replicate this finding and to assess how long this effect may persist for high procrastinators.

Conversely, while low procrastinators demonstrated less overall certainty in rejecting negative attributes from pre-to post task, the actual number of negative attributes remained stable, and consistently lower than the number endorsed by high procrastinators. Furthermore, the decline in certainty for low procrastinators occurred regardless of whether they received positive, negative or no feedback, indicating that the change was more likely to be related to variables associated with completing the task itself, such as their own evaluation of their performance, or simply the fact that they were asked to complete the same task again, rather than any effect of external feedback.

Hypotheses regarding positive aspects of the self-concept were only partially supported. Contrary to expectations, both high and low procrastinators reported possessing a similar number of positive attributes and were equally as certain as each other about possessing them, prior to receiving feedback for the writing task. After receiving feedback, however, this pattern changed; while there were no changes in the content, certainty or stability of positive attributes for low procrastinators, high procrastinators gave significantly different responses about their positive attributes depending on the type of feedback they received. High procrastinators who received negative feedback reported seeing themselves in a significantly less positive way than those who received positive feedback and were also significantly less certain about the positive qualities they endorsed. It therefore seems that while high procrastinators resembled low procrastinators in terms of their views about their positive attributes outside of conditions of evaluation, when faced with negative performance feedback these procrastinators seemed to lose faith in their judgement to the point where their self-concept reports became significantly less positive and their overall certainty in their positive attributes declined. These findings emphasise the importance of employing

experimental methods and measuring state-based variables when investigating self-concept variables in procrastinators, as it appears that the instability around academic procrastinators' perceptions of their positive attributes may only be activated under conditions of evaluation and would therefore not have been captured by studies which did not induce schemata and affective responses associated with an academic performance situation.

In contrast to the differences observed between high and low procrastinators on self-perceptions of positive and negative attributes, the responses of all participants regarding procrastination/task accomplishment attributes changed in similar ways as a result of the type of feedback they received. While high procrastinators described a self-concept characterised by a greater number of procrastination-related attributes and were significantly less certain about rejecting such attributes before completing the academic task, after completing the task, all participants who received negative feedback reported possessing significantly more procrastination-related attributes than those who received positive or no feedback. In this instance it appears that none of the first year psychology students in our sample, regardless of whether or not they procrastinate, were confident enough in their task completion capabilities to remain unaffected by negative feedback from a more experienced academic.

4.3.2 Traits and Symptoms Associated with Academic Procrastination

The majority of our hypotheses regarding the traits and symptoms associated with academic procrastination were supported. Consistent with the self-concept research reviewed in Chapters 1 and 2, high procrastinators reported significantly higher levels of fear of negative evaluation and significantly lower levels of self-esteem than low procrastinators, as well as more severe symptoms of depression, anxiety and stress in the week preceding the study. Contrary to hypotheses, however, both high and low procrastinators reported levels of socially prescribed perfectionism which fell within the clinical range (Hewitt et al., 1991).

While meta-analysis has revealed only a modest and non-significant relationship between socially prescribed perfectionism and procrastination across domains of procrastination (r = .18; Steel, 2007), the systematic review presented in Chapter 2 found a consistent positive relationship (average r =.29; n = 4) when socially prescribed perfectionism was examined with respect to academic procrastination specifically (Flett et al., 1992; Onwuegbuzie, 2000; Saddler & Buley, 1999; Saddler & Sacks, 1993, see also Dangas et al., 2014). One reason for this unexpected finding may be the method of sampling used to categorise participants as high and low procrastinators in the present study. While previous research which has found a relationship between procrastination and socially prescribed perfectionism has been correlational, the present study did not conceptualise procrastination as a continuous variable and did not use a median-split to categorise participants as high and low procrastinators, meaning that participants who did not meet criteria for being classified as high or low procrastinators were excluded from analyses. It is therefore possible that the relationship between socially prescribed perfectionism and academic procrastination can only be seen by examining the full range of academic procrastination profiles and/or that the influence of socially prescribed perfectionism on procrastination may be mediated by one or more variables which were not measured in the current study. In fact, findings from one unpublished study (Wernicke, 1999) suggest that socially prescribed perfectionism may mediate the relationship between fear of negative evaluation, self-worth contingency or low self-esteem and academic procrastination. That is, a pre-existing insecurity in the self may precipitate academic procrastinators' beliefs that they cannot meet the standards set for them by others, which, in turn, may result in a loss of self-efficacy and consequent delay of academic tasks. Wernicke's findings may therefore provide an explanation for the pattern of results seen in the present study, as although both high and low procrastinators reported high levels of socially prescribed perfectionism, only high procrastinators reported high levels of

fear of negative evaluation and low levels of self-esteem and self-efficacy, in addition to high levels of socially prescribed perfectionism. This suggests that, as per the theory proposed by Burka and Yuen (1983, 2008); it may be the presence of these pre-existing vulnerabilities in the self-concept which are responsible for the influence of socially prescribed perfectionism on academic procrastination.

4.3.3 State-Based Cognitive and Affective Measures

Our hypotheses about the differences between high and low procrastinators on state-based measures at baseline were supported. As expected, high procrastinators reported higher levels of state-based test anxiety and lower levels of self-efficacy than low procrastinators, both before and after completing the task. They also reported thinking that there was a significantly higher probability that they would perform poorly and that they would not cope with the consequences of their poor performance, when compared to low procrastinators. These results are consistent with research which has shown that procrastinators will try to avoid self-relevant feedback that is indicative of their performance or ability, perhaps because of a perception they will be unable to cope with the perceived negative consequences of such feedback (e.g., Ferrari, 1991b).

The differences between high and low procrastinators on state-based measures, however, did not hold after participants received feedback for their writing task. All participants who received negative feedback were more anxious than those who received no feedback, who, in turn, were more anxious than those who received positive feedback. Differences in test anxiety were therefore related to baseline levels and the change from these baseline levels after feedback; high procrastinators began with levels of anticipatory anxiety similar to those associated with having already received negative feedback, whereas low procrastinators reported baseline levels of anxiety closer to those associated with having

received positive feedback. These levels of baseline test anxiety therefore appear to reflect the affective response to high procrastinators' self-reported expectation of poor performance.

Measures of self-efficacy followed a similar pattern, with academic performance feedback affecting all participants' perceptions of their ability to complete the task, and only slight differences in the extent to which high and low procrastinators were affected. High procrastinators who received positive feedback reported significantly better levels of self-efficacy than those who received no feedback, who, in turn, reported significantly better levels than those who received negative feedback, whereas low procrastinators who received positive feedback reported significantly better levels of self-efficacy than those who received no feedback or negative feedback. Therefore, as in the case of test anxiety, high procrastinators reported lower levels of baseline self-efficacy which then altered as a result of the feedback they received, while low procrastinators reported higher levels of baseline self-efficacy which also changed as a result of feedback.

4.3.4 Performance Measures

Given that high procrastinators reported higher levels of baseline test anxiety and lower levels of self-efficacy than low procrastinators, it is not surprising that they also anticipated that their written work would be of a significantly poorer quality than low procrastinators', before and after completing the task. The effect of feedback on self-evaluation, however, did not differ between high and low procrastinators. All participants who received negative feedback reported significantly lower self-evaluations of their performance than those who received no feedback or positive feedback. There was also a significant decline from expected writing performance ratings for participants who received negative feedback and a nonsignificant trend toward a significant increase in such ratings for participants who received positive feedback. Again, these results indicate that high

procrastinators began with lower expectations of their ability than low procrastinators; but that both groups of individuals adjusted their judgements appropriately, based on the feedback they were given.

In terms of objective evaluation, all participants significantly underestimated their performance when compared to the evaluation made by the objective marker and there were no differences in objective ratings given to participants in the positive, negative or control conditions, indicating that the significant differences in self-evaluations by condition were not related to any objective difference in the quality of the work, only in participants' self-assessments as a result of the feedback they received. There was a nonsignificant trend for low procrastinators to receive a higher mark than high procrastinators from the objective marker, which may have been due to a number of factors including the shorter timeframe high procrastinators had in which to complete the task (due to a longer delay before commencement), a lower academic aptitude or additional factors not measured in the present study. Indeed, previous research has revealed that the relationship between procrastination and academic performance is mediated by general intelligence (Bridges & Roig, 1997) as well as study habits such as lecture attendance (Beck et al., 2000). As the objective rating in the present study was used as a control for self-evaluations rather than to investigate the factors influencing academic performance for procrastinators, there is insufficient information to draw conclusions about the reasons behind this trend.

4.3.5 Relationship between Self-Report and Behavioural Measures

Individuals classified as high procrastinators (those who reported that they nearly always or always experienced problematic procrastination) delayed commencing the writing task longer than individuals classified as low procrastinators (those who reported that they sometimes, almost never or never experienced problematic procrastination on essays, $p = .05$),

thereby providing further support for the use of the PASS (Solomon & Rothblum, 1984) in identifying problematic academic procrastinators.

4.3.6 Strengths

The present study had a number of strengths. The study design was based on both an established theoretical model and a systematic review of all published articles investigating the factors proposed by the model to influence academic procrastination. The empirical study was designed to address the limitations identified by the systematic review and is, to the best of my knowledge, the first to investigate the content, certainty and stability of the self-concept of academic procrastinators using an experimental design. It used a standardised and well validated instrument to measure academic procrastination and specifically identified problematic academic procrastinators. Furthermore, while most previous research has relied on the use of self-report measures, the present study sought to maximise the validity of the data by employing behavioural as well as self-report measures of academic procrastination (writing task), self-concept certainty (reaction time task) and self-concept stability (change in self-concept measures as a result of feedback). This study was the first to our knowledge to use behavioural measures of self-concept. Finally, as the sample of participants was drawn from the population of interest (university students), the results are likely to generalise well to individuals presenting to treatment for academic procrastination in clinical practice, particularly student counselling services.

4.3.7 Limitations

Despite these strengths, there are some limitations which should be considered when interpreting the results of the present study. Firstly, the sample size was relatively small, given the number of conditions in the study (10-21 participants per condition, with an average of $n = 15$). It is therefore possible that some significant effects were obscured due to

a lack of power to detect the relevant effect size, which might be one explanation for the number of results which approached, but did not reach, statistical significance. Alternatively, significant or marginally significant results may have been found in the present sample which would not be observed with a larger sample size. It is therefore important that the results of the present study by interpreted conservatively, and that this study be replicated with a larger sample size before firm conclusions about the results are drawn.

Secondly, although the academic task that participants completed was designed to resemble an essay that students might be given as part of their university studies, it was a short task, completed as part of a study, and did not contribute to their academic results in any way. As such, the task may not have triggered the cognitive schemata or levels of anxiety associated with completing an actual class assignment and would therefore limit the extent to which the results of the present study could be generalised to academic procrastination in university class settings. As a number of significant effects emerged, however, including changes to self-efficacy and test anxiety, it appears likely that the task and feedback were at least sufficient for investigating the variables of interest. It is therefore possible, in fact, that the present results may underestimate the effects which might be observed in academic settings, in which academic assessment is highly valued and marks achieved result in important outcomes for a student's future.

A potentially more significant limitation is the inconsistency in the extent to which participants reported believing the feedback they were given for the writing task. Overall, participants reported believing the feedback to a moderate extent and indicated that if they did have doubts about the validity of the feedback they did not think their doubts had any effect on their responses. Nonetheless, as low procrastinators reported low levels of believability for the negative feedback in particular, it is possible that they would have demonstrated similar levels of uncertainty and instability in their self-concept measures if

they had been more certain that the feedback was genuine. This interpretation appears less likely, however, given that low procrastinators did report differences in task accomplishment attributes, test anxiety, self-efficacy and self-evaluation of performance as a result of receiving negative feedback. An alternative explanation is that low procrastinators expressed a lack of confidence in the negative feedback they received because the feedback conflicted with their self-beliefs to the extent that they were sure it was not genuine, thus providing further evidence for the stability of their self-concept. This interpretation is supported by research which has found that people with high self-esteem will only accept information that is consistent with their self-concept (i.e., predominantly positive information) whereas those with low self-esteem tend to believe both positive and negative information (Brockner, 1984). Given that low procrastinators in the present sample reported high levels of self-esteem, this may be a plausible explanation for their response to negative feedback. Low procrastinators with moderate levels of self-esteem and self-efficacy may show varying results.

Finally, although the present study attempted to improve the validity of self-concept measures by using reaction time data and changes in self-concept responses as a result of an experimental manipulation, these data were still of a self-report nature and was therefore still susceptible to social desirability demands and response bias. Although participants completed the task alone in private offices and were ensured that their responses would be recorded anonymously and stored confidentially, these demand characteristics may still have influenced responses, particularly for individuals with an unstable self-concept who fear negative evaluation, as was the case for the high procrastinators in the present study. Assessing for social desirability bias during the present study would have assisted in controlling for such effects.

4.3.8 Theoretical Implications

The findings of the present study make a unique theoretical contribution by providing the first experimental evidence to support the model of procrastination proposed by Burka and Yuen (1983, 2008) for academic procrastinators. Burka and Yuen conceptualise the procrastinator as an individual with a vulnerable sense of self, who therefore places exaggerated emphasis on achievement to maintain their self-worth. The procrastinator's insecurity is proposed to result in irrational beliefs about their capacity to achieve the required standard, and this belief, combined with the associated attributions to their worth as a person, is thought to generate extreme anxiety under conditions of overt or perceived evaluation, which is relieved in the short term by task delay. In support of this theory, the present study found evidence for the presence of an unstable self-concept, significant fear of negative evaluation, low levels of self-esteem and self-efficacy, high levels of test anxiety and anticipation of poor academic performance in high procrastinators. While the direction of the relationship between these variables cannot be inferred from the results of the present study, the trajectory of events described by Burka and Yuen is supported by research which suggests that the evaluative component of the self forms relatively early in development and remains fairly constant over time (Epstein, 1983; Mortimer et al., 1982; O'Malley & Bachman, 1983) and that, for academic procrastinators, it is the presence of self-worth contingency or low self-esteem which seems to account for the effect of perfectionistic beliefs on academic procrastination (Wernicke, 1999). These results also provide an explanation for why socially prescribed perfectionism may have had differential effects on high and low procrastinators in the present study, as while low procrastinators reported high levels of socially prescribed perfectionism, they also reported a more positive and stable self-concept, high levels of self-esteem and self-efficacy and low levels of fear of negative evaluation. This suggests that the presence of a negative and unstable self-concept characterised by low levels of self-esteem

and self-efficacy as well as significant fears of negative evaluation may maintain anxious responding in evaluative situations for high procrastinators, which may, in turn, be perceived as confirming their negative self-beliefs while destabilising their positive self-beliefs and therefore maintaining the cycle of academic procrastination.

Furthermore, results from the present study extend Burka and Yuen's theory by suggesting that while a more negative and unstable self-concept may result in irrational beliefs, anxiety and procrastination, feedback from others could significantly impact the way in which this self-concept instability manifests itself. Our results indicate that negative academic performance feedback caused procrastinators to lose certainty in the positive aspects of their self-concept, which was likely to have reinforced and perhaps exacerbated negative beliefs about their self-efficacy and the standards expected by others. It is possible that these increasingly negative beliefs may then become salient the next time these individuals come to complete an academic task, thus perpetuating the cycle of academic procrastination. Conversely, and more significantly, positive feedback was found to result in significant improvements to the actual content, not just the certainty, of the self-concept of high procrastinators. High procrastinators who received positive feedback endorsed a significantly greater number of positive attributes and rejected a significantly greater number of negative attributes than those who received negative feedback, while at the same time endorsing fewer negative self-beliefs than they did prior to receiving such feedback. Furthermore, positive feedback also resulted in significant improvements to self-efficacy and significant reductions in test anxiety, suggesting that shifting academic procrastinators' attentional biases toward positive self-relevant information may help to break the cycle of procrastination by minimising the self-concept instability which may precipitate irrational beliefs, anxiety and subsequent task delay.

4.3.9 Clinical Implications

Current cognitive behavioural treatments for academic procrastination focus on helping individuals to form an understanding of the cycle of procrastination, including unhelpful assumptions, beliefs about tolerating discomfort, positive and negative consequences of procrastination and the excuses individuals make which are likely to maintain their procrastination (Saulsman & Nathan, 2008). Psychological treatment then focuses on providing individuals with the skills to challenge their unhelpful beliefs, tolerate distress, and reassess the consequences and the validity of the excuses they make for their procrastination. Practical skills such as time management, prioritisation, reminders and rewards may also be provided.

These interventions are not effective for all individuals, however (Ferrari et al., 1995), suggesting that alternative or additional interventions may improve the effectiveness of psychological treatments for academic procrastination. Combined with Burka and Yuen's (1983, 2008) procrastination theory, the results of the present study suggest it is possible that for some, an academic performance situation may activate a level of uncertainty in the self which may perpetuate behavioural avoidance, perhaps through the desire to escape unpleasant emotions, resulting in the individual failing to access and apply the types of interventions which form the basis of CBT interventions. The intensity of distress and severity of avoidance may therefore warrant the inclusion of additional approaches or strategies separately or in combination with existing CBT strategies. As studies have shown that procrastination is associated with avoidance of unpleasant thoughts, emotions and actions (Sirois, 2004; Tice et al., 2001) and lower scores on measures of mindfulness (Sirios & Tosti, 2012), as well as the fact that mindful awareness has been associated with enhanced executive control and emotion regulation (see Teper, Segal & Inzlicht, 2013 for a review), mindfulness-based interventions may assist the procrastinator by increasing their sense of

self-concept stability, or by helping them to accept its instability, as well as by reducing both unpleasant emotions and the desire to escape such emotions through procrastination. Procrastinators may then be better equipped to consider the alternative thoughts and behaviours proposed by existing cognitive behavioural treatments, including grading behaviours that approach, rather than avoid, constructive feedback.

Given that academic performance feedback was found to result in generalised changes to the wider self-concept of high procrastinators, interventions which focus on broadening these individuals' perceptions of self-worth may also be helpful in stabilising the self-concept, thereby minimising the impact of future academic feedback on their broader self-views and reducing the chance that this feedback will impact upon their ability to complete future tasks in a timely manner.

Finally, as previously discussed, the results of the present study emphasise the importance of positive feedback in improving procrastinators' self-concept, self-efficacy and anxiety. As such, clinicians should be mindful of the importance of providing and eliciting genuine positive regard, as well as providing a therapeutic relationship in which procrastinators' fears about the consequences of negative evaluation can be addressed in a supportive environment, and whereby patterns of avoidance can be countered with a graded approach, incorporating strategies and behavioural experiments to improve distress tolerance.

4.3.10 Future Directions

The results of the present study provide a number of directions for future research. As the present study was, to my knowledge, the first to employ an experimental design to the study of the self-concept of academic procrastinators, future studies may wish to expand upon this methodology to address some of the limitations previously noted. For example, conducting this experiment with an ecologically valid task that was actually part of a subject

curriculum is likely to significantly enhance the believability of the academic performance feedback and therefore the validity of the results, and including a social desirability scale would improve the validity of the self-concept measures. Replicating the present study with a treatment-seeking population would assist in determining the extent to which the results of the present study can be generalised to the relevant population and therefore whether they provide a valid contribution to theoretical models of academic procrastination. Should these results prove consistent in treatment seeking samples, future research could focus on conducting randomised controlled trials to determine whether interventions targeting self-concept stability might enhance current evidence-based treatments for academic procrastination.

Finally, given that the present study was unable to delineate the developmental trajectory of the factors influencing academic procrastination, future studies may also wish to employ a longitudinal design to investigating whether instability in the self-concept does indeed precede irrational beliefs, anxiety and subsequently, procrastination, as proposed by Burka and Yuen (1983, 2008). Although previous studies have examined academic procrastination over the course of a semester (Moon & Illingworth, 2005; Rice et al., 2012; Tice & Baumeister, 1997), these studies were unable to draw conclusions about the timeline for development of the contributing self-concept attributes. Longitudinal studies would therefore need to investigate these attributes from the proposed stage of self-concept development in order to delineate the developmental trajectory involved in academic procrastination.

4.3.11 Conclusions

The present study examined the self-concept stability of academic procrastinators by measuring self-concept content and certainty as well as associated cognitive schemata,

affective states and symptomatology before an academic writing task and investigating how these measures changed as a result of receiving positive, negative or no performance feedback. Overall, low procrastinators reported a more positive self-concept which was less susceptible to the influence of external feedback, regardless of whether it was positive or negative, suggesting that they were confident in their own self-evaluations. They also reported lower baseline levels of state-based test anxiety and higher baseline levels of self-efficacy than high procrastinators, gave better self-evaluations of their performance and reported a greater capacity to cope with potential poor performance than high procrastinators. When their self-perceptions did change, they did so in ways which were consistent with the context of the situation, for example, their self-efficacy for completing the writing task reduced after being told that they had performed poorly on that task, while other aspects of their self-concept remained unaffected. In contrast, high procrastinators reported a more negative self-concept which was less clearly defined, in addition to lower baseline levels of self-efficacy, higher baseline levels of anxiety, poorer self-evaluations and lower expectations of their capacity to cope with poor performance. Moreover, while academic feedback resulted in similar changes to high procrastinators' views about their task completion capabilities, high procrastinators appeared to generalise the academic feedback they were given to their broader self-concept, despite the fact that the feedback only referred to their performance on a 10-minute writing task and was, in fact, unrelated to the quality of their work. Positive feedback had a particularly strong impact on high procrastinators' self-concept, suggesting that interventions which address negative attentional biases and self-views while enhancing the stability of positive self-views may improve outcomes for individuals who have not responded fully to existing evidence-based treatments for academic procrastination. Further research is needed to determine whether the findings of the present study extend to treatment-

seeking populations and whether interventions directed at improving self-concept stability will enhance existing treatments for academic procrastination.

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Appendices

Appendix A: Experiment Advertisement

School of Psychology
Faculty of Science

ABN 15 211 513 464

Bianca Petrie
Psychologist

Maree Abbott
Supervising Clinical Psychologist

Mackie Building K01
The University of Sydney
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Experiment Advertisement

Number of subject hours requested for the experiment
100 hours

Number of credit points to be given to each subject
1.5 hours

Supervisor
Dr Maree Abbott (maree.abbott@sydney.edu.au)

Researcher
Bianca Petrie (bpet8462@uni.sydney.edu.au)

Name of experiment
Academic Performance and the Relationship Between Personality and Psychological Factors

Abstract
This study is about the different personality traits of first year psychology students, their relationship to levels of depression, anxiety and stress, and their association with performance on academic tasks.

Description:
The study involves completion of a number of self-report questionnaires about your thoughts, feelings and behaviour administered by computer, as well as several other computer tasks such as a self-concept task in which you will make ratings about a list of personality traits.

Appendix B: Ethics Approval

RESEARCH INTEGRITY
Human Research Ethics Committee
Web: http://sydney.edu.au/ethics/
Email: ro.humanethics@sydney.edu.au

Address for all correspondence:
Level 6, Jane Foss Russell Building - G02
The University of Sydney
NSW 2006 AUSTRALIA

Ref. MF/PE

25 July 2011

Dr Maree Abbott
School of Psychology
Mackie Building – K01
The University of Sydney
Email: maree.abbott@sydney.edu.au

Dear Dr Abbott

Thank you for your correspondence dated 13 July 2011 addressing comments made to you by the Human Research Ethics Committee (HREC).

I am pleased to inform you that with the matters now addressed your protocol entitled **"Positive and Negative Self-Concept Certainty in Academic Procrastinators"** has been approved.

Details of the approval are as follows:

Protocol No.: **13829**

Approval Period: **July 2011 to July 2012**

Authorised Personnel: **Dr Maree Abbott**
Ms Bianca Petrie
Associate Professor Caroline Hunt
Ms Lisa Zadro

Documents Approved:
SONA Advertisement Version 1 27 April 2011
Participant Information Statement A Version 1 27 April 2011
Participant Consent Form A Version 1 27 April 2011
Participant Information Statement B1 Version 1 27 April 2011
Participant Information Statement B2 Version 1 27 April 2011
Participant Consent Form B Version 1 27 April 2011
Debrief Information Version 1 27 April 2011
Measures (Appendix H) 27 April 2011

The HREC is a fully constituted Ethics Committee in accordance with the National Statement on Ethical Conduct in Research Involving Humans-March 2007 under Section 5.1.29.

The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Research Involving Humans. A report on this research must be submitted every 12 months from the date of the approval or on completion of the project, whichever occurs first. Failure to submit reports will result in withdrawal of consent for the project to proceed. Your report is due by **30 June 2012.**

Human Ethics
ɜt Faedo
527 8176
ɜt.faedo @sydney.edu.au

Human Ethics Secretariat:
Ms Karen Greer T: +61 2 8627 8171 E: karen.greer@sydney.edu.au
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Ms Kala Retnam T: +61 2 8627 8173 E: kala.retnam@sydney.edu.au

ABN 15 2
CRICOS

THE UNIVERSITY OF SYDNEY

Chief Investigator / Supervisor's responsibilities to ensure that:

1. All serious and unexpected adverse events should be reported to the HREC within 72 hours for clinical trials/interventional research.
2. All unforeseen events that might affect continued ethical acceptability of the project should be reported to the HREC as soon as possible.
3. Any changes to the protocol must be approved by the HREC before the research project can proceed.
4. All research participants are to be provided with a Participant Information Statement and Consent Form, unless otherwise agreed by the Committee. The following statement must appear on the bottom of the Participant Information Statement: *Any person with concerns or complaints about the conduct of a research study can contact the Manager, Human Ethics, University of Sydney on +61 2 8627 8176 (Telephone); + 61 2 8627 8177 (Facsimile) or ro.humanethics@sydney.edu.au (Email).*
5. You must retain copies of all signed Consent Forms and provide these to the HREC on request.
6. It is your responsibility to provide a copy of this letter to any internal/external granting agencies if requested.
7. The HREC approval is valid for four (4) years from the Approval Period stated in this letter. Investigators are requested to submit a progress report annually.
8. A report and a copy of any published material should be provided at the completion of the Project.

Please do not hesitate to contact Research Integrity (Human Ethics) should you require further information or clarification.

Yours sincerely

Dr Margaret Faedo
Manager, Human Ethics
On behalf of the HREC

Copy: Bianca Petrie bpet8462@uni.sydney.edu.au

Modification to Human Ethics Protocol Approved (13829) Inbox x

Animal Ethics animal.ethics@sydney.edu 20/07/2012
to Maree, bpet8462

Dear Dr Abbott

Title: Positive and Negative Self-Concept Certainty in Academic Procrastinators
Protocol No: 13829

Modifications:
1. Addition of the PANAS and Self-Concept Clarity Scale
2. Changes to feedback format
3. Changes in the PIS, debrief statement and collection of consent

Your request to modify the above application was considered by the Executive Committee of the Human Research Ethics Committee (HREC) at its meeting on 18 July 2012. The modification has been approved as attached.

The Committee had no ethical objections to the modification/s and has approved the protocol to proceed.

Please do not hesitate to contact Research Integrity (Human Ethics) should you require further information or clarification.

Yours Sincerely

Human Research Ethics Committee
The University of Sydney

Annual Report Form Approved (13829) Inbox x

Human Ethics ro.humanethics@sydney.edu.au 03/10/2012
to cclarke, bpet8462

Dear Dr Abbott,

Title: Positive and Negative Self-Concept Certainty in Academic Procrastinators
Protocol No: 13829
First Approval Date: July 2011

Thank you for forwarding the Annual Report Form for the above study. Your protocol has been renewed to **31 July 2013.**

Please note that if your project is not completed within four (4) years from the first approval date, you will have to submit a Modification Form requesting an extension. Please refer to the guidelines on extension of ethics approval which is available on the website at: http://sydney.edu.au/research_support/ethics/human/extension.

Any amendments/modifications to the protocol must be approved by the Human Research Ethics Committee (HREC) [refer to the website at: http://sydney.edu.au/research_support/ethics/humans/forms for a Modification Form].

Please do not hesitate to contact the Research Integrity (Human Ethics) should you require further information or clarification.

Regards,

Angela

THE UNIVERSITY OF SYDNEY

Research Integrity
Human Research Ethics Committee

Tuesday, 21 May 2013

Dr Maree Abbott
Psychology; Faculty of Science
Email: maree.abbott@sydney.edu.au

Dear Maree

Your request to modify the above project submitted on 3 May 2013 was considered by the Executive of the Human Research Ethics Committee at its meeting on **15 May 2013**.

The Committee had no ethical objections to the modification/s and has approved the project to proceed.

Details of the approval are as follows:

Project No.: **2012/1814**

Project Title: **Positive and Negative Self-Concept Certainty in Academic Procrastinators**

Approved Documents:

Date Uploaded	Type	Document Name
03/05/2013	Other Type	Proposed new feedback

Please do not hesitate to contact Research Integrity (Human Ethics) should you require further information or clarification.

Yours sincerely

Dr Stephen Assinder
Chair
Human Research Ethics Committee

This HREC is constituted and operates in accordance with the National Health and Medical Research Council's (NHMRC) National Statement on Ethical Conduct in Human Research (2007), NHMRC and Universities Australia Australian Code for the Responsible Conduct of Research (2007) and the CPMP/ICH Note for Guidance on Good Clinical Practice.

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Annual report outcome - 2012/1814 Inbox x

Human Ethics ro.humanethics@sydney.edu.a 18/07/2013

to Maree, Caroline, bpet8462, lisa.zadro

Dear Dr Maree Abbott

Project Title: Positive and Negative Self-Concept Certainty in Academic Procrastinators

Project No: 2012/1814

Thank you for forwarding the Annual Report Form for the above project.

Your project has been renewed for another year.

Regards,

Human Ethics Administration

The University of Sydney

Appendix C: Self-Report Questionnaires

Demographic Details

Are you male or female?

O Female **O** Male

How old are you?

_____

What is your overall annual family income?

Choose one of the following answers:

- Less than $20 000
- $20 000- $30 000
- $30 000- $40 000
- $40 000- $50 000
- $50 000 - $ 60 000
- $60 000 - $ 70 000
- $70 000- $80 000
- Above $80 000

In which year of tertiary education are you currently enrolled?

Choose one of the following answers:

- First year
- Second year
- Third year
- Fourth year
- Fifth year
- Sixth year or above

Is English your first language?

Choose one of the following answers:

- Yes, English is my first language
- No, I have spoken English for 10 years or more
- No, I have spoken English for less than 10 years

PASS

For each of the following activities, please rate the degree to which you delay or procrastinate. Rate each item according to how often you wait until the last minute to do the activity.

	Never	Almost Never	Sometimes	Nearly Always	Always
Writing an essay or report	o	o	o	o	o
Studying for exams	o	o	o	o	o
Keeping up with weekly readings	o	o	o	o	o

Now indicate the degree to which procrastination is a problem for you.

	Not at all a problem	Almost never a problem	Sometimes problem	Nearly always a problem	Always a problem
Writing an essay or report	o	o	o	o	o
Studying for exams	o	o	o	o	o
Keeping up with weekly readings	o	o	o	o	o

Finally, please indicate the degree to which you would like to decrease your tendency to procrastinate on each task.

	Do not want to decrease		Somewhat		Definitely want to decrease
Writing an essay or report	o	o	o	o	o
Studying for exams	o	o	o	o	o
Keeping up with weekly readings	o	o	o	o	o

DASS-21

DASS21

Name: *Date:*

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

BFNE Scale

Read each of the following statements carefully and indicate how characteristic it is of you according to the following scale:

1 = Not at all characteristic of me
2 = Slightly characteristic of me
3 = Moderately characteristic of me
4 = Very characteristic of me
5 = Extremely characteristic of me

_____ 1. I worry about what other people will think of me even when I know it doesn't make any difference.

_____ 2.* I am unconcerned even if I know people are forming an unfavorable impression of me.

_____ 3. I am frequently afraid of other people noticing my shortcomings.

_____ 4.* I rarely worry about what kind of impression I am making on someone.

_____ 5. I am afraid others will not approve of me.

_____ 6. I am afraid that people will find fault with me.

_____ 7.* Other people's opinions of me do not bother me.

_____ 8. When I am talking to someone, I worry about what they may be thinking about me.

_____ 9. I am usually worried about what kind of impression I make.

_____ 10.* If I know someone is judging me, it has little effect on me.

_____ 11. Sometimes I think I am too concerned with what other people think of me.

_____ 12. I often worry that I will say or do the wrong things.

* Reverse scored item

RSES

Below is a list of statements dealing with your general feelings about yourself. Please indicate your feelings using the scale below.

1.	On the whole, I am satisfied with myself.	SA	A	D	SD
2.*	At times, I think I am no good at all.	SA	A	D	SD
3.	I feel that I have a number of good qualities.	SA	A	D	SD
4.	I am able to do things as well as most other people.	SA	A	D	SD
5.*	I feel I do not have much to be proud of.	SA	A	D	SD
6.*	I certainly feel useless at times.	SA	A	D	SD
7.	I feel that I'm a person of worth, at least on an equal plane with others.	SA	A	D	SD
8.*	I wish I could have more respect for myself.	SA	A	D	SD
9.*	All in all, I am inclined to feel that I am a failure.	SA	A	D	SD
10.	I take a positive attitude toward myself.	SA	A	D	SD

* Reverse scored item

MPQ (Socially prescribed perfectionism scale)

Listed below are a number of statements concerning personal characteristics and traits. Read each item and decide whether you agree or disagree and to what extent. If you strongly agree, circle 7. If you strongly disagree, circle 1; if you feel somewhere in between, circle one of the numbers between 1 and 7. If you feel neutral or undecided the midpoint is 4.

1	I find it difficult to meet others' expectations of me	1	2	3	4	5	6	7
2	The better I do, the better I am expected to do	1	2	3	4	5	6	7
3	Anything that I do that is less than excellent will be seen as poor work by those around me	1	2	3	4	5	6	7
4	The people around me expect me to be the best at everything I do	1	2	3	4	5	6	7
5	Success means I must work even harder to please others	1	2	3	4	5	6	7
6	I feel that people are too demanding of me	1	2	3	4	5	6	7
7	Although they don't show it, other people get very upset with me when I slip up	1	2	3	4	5	6	7
8	My family expects me to be perfect	1	2	3	4	5	6	7
9	People expect nothing less than perfection from me	1	2	3	4	5	6	7
10	People expect more from me than I am capable of giving	1	2	3	4	5	6	7

SCCS

Please select the option that best applies to you, using the following scale:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

1 My beliefs about myself often conflict with one another.

2 On one day I might have one opinion of myself and on another day I might have a different opinion

3. I spend a lot of time wondering about what kind of person I really am

4. Sometimes I feel that I am not really the person that I appear to be

5. When I think about the kind of person I have been in the past, I'm not sure what I was really like

6.* I seldom experience conflict between the different aspects of my personality.

7. Sometimes I think I know other people better than I know myself

8. My beliefs about myself seem to change very frequently

9. If l were asked to describe my personality, my description might end up being different from one day to another day

10. Even if l wanted to, I don't think I could tell someone what I'm really like

11.* In general, I have a clear sense of who I am and what I am.

12. It is often hard for me to make up my mind about things because I don't really know what I want.

* Reverse scored item

Appendix D: Experimental Measures

Note: The AQ, SAR and WPQ were administered at three time points. Time one questions were worded as shown, time 2 questions were worded to assess participants' ratings of their ability, anxiety and performance *during* the task and time 3 questions were worded to assess participants' ratings of their ability, anxiety and performance *after* having completed the task. The EQ, PQ and CQ were administered at one time point only, before completing the task.

AQ

Instructions: Please indicate what you believe about your ability to meet the expected standard of the summary. Rate the following items in terms of what you truly believe about your ability to meet the expected standard of the summary, using the following scale:

0	1	2	3	4
Not at all true	**Somewhat true**	**Moderately true**	**Very true**	**Extremely true**

1. I am doubtful of my ability to meet the rater's expectations
2. I am confident in my ability to meet the expected standard
3. I am likely to do worse than what the rater expects
4. * I am confident that my writing ability will meet the expected standard
5. I don't think I'll do very well at the task
6. * I am able to write the summary to a high standard
7. I think I'll fall short of the expected standard for this summary
8. I am worried about not performing well on the task
9. My summary will be worse than what is expected of me
10. I don't have the ability to meet the expected standard
11. I'll fail to meet the standard expected of me for this task
12. It's unlikely that I'll meet the expected standard for this task

* Reverse scored item

SAR

Instructions: Please rate how you are feeling about having to write the summary. Answer all items as they are true for you **right now**, using the following scale:

0	1	2	3	4
Not at all	**Somewhat**	**Moderately**	**Much**	**Extremely**

1. I feel nervous about the summary
2. I feel worried about the summary
3. I don't want to do the summary
4. I feel concerned about someone else reading my written work
5. I feel anxious about doing this summary
6. I would prefer not to do the summary
7. I am trying not to think about having to do the summary
8. I am anxious about my summary being marked by the rater
9. I am worried that I won't think of anything to write for the task
10. I am concerned that I won't have enough to write about
11. I am anxious that I won't have enough time to do the task well

WPQ

Instructions: Please rate the expected quality of your summary on the items listed below. Rate each item as you believe will be true of your summary using the following scale:

0	1	2	3	4
Not at all	**Somewhat**	**Moderately**	**Much**	**Extremely**

1. My summary will demonstrate a good level of creativity
2. My summary will show a clear expression of ideas
3. My summary will be well written
4. My summary will be interesting
5. My written work will be well structured
6. My summary will use correct APA formatting

EQ

Instructions: Please rate the following items in terms of what you truly believe the rater expects of your summary.

0	1	2	3	4
Not at all true	**Somewhat true**	**Moderately true**	**Very true**	**Extremely true**

1. The rater expects my summary to be at the level of an experienced writer
2. The rater expects my summary to meet a high standard
3. My summary will be judged against a professional, polished standard of writing
4. The rater expects me to write a good quality summary
5. The rater is marking the summaries to a high standard
6. My summary will be judged against a high standard

PQ

Instructions: Listed below are a number of beliefs you may have about writing the summary. Please rate the following items as you believe to be true for you **right now** using the scale below*:*

0	1	2	3	4
Not at all likely	**Somewhat likely**	**Moderately likely**	**Very likely**	**Extremely likely**

How likely is it that:

1. You won't do well on the task
2. You will fail this task
3. You will not understand what is required to successfully write this summary
4. You will be frustrated when writing this summary
5. You will feel confused by this written task
6. You will not work well under these conditions
7. You will feel anxious when writing this summary
8. You will feel stressed writing this summary
9. You will find writing this summary hard
10. You will feel overwhelmed by this task
11. You will be bored by this writing task

CQ

Instructions: Listed below are a number of beliefs you may have about writing the summary. Please rate the following items as you believe them to be true for you **right now** using the scale below:

0	1	2	3	4
Not at all bad	**Somewhat bad**	**Moderately bad**	**Very bad**	**Extremely bad**

How bad would it be if:

1. You did not do well on the summary
2. You failed this writing task
3. You did not understand what was required to successfully write this summary
4. You were frustrated when writing this summary
5. You felt confused by this written task
6. You were unable to work well under these conditions
7. You felt anxious when writing this summary
8. You felt stressed writing this summary
9. You found writing this summary hard
10. You were overwhelmed by this task
11. You were bored by this writing task

Experimental and matched control adjectives used in the self-concept certainty computer task

Experimental List			Control List		
POS	NEG	PROC	POS	NEG	PROC
Admirable	Annoying	Deficient	Glamorous	Withdrawn	Childish
Athletic	Arrogant	Dumb	Respectful	Snobbish	Antisocial
Attractive	Boring	Failure	Motivated	Malicious	Corrupted
Capable	Cruel	Foolish	Remarkable	Vague	Anxious
Caring	Deceitful	Hopeless	Benevolent	Ugly	Ruthless
Considerate	Dull	Idle	Respected	Vindictive	Stubborn
Courageous	Inactive	Critical	Helpful	Insensitive	Violent
Creative	Greedy	Inadequate	Sensitive	Vicious	Unpleasant
Enchanting	Helpless	Incapable	Decent	Crude	Cunning
Ethical	Ignorant	Ineffective	Enthusiastic	Hostile	Unscrupulous
Generous	Inferior	Lazy	Fun	Obscure	Dangerous
Gorgeous	Insignificant	Loser	Adventurous	Insecure	Vulnerable
Handsome	Irresponsible	Pathetic	Honourable	Uncreative	Defensive
Honest	Nasty	Slack	Excellent	Conceited	Irritable
Humorous	Passive	Slow	Talented	Submissive	Plain
Imaginative	Possessive	Stupid	Stable	Unjust	Artificial
Intelligent	Selfish	Uncertain	Amiable	Unreasonable	Awkward
Interesting	Superficial	Unproductive	Refined	Offensive	Disastrous
Knowledgeable	Tactless	Unreliable	Gifted	Assuming	Disgusting
Lovable	Thoughtless	Useless	Fair	Heartless	Dominating
Loyal	Unappealing	Weak	Clever	Disagreeable	Formidable
Optimistic	Uneducated	Worthless	Agreeable	Jealous	Impatient
Perceptive	Unfriendly		Outgoing	Ungrateful	
Pleasant			Patient		
Polite			Earnest		
Sexy			Trendy		
Sincere			Eloquent		
Successful			Popular		
Supportive			Charitable		
Tolerant			Congenial		
Valuable			Original		
Warm			Genuine		
Wise			Calm		
Witty			Energetic		
Worthy			Compassionate		

Note. POS: positive attributes; NEG: negative attributes; PROC; procrastination attributes

Appendix E: Feedback

Positive Feedback

Dear Participant,

Compared with the other participants I have evaluated, this is one of the better summaries I have seen. I understand that it is difficult to produce a well-structured and referenced summary within the time limit given, however it is evident that you have understood the task to a much greater degree than most other participants. Given your stage of training in psychology, I think you have done an excellent job. Well done!

Regards,

Sally

Negative Feedback

Dear Participant,

Compared with the other participants I have evaluated, your summary did not match the standard of most other summaries I have seen. I understand that it is difficult to produce a well-structured and referenced summary within the time limit given, however it is evident that you have not understood the task to the same degree as most other participants. Given your stage of training I would have expected a more advanced level of writing.

Regards,

Sally

Appendix F: Statistical Analyses

Please see attached disc.