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**An Examination of the Content and Construct Validity of
Four Measures of Procrastination
by
Christine M. Vestervelt, B.A.**

**A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfilment of
the requirements for the degree of
Master of Arts**

**Carleton University
Ottawa, Ontario
January, 2000
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acceptance of the thesis**

**AN EXAMINATION OF THE CONTENT AND CONSTRUCT VALIDITY OF
FOUR MEASURES OF PROCRASTINATION**

**submitted by Christine M. Vestervelt, B.A.
in partial fulfilment of the requirements for
the degree of Master of Arts**

A handwritten signature in black ink, appearing to read 'T. Ryck', written over a horizontal line.

Thesis Supervisor

A handwritten signature in black ink, appearing to read 'K. Math', written over a horizontal line.

Chair, Department of Psychology

**Carleton University
February, 2000**

Abstract

The purpose of the present study was to explore the content and construct validity of four measures of procrastination (i.e., General Procrastination Scale, Decisional Procrastination Scale, Adult Inventory of Procrastination, Aitken Academic Procrastination Scale) through examining the underlying factor structure of each measure and the overall factor structure across the measures. Data collected from 914 undergraduate students was analysed using a one-factor confirmatory factor analysis for each of these measures, followed by principal components analyses (PCAs). A one-factor model only fit the Decisional Procrastination Scale with the other measures having three factors each. An overall PCA of the measures resulted in five interpretable factors: generalized behavioural delay, punctuality with regard to appointments, delay with regard to decisions, punctuality with regard to routine personal tasks, and failure to meet deadlines. The results of these analyses are discussed in relation to the discrepancy between the theoretical and operational definitions of procrastination.

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An Examination of the Content and Construct Validity of Four Measures of Procrastination

Introduction

Procrastination has really only become a serious topic for empirical research in the past 10 to 15 years (Milgram, Mey-Tal, & Levison, 1998), and the results of this research indicate that it is prevalent (e.g., Ferrari, Johnson, & McCown, 1995; Senécal, Koestner, & Vallerand, 1995) and personally harmful (e.g., Beswick, Rothblum, & Mann, 1988; Ferrari, 1991b; Ferrari & Emmons, 1994; Johnson & Bloom, 1995). Although many scales have been developed to measure procrastination (for a review see Ferrari, Johnson, & McCown, 1995), these measures do not appear to be homogeneous and, to date, no studies have examined the underlying structure of four of the most commonly used measures or the relationships between them. As well, there appears to be a lack of congruence between the theoretical formulation and operational definitions of procrastination. Thus it is possible that extant scales of procrastination may have limited validity. The purpose of the present study is to address this gap in the research literature through an examination of four commonly used measures of procrastination including an exploration of the relationships among these measures, as well as the underlying factor structure.

The thesis begins with a review of the existing research literature with the aim of defining procrastination theoretically and then moves to differentiating the identified types of procrastination. Findings are then presented to show how researchers have divided the construct of procrastination into two basic types, trait and situational. A

review of psychometric information regarding three trait measures and one situational measure of procrastination is given, and the rationale for the study is explained.

A Theory of Procrastination

At present, there appears to be no consensus in the research literature regarding a complete, specific, and adequate definition of procrastination (Ferrari, Johnson, & McCown, 1995). Nevertheless, there does appear to be some agreement amongst researchers that procrastination, in general, includes not only a behavioural component of task avoidance or delay but also cognitive and affective components (Bridges & Roig, 1997; Haycock, McCarthy, & Skay, 1998; Solomon & Rothblum, 1984; White, 1988). Researchers' views regarding each of these three components follow in order to arrive at definitions of each component for the present study.

When defining the behavioural component of procrastination, some researchers discuss the initiation, performance, or completion of a task being postponed, delayed, or put off (Birner, 1993; Effert & Ferrari, 1989; Ferrari, 1989; Ferrari, 1992a; Milgram, Sroloff, & Rosenbaum, 1988), as well as having taken "excessively long" (Senécal, Lavoie, & Koestner, 1997, p. 900) or an unreasonable amount of time to have done the task (Rothblum, Solomon, & Murakami, 1986). Other researchers consider procrastination to be either the delaying of a task and/or the incompleteness of a task (Hill, Hill, Chabot, & Barrall, 1978; Tuckman & Sexton, 1989, as cited in Tuckman, 1991) by a certain deadline (Ellis & Knaus, 1977, as cited in Green, 1982). As well, some researchers believe that a definition of procrastination should not only

include the inactions of delaying or not completing tasks but also dilatory acts (Lay & Silverman, 1996; Schouwenburg & Lay, 1995) or "delay behaviors" such as watching television (Lay & Brokenshire, 1997, p. 89), that enable one to avoid doing the intended task (Lay, 1986; White, 1988). Lastly, there appears to be consensus that a person is not procrastinating if a task is occasionally put off, but rather if there is a chronic, habitual, or frequent tendency to postpone the initiation or completion of tasks (Burka & Yuen, 1982; Ferrari, 1993; Ferrari & Emmons, 1994; Ferrari & Emmons, 1995; Ferrari & McCown, 1994; Lay, 1986; Rothblum, Solomon, & Murakami, 1986). Thus, for the purposes of the present study, the behavioural component of procrastination was defined as a chronic or habitual tendency to delay, possibly through dilatory acts, the initiation, performance, or completion of tasks by deadlines.

A cognitive element of unrealized intentions, goals, priorities, or requirements in regard to performing tasks has also been included by many researchers in defining procrastination (Blunt & Pychyl, 1998; Effert & Ferrari, 1989; Ferrari, 1989; Ferrari, 1993; Ferrari & Emmons, 1994; Hill, Hill, Chabot, & Barrall, 1978; Lay, 1986; Lay & Burns, 1991; Milgram, Sroloff, & Rosenbaum, 1988; Senécal, Lavoie, & Koestner, 1997; Wesley, 1994; White, 1988). According to these researchers, it appears that the essence of procrastination involves a lack of congruence between intentions and performance. Whereas some researchers (Blunt & Pychyl, 1998; Effert & Ferrari, 1989; Ferrari, 1989; Ferrari, 1993; Ferrari & Emmons, 1994; Hill, Hill, Chabot, & Barrall, 1978; Lay & Burns, 1991; Milgram, Sroloff, & Rosenbaum, 1988; Senécal, Lavoie, & Koestner, 1997; Wesley, 1994) do not specifically state in their definitions

of procrastination who decides when a task should be done, other researchers point out that it is when a task is not performed in relation to the individual's own intentions, priorities, or objectives that constitutes procrastination (Ferrari, 1994; Lay, 1986; Lay, 1987; Lay & Brokenshire, 1997; Lay & Schouwenburg, 1993; Lay & Silverman, 1996; Schouwenburg & Lay, 1995; White, 1988). As well, if a task that an individual has designated as a low priority is performed before a task that the same individual has designated as a high priority, then this individual could be considered to be procrastinating on this high priority task. For Lay (1986), it is not if one task is performed before another, but if an individual does not spend enough time on his or her most significant priorities in relation to lower priorities that this individual would be considered to be procrastinating. Lay (1986, 1987) also believes that this would rule out being too busy as an excuse for procrastination, as he believes that these individuals should use what time they have to perform tasks in their order of priority.

This notion of congruence between intentions and performance accords well with the definition of procrastination put forth by Milgram, Sroloff, and Rosenbaum (1988) who would like to see not only the temporal aspect of when the task was performed included but also the scheduling of and adherence to a schedule for the task. Even if no formal scheduling is done by an individual, his or her intentions, priorities, or objectives could constitute an informal schedule against which performance can be compared.

There are times, however, when an individual's performance does not accord with his or her intentions to complete a task "on time," yet this person may not be

considered to be procrastinating. According to Silver and Sabini (1981), if an individual started and performed a task when intended, even if this was at a time that most people would consider to be late, this person is not to blame if he or she simply misjudged the amount of time needed to complete the task. Thus, at times when an individual does not complete a task by a certain deadline, even though he or she intended to do so, it may not be procrastination. In addition, it does not appear to be procrastination if an individual is unaware that he or she is delaying beginning or completing a task.

Although it is possible that "one could unconsciously delay action" (Freud, 1901, as cited in Birner, 1993, p. 541), some researchers state that an individual must recognize or know that he or she is purposely delaying a task for it to be considered procrastination (Ferrari, 1991a; Ferrari, 1992c; Senécal, Koestner, & Vallerand, 1995; Senécal, Lavoie, & Koestner, 1997; Silver & Sabini, 1981; Silver & Sabini, 1982). Thus it seems reasonable to conclude that an individual is not procrastinating if he or she simply did not remember to do a task at the time that it needed doing.

Therefore, for the purposes of the present study, the cognitive component of procrastination was defined as the chronic or habitual lack of congruence between an individual's intentions, priorities, or objectives with regard to tasks, and his or her performance of these tasks. It is not considered to be procrastination if an individual misjudged the time needed to complete a task or was unaware of his or her delay with regard to a task.

That procrastination must also include an affective component has been insisted upon by some researchers; be it a feeling of pressure, distress, or discomfort at not

having begun, worked on, or finished a task (Ellis & Knaus, 1977, as cited in Ferrari 1992c; Haycock, McCarthy, & Skay, 1998; Johnson & Bloom, 1995; Rothblum, Solomon, & Murakami, 1986; Senécal, Koestner, & Vallerand, 1995; Solomon & Rothblum, 1984; White, 1988). For example, Haycock, McCarthy, & Skay (1998) believe that it is this affective component that distinguishes procrastination from just deciding to do a task at a later time, and they label this procrastination as "problematic" (p. 317). Thus, according to these researchers, if an individual misses a deadline or delays doing a task, without feeling any negative affect, this would not be procrastination.

The issue of how much negative affect would have to be experienced to be considered an instance of procrastination is also of concern to researchers. Rothblum, Solomon, and Murakami (1986) believe that one must experience "considerable anxiety" (p. 387). Other researchers note that the discomfort that is felt with regard to procrastination is subjective (Ellis & Knaus, 1977, as cited in Ferrari, 1992a; Solomon & Rothblum, 1984). Therefore, a situation in which one individual may feel considerable anxiety may be of little or no concern to another individual. Thus, for the purposes of the present study, the affective component of procrastination was defined as the subjective distress that is felt by an individual in regard to his or her habitual tendency to not begin, work on, or finish tasks by deadlines.

In summary then, many researchers describe procrastination as including behavioural, cognitive, and affective components. In the present study, the behavioural component of procrastination was defined as a chronic or habitual tendency to delay,

possibly through dilatory acts, the initiation, performance, or completion of tasks by deadlines. The cognitive component of procrastination was defined as the chronic or habitual lack of congruence between an individual's intentions, priorities, or objectives with regard to tasks, and his or her performance of these tasks. Lastly, the affective component of procrastination was defined as the subjective distress that is felt by an individual in regard to his or her habitual tendency to not begin, work on, or finish tasks by deadlines.

The issue may also arise as to whether procrastination always leads to negative outcomes. According to Milgram (1991), procrastination involves delaying the completion of a task and, because of this, not accomplishing the task as well as one could have. For Milgram procrastination also includes recognizing that this task accords with one's priorities, goals, intentions or requirements, and experiencing some amount of distress over having procrastinated on this task. Thus, not only has Milgram included behavioural, cognitive, and affective components in his definition, he has also added the expected outcome of the task; a "substandard behavioral product" (p. 151). However, it is possible that not all behavioral products of procrastinators turn out to be substandard. If this were so, then procrastination might be thought of as a subcategory of self-handicapping behavior which, according to some researchers (e.g., Lay, Knish, & Zanatta, 1992), is not the case.

There are also times when procrastination may even be beneficial (Birner, 1993; Ferrari, 1992b), and some researchers have referred to these situations as "functional procrastination" (Ferrari, 1993b, as cited in Ferrari, 1994; Ferrari &

Emmons, 1995). Under these circumstances, according to Birner, the individual would not be considered to be procrastinating. Thus it appears that whereas Birner does not consider functional procrastination to really even be procrastination, other researchers continue to use the term functional procrastination.

With regard to instances of procrastination with positive outcomes, an important definitional issue becomes whether or not all situations in which an individual procrastinated with positive outcomes are not to be considered procrastination. It does appear to make a difference though when it becomes apparent to someone that it would be advantageous to delay the task. If an individual knows right from the start that he or she should delay doing the task, then this individual's behaviour does match his or her intentions and could either be considered to not be procrastination or to be functional procrastination; whereas if someone delays a task with no clear advantage in mind, then it appears reasonable to continue to label this behaviour as procrastination even if there is a positive outcome. For example, if an individual has a report due for work on Wednesday but knows that he or she will only be getting some information pertinent to this topic on Wednesday, then his or her delaying handing in the report can be considered an instance of functional procrastination. In this regard, Solomon and Rothblum (1984) define procrastination as "the act of needlessly delaying tasks" (p. 503) and Holtzman (as cited in Birner, 1993) defines it as "delay without purpose" (p. 546). In the present study, the focus is on identifying the components of procrastination in general, as well as the types of procrastination identified in the research literature, without regard for the outcomes of procrastination.

Lastly, some researchers have noted the importance of ability to do a task and control over a task in their definitions of procrastination (Ferrari, 1994; Silver & Sabini, 1981; Tuckman & Sexton, 1989, as cited in Tuckman, 1991). Thus, for the purposes of the present study, if someone intends and attempts to do a task but does not succeed, it is not procrastination if he or she did not have control over the task, as well as the ability or resources to do the task, as opposed to having had all of these.

In summary then, in the present study, given control over, as well as the ability and resources to do a task, procrastination, in general, was defined theoretically as including a behavioural (delay) component, a cognitive (intention) component, and an affective (emotional distress) component. Moving from a general definition of procrastination, most researchers argue, more specifically, that procrastination is divided into two main types or approaches to understanding procrastination that mirror general trends in social and personality psychology, namely trait-based procrastination and situationally-specific procrastination. Moreover, as procrastination in general was defined in the present study as including behavioural, cognitive, and affective components, it follows that each of these main types of procrastination would also include these components. The following section provides a review of the literature regarding these two main types of procrastination and their possible subtypes.

Differentiating Types of Procrastination

In general, different "types" of procrastination have been identified in the research literature including: trait, life routine, decisional, arousal, avoidant, situational

or task, and academic procrastination. As there is a lack of research comparing these types of procrastination (Milgram, Batori, & Mowrer, 1993), the issue appears to be whether or not these are discrete types of procrastination sharing no common features, whether there is some degree of overlap, or whether they are all basically reducible to one or a couple of constructs. Based on a review of the research literature, a classification of the various types of procrastination emerges with trait procrastination as one main category (with decisional, life routine, arousal, and avoidant procrastination as subcategories) and situational or task procrastination as another main category (with academic procrastination as a subcategory). Researchers' theoretical views regarding each of these types of procrastination follow in order to provide some support for how this classification system was arrived at.

Trait Procrastination. For the purposes of the present study, trait procrastination was defined as an individual's chronic or habitual tendency to delay the initiation, performance, or completion by deadlines of diverse tasks. Thus, this definition of trait procrastination is similar to the definition of the behavioural component of procrastination except that trait procrastination adds that the delay must be across diverse tasks. Researchers' theoretical views regarding trait procrastination follow in order to show how this definition was arrived at.

In the research literature, trait procrastination has been defined as "the predisposition to engage in dilatory behavior" (Lay & Brokenshire, 1997, p. 83) and "the tendency to postpone that which is necessary to reach some goal" (Lay, 1990, p.

93). Thus, in these definitions reference is made to a general tendency to delay performing tasks.

Trait procrastination also appears to have had many other labels applied to it, in the research literature, including dysfunctional (Ferrari, 1994; Ferrari & Emmons, 1994; Ferrari & Emmons, 1995; Ferrari & Olivette, 1994), chronic (Ferrari, 1993; Ferrari & Emmons, 1994), compulsive (Ferrari, 1991b), dispositional (Ferrari, 1991a; Lay & Silverman, 1996), and persistent procrastination (Ferrari, 1991b). For example, dysfunctional procrastination has been defined as "frequent delays" which are "inappropriate and self-defeating" (Ferrari & Emmons, 1995, p. 135), and "chronically delay[ing] tasks" (Ferrari, 1993b, as cited in Ferrari, 1994). Again, reference is made to a general tendency to delay performing tasks. Chronic procrastination, though, has been defined as an "habitual difficulty in completing life tasks in a timely fashion, evident in more than one social environment (McCown & Johnson, 1989, as cited in McCown, Carise, & Johnson, 1991, p. 148). Thus this definition for chronic procrastination more explicitly mentions that this type of procrastination will be evident in many areas of an individual's life, as opposed to just a single area, which, in the present study, is regarded to be the distinguishing feature of trait procrastination as distinct from situational procrastination. Therefore, based on a review of the research literature, for the purposes of the present study, trait, dysfunctional, chronic, compulsive, dispositional, and persistent procrastination all appear to be the same construct and will from this point be referred to as trait procrastination.

Some researchers treat procrastination in everyday living or "life routine" procrastination as a subtype of trait procrastination (Milgram, Batori, & Mowrer, 1993, p. 487; Milgram, Sroloff, & Rosenbaum, 1988), although it could be argued that life routine tasks are not that diverse, and could be considered a type of situational procrastination (discussed below). Another subtype of trait procrastination identified in the research literature is decisional procrastination (Harriott & Ferrari, 1996), indecision (Blunt & Pychyl, 1998; Effert & Ferrari, 1989; Ferrari & Dovidio, 1997; Harriott & Ferrari, 1996; Harriott, Ferrari, & Dovidio, 1996), or neurotic procrastination (Ellis & Knaus, 1979, as cited in Milgram, Mey-Tal, & Levison, 1998). It has been defined as "the purposive delay in making decisions within some specific time frame" (Effert & Ferrari, 1989, p. 152) or "a strong predisposition toward an inability to make timely decisions" (Janis & Mann, 1977, as cited in Ferrari, 1991b, p. 455). Effert and Ferrari (1989) specify that these decisions should be "major" (p. 151). For example, if almost every time someone has an important decision to make such as what house to buy, when to ask for a promotion, or how to discipline their children, and this decision is put off past when he or she would have liked to have made these decisions, then this person can be described as a decisional procrastinator.

Finally, two other subtypes of trait procrastination, defined by motivational reasons, have been identified in the research literature including arousal (Ferrari, 1993; Harriott & Ferrari, 1996), and avoidance/behavioral procrastination (Ferrari, 1992c; Ferrari, 1994; Ferrari & Emmons, 1994; Ferrari & Olivette, 1994; McCown & Johnson, 1989, as cited in Ferrari & Emmons, 1995; Milgram, Mey-Tal, & Levison,

1998). More specifically, both arousal and avoidant procrastination are defined as types of "dispositional" (Harriott & Ferrari, 1996, p. 613; Milgram, Mey-Tal, & Levison, 1998) or "chronic" procrastination (Ferrari, 1993, p. 31), which, in the present study, are taken to be equivalent to trait procrastination. Regarding arousal procrastination, Ferrari (1993) explains that "[p]rocrastinators [are] motivated by arousal from working against a deadline" (p. 25). In contrast, avoidant procrastination has been defined as "...a tendency to delay task performance as a way to avoid aversive tasks, performance failure, or threats to self-esteem" (Ferrari, 1989; McCown & Johnson, 1989, as cited in Ferrari & Olivette, 1994, p. 89).

In summary then, in the present study, trait procrastination was defined as an individual's chronic or habitual tendency to delay the initiation, performance, or completion by deadlines of diverse tasks. The subtypes of trait procrastination that have been identified in the research literature include life routine, decisional, arousal, and avoidant.

Situational Procrastination. For the purposes of the present study, situational procrastination was defined as a chronic or habitual tendency to delay the initiation, performance, or completion of tasks by deadlines in a single area of an individual's life. A very common and often studied subtype of situational procrastination is academic procrastination (e.g., Blunt & Pychyl, 1998; Milgram & Naaman, 1996; Senécal, Lavoie, & Koestner, 1997). Different definitions of academic procrastination have been put forth by various researchers. Rothblum, Beswick, and Mann (1984, as cited in Rothblum, Solomon, & Murakami, 1986) define academic procrastination as a "self-

reported tendency (a) to nearly always or always put off academic tasks, and (b) to nearly always or always experience problematic levels of anxiety associated with this procrastination" (p. 387). Specifically, Solomon and Rothblum (1984) found that the academic tasks for which procrastination was highest included doing weekly reading assignments, studying for exams, and writing term papers. Ellis and Knaus (1977, as cited in Ferrari, Parker, & Ware, 1992, and Harriott & Ferrari, 1996) define this type of situational procrastination as purposively delaying beginning or completing academic tasks. Milgram, Marshevsky, and Sadeh (1995) go a step further and look at "...five aspects of academic procrastination--behavioral delay, personal upset about the delay, task aversiveness, task capability, and the desire to reduce behavioral delay..." (p. 145). Thus it appears that, as defined in the research literature, academic procrastination, a subtype of situational procrastination, comprises some number of related academic tasks, the initiation, performance, or completion of which, might be delayed by an individual.

In contrast, situational, or task, procrastination is regarded by Harris and Sutton (1983) as "a behavior that is tied to a specific task" (p. 988). Consonant though with the proposed division, in the present study, between trait and situational procrastination, Harris and Sutton do not see task procrastination as a result of an individual's personality but rather as a result of the situation, including characteristics of the task that elicit procrastination. Thus, rather than defining situational procrastination as comprising subgroups of related tasks, Harris and Sutton regard a specific task as the "unit of analysis" (p. 988).

In summary then, in the present study, situational procrastination was defined as a chronic or habitual tendency to delay the initiation, performance, or completion of tasks by deadlines in a single area of an individual's life. What is not defined in the present though, but open to debate, is whether an area is defined as a subgroup of related tasks or as one specific task.

Overall, what is evident from this review of the literature is that although different types of procrastination have been identified, generally researchers agree that there is one main category of procrastination that is trait-like (i.e., life routine, dysfunctional, chronic, compulsive, dispositional, persistent, decisional, indecision, neurotic, arousal, avoidant, behavioral), and one main category of procrastination that is situational (particularly academic).¹ Not only does a trait and situational categorization of procrastination emerge theoretically in the research literature, but there also appears to be empirical evidence in the research literature for such a division (Ferrari & Pychyl, in press).

Trait and Situational Procrastination

The existence of both trait and situational explanations of procrastination is acknowledged theoretically by many researchers (Harriott & Ferrari, 1996; Johnson & Bloom, 1995; Lay, Knish, & Zanatta, 1992; Milgram, Batori, & Mowrer, 1993; Milgram, Dangour, & Raviv, 1992; Milgram, Sroloff, & Rosenbaum, 1988; Senécal, Lavoie, & Koestner, 1997). Empirical findings regarding trait and situational explanations of procrastination follow in order to highlight the importance of

considering both of these influences on procrastination, even though some researchers might simply want to acknowledge one of them.

Procrastination as a trait is advocated by Johnson (1992, as cited in Ferrari, Johnson, & McCown, 1995). She found significant positive correlations ranging from 0.21 to 0.41 between psychological symptoms and procrastination, as measured by the Adult Inventory of Procrastination (McCown & Johnson, 1989), for a clinical group of individuals during their first appointment. Their procrastination was found to have been only slightly reduced after the psychological symptoms that these clients displayed got better. Johnson thus concludes that procrastination is a stable trait, but her study did not test for and rule out the possibility of situational procrastination. These individuals may still have been subjected to the same situational conditions that might have first elicited their procrastinatory behaviours.

Evidence for a situational form of procrastination is provided by Milgram, Batori, and Mowrer (1993) who observed that there was a moderate correlation between students' procrastinatory behaviours in an English course and other courses given in Hebrew that they were taking at the same time, whereas no correlation was found between academic procrastinatory behaviour and procrastinatory behaviour for everyday tasks. To measure academic procrastination, a modified version of the Procrastination Assessment Scale--Students or PASS was used. This scale measures the frequency of some academic procrastinatory behaviours (i.e., behavioural delay) as well as emotional upset regarding these behaviours. To measure procrastinatory behaviour for everyday tasks, a scale developed by Milgram, Sroloff, and Rosenbaum

(1988) was used. This scale defines procrastination as a combination of scheduling various tasks and adhering to these schedules (i.e., behavioural delay and a possible cognitive component).

A later study, though, by Milgram, Mey-Tal, and Levison (1998) found that there was a correlation of 0.65 between academic procrastination and life routine procrastination for both a group of students and their parents, now providing what they believe to be evidence for generalized or trait procrastination. This study developed its own measures including student and parent forms of an Academic Procrastination Scale and student and parent forms of a Life Routine Procrastination Scale. All of these measures define procrastination as "putting off to a later date things that we should or think we should do earlier" (p. 304), or, in other words, behavioural delay.

The difference in results between the study by Milgram, Batori, and Mowrer (1993) and Milgram, Mey-Tal, and Levison (1998) may be due to the different operationalizations of academic and everyday tasks/life routine procrastination in the two studies. In the earlier study not only was behavioural delay with regard to academic procrastination measured but also affect with regard to this procrastination. In contrast, in the later study only behavioural delay with regard to academic procrastination was measured, disregarding a possible affective component. In both studies life routine procrastination was operationalized as behavioural delay, but the earlier study also measured a possible cognitive component. Thus, it is possible that the later study found a correlation between academic and life routine procrastination due to the subsequent

exclusion of items, in the academic and life routine measures, tapping an affective component, as well as a possible cognitive component of procrastination.

Lastly, Ferrari (1993) found that both trait and situational explanations of procrastination appear to have ecological validity. He found that whereas some individuals said that their procrastinatory behaviour was a result of personal attributes including "lack of energy, indecisiveness, [and] perceived task aversiveness," others gave situational reasons including "work, [and] business commitments" (p. 25).

Thus, the empirical findings in the research literature with regard to whether procrastination is strictly trait or situationally-based appear to be inconclusive emphasizing the importance of considering both trait as well as situational or task factors in explaining procrastination. Theoretically, Schouwenburg and Lay (1995) believe that achievement, or lack of achievement, in university is due to more than just trait procrastination, but is also due to intelligence, effort, as well as situational aspects of the university. Milgram, Mey-Tal, and Levison (1998) state that before an individual procrastinates on a task, that person first considers both task and personal issues to arrive at an idiosyncratic judgment of aversiveness. Thus these researchers appear to be acknowledging not only the existence but also the importance of both situational and trait explanations of procrastination.

In summary then, there appears to be both theoretical and empirical support in the research literature for both trait and situational explanations of procrastination. Generally, most personality psychologists acknowledge that both trait and situational factors combine to lead to an individual's behaviour (Atkinson, Atkinson, Smith, &

Bern, 1990). In the area of procrastination, these broad influences have been operationalized as two distinct categories of procrastination, namely trait and situational (particularly academic) procrastination. As it appears that trait and situational procrastination are related to some extent conceptually in that, in the present study, they are both defined as having behavioural, cognitive, and affective components, measures of these constructs may also be related empirically and share similar factor structures.

Measures of Procrastination

A chapter by Ferrari, Johnson, and McCown (1995) reviews seven current measures of procrastination. They state that measures of procrastination assess "everyday, global tendencies" (i.e., trait procrastination) and "academic behaviors" (i.e., situational procrastination) (p. 49). Thus, measures of procrastination appear to be separated according to this trait-situational classification. Among the measures of everyday procrastination listed by Ferrari et al. are the General Procrastination Scale or GP (Lay, 1986), the Decisional Procrastination Scale or DP (Mann, 1982), and the Adult Inventory of Procrastination or AIP (McCown & Johnson, 1989) (refer to Appendix A). Ferrari et al. (1995) classify the Aitken Academic Procrastination Scale (Aitken, 1982) as an academic procrastination measure (refer to Appendix A).

Although in the research literature on procrastination, it appears that there is some agreement amongst researchers that procrastination, in general, includes not only a behavioural component of task avoidance or delay, but also cognitive and affective components, interestingly these four commonly used measures of procrastination

appear to simply tap a behavioural component of procrastination, comparable to a layperson's definition of procrastination as task delay. Thus there is a gap between the theoretical and operational definitions of procrastination. Each of these scales is discussed below in order to investigate the established validity of these measures to date.

General Procrastination Scale. The General Procrastination Scale, GP, or Form G (Lay, 1986) is the most general measure of procrastination and the most widely used of all measures. It consists of 20 items scored on a 5-point Likert-type scale, with half of the items reverse scored. All items are summed together for one score with higher scores indicative of greater procrastinatory tendencies.

In regard to content validity, the construction of the scale is based on the definition of procrastination as "the tendency to postpone that which is necessary to reach some goal" (p. 475). Although all items tap a behavioural component of procrastination, only some items explicitly include mention of some sort of goal. For example, items include "In preparing for some deadlines, I often waste time by doing other things," and "I generally return phone calls promptly." There are no items which tap a cognitive or affective component of procrastination. Lastly, this measure does not include items which make specific reference to academic behaviours or possible motives for procrastination (Lay, 1986). Thus, this measure does not appear to have content validity with regard to either the definition of procrastination on which it was based or with regard to the theoretical definition of procrastination established by the present study.

Despite the omission of possible reasons for procrastination, Ferrari (1992c) believes that this scale measures procrastination that is motivated by "sensation seeking" (p. 106), or, in other words, postponing finishing a task in order to augment the arousal from working against a deadline, possibly easing doing the task (Ferrari, 1993). Ferrari (1992c) arrived at this conclusion on the basis of a factor analysis on data from 215 older part-time students, which included the GP, the Adult Inventory of Procrastination (AIP), Zuckerman, Eysenck, and Eysenck's (1978) Sensation-Seeking Scale (Form V), Cacioppo and Petty's (1982) Need for Cognition Scale, and Rosenberg's (1979) Self-Esteem Scale. He found that the GP loaded positively, although not highly, onto a factor that also included the subscales of the sensation-seeking scale.

Cronbach alphas for the GP scale have been found to range from 0.79 to 0.89 (Blunt & Pychyl, 1998; Donovan, 1995; Ferrari, 1992b; Harriott & Ferrari, 1996; Lay, 1986; Lay, 1987). There is some consensus among researchers that a correlation of less than 0.70 indicates a level of internal consistency of a scale or subscale that is inadequate, from 0.70 to 0.84 that a scale or subscale is not homogeneous, and 0.85 or greater that the scale or subscale is homogeneous and measures only one construct (Murphy, 1993). Thus, whereas some studies have found this measure to be homogeneous (Blunt & Pychyl, 1998; Harriott & Ferrari, 1996; Lay, 1987), others have not (Donovan, 1995; Ferrari 1992b; Lay, 1986). Ferrari (1989) found that this measure has a test-retest reliability of 0.80 for a one month period.

Procrastination scores as assessed by this measure have been found to be significantly positively correlated with task delays including taking longer to use gift

certificates issued for participation in a study (Ferrari, 1993), taking longer to return a completed inventory to the researcher (Ferrari, 1992c), taking longer to return a completed postage-paid inventory to the researcher (Lay, 1986), and taking longer to return a postage-paid envelope to the researcher (Lay, 1986). Ferrari (1993) found that individuals who did their shopping on Christmas Eve had significantly higher procrastination scores than individuals who were tested five weeks previously. As well, Lay found that high procrastinators in contrast to low procrastinators reported expending not as much time, as well as insufficient time, on their tasks.

Table 1 presents a summary of research regarding the convergent and divergent validity of the GP. Although the GP was found to be moderately to highly correlated with the Decisional Procrastination Scale (DP), contradictory convergent evidence with the AIP was found, which necessitates further investigation. As well, the homogeneity of this measure is questionable, and no factor analysis of the underlying structure of this scale has been reported. In summary then, there is not adequate evidence of the validity of this measure.

Table 1.

Correlations of the General Procrastination Scale with Other Measures of Procrastination and with Other Relevant Scales

Correlations with the Decisional Procrastination Scale (DP)

<u>Correlation</u>	<u>Study</u>	<u>Sample</u>
0.88	Ferrari, 1991c	female college students ($N=120$)
0.78	Ferrari, 1991b	female college students ($N=241$), Sample 1
0.74	Ferrari, 1991b	female college students ($N=287$), Sample 2
0.71	Blunt & Pychyl, 1998	female university students ($N=89$), Study 1
0.66	Blunt & Pychyl, 1998	female university students ($N=79$), Study 2
0.58	Blunt & Pychyl, 1998	male university students ($N=40$), Study 2
0.56	Blunt & Pychyl, 1998	male university students ($N=53$), Study 1
	Harriott & Ferrari, 1996	adult nonstudent males & females, partial correlation controlling for age ($N=211$)

(table continues)

TABLE 1. (continued)

Correlations with the Adult Inventory of Procrastination (AIP)

<u>Correlation</u>	<u>Study</u>	<u>Sample</u>
0.79	Blunt & Pychyl, 1998	female university students ($N=89$), Study 1
0.76	Harriott & Ferrari, 1996	adult nonstudent males & females, partial correlation controlling for age ($N=211$)
0.67	Blunt & Pychyl, 1998	male university students ($N=53$), Study 1
<u>ns</u>	Ferrari, 1992c	nontraditional ($N=52$) & traditional ($N=59$) male & female college students, Study 1
<u>ns</u>	Ferrari, 1992c	nontraditional male & female college students ($N=215$), Study 2

Correlations with other scales

Lay, 1986, sample of male & female undergraduates ($N=76$)

0.69	neurotic disorganization (Jackson, 1967a)
-0.49	organization (Jackson, 1976)
-0.43	social desirability (Jackson, 1967b)
0.34	rebelliousness (Jackson, 1967a)

(table continues)

TABLE 1. (continued)

Lay, 1986, adult nonstudent sample (N=86)

0.40 variation of the Cognitive Failures Questionnaire (Broadbent, Cooper, Fitzgerald, & Parkes, 1982)

Donovan, 1995, sample of male & female undergraduates (N=54)

0.28 Death Anxiety Scale (Templer, 1967, 1970)

Decisional Procrastination Scale. The Decisional Procrastination Scale or DP (Mann, 1982, as cited in Ferrari, Johnson, & McCown, 1995) consists of 5 items scored on a 5-point Likert-type scale. Higher scores are taken to be indicative of greater procrastinatory tendencies. This scale was originally part of a larger inventory of "conflict coping patterns" (Burnett et al., 1989; Janis & Mann, 1977, both as cited in Harriott, Ferrari, & Dovidio, 1996, p. 339).

Ferrari and Dovidio (1997) state that "[h]igh scores on this scale reflect a tendency to put off decisions by doing other tasks" (p. 529), but there is only one out of the five items that refers to this. Beswick, Rothblum, and Mann (1988) describe this procrastination scale as corresponding to "conflictful [sic] decisions" (p. 208), but these items say nothing about the type of decisions that are involved. According to Janis and Mann (1977, as cited in Ferrari, 1991b) decisional procrastination is "a strong predisposition toward an inability to make timely decisions (to be indecisive)" (p. 455), but it is not known whether this measure was based on this definition. Nevertheless, there is a single item that taps untimely decisions.

Regarding content validity, all of the items appear to tap a behavioural component of procrastination with regard to making and acting upon decisions. Examples of items include "I put off making decisions," and "Even after I make a decision I delay acting upon it." Again, there are no items which tap a cognitive or affective component of delay with regard to decisions. Thus, this measure does not appear to have content validity with regard to the theoretical definition of procrastination established by the present study.

This scale has been found to have Cronbach alphas ranging from 0.70 to 0.81 (Blunt & Pychyl, 1998; Ferrari, 1994; Ferrari & Dovidio, 1997; Ferrari & Emmons, 1994; Harriott & Ferrari, 1996; Harriott, Ferrari, & Dovidio, 1996; Mann, 1982, as cited in Beswick et al., 1988 and Ferrari, Johnson, & McCown, 1995). Thus it appears that the DP is not homogeneous but measures more than one construct. Concerning test-retest reliability, this scale has been found to have correlations of 0.62 (Mann, 1982, as cited in Ferrari, Johnson, & McCown, 1995) and 0.69 for a one month period (Mann, 1982, as cited in Beswick et al., 1988).

Procrastination scores as assessed by this measure have been found to be significantly positively correlated with delaying handing in a term paper (Beswick, Rothblum, & Mann, 1988). Procrastination scores as assessed by this measure have also been found to have predicted task delays regarding handing in a term paper and failing to meet deadlines (Beswick & Mann, 1994, as cited in Effert & Ferrari, 1989).

Table 2 presents a summary of research regarding the convergent and divergent validity of the DP. As presented in the table, there are moderate correlations between

the DP and the General Procrastination Scale (GP) and the DP and the Adult Inventory of Procrastination (AIP), for different samples of individuals, indicating that these scales are measuring somewhat similar yet different constructs. No factor analysis of this measure has been reported. In summary then, there is not adequate evidence of the validity of this measure.

Table 2.

Correlations of the Decisional Procrastination Scale with Other Measures of Procrastination and with a Subscale of the Self-Defeating Personality Scale

Correlations with the General Procrastination Scale (GP)

<u>Correlation</u>	<u>Study</u>	<u>Sample</u>
0.88	Ferrari, 1991c	female college students ($N=120$)
0.78	Ferrari, 1991b	female college students ($N=241$), Sample 1
0.74	Ferrari, 1991b	female college students ($N=287$), Sample 2
0.71	Blunt & Pychyl, 1998	female university students ($N=89$), Study 1
0.66	Blunt & Pychyl, 1998	female university students ($N=79$), Study 2
0.58	Blunt & Pychyl, 1998	male university students ($N=40$), Study 2
0.56	Blunt & Pychyl, 1998	male university students ($N=53$), Study 1
	Harriott & Ferrari, 1996	adult nonstudent males & females, partial correlation controlling for age ($N=211$)

(table continues)

TABLE 2. (continued)

Correlations with the Adult Inventory of Procrastination (AIP)

<u>Correlation</u>	<u>Study</u>	<u>Sample</u>
0.65	Ferrari & Olivette, 1994	female college students ($N=84$)
0.61	Blunt & Pychyl, 1998	female university students ($N=90$), Study 1
0.52	Blunt & Pychyl, 1998	male university students ($N=53$), Study 1
0.46	Harriott & Ferrari, 1996	adult nonstudent males & females, partial correlation controlling for age ($N=211$)
0.45	Ferrari & Emmons, 1994	male & female college students ($N=263$), Sample 1
0.44	Ferrari, 1994	male & female college students ($N=263$)
	Ferrari & Emmons, 1994	male & female college students ($N=277$), Sample 2
	Ferrari & Emmons, 1995	male & female college students ($N=277$)
0.41	Ferrari & Olivette, 1994	fathers of female college students/adult nonstudent males ($N=84$)
0.31	Ferrari & McCown, 1994	male & female adult obsessive- compulsives ($N=65$)
na	Ferrari & Olivette, 1994	mothers of female college students/adult nonstudent females ($N=84$)

(table continues)

TABLE 2. (continued)

Correlation with a subscale of a modified version of the Self-Defeating Personality Scale (Schill, 1990)

<u>Correlation</u>	<u>Study</u>	<u>Sample</u>
0.27	Ferrari, 1994	male & female college students (N=263)

Adult Inventory of Procrastination. The Adult Inventory of Procrastination or AIP (McCown & Johnson, 1989, as cited in Ferrari, Johnson, & McCown, 1995) consists of 15 items scored on a 5-point Likert-type scale. Seven items are reverse-scored, and ratings on all items are added together for one score, with higher scores indicative of recurrent procrastinatory behaviour (Ferrari & Emmons, 1995).

Regarding content validity, although Ferrari and Emmons (1994) state that this measure "assesses an individual's behavioral tendency to delay the beginning and/or completion of tasks" (p. 541), it is not known for certain on which definition of procrastination, if any, this measure was based. The items in the measure do appear to tap a behavioural component of procrastination. For example, items include "I pay my bills on time," and "I don't get things done on time." There are no items which tap a cognitive or affective component of procrastination. More specifically, the items of the measure do appear to represent a tendency to delay completing tasks, but it is not clear that a tendency to delay beginning tasks is being measured. Thus, this measure does not appear to have content validity with regard to the theoretical definition of procrastination established by the present study.

McCown and Johnson (1989b, as cited in Ferrari, Johnson, & McCown, 1995) created this measure through a factor analysis of a larger pool of items by choosing items that loaded 0.5 or greater onto a general procrastination factor. Ferrari (1994) states that this measure is unidimensional, and some researchers suggest that the AIP measures procrastination that is motivated by avoidance (Blunt & Pychyl, 1998; Ferrari, 1992c; Ferrari & McCown, 1994) so that one's self-esteem or self-confidence will be safeguarded (Ferrari, 1992c; Ferrari, 1993; Ferrari, Johnson, & McCown, 1995). Ferrari (1992c) carried out a factor analysis on data from 215 older part-time students which included the AIP, General Procrastination Scale (GP), Zuckerman, Eysenck, and Eysenck's (1978) Sensation-Seeking Scale (Form V), Cacioppo and Petty's (1982) Need for Cognition Scale, and Rosenberg's (1979) Self-Esteem Scale. He found that the AIP loaded negatively, although not highly, onto a factor that also included the need for cognition subscales and self-esteem scale.

This scale has been found to have Cronbach alphas ranging from 0.75 to 0.86 (Blunt & Pychyl, 1998; Ferrari, 1994; Ferrari & Emmons, 1994; Harriott & Ferrari, 1996; McCown & Johnson, 1989a, McCown & Johnson, 1989b, both as cited in Ferrari, Johnson, & McCown, 1995), indicating that the measure may not be homogeneous. McCown and Johnson (1989a) found that this measure has a test-retest reliability coefficient of 0.71 for a one month period and 0.76 for a six month period (1989b).

Procrastination scores as assessed by this measure have been found to be significantly positively correlated with task delays including taking longer to return a

completed inventory to the researcher (Ferrari, 1992c) and taking longer to use gift certificates issued for participation in a study (Ferrari, 1993). Ferrari (1993) found that individuals who did their shopping on Christmas Eve had significantly higher procrastination scores than individuals who were tested five weeks previously. As well, scores on the AIP have been reported to be related to task delays including taking longer to file income tax returns and to pay telephone bills (McCown & Johnson, 1989, as cited in Ferrari, 1994).

Table 3 presents a summary of research regarding the convergent and divergent validity of the AIP. As presented in the table, moderate correlations between the AIP and the Decisional Procrastination Scale (DP), and the AIP and the Aitken Academic Procrastination Scale, for different samples of individuals, were found, again indicating that these scales are measuring somewhat similar yet different constructs. Although significant correlations between the AIP and GP, ranging from 0.67 to 0.79, have been found (Blunt & Pychyl, 1998; Harriott & Ferrari, 1996), Ferrari (1992c) found no significant correlations between these two measures using samples of individuals somewhat similar to those used in the study by Blunt and Pychyl (i.e., student samples). No explanation has been given for these contradictory results. More research is needed to clarify the contradictory evidence found in regard to the GP, as well as the moderate correlation that was found between this trait measure and the Aitken Academic Procrastination Scale. In summary then, there is not adequate evidence of the validity of this measure.

Table 3.

Correlations of the Adult Inventory of Procrastination with Other Measures of Procrastination and with a Subscale of the Self-Defeating Personality Scale

Correlations with the Decisional Procrastination Scale (DP)

<u>Correlation</u>	<u>Study</u>	<u>Sample</u>
0.65	Ferrari & Olivette, 1994	female college students ($N=84$)
0.61	Blunt & Pychyl, 1998	female university students ($N=90$), Study 1
0.52	Blunt & Pychyl, 1998	male university students ($N=53$), Study 1
0.46	Harriott & Ferrari, 1996	adult nonstudent males & females, partial correlation controlling for age ($N=211$)
0.45	Ferrari & Emmons, 1994	male & female college students ($N=263$), Sample 1
0.44	Ferrari, 1994	male & female college students ($N=263$)
	Ferrari & Emmons, 1994	male & female college students ($N=277$), Sample 2
	Ferrari & Emmons, 1995	male & female college students ($N=277$)
0.41	Ferrari & Olivette, 1994	fathers of female college students/adult nonstudent males ($N=84$)

(table continues)

TABLE 3. (continued)

<u>Correlation</u>	<u>Study</u>	<u>Sample</u>
0.31	Ferrari & McCown, 1994	male & female adult obsessive-compulsives ($N=65$)
ns	Ferrari & Olivette, 1994	mothers of female college students/adult nonstudent females ($N=84$)
Correlations with the General Procrastination Scale (GP)		
<u>Correlation</u>	<u>Study</u>	<u>Sample</u>
0.79	Blunt & Pychyl, 1998	female university students ($N=89$), Study 1
0.76	Harriott & Ferrari, 1996	adult nonstudent males & females, partial correlation controlling for age ($N=211$)
0.67	Blunt & Pychyl, 1998	male university students ($N=53$), Study 1
ns	Ferrari, 1992c	nontraditional ($N=52$) & traditional ($N=59$) male & female college students, Study 1
ns	Ferrari, 1992c	nontraditional male & female college students ($N=215$), Study 2

(table continues)

TABLE 3. (continued)

Correlation with the Aitken Academic Procrastination Scale

<u>Correlation</u>	<u>Study</u>	<u>Sample</u>
0.72	Johnson & McCown, 1988	university students (<u>N</u> not reported)

Correlation with a subscale of a modified version of the Self-Defeating Personality Scale (Schill, 1990)

<u>Correlation</u>	<u>Study</u>	<u>Sample</u>
0.38	Ferrari, 1994	male & female college students (<u>N</u> =263)

Aitken Academic Procrastination Scale. The Aitken Academic Procrastination Scale (Aitken, 1982) consists of 19 items scored on a 5-point Likert-type scale, with half of the items being reverse scored. Higher scores are taken to be indicative of a tendency to procrastinate on academic tasks.

It is not known on which definition of procrastination, if any, this measure was based, but Aitken (1982) did intend for this scale to be a measure of procrastination for college students. According to Milgram, Mey-Tal, and Levison (1998), although researchers do consider this scale to be a measure of academic procrastination, they state that the majority of the items refer to general tasks rather than academic ones; that a majority of the items use "vague language" (e.g., "starting things," "working at jobs") (p. 303). Moreover, McCown, Carise, and Johnson (1991) state that this scale measures trait procrastination.

In regard to content validity, according to Saddler and Sacks (1993), these items represent "a tendency to delay completing tasks" (p. 865), but this does not appear to be correct as almost half of the items refer rather to a tendency to delay starting tasks. Nevertheless, all of the items, except one, do appear to tap a behavioural component of procrastination. For example, items include "I delay starting things until the last minute" and "When I have a test scheduled soon, I often find myself working on other jobs when a deadline is near." There is a single item which may tap a cognitive aspect of procrastination ("I overestimate the amount of work that I have to do in a given amount of time"). Lastly, there are no items which tap an affective component of procrastination. Thus, this measure does not appear to have content validity with regard to the theoretical definition of procrastination established by the present study.

McCown and Ferrari (1995, as cited in Ferrari, Johnson, & McCown, 1995) conducted a factor analysis on this measure in which two unidentifiable factors emerged, suggesting that there may be no clear structure underlying this scale. No other factor analysis of this measure has been reported.

Cronbach alphas for this measure have been found to be 0.79 (McCown & Ferrari, 1995, as cited in Ferrari, Johnson, & McCown, 1995), 0.82 (McCown & Johnson, 1989, as cited in McCown, Carise, & Johnson, 1991), and 0.85 (Aitken, 1982) indicating that the scale may not be homogeneous. McCown and Ferrari (1995) found that this measure has a test-retest correlation of 0.71 for a one month period.

This scale has been found to have high predictive validity for procrastinatory behaviour in college students (McCown & Johnson, 1989, as cited in McCown, Carise,

& Johnson, 1991). McCown (1986, as cited in Saddler & Sacks, 1993) found that the scale consistently identified the students who habitually procrastinated, and even more specifically, Aitken (1982) found that students who scored high on the scale exhibited procrastination not only on academic but possibly personal tasks as well, as the majority of the items do refer to general tasks rather than academic ones. This would suggest a trait type of procrastination. As well, Aitken found that students who scored at the bottom end of the scale exhibited timely behaviour for both academic and possibly personal tasks as well, again suggesting trait-like behaviour. Thus McCown, Petzel, and Rupert (1987) reason that students who score in the middle of the scale range exhibit behaviour that is more of a situational nature.

Regarding convergent validity, Johnson and McCown (1988, as cited in McCown, Johnson, & Petzel, 1989) found that this measure was correlated 0.72 with the Adult Inventory of Procrastination (AIP) (N not reported). McCown and Johnson (1989, as cited in McCown, Carise, & Johnson, 1991) found that this scale was related to measures of trait procrastination in college students, as well as to nonacademic procrastinatory behaviours.

Together these data suggest that this scale is a measure of both situational and trait procrastination. Although correlations with trait measures have been reported, there is a lack of information in regard to the convergent validity of this measure with other measures of academic procrastination. In summary then, there is certainly not adequate evidence of the validity of this measure.

Overall, except for a single item of the Aitken Academic Procrastination Scale, which may tap a cognitive component of procrastination, the rest of the items of each of these four scales appear to tap a behavioural component of procrastination. This clearly indicates a gap between these commonly used operationalizations of procrastination and the theoretical definition of procrastination which includes behavioural, cognitive, and affective components. As well, there is not adequate evidence as to the established validity of any of these measures to date.

Rationale for the Present Study

What the preceding literature review indicates is that there is a gap between the theoretical and operational definitions of the construct of procrastination. The content or items of the General Procrastination Scale (GP), Decisional Procrastination Scale (DP), Adult Inventory of Procrastination (AIP), and Aitken Academic Procrastination Scale do not reflect the content of the construct which includes behavioural, cognitive, and affective components. These measures only tap a behavioural component of task delay, for example, "It often takes me a long time to get started on something," "I put off making decisions," and "I always seem to end up shopping for birthday gifts at the last minute."

In order for a scale to have content validity, its items must sufficiently tap all aspects that are pertinent to whatever construct it is attempting to measure, while avoiding those aspects that are not applicable (Cronbach, 1984; Murphy, 1993). We are able to conclude, therefore, that at a very basic level these four current measures of procrastination do not exhibit content validity as they do not sample across the whole domain of the content of the construct.

The limited content validity certainly undermines the overall construct validity of the scales as inadequate content can certainly not provide a full measure of the construct. However, given the behavioural component reflected in the content of all of these measures, it was possible to investigate the underlying structure of this component of procrastination. Therefore, the purpose of the present study was to explore further

the construct validity of these scales, in terms of behavioural delay, by examining their underlying structures through factor analysis.

Construct validity is the extent to which a scale actually does measure the construct of interest and individuals' behaviours, as measured by this scale, correspond with theory regarding the construct (Cronbach, 1984). Although all of the various forms of validity are ultimately involved in establishing the construct validity of a measure (i.e., predictive validity, face validity, etc.), the present study focused on the underlying factor structures of the GP, DP, AIP, and Aitken scale as one approach to understanding the behavioural delay construct that is measured by each scale.

Factor analysis is typically used as one method to address construct validity by exploring the underlying structure or factors of a measure or measures (Tabachnick & Fidell, 1996). Factor analysis accomplishes this through an examination of the pattern of correlations among variables (Tabachnick & Fidell, 1996). To the extent that a scale demonstrates construct validity, the factor(s) which emerges from the analysis should mirror the theoretical factor(s) of the construct of interest. No adequate factor analyses examining the underlying structure of each of the GP, DP, AIP, or Aitken scale have been reported.

It is important to note that although the GP and AIP appear to include items tapping both trait and situational influences on procrastination, these scales are purported to simply measure trait procrastination (Ferrari, 1994; Ferrari, Johnson, & McCown, 1995). Although the review of psychometric information regarding the Aitken scale suggests that this scale may be a measure of both situational and trait

procrastination, this is mere speculation (McCown, Petzel, & Rupert, 1987), and the Aitken scale is commonly accepted as a unidimensional measure of academic procrastination (Ferrari, Johnson, & McCown, 1995). Therefore, as the GP, DP, AIP, and Aitken scale are purported to measure either trait or situational procrastination, not both, and as these four operational definitions of procrastination are based on only one component of the theoretical definition of procrastination, it was hypothesized that each scale would be unidimensional reflecting a behavioural definition of procrastination as task delay. Therefore, one-factor confirmatory factor analyses were conducted on each of these scales. For a given measure, when a unidimensional structure did not fit the data, this analysis was followed by a principal components analysis (PCA) in order to explore the actual underlying structure of the measure.

Finally, the preceding literature has also revealed that these four measures of procrastination appear to be conceptually related through task delay and share, on average, moderate correlations with one another empirically. In order to further examine possible relationships among the scales, a joint principal components analysis of all the items from the scales was conducted to examine the underlying common structure of these four measures of procrastination.

Method

Participants

The total sample included 914 first-year undergraduate students (374 males and 540 females) taking "Introduction to Psychology" at Carleton University. These individuals volunteered to participate in a research study for extra credit. This sample size was more than adequate for conducting the analyses as Comrey and Lee (1992, as cited in Tabachnick & Fidell, 1996) describe having a sample size of 500 individuals as "very good" and 1000 as "excellent" when conducting a factor analysis. As the data were collected in a previous study, the ages of these individuals are not known but are assumed to be approximately equal to those of a similar previously collected sample ($N=149$), which included a mean age for males of 22.1 ($SD=5.0$) and 21.0 ($SD=4.9$) for females (Blunt, 1998).

Materials

Each participant completed four procrastination questionnaires including the General Procrastination Scale (GP; Lay, 1986), Decisional Procrastination Scale (DP; Mann, 1982, as cited in Ferrari, Johnson, & McCown, 1995), Adult Inventory of Procrastination (AIP; McCown & Johnson, 1989, as cited in Ferrari et al., 1995), and Aitken Academic Procrastination Scale (Aitken, 1982, as cited in Ferrari et al., 1995). For a complete description of each of these scales please refer to the preceding discussion of the measures of procrastination (pp. 19-38).

Procedure

Extant data from one large study, collected using the aforementioned four measures of procrastination, were used. These data were subjected to confirmatory factor analyses and principal components analyses.

Results

Prior to conducting the analyses, the data were checked for their appropriateness for use in factor analysis. The data were screened for univariate outliers and none were found. For all cases in which there were missing data (this appears to have occurred randomly), the mean scores for the respective variables were assigned for missing values. The normality of each variable was also assessed. Only four variables were found to deviate considerably either because of skewness or kurtosis. The decision was made not to transform any variables as these data were gathered from already accepted published measures (Tabachnick & Fidell, 1996). As well, for the pairs of variables checked, none appeared to deviate from linearity. Lastly, no gender differences were found with respect to any of the analyses of the scales, thus a pooled sample of male and female data was used.

Confirmatory Factor Analysis

Confirmatory factor analysis was used to test the unidimensionality of each measure. For each measure, one factor was forced through the maximum likelihood factoring extraction procedure. This procedure was chosen as within its estimates of population values for factor loadings, it allows for the greatest probability of sampling the observed correlation matrix, and is considered to be the best method to use for confirmatory factor analysis (Tabachnick & Fidell, 1996).

A one-factor model was found not to fit the General Procrastination Scale (GP) as after the extraction of this factor there were still 67 (35%) residuals with absolute values greater than 0.05. The large number of moderate residuals remaining in the

residual correlation matrix indicated the presence of another factor (Tabachnick & Fidell, 1996). As well, a one-factor model was found not to fit the Adult Inventory of Procrastination (AIP) as after the extraction of the factor there were still 49 (46%) residuals with absolute values greater than 0.05, again suggesting the presence of another factor. Moreover, a one-factor model did not fit the Aitken Academic Procrastination Scale, as after the extraction of the single factor there were 54 (31%) residuals remaining with absolute values greater than 0.05. Finally, in contrast, a one-factor model did appear to fit the Decisional Procrastination Scale (DP) as after extraction of that factor there was only one residual (10%) remaining, with an absolute value of 0.14. Table 4 presents the loadings for the items on this factor. This factor was labelled "delay with regard to decisions," and appears to tap both delay in making decisions (e.g., I delay making decisions until it is too late) and delay in taking action once a decision has been made (i.e., Even after I make a decision I delay acting upon it). This factor accounted for 58% of the variance of the data for this measure.

Table 4.

Loadings for the Confirmatory Factor Analysis of the Decisional Procrastination Scale**Factor 1 (Eigenvalue=2.91) Factor Label: Delay With Regard to Decisions**

<u>Loading</u>	<u>Item</u>
0.82	I put off making decisions.
0.74	I don't make decisions unless I really have to.
0.66	I delay making decisions until it is too late.
0.64	Even after I make a decision I delay acting upon it.
0.57	I waste a lot of time on trivial matters before getting to the final decision.

Principal Components Analyses

Due to the lack of a one-factor fit for the General Procrastination Scale (GP), Adult Inventory of Procrastination (AIP), and Aitken Academic Procrastination Scale, as well as indications of other factors based on the residual correlation matrices, principal components analyses (PCA) were conducted separately on each measure in order to further explore each of these measures. PCA was chosen as the method of analysis in the present study as not a lot is currently known about the underlying structures of the GP, AIP, and the Aitken Academic Procrastination Scale. Tabachnick and Fidell (1996) point out that PCA is suitable to determine what type of components and how many are likely to form a construct of interest. As well, PCA is considered to

be the most useful method for the descriptive purpose of simplifying a group of observed variables into a set of components (Tabachnick & Fidell, 1996). Components were selected from these analyses using the decision rule of eigenvalue greater than 1 (Kim & Mueller, 1978), as well as an examination of the scree plot (Cattell, 1966, as cited in Tabachnick & Fidell, 1996).

General Procrastination Scale. For the GP scale, 3 factors were extracted. As these factors were uninterpretable, both Varimax orthogonal and Direct Oblimin oblique rotations (with the delta value set to zero) were conducted. An essentially orthogonal solution was found using this oblique rotation as only one out of the three intercomponent correlations (between Factor 1 and Factor 3) was greater than 0.32 ($r = 0.51$). Thus, only the results of the orthogonal rotation are reported. As well, in order to eliminate double loading items, only variables with loadings of 0.43 or greater were interpreted. This criterion level was chosen as this is the level at which all double loadings are eliminated, enabling the interpretation of the solution (Tabachnick & Fidell, 1996).²

Table 5 presents the loadings for the Varimax orthogonal solution of the GP. Based on an examination of the items loading on each factor, it would appear that Factor 1 is tapping a general behavioural component of trait procrastination or habitual task delay for which the shortened label "generalized behavioural delay" was used. No specific tasks are referred to, rather the items appear to tap task delay across many areas using such words as "tasks," "jobs," "things," and "deadlines," and the element of habit appears to be additionally tapped by such words as "usually," "continually,"

"generally," and "often." Items include for example, "I usually take care of all the tasks I have to do before I settle down and relax for the evening." Factor 2 appears to be tapping, and was labelled, "procrastination as executing routine personal tasks at the last minute," for example, "I usually buy even an essential item at the last minute." Factor 3 appears to be tapping, and was labelled, "punctuality with regard to routine personal tasks" (e.g., returning phone calls, paying a bill) and items include such terms as "promptly," "very shortly," "well in advance," "right away," and "as soon as possible." Items include for example, "I generally return phone calls promptly." For this factor and others throughout the analyses that include the notion of punctuality, the opposite of punctuality is taken to be delay. These 3 factors accounted for 47.3% of the total variance for this measure.

Table 5.

Factor Loadings for the Varimax Orthogonal Solution of the General Procrastination**Scale****Factor 1 (Eigenvalue=6.89, Percent of Variance=34.4) Factor Label: Generalized****Behavioural Delay**

<u>Loading</u>	<u>Item</u>
0.74	I usually take care of all the tasks I have to do before I settle down and relax for the evening.*
0.74	I am continually saying "I'll do it tomorrow."
0.73	I generally delay before starting on work I have to do.
0.68	I often have a task finished sooner than necessary.*
0.67	I usually accomplish all things I plan to do in a day.*
0.65	In preparing for some deadlines, I often waste time by doing other things.
0.63	I often find myself performing tasks that I had intended to do days before.
0.59	Even with jobs that require little else except sitting down and doing them, I find they seldom get done for days.

(table continues)

TABLE 5. (continued)

Factor 2 (Eigenvalue=1.50, Percent of Variance=7.5) Factor Label: Executing Routine

Personal Tasks at the Last Minute

<u>Loading</u>	<u>Item</u>
0.76	I usually buy even an essential item at the last minute.
0.75	I always seem to end up shopping for birthday gifts at the last minute.
0.51	When travelling, I usually have to rush in preparing to arrive at the airport or station at the appropriate time.
0.43	I often miss concerts, sporting events, or the like, because I don't get around to buying tickets on time.

Factor 3 (Eigenvalue=1.07, Percent of Variance=5.4) Factor Label: Punctuality With
 Regard to Routine Personal Tasks

<u>Loading</u>	<u>Item</u>
0.72	I generally return phone calls promptly.*
0.61	I usually return an "R.S.V.P." request very shortly after receiving it.*
0.51	When planning a party, I make the necessary arrangements well in advance.*
0.51	If a bill for a small amount comes, I pay it right away.*
0.43	I usually make decisions as soon as possible.*

Note. An asterisk indicates that an item has been reverse scored.

Adult Inventory of Procrastination. For the AIP, 3 factors were extracted. As these factors were uninterpretable, both Varimax orthogonal and Direct Oblimin oblique rotations (with the delta value set to zero) were conducted. An essentially orthogonal solution was found using this oblique rotation as only one of the three intercomponent correlations (between Factor 1 and Factor 2) was greater than 0.32 ($r = -0.41$). Thus, only the results of the orthogonal rotation are reported. As well, in order to eliminate double loading items, only variables with loadings of 0.42 or greater were interpreted. This criterion level was chosen as this is the level at which all double loadings are eliminated, enabling the interpretation of the solution (Tabachnick & Fidell, 1996).

Table 6 presents the loadings for the Varimax orthogonal solution of the AIP. Based on an examination of the items loading on each factor, it would appear that Factor 1 is tapping a general behavioural component of trait procrastination or habitual task delay, including not completing tasks on time, for which the shortened label "generalized behavioural delay" was used. Items include for example, "Putting things off until the last minute has cost me money in the past year," and "I don't get things done on time." Factor 2 appears to be tapping, and was labelled, "punctuality with regard to appointments," for example, "When I have to be somewhere at a certain time my friends expect me to run a bit late." Factor 3 appears to be tapping, and was labelled, "punctuality with regard to routine personal tasks" including doctor's appointments and routine maintenance. Items include for example, "I schedule doctor's

appointments when I am supposed to without delay." These 3 factors accounted for 52.1% of the total variance for this measure.

Table 6.

Factor Loadings for the Varimax Orthogonal Solution of the Adult Inventory of Procrastination

Factor 1 (Eigenvalue=5.28, Percent of Variance=35.2) Factor Label: Generalized Behavioural Delay

<u>Loading</u>	<u>Item</u>
0.72	I don't get things done on time.
0.69	I am not very good at meeting deadlines.
0.62	I get important things done with time to spare.*
0.61	I find myself running out of time.
0.58	Putting things off until the last minute has cost me money in the past year.
0.57	If someone was teaching a course on how to get things done on time, I would attend.
0.55	My friends and family think I wait until the last minute.
0.43	I pay my bills on time.*

(table continues)

TABLE 6. (continued)

**Factor 2 (Eigenvalue=1.31, Percent of Variance=8.8) Factor Label: Punctuality With
Regard to Appointments**

<u>Loading</u>	<u>Item</u>
0.82	When I have to be somewhere at a certain time my friends expect me to run a bit late.
0.77	I am more punctual than most people I know.*
0.73	I am prompt and on time for most appointments.*
0.68	I find myself running later than I would like to be.

**Factor 3 (Eigenvalue=1.22, Percent of Variance=8.1) Factor Label: Punctuality With
Regard to Routine Personal Tasks**

<u>Loading</u>	<u>Item</u>
0.71	I schedule doctor's appointments when I am supposed to without delay.*
0.71	I do routine maintenance (e.g., changing the car's oil) on things I own as often as I should.*
0.44	I lay out my clothes the night before I have an appointment so I won't be late.*

Note. An asterisk indicates that an item has been reverse scored.

Aitken Academic Procrastination Scale. For the Aitken Academic Procrastination Scale, 3 factors were also extracted. As these factors were

uninterpretable, both Varimax orthogonal and Direct Oblimin oblique rotations (with the delta value set to zero) were conducted. An essentially orthogonal solution was found using this oblique rotation as only one of the three intercomponent correlations (between Factor 1 and Factor 2) was greater than 0.32 ($r = 0.46$). Thus, only the results of the orthogonal rotation are reported. As well, in order to eliminate double loading items, only variables with loadings of 0.36 or greater were interpreted. This criterion level was chosen as this is the level at which all double loadings are eliminated, enabling the interpretation of the solution (Tabachnick & Fidell, 1996).

Table 7 presents the loadings for the Varimax orthogonal solution of the Aitken scale. Based on an examination of the items loading on each factor, it would appear that Factor 1 is tapping a general behavioural component of trait procrastination or habitual task delay for which the shortened label "generalized behavioural delay" was used. Items include for example, "It often takes me a long time to get started on something." Factor 2 appears to be tapping, and was labelled, "punctuality with regard to appointments and obligations," for example, "I generally arrive on time to class" and "I'm careful to return library books on time." Factor 3 consisted of three items that are somewhat disparate and interpretation of the items is not entirely clear, although it may be that these items are tapping an individual's time management, or lack of it, with regard to the execution of tasks. It may be that these items are related to time management in that an individual may desire to go to a workshop in order to learn how to manage his or her time more effectively. As well, an individual may attempt to manage his or her time by estimating how long it would take him or her to do a certain

task. Lastly, one strategy for managing one's time more efficiently may be to plan in advance what one is going to wear the next day. Given that the interpretation of these items is tentative, as well as a negative loading on one of the items, it is suggested that this factor requires further research before a more definite interpretation can be given. As a result, no factor label was assigned to this factor. These 3 factors accounted for 51.4% of the total variance for this measure.

Table 7.

Factor Loadings for the Varimax Orthogonal Solution of the Aitken Academic Procrastination Scale

Factor 1 (Eigenvalue=6.79, Percent of Variance=35.7) Factor Label: Generalized Behavioural Delay

<u>Loading</u>	<u>Item</u>
0.76	It often takes me a long time to get started on something.
0.76	If I had an important project to do, I'd get started on it as quickly as possible.*
0.76	I delay starting things until the last minute.
0.74	I get right to work at jobs that need to be done.*
0.72	Even when I know a job needs to be done, I never want to start it right away.
0.71	I keep my assignments up to date by doing my work regularly from day to day.*
0.68	I am often frantically rushing to meet deadlines.
0.67	I often finish my work before it is due.*
0.60	I don't delay when I know I really need to get the job done.*
0.56	I use the vacant hours between classes to get started on my evening's work.*

(table continues)

TABLE 7. (continued)

Factor 1 (continued)

<u>Loading</u>	<u>Item</u>
0.52	When I have a test scheduled soon, I often find myself working on other jobs when a deadline is near.

Factor 2 (Eigenvalue=1.62, Percent of Variance=8.5) Factor Label: Punctuality With Regard to Appointments and Obligations

<u>Loading</u>	<u>Item</u>
0.79	I generally arrive on time to class.*
0.77	I am often late for appointments and meetings.
0.69	I arrive at college appointments with plenty of time to spare.*
0.53	I delay starting things so long that I don't get them done by the deadline.
0.51	I'm careful to return library books on time.*

Factor 3 (Eigenvalue=1.36, Percent of Variance=7.2)

<u>Loading</u>	<u>Item</u>
0.62	If there were a workshop offered that would help me learn not to put off starting my work, I would go.
0.54	I overestimate the amount of work that I have to do in a given amount of time.
-0.44	If I have an important appointment, I make sure the clothes I want to wear are ready the day before.*

Note. An asterisk indicates that an item has been reverse scored.

There are similarities in the results of the principal components analyses (PCAs) for the GP, AIP, and Aitken scale. The results reveal that these scales each have three factors with similar components. The first factor of each of these scales appears to tap a general behavioural component of habitual task delay or trait procrastination. Both the GP and the AIP contain a factor which taps punctuality with regard to routine personal tasks. In addition, the GP also contains another factor that taps punctuality with regard to routine personal tasks, more specifically executing these tasks at the last minute. Lastly, both the AIP and the Aitken scale contain a factor which taps punctuality with regard to appointments, and, in the case of the Aitken, obligations as well.

Four Measures Combined. For the joint principal components analysis of all the items from the General Procrastination Scale (GP), Decisional Procrastination Scale (DP), Adult Inventory of Procrastination (AIP), and the Aitken Academic Procrastination Scale, 10 factors were extracted using a Varimax orthogonal rotation and a criterion level of 0.43, but only 5 factors were interpretable (refer to Appendix B).³ These 10 factors accounted for 57.0% of the total variance for all of the items from these measures.

A second iterative PCA was then conducted using only the items of the first five interpretable factors. Six factors were extracted. As these factors were uninterpretable, both Varimax orthogonal and Direct Oblimin oblique rotations (with the delta value set to zero) were conducted to increase the interpretability of the solution. An essentially orthogonal solution was found using this oblique rotation, as

only 4 out of 15 intercomponent correlations were slightly greater than 0.32 ($r = 0.38$ for Factors 1 & 4, 0.41 for Factors 2 & 4, 0.41 for Factors 1 & 2, and 0.44 for Factors 1 and 3). Thus, only the results of the orthogonal rotation are reported. As well, in order to eliminate double loading items, only variables with loadings of 0.48 or greater were interpreted. This criterion level was chosen as this is the level at which all double loadings are eliminated, enabling the interpretation of the solution (Tabachnick & Fidell, 1996).

Table 8 presents the loadings for the Varimax orthogonal solution of this reduced set of items from these scales. Based on an examination of the items loading on each factor, it would appear that Factor 1 is tapping a general behavioural component of trait procrastination or habitual task delay for which the shortened label "generalized behavioural delay" was used. Items include for example, "I generally delay before starting on work I have to do." Factor 2 appears to be tapping, and was labelled, "punctuality with regard to appointments," for example, "I am prompt and on time for most appointments." Factor 3 appears to be tapping, and was labelled, "delay with regard to decisions," for example, "I put off making decisions" and "Even after I make a decision I delay acting upon it." Factor 4 appears to be tapping, and was labelled, "punctuality with regard to routine personal tasks," for example, "I pay my bills on time." Factor 5 appears to be tapping, and was labelled, "failure to meet deadlines," for example, "I delay starting things so long that I don't get them done by the deadline." As the last factor consisted of only one item, it was not well defined (Tabachnick & Fidell,

1996), and therefore was not interpreted with a factor label. These 6 factors accounted for 55.8% of the total variance for this reduced set of items from these scales.

Table 8.

Factor Loadings for the Varimax Orthogonal Solution of the Joint Principal Components Analysis of a Reduced Set of Items

Factor 1 (Eigenvalue=15.31, Percent of Variance=34.8) Factor Label: Generalized Behavioural Delay

<u>Loading</u>	<u>Item</u>
0.72	I often have a task finished sooner than necessary.*
0.71	I delay starting things until the last minute.
0.71	I generally delay before starting on work I have to do.
0.71	I keep my assignments up to date by doing my work regularly from day to day.*
0.71	Even when I know a job needs to be done, I never want to start it right away.
0.70	It often takes me a long time to get started on something.
0.70	I often finish my work before it is due.*
0.69	I get right to work at jobs that need to be done.*
0.67	If I had an important project to do, I'd get started on it as quickly as possible.*
0.65	I am continually saying "I'll do it tomorrow."

(table continues)

TABLE 8. (continued)

Factor 1 (continued)

Loading	Item
0.64	I usually take care of all the tasks I have to do before I settle down and relax for the evening.*
0.59	In preparing for some deadlines, I often waste time by doing other things.
0.58	I am often frantically rushing to meet deadlines.
0.57	I use the vacant hours between classes to get started on my evening's work.*
0.54	My friends and family think I wait until the last minute.
0.54	Even with jobs that require little else except sitting down and doing them, I find they seldom get done for days.
0.52	I get important things done with time to spare.*

(table continues)

TABLE 8. (continued)

Factor 2 (Eigenvalue=3.02, Percent of Variance=6.9) **Factor Label:** Punctuality With
 Regard to Appointments

Loading	Item
0.78	I am prompt and on time for most appointments.*
0.75	When I have to be somewhere at a certain time my friends expect me to run a bit late.
0.75	I am often late for appointments and meetings.
0.72	I am more punctual than most people I know.*
0.66	I generally arrive on time to class.*
0.65	I find myself running later than I would like to be.
0.63	I arrive at college appointments with plenty of time to spare.*
0.57	When travelling, I usually have to rush in preparing to arrive at the airport or station at the appropriate time.

(table continues)

TABLE 8. (continued)

Factor 3 (Eigenvalue=2.10, Percent of Variance=4.8) Factor Label: Delay With Regard to Decisions

<u>Loading</u>	<u>Item</u>
0.81	I don't make decisions unless I really have to.
0.77	I put off making decisions.
0.65	I usually make decisions as soon as possible.*
0.62	Even after I make a decision I delay acting upon it.
0.61	I delay making decisions until it is too late.
0.57	I waste a lot of time on trivial matters before getting to the final decision.

Factor 4 (Eigenvalue=1.57, Percent of Variance=3.6) Factor Label: Punctuality With Regard to Routine Personal Tasks

<u>Loading</u>	<u>Item</u>
0.73	I pay my bills on time.*
0.69	If a bill for a small amount comes, I pay it right away.*
0.60	I usually return an "R.S.V.P." request very shortly after receiving it.*
0.49	I generally return phone calls promptly.*

(table continues)

TABLE 8. (continued)

Factor 5 (Eigenvalue=1.44, Percent of Variance=3.3) Factor Label: Failure to Meet

Deadlines

<u>Loading</u>	<u>Item</u>
0.67	I delay starting things so long that I don't get them done by the deadline.
0.65	I am not very good at meeting deadlines.
0.59	I don't get things done on time.

Factor 6 (Eigenvalue=1.13, Percent of Variance=2.6)

<u>Loading</u>	<u>Item</u>
0.49	I often find myself performing tasks that I had intended to do days before.

Note. An asterisk indicates that an item has been reverse scored.

Discussion

It will be recalled that the purpose of this study was to explore the content and construct validity of the General Procrastination Scale (GP), Decisional Procrastination Scale (DP), Adult Inventory of Procrastination (AIP), and Aitken Academic Procrastination Scale through an examination of the underlying factor structure of these measures. As the GP, DP, AIP, and Aitken scale are purported to measure either trait or situational procrastination, not both, and as it was determined, based on a review of the items for each scale, that these four operational definitions of procrastination tap only behavioural aspects of procrastination, it was hypothesized that these scales would be unidimensional measures of the behavioural component of task delay. The results of the present study did not support this hypothesis except for the case of the DP, which was found to be a unidimensional measure. That the DP was found to be unidimensional is not surprising given that the scale only consists of five items, with clear face validity of these items in terms of delay with regard to decisions. The other three measures, the GP, AIP, and Aitken scale all had similar factors revealing multidimensional structures tapping trait and situational influences on procrastination. With regard to the joint PCA of all of the scales combined, this analysis resulted in five interpretable factors revealing a multidimensional underlying structure. These factors, which make theoretical sense, may be informative to future research and scale development.

Thus, even without items tapping a cognitive or affective component of procrastination, an analysis of the underlying factor structure of the items included on

these four procrastination scales revealed that there is more than simply a general behavioural tendency to delay. Although the GP, AIP, and Aitken scale have generally been discussed as either trait or situational measures of procrastination, it seems from the underlying structure revealed in the factor analyses that there are both trait and situational influences being tapped in each of these measures.

In order to understand these findings, the discussion begins with a consideration of the role of generalized behavioural delay as an essential but not exclusive component of the GP, AIP, and Aitken scale. Following this, the contrast between trait and situational aspects of procrastination is considered. Finally, all four measures are discussed in relation to the incongruency between the theoretical and operational definitions of procrastination, and directions for future research are considered.

Generalized Behavioural Delay

For both the joint PCA and the individual PCAs, the first and most significant factor which emerged appears to tap generalized behavioural delay. A pattern appeared such that this first factor of each solution had a significantly larger eigenvalue and explained a significantly greater percentage of variance of the data (i.e., about a third) than did the other factors that emerged in each PCA. In addition, the scree plots for each analysis indicated a steep change in slope after the first factor, even though other eigenvalues were also greater than one. This indicates that the first factor is more important or dominant in the overall factor structure of the scale items. Having one "dominant" factor with one or more "minor" factors has been referred to as "essential

unidimensionality" (B. Zumbo, personal communication, November 18, 1999). In this case, the scales may be considered essentially unidimensional with respect to this general behavioural component of habitual task delay. This factor is essentially a trait measure of behavioural delay, however, it is not a trait measure of procrastination *per se* because it lacks the other cognitive and affective components of the construct as identified in the theoretical definition of procrastination. The shortened label "generalized behavioural delay" will henceforth be used in the discussion of this factor.

It is not surprising that a factor tapping generalized behavioural delay was found for each of these PCAs as the GP and AIP are considered to tap everyday global tendencies (Ferrari, Johnson, & McCown, 1995). As well, the Aitken scale, although it is known as a measure of situational, specifically academic, procrastination (Ferrari, Johnson, & McCown, 1995), is nevertheless considered by McCown, Carise, and Johnson (1991) to tap trait procrastination. That the GP, DP, AIP, and Aitken scale were all found to tap a behavioural component of procrastination may explain why, in the research literature, these scales have been found to share, on average, moderate correlations with one another.

Thus, one interpretation of the results of the present study might be that although, on the surface, the results seem to indicate that the scales are multidimensional (i.e., generalized behavioural delay and other more minor factors), given the dominance of the generalized behavioural delay component, these scales could be interpreted as being unidimensional. According to this interpretation the items comprising the more minor factors would be extraneous, not related to the construct of

procrastination, and should therefore be removed from a possible relationship with procrastination. The alternative interpretation that the scales are multidimensional, with the items comprising the more minor factors being related to the construct of procrastination, is more plausible though for a couple of reasons.

First of all, Ellis and Knaus (1977, as cited in Aitken, 1982) based on their clinical work with clients, state that there are three categories of tasks on which individuals procrastinate: "self-development" tasks, routine personal tasks, and tasks for which the consequence of procrastination is "irresponsibility" or "inconvenience" to others, which include being late for appointments (p. 16). Thus, the factors found in the present study that appear to tap an individual's punctuality with regard to certain situations (i.e., appointments and routine personal tasks) would constitute two of these three categories acknowledged by Ellis and Knaus. The correspondence between the routine personal task category and the factors that appears to tap an individual's punctuality with regard to routine personal tasks is self-explanatory. There is also a direct correspondence between the category of tasks for which the consequence of procrastination is "irresponsibility" or "inconvenience" to others and the component that appears to tap an individual's punctuality with regard to appointments. As appointments are generally with people (e.g., friends, class, college appointments), if an individual is habitually late for appointments, it is reasonable to assume that this person is going to inconvenience whomever he or she had an appointment with, or in the case of a class, the person who is lecturing. Therefore, based on previous theory there is evidence to suggest that the factors found in the present study that appear to tap an

individual's punctuality with regard to certain situations are not extraneous but are very much related to the construct of procrastination.

Secondly, during the scale constructions of the GP, AIP, and Aitken scale, the items which comprise these measures were not simply chosen randomly but were selected empirically for inclusion in each of these measures. Regarding the GP or Form G, all items except for one were selected from Forms A and B, (i.e., earlier versions of the GP). Forms A and B themselves had been created from a factor analysis of a larger pool of items (Lay, 1986). Likewise, McCown and Johnson (1989b, as cited in Ferrari, Johnson, & McCown, 1995) created the AIP through a factor analysis of a larger pool of items by choosing items that loaded 0.5 or greater onto a general procrastination factor. Lastly, for the Aitken scale, the items included in this measure were selected or adapted from four pre-existing measures.⁴ Thus, again, there is evidence to suggest that the factors found in the present study that appear to tap an individual's punctuality with regard to certain situations are not simply extraneous but are related to the construct of procrastination. In summary then, although this generalized behavioural delay component emerged in each of the PCAs, individual and joint, other components were also found to be important in explaining the underlying structure of these measures.

The Contrast Between Trait and Situational Aspects of Procrastination

Apart from this factor that emerged in each of the PCAs which appears to tap a general behavioural component of trait procrastination, other factors also emerged in

these analyses including: factors that appear to tap an individual's punctuality with regard to certain situations (i.e., appointments and routine personal tasks), a factor that appears to tap delay with regard to decisions, and a factor that appears to tap the failure to meet deadlines in general. Thus, the underlying structure of these measures was revealed to be multidimensional.

Punctuality Factors. In the joint PCA, a factor emerged which appears to tap punctuality with regard to appointments. This factor also emerged in the PCAs of the Adult Inventory of Procrastination (AIP) and the Aitken Academic Procrastination Scale. Another factor which emerged in the joint PCA appears to tap punctuality with regard to routine personal tasks. This factor also emerged in the PCAs of the General Procrastination Scale (GP) and the AIP. The PCA of the GP also revealed another factor that appears to tap punctuality with regard to routine personal tasks, more specifically executing these tasks at the last minute.

Based on the results of the present study, it is suggested that punctuality with regard to appointments and punctuality with regard to routine personal tasks be considered as two different types of situational procrastination. These factors emerged in the PCAs apart from the first factor found in each of the analyses, tapping generalized behavioural delay. This is interesting as Ferrari, Johnson, and McCown (1995) have referred to the GP, DP, and AIP as measures of everyday tendencies (i.e., trait measures), and other researchers have suggested that life routine procrastination be considered as one specific area of trait procrastination (Milgram, Batori, & Mowrer, 1993; Milgram, Sroloff, & Rosenbaum, 1988).

The factor that appears to tap executing routine personal tasks at the last minute may relate to what Ferrari (1993) has labelled as arousal procrastination. As discussed in the review of the literature, Ferrari explains that some procrastinators may be motivated by the arousal produced from working against a deadline. He also explains that these individuals may even postpone finishing a task in order to augment this arousal and possibly ease doing the task. Perhaps with regard to this factor tapping routine personal tasks that are executed at the last minute, some individuals may need the motivation of working against a deadline before they will do their shopping or leave for the airport/station.

There are some possible interesting differences between the factor that appears to tap punctuality with regard to appointments and the factor that appears to tap punctuality with regard to routine personal tasks. That the underlying structure of these four measures revealed two factors, which emerged orthogonally, reflecting punctuality was unexpected. As these are two essentially unrelated factors, whether an individual is punctual with regard to appointments says nothing about whether this person is punctual with regard to his or her various routine personal tasks, such as paying bills, and vice versa.

The factor tapping punctuality with regard to appointments appears to be more socially oriented as appointments are generally with people (e.g., friends, class, college appointments). In contrast, for the factor tapping punctuality with regard to routine personal tasks, except for returning phone calls, the items that loaded onto this factor do not appear to be very socially oriented (e.g., paying bills, doing routine maintenance,

returning library books). Although the routine personal tasks do not appear to be social in nature, they do appear to have socially prescribed time limits (e.g., returning an R.S.V.P. before a party, at what point it becomes rude not to have returned a phone call).

Also of interest in regard to these two punctuality factors, some people might argue that they reflect procrastinatory behaviour that everyone engages in to some extent, and because of this scores on procrastination measures do not differentiate an occasional procrastinatory action from habitual procrastinatory behaviour. The present analyses reveal that for the GP, AIP, and Aitken scale an individual may indeed be interpreted as having a tendency to procrastinate when all that is really being indicated is a proclivity to procrastinate within a specific domain, such as on routine personal tasks. McCown, Johnson, and Petzel (1989) have noted that past research has failed to consider the possibility of the multidimensional nature of procrastination, instead presuming a unidimensional nature. More research will be required in order to understand how individuals deal with these two different types of tasks (i.e., appointments and routine personal tasks) in their lives.

Delay With Regard to Decisions. Another factor that emerged from the joint PCA seems to reflect delay with regard to decisions, and includes all of the items from the Decisional Procrastination Scale (DP), as well as an item from the General Procrastination Scale (GP) (i.e., I usually make decisions as soon as possible). It is not surprising that these items of the DP emerge as a separate factor in this joint analysis as the DP was found to be a unidimensional measure. What is interesting though is that

the items of the DP emerged apart from both the generalized behavioural delay factor, as well as the situationally-specific punctuality factors. Whereas it is tempting to conclude that decisional procrastination may in fact be a separate type of procrastination, so that we would have a tripartite division of procrastination into trait, situational, and decisional types, it is also possible that decisional procrastination is simply a manifestation of another type of situational procrastination. That is, whether or not an individual procrastinates with regard to a decision may be strongly influenced depending on the situation. For example, an individual might only delay making or acting on decisions related to his or her job, or family, or finances, etc.

Failure to Meet Deadlines. The last interpretable factor that emerged in the joint PCA appears to tap the failure to meet deadlines in general. This factor was not found in any of the individual PCAs. According to Milgram (1991), procrastination involves delaying the completion of a task, and, because of this not accomplishing the task as well as one could have. This factor tapping the failure to meet deadlines appears to make the distinction that although an individual might procrastinate, that person might also still meet his or her deadline and do really well, as opposed to failing to meet the deadline for a task and not doing very well. Thus this factor that appears to tap the failure to meet deadlines in general may discriminate when procrastination, as Milgram says, results in a substandard behavioural product.

In sum, the underlying structure of these scales reveals that the behavioural component of the construct of procrastination, as reflected in the items comprising these scales, is not simply generic but rather multidimensional, involving both trait and

situational aspects of procrastination, even though one would have expected these measures to be unidimensional. These results question the clear differentiation of trait and situational procrastination by Ferrari and Pychyl (in press). Although these influences, trait and situational, are certainly valid in terms of the influences on procrastination, the results of the present study reveal that the GP, AIP, and Aitken scale tap both trait and situational influences. Therefore, it may be misleading to think that any one study that has been conducted to date with one of these measures necessarily reveals trait versus situational procrastination.

Incongruency Between the Theoretical and Operational Definitions of Procrastination : Implications for Future Research

For the individual PCAs of the General Procrastination Scale (GP), Adult Inventory of Procrastination (AIP), and Aitken Academic Procrastination Scale, as well as the joint PCA involving all four of the scales, factors tapping generalized behavioural delay and situationally-specific task delay (punctuality with regard to appointments and punctuality with regard to routine personal tasks) were found. These operational measures are not very good though as they stay at the surface of what procrastination seems to be, that is behavioural delay, and have yet to tap what other researchers have identified theoretically as important. In other words, these measures do not have content validity with regard to the theoretical construct of procrastination which includes not only a behavioural component but also cognitive and affective components. That people have a tendency to delay does not aid in the understanding as

to what cognitions and affect are related to this construct, which, if included, might help us to more fully understand and measure the construct of procrastination.

Some major recommendations arise from these results in terms of future research. First and foremost, based on the results of the present study, as well as on the theoretical definition of procrastination, the recommendation is made that measures of procrastination be reconstructed to include not only behavioural, cognitive, and affective components, but also trait and situational aspects of procrastination. Measures that include items tapping these components will better account for the whole construct of procrastination and have more content validity.

Future measures of procrastination might include such cognitive items as "I often think a task is more difficult than it actually is," "I often think I'll feel more like working on a task the next day," or "I think that I need to have an adequate block of time before it is even worth working on things." Another option regarding a cognitive component of procrastination may be to measure not only the temporal aspect of when a task was performed, but also the scheduling of and adherence to a schedule for this task (Milgram, Sroloff, & Rosenbaum, 1988). This would allow for an examination of the congruence between the intentions and performance of an individual with regard to a task or tasks. Even if no formal scheduling is done by an individual, his or her intentions, priorities, or objectives could constitute an informal schedule against which performance can be compared.

As well, it is recommended that future measures of procrastination include items that tap an affective component of procrastination. In order to accomplish this

procrastination scales might include such items as "When I do things later than I intended, I feel depressed" and "I often wake up feeling guilty about things I didn't do yesterday."

It is not certain yet as to whether the DP taps a trait or situational influence of procrastination. It would be interesting for future research to explore how decisions relate to various contexts in order to attempt to tease out whether decisional procrastination is a separate type of procrastination or is strongly influenced depending on the situation.

Understanding how the situational plays itself out in procrastination is worthy of a great deal of further research. Future scales, acknowledging both trait and situational influences on procrastination should have more diagnostic ability, thus providing more information. Not only, though, does it appear that to more fully measure the construct of procrastination, a scale needs to tap behavioural, cognitive, and affective components, as well as aspects of trait and situational procrastination, it also appears that this scale would have to take the differences between these various components into account in its scoring procedure. Instead of summing across all items, there would have to be separate scores for trait and situational subscales so as not to confuse these different types of procrastination. This scoring procedure would allow a researcher to look at procrastination more diagnostically in order to say, for example, whether procrastination on routine personal tasks is or is not indicative of a problem.

Regarding the situationally-specific factors found (i.e., punctuality with regard to appointments and punctuality with regard to routine personal tasks), a scale that

includes both of these factors would allow for a more diagnostic analysis of the social nature that potentially distinguishes the two. Perhaps extroverts would never be late for an appointment but would procrastinate more on their routine personal tasks, whereas introverts would not procrastinate on their routine personal tasks but might instead be late for appointments. As well, although the routine personal tasks tapped in one of these factors do not appear to be social in nature, they do appear to have socially prescribed time limits (e.g., returning an R.S.V.P. before a party, at what point it becomes rude not to have returned a phone call). These items might reflect an individual's attitude towards time, and this factor alone might be explored further in terms of a type of procrastination, or how this factor may function in relation to procrastination. For example, do people who score high on this factor experience as much guilt as people who score high on another factor, for example, punctuality with regard to appointments?

Another interesting result of the present study that deserves further research concerns the factor tapping failure to meet deadlines in general. Whereas generally delaying things or not completing them when intended may leave an individual upset, these two situations will probably not lead to a substandard behavioural product as much as a clear-cut failure to meet deadlines will, particularly in a society where deadlines are so crucial. If future scales were to measure this factor more precisely by including items regarding the outcome of tasks not completed on time, it might predict when procrastination results in a substandard behavioural product.

It is interesting that no situationally-specific factor tapping academic procrastination emerged in the PCA of the Aitken scale. Although the majority of the items do use vague language, there were still three items strictly pertaining to academic behaviour (e.g., "When I have a test scheduled soon, I often find myself working on other jobs when a deadline is near," and "I generally arrive on time to class"), and three additional items that might be interpreted as pertaining to academic behaviour (e.g., "I use the vacant hours between classes to get started on my evening's work," and "I keep my assignments up to date by doing my work regularly from day to day"). Future studies may want to use other scales that purport to measure academic procrastination, and that use less vague and ambiguous language, in order to investigate whether a factor or factors tapping aspects of situationally-specific academic procrastination might emerge in other analyses.

A final recommendation for future research stems from a limitation of the present study. The present study appears to be limited by the uncertainty regarding the generalizability of the results. The participants included first-year undergraduate students, and are thus assumed to generalize to other samples of undergraduates. But it is not known whether these results would apply to different age groups of individuals or even to individuals who are of the same age group but who are not students. Thus, the results of the present study might have differed for a group of older working adults, for example. Perhaps too much study has now been done on academic procrastination as opposed to procrastination regarding other situations. This overreliance on data collected from undergraduates has typically been considered to be a limitation of social

scientific studies interested in variability among individuals, in certain areas (Palys, 1992). It is conceivable that scales could be developed around, for example, work procrastination. This has probably not yet occurred due to this overreliance on sampling undergraduate students which might have biased the creation of scales that may have otherwise tapped different domains of situationally-specific procrastination. Therefore, future scale development and studies in the area of procrastination may want to include less traditional samples of participants such as older working adults, retired individuals, people in positions of power, etc.

In conclusion, the results of the present study indicate that the theoretical definition of procrastination, which includes behavioural, cognitive, and affective components, is not mirrored in four commonly used operational definitions of procrastination: the General Procrastination Scale, the Decisional Procrastination Scale, the Adult Inventory of Procrastination, and the Aitken Academic Procrastination Scale. To this extent, the scales are inadequate psychometrically, lacking content validity, and thus certainly having questionable construct validity. The principal components analyses of these measures revealed a more complex underlying structure, including trait and situational influences on procrastination, than the unidimensional one that is assumed for each scale. The factors that emerged in these analyses present interesting new ideas for future research.

Footnotes

¹The prevalence of academic procrastination as the only form of situational procrastination is most likely due to the general context for research in psychology which samples undergraduates. This overreliance on data collected from undergraduates has typically been considered to be a limitation of social scientific studies interested in variability among individuals, in certain areas (Palys, 1992).

²More specifically, Tabachnick and Fidell (1996) explain that "[c]hoice of the cutoff for size of loading to be interpreted is a matter of researcher preference. Sometimes there is a gap in loadings across the factors and, if the cutoff is in the gap, it is easy to specify which variables load and which do not. Other times, the cutoff is selected because one can interpret factors with that cutoff but not with a lower cutoff" (p. 677).

³It was concluded that the factors best fit an orthogonal solution using a Direct Oblimin oblique rotation (with the delta value set to zero), as only 3 out of 45 intercomponent correlations were equal to or slightly greater than 0.32 ($r=0.32$ for Factors 1 & 7, -0.34 for Factors 3 & 6, and 0.42 for Factors 1 & 3). Thus, only the results of the orthogonal rotation were considered.

⁴These existing measures included: The Procrastination Determination Questionnaire (Green, 1981), The Procrastination Inventory (Strong, Wambach, Lopez, & Cooper, 1979), The Ricks, Epley, Wessman Temporal Experience Questionnaire (Wessman, 1973), and the Survey of Student Habits and Attitudes (Brown & Holtzman, 1967).

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Appendix A

General Procrastination Questionnaire

Instructions

On a scale of 1 (LOW VALUE) to 5 (HIGH VALUE) please answer each of the items below by circling the number (i.e., 1, 2, 3, 4 or 5) that best describes you. These items are concerned with your opinions on different situations. No two statements are exactly alike, so please consider each statement carefully before responding. Answer as honestly as possible. This information, as mentioned in the informed consent, is completely confidential.

1. I often find myself performing tasks that I had intended to do days before.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

2. I often miss concerts, sporting events, or the like, because I don't get around to buying tickets on time.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

3. When planning a party, I make the necessary arrangements well in advance.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

4. When it is time to get up in the morning, I often get right out of bed.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

5. A letter may sit for days after I write it before I mail it.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

6. I generally return phone calls promptly.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

7. Even with jobs that require little else except sitting down and doing them, I find they seldom get done for days.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

8. I usually make decisions as soon as possible.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

9. I generally delay before starting on work I have to do.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

10. When travelling, I usually have to rush in preparing to arrive at the airport or station at the appropriate time.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

11. When preparing to go out, I am seldom caught having to do something at the last minute.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

12. In preparing for some deadlines, I often waste time by doing other things.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

13. If a bill for a small amount comes, I pay it right away.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

14. I usually return an "R.S.V.P." request very shortly after receiving it.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

15. I often have a task finished sooner than necessary.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

16. I always seem to end up shopping for birthday gifts at the last minute.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

17. I usually buy even an essential item at the last minute.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

18. I usually accomplish all things I plan to do in a day.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

19. I am continually saying "I'll do it tomorrow".

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

20. I usually take care of all the tasks I have to do before I settle down and relax for the evening.

False of Me	Not Usually True of Me	Sometimes False/True	Mostly True of Me	True of Me
1	2	3	4	5

Decisional Procrastination Questionnaire

Instructions

People differ in how they go about making decisions. Please indicate how you make decisions by selecting the response from 1 (not true) to 5 (true) to each question that best fits your personal style. No two statements are exactly alike, so please consider each statement carefully before responding. Answer as honestly as possible. Remember, there are no right or wrong answers. This information, as mentioned in the informed consent, is completely confidential.

1. I waste a lot of time on trivial matters before getting to the final decision.

Not True 1	Often Untrue 2	Sometimes True\False 3	Often True 4	True 5
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2. Even after I make a decision I delay acting upon it.

Not True 1	Often Untrue 2	Sometimes True\False 3	Often True 4	True 5
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3. I don't make decisions unless I really have to.

Not True 1	Often Untrue 2	Sometimes True\False 3	Often True 4	True 5
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4. I delay making decisions until it is too late.

Not True 1	Often Untrue 2	Sometimes True\False 3	Often True 4	True 5
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5. I put off making decisions.

Not True 1	Often Untrue 2	Sometimes True\False 3	Often True 4	True 5
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Adult Inventory of Procrastination Questionnaire

Instructions

The statements below are concerned with your opinions on different situations. On a scale of 1 (strongly disagree) to 5 (strongly agree) please answer each of the items below. No two statements are exactly alike, so please consider each statement carefully before responding. Answer as honestly as possible. Remember, there are no right or wrong answers. This information, as mentioned in the informed consent, is completely confidential.

1. I pay my bills on time.

Strongly Disagree	Disagree	Sometimes Disagree\Agree	Agree	Strongly Agree
1	2	3	4	5

2. I am prompt and on time for most appointments.

Strongly Disagree	Disagree	Sometimes Disagree\Agree	Agree	Strongly Agree
1	2	3	4	5

3. I lay out my clothes the night before I have an appointment so I won't be late.

Strongly Disagree	Disagree	Sometimes Disagree\Agree	Agree	Strongly Agree
1	2	3	4	5

4. I find myself running later than I would like to be.

Strongly Disagree	Disagree	Sometimes Disagree\Agree	Agree	Strongly Agree
1	2	3	4	5

5. I don't get things done on time.

Strongly Disagree	Disagree	Sometimes Disagree\Agree	Agree	Strongly Agree
1	2	3	4	5

6. If someone was teaching a course on how to get things done on time, I would attend.

Strongly Disagree	Disagree	Sometimes Disagree\Agree	Agree	Strongly Agree
1	2	3	4	5

7. My friends and family think I wait until the last minute.

Strongly Disagree	Disagree	Sometimes Disagree\Agree	Agree	Strongly Agree
1	2	3	4	5

8. I get important things done with time to spare.

Strongly Disagree	Disagree	Sometimes Disagree\Agree	Agree	Strongly Agree
1	2	3	4	5

9. I am not very good at meeting deadlines.

Strongly Disagree	Disagree	Sometimes Disagree\Agree	Agree	Strongly Agree
1	2	3	4	5

10. I find myself running out of time.

Strongly Disagree	Disagree	Sometimes Disagree\Agree	Agree	Strongly Agree
1	2	3	4	5

11. I schedule doctor's appointments when I am supposed to without delay.

Strongly Disagree	Disagree	Sometimes Disagree\Agree	Agree	Strongly Agree
1	2	3	4	5

12. I am more punctual than most people I know.

Strongly Disagree	Disagree	Sometimes Disagree\Agree	Agree	Strongly Agree
1	2	3	4	5

13. I do routine maintenance (e.g., changing the car's oil) on things I own as often as I should.

Strongly Disagree	Disagree	Sometimes Disagree\Agree	Agree	Strongly Agree
1	2	3	4	5

14. When I have to be somewhere at a certain time my friends expect me to run a bit late.

Strongly Disagree	Disagree	Sometimes Disagree\Agree	Agree	Strongly Agree
1	2	3	4	5

15. Putting things off until the last minute has cost me money in the past year.

Strongly Disagree	Disagree	Sometimes Disagree\Agree	Agree	Strongly Agree
1	2	3	4	5

Questionnaire

Instructions

For each of the items below, please indicate the extent to which the statement is more or less FALSE (1) or TRUE (5) of you. No two statements are exactly alike, so please consider each statement carefully before responding. Answer as honestly as possible. Remember, there are no right or wrong answers. Thank You.

- 1 = False
 2 = Mostly false
 3 = Sometimes false/sometimes true
 4 = Mostly true
 5 = True

1. I delay starting things until the last minute.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

2. I'm careful to return library books on time.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

3. Even when I know a job needs to be done, I never want to start it right away.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

4. I keep my assignments up to date by doing my work regularly from day to day.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

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5. If there were a workshop offered that would help me learn not to put off starting my work, I would go.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

6. I am often late for appointments and meetings.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

7. I use the vacant hours between classes to get started on my evening's work.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

8. I delay starting things so long that I don't get them done by the deadline.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

9. I am often frantically rushing to meet deadlines.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

10. It often takes me a long time to get started on something.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

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11. I don't delay when I know I really need to get the job done.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

12. If I had an important project to do, I'd get started on it as quickly as possible.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

13. When I have a test scheduled soon, I often find myself working on other jobs when a deadline is near.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

14. I often finish my work before it is due.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

15. I get right to work at jobs that need to be done.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

16. If I have an important appointment, I make sure the clothes I want to wear are ready the day before.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

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17. I arrive at college appointments with plenty of time to spare.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

18. I generally arrive on time to class.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

19. I overestimate the amount of work that I have to do in a given amount of time.

False	Mostly False	Sometimes True/False	Mostly True	True
1	2	3	4	5

Appendix B

Factor Loadings for the Varimax Orthogonal Solution of the Joint Principal Components Analysis of All Items

Factor 1 (Eigenvalue=17.86, Percent of Variance=30.3) Factor Label: Generalized Behavioural Delay

<u>Loading</u>	<u>Item</u>
0.73	I delay starting things until the last minute.
0.73	I generally delay before starting on work I have to do.
0.72	It often takes me a long time to get started on something.
0.71	I keep my assignments up to date by doing my work regularly from day to day.*
0.71	Even when I know a job needs to be done, I never want to start it right away.
0.70	I often have a task finished sooner than necessary.*
0.67	I often finish my work before it is due.*
0.65	I am continually saying "I'll do it tomorrow."
0.64	I get right to work at jobs that need to be done.*
0.63	I am often frantically rushing to meet deadlines.
0.62	If I had an important project to do, I'd get started on it as quickly as possible.*

(table continues)

TABLE. (continued)

Factor 1 (continued)

Loading	Item
0.61	In preparing for some deadlines, I often waste time by doing other things.
0.60	I usually take care of all the tasks I have to do before I settle down and relax for the evening.*
0.55	I use the vacant hours between classes to get started on my evening's work.*
0.55	My friends and family think I wait until the last minute.
0.52	Even with jobs that require little else except sitting down and doing them, I find they seldom get done for days.
0.50	When I have a test scheduled soon, I often find myself working on other jobs when a deadline is near.
0.48	I get important things done with time to spare.*
0.47	I often find myself performing tasks that I had intended to do days before.
0.45	I find myself running out of time.
0.44	I usually accomplish all things I plan to do in a day.*

(table continues)

TABLE. (continued)

**Factor 2 (Eigenvalue=3.14, Percent of Variance=5.3) Factor Label: Punctuality With
Regard to Appointments**

<u>Loading</u>	<u>Item</u>
0.75	I am prompt and on time for most appointments.*
0.74	When I have to be somewhere at a certain time my friends expect me to run a bit late.
0.72	I am often late for appointments and meetings.
0.69	I am more punctual than most people I know.*
0.65	I generally arrive on time to class.*
0.61	I find myself running later than I would like to be.
0.58	I arrive at college appointments with plenty of time to spare.*
0.52	When travelling, I usually have to rush in preparing to arrive at the airport or station at the appropriate time.

(table continues)

TABLE. (continued)

Factor 3 (Eigenvalue=2.40, Percent of Variance=4.1) Factor Label: Delay With Regard to Decisions

<u>Loading</u>	<u>Item</u>
0.78	I don't make decisions unless I really have to.
0.76	I put off making decisions.
0.63	I usually make decisions as soon as possible.*
0.63	Even after I make a decision I delay acting upon it.
0.60	I delay making decisions until it is too late.
0.59	I waste a lot of time on trivial matters before getting to the final decision.

Factor 4 (Eigenvalue=2.05, Percent of Variance=3.5) Factor Label: Punctuality With Regard to Routine Personal Tasks

<u>Loading</u>	<u>Item</u>
0.71	I pay my bills on time.*
0.67	If a bill for a small amount comes, I pay it right away.*
0.56	I usually return an "R.S.V.P." request very shortly after receiving it.*
0.49	I do routine maintenance (e.g., changing the car's oil) on things I own as often as I should.*
0.46	I'm careful to return library books on time.*
0.46	I generally return phone calls promptly.*

(table continues)

TABLE. (continued)

Factor 5 (Eigenvalue=1.75, Percent of Variance=3.0) **Factor Label:** Failure to Meet Deadlines

Loading	Item
0.66	I delay starting things so long that I don't get them done by the deadline.
0.64	I am not very good at meeting deadlines.
0.61	I don't get things done on time.

Factor 6 (Eigenvalue=1.57, Percent of Variance=2.7)

Loading	Item
0.64	I always seem to end up shopping for birthday gifts at the last minute.
0.62	I usually buy even an essential item at the last minute.

Factor 7 (Eigenvalue=1.38, Percent of Variance=2.3)

Loading	Item
0.87	If I have an important appointment, I make sure the clothes I want to wear are ready the day before.*
0.87	I lay out my clothes the night before I have an appointment so I won't be late.*

(table continues)

TABLE. (continued)

Factor 8 (Eigenvalue=1.31, Percent of Variance=2.2)

Loading	Item
0.88	If there were a workshop offered that would help me learn not to put off starting my work, I would go.
0.88	If someone was teaching a course on how to get things done on time, I would attend.

Factor 9 (Eigenvalue=1.13, Percent of Variance=1.9)

Loading	Item
0.45	A letter may sit for days after I write it before I mail it.
-0.45	I don't delay when I know I really need to get the job done.*

Factor 10 (Eigenvalue=1.04, Percent of Variance=1.8)

Loading	Item
-0.63	I overestimate the amount of work that I have to do in a given amount of time.

Note. An asterisk indicates that an item has been reverse scored.