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CHRONIC PAIN AND APS (ACTIVITY, PRODUCTIVITY, STANDARDS AND SUBJUGATION OF NEEDS) PERSONALITY CHARACTERISTICS

by

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ABSTRACT

The APS theory of chronic pain proposes that certain dispositions (namely high activity levels, high productivity needs, high standards, and the tendency to subjugate one's needs), may interact with an initial physical injury to place some people at risk for developing severe physical and emotional difficulties secondary to pain. The constellation of these dispositions was assessed through a recently developed 58 item questionnaire. The factor structure of this questionnaire was examined in a pilot study using a population of 202 (72 male) undergraduates at the University of Western Ontario. The results suggest the presence of five reliable factors: Autonomy/Personal Standards; Orderliness/Tidiness; Hard-driving/Productive; Activity, and Subjugation of Needs. APS subscales were developed based on these five factors. Correlations of these subscale scores with a variety of measures tapping related and unrelated constructs support the convergent and discriminant validity of each of the five subscales.

Two subsequent studies were conducted to test the APS theory of chronic pain. The first study was designed to determine whether severe chronic pain patients ($N=62$; 17 males) did in fact possess more APS characteristics than non-pain population controls ($N=69$; 20 males). As predicted, chronic musculoskeletal pain patients drawn from a tertiary care centre reported higher retrospective (i.e., pre-pain) total and subscale scores on the APS questionnaire than non-pain controls ($p<.001$). Contrary to prediction, the musculoskeletal pain patients reported higher total and subscale scores on the APS questionnaire prior to injury compared to their levels now ($p<.001$). The musculoskeletal pain patients' current total and subscale APS questionnaire scores were not significantly different from those of the non-pain controls, with the exception of lower levels of "activity".

In the second study, the predictive validity of the APS Questionnaire was further examined in a sample of 81 (32 male) newly referred chronic pain patients (evaluated at the Regional Evaluation Center & St. Joseph's Outpatient Clinic; LHSC). The convergent and discriminant validity of the APS questionnaire was somewhat supported through its relationship with related personality constructs. Contrary to prediction, scores on the APS questionnaire administered retrospectively were not significantly correlated with any of the outcome variables (i.e., pain disability, pain intensity, anxiety and depression). Scores on the current APS questionnaire, however, were significantly correlated with pain disability (r=-.33, p<.004) and depression (r=-.32, p<.004), though, in the direction opposite to that predicted. The relationship between current total APS scores and pain disability was mediated in part by the "activity" subscale. The relationship between current total APS scores and depression was almost entirely mediated by the "activity" and "subjugation of needs" subscales. "Subjugation of needs" subscale scores were significantly correlated with anxiety (r=-.41, p<.004). Current APS scores were not significantly correlated with pain intensity. Contrary to prediction, the relationship between APS scores and pain outcome was not mediated by tenacious goal pursuit or flexible goal adjustment.

Taken together, the present findings fail to support the APS theory of pain, in that APS status (as assessed currently) appears to be predictive against rather than predisposing one to pain-related disability, depression and anxiety. This study, however, is cross-sectional, and future research should follow individuals before the injury, through to the acute phase of injury, and into the chronic phase. This would allow for a direct examination of the progression of pain related factors and their relationship to APS characteristics over time.

Keywords: APS personality characteristics, chronic pain, pain intensity, pain disability, depression, anxiety, coping

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER 1: GENERAL INTRODUCTION

1.1 OVERVIEW

Chronic pain is characterised by persistent post-injury pain. For the majority of people, the acute pain symptoms will resolve within 3 to 6 months following the injury. However, for 10 to 15%, pain becomes chronic (Philips & Grant, 1991). Even within this chronic pain population, there is a considerable range of disability and pain adjustment among individuals (Crook & Moldofsky, 1996). The question remains as to why, with time, pain becomes more chronic and more disabling in some patients than it does in others after the initial injury.

1.2 PSYCHOGENIC THEORY OF CHRONIC PAIN

The traditional etiological view of chronic pain has centered on the idea of chronic pain representing a physical manifestation of underlying psychological problems. According to this view, the failure of pain to remit after the initial injury is seen to be an expression of emotional distress. That is, non-organic chronic pain has been seen to be an expression of depression, a symptom of somatoform disorder, or a symptom of hypochondriasis (Peyrot, Moody, & Wiese, 1993; Love & Peck, 1987; Wade, Dougherty, Hart, & Cook, 1992; Valdes, Treserra, Garcia, & DePablo, 1988).

Related to this traditional etiological view is the concept of the pain prone personality (Blumer & Heilbronn, 1981). Blumer and Heilbronn (1981) theorize that chronic pain patients have unconscious dependency needs which conflict with their need to be viewed as solid citizens. They reason that this conflict produces emotional distress, which manifests itself in the form of somatized medical complaints (i.e., pain).

There are some difficulties with these traditional psychogenic models of pain. Of primary concern is the inability to determine the causal ordering between chronic pain and emotional distress (Peyrot, Moody, & Wiese, 1993). It has been hypothesized that symptoms of neuroticism (i.e., somatoform disorder, depression, anxiety, or hypochondriasis) may be a consequence of the pain, as opposed to the cause of the pain.

Furthermore, psychogenic theories are based on an underlying assumption that "the cause of the pain is non-organic". However, with the advancement of new technology and increased knowledge, this traditional assumption is beginning to be challenged (Barnsley, Lord, Wallis & Bogduk, 1995; Lord, Barnsley, Wallis & Bogduk, 1996). That is, organic causes for the pain are beginning to be discovered in patients previously labeled "non-organic".

The application of the label "non-organic" can itself be iatrogenic. That is, the label "non-organic" pain can produce emotional distress for the patient, because it implies that the pain is not legitimate, and they are in essence malingering (Simmonds, Kumar, & Lechelt, 1996). The view that chronic pain patients are malingerers, freeloaders, or lazy is common in the legal literature and profession, and among laypersons (Swartzman, Teasell, Shapiro, & McDermid, 1996; Shapiro & Roth, 1993).

1.3 THE APS THEORY OF CHRONIC PAIN

1.3.1 Overview

The theory of pain that drives the present group of studies represents an alternative view of the etiology of chronic pain. Similar to the traditional psychogenic theories, it is believed that psychological factors play an important role in chronic pain. However, contrary to the traditional theories, it is not believed that chronic pain is merely a physical manifestation of psychological

factors, nor that pain patients are malingerers. In contrast, the APS theory of chronic pain proposes that certain personality characteristics (that are in direct opposition to laziness or dependency) may interact with the initial physical injury to place some patients at risk for developing more severe physical and emotional difficulties secondary to the organic pain condition (see Figure 1). This theory will be discussed in detail below.

1.3.2 APS Personality Characteristics

The personality characteristics which may place patients at risk is termed APS personality, which stands for high Activity, high Productivity, high Standards and high Subjugation of needs (Shapiro & Teasell, in press). Although these characteristics may occur independently in some individuals (e.g., individuals with high activity levels but not high standards), Shapiro and Teasell (in press) observed that, the subset of chronic pain patients in tertiary pain clinics who are having difficulty with their pain seem to possess these characteristics simultaneously. These individuals reportedly have a need to be constantly busy (i.e., activity), extremely efficient (i.e., hard-driving/productivity), set high standards for themselves (i.e., standards) and also report having a need to take care of those around them, putting their own needs behind those of others (i.e., subjugation of needs).

Although these individuals admittedly have some characteristics of the Type A personality profile (i.e., hard-driving/productive), their need to take care of those around them is almost antithetical to cynical hostility, the pathogenic component of Type A behaviour. APS individuals also arguably share some elements of perfectionism, including high standards, concern over mistakes, and the need for organization. However, they do not share that aspect of perfectionism "doubts about action" that can lead to obsessive inaction and procrastination. In contrast, APS

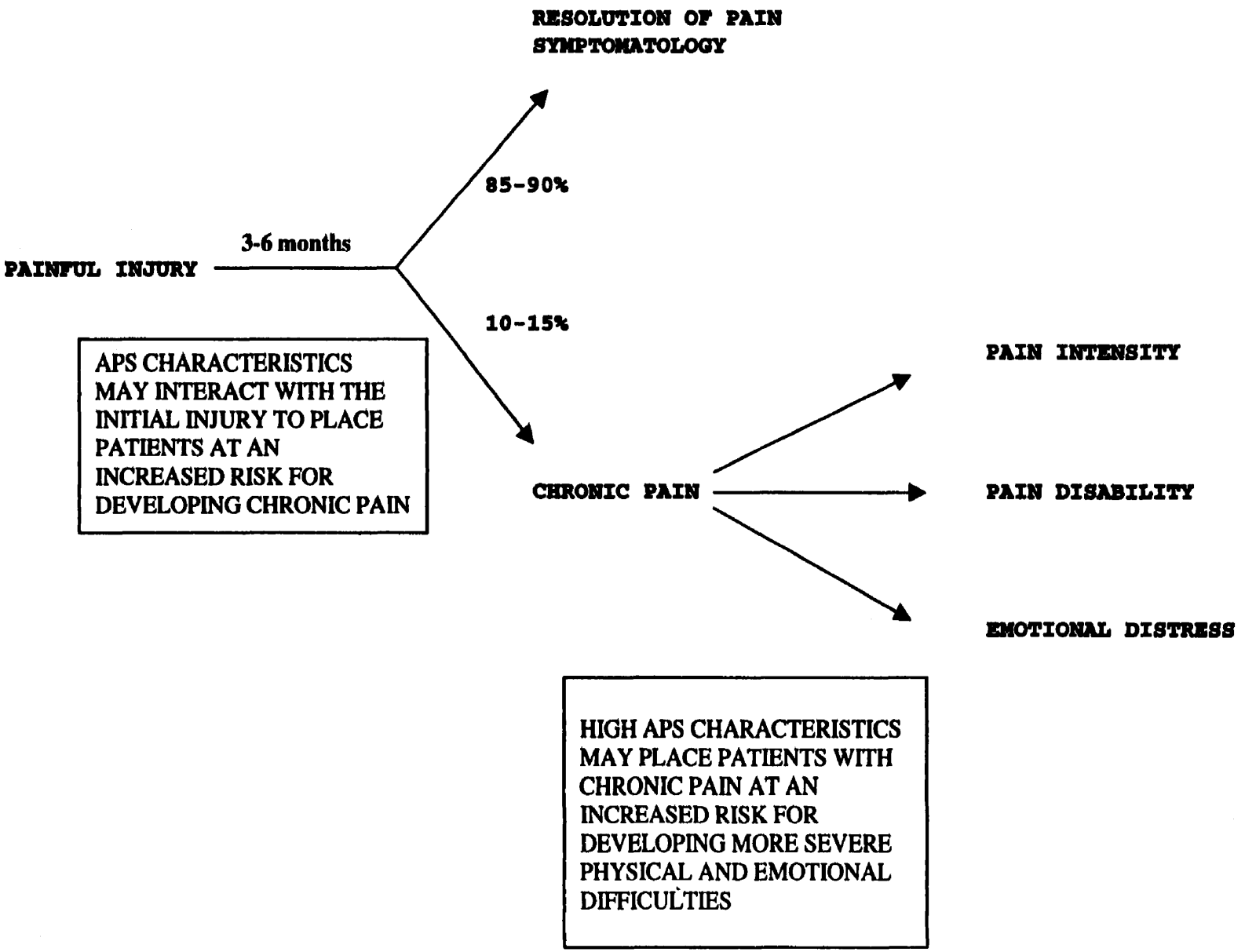

Figure 1. The APS theory of chronic pain.

individuals describe themselves as "doers" (rather than thinkers) and they would not be rendered paralyzed (or slowed down) by doubts.

These individuals are described as having been very successful in their pre-pain endeavors. An example may be someone who is a successful homemaker and mother, keeps an immaculate house and cooks everything from scratch. Patients report that premorbidly, they insisted on "doing it all" and did things at a much faster pace than others around them. Driven, in part by their high standards, these patients report that they seldom took help from others, and rarely took breaks in their daily activities. They don't regard this behaviour as perfectionistic, but rather see it simply as doing things "the way they should be done". Prior to their pain, their ability to maintain a high level of activity, productivity and caring for others might be adaptive. However, post-injury, these tendencies/needs may be thwarted by the physical limitation imposed by the pain, which can be frustrating for these patients. Accordingly, one would predict that APS characteristics are not thought to be related to adjustment difficulty premorbidly, but would cause problems postmorbidly.

There are observations from other clinicians/researchers that suggests that pain patients do indeed possess similar characteristics of APS prior to the onset of their pain. For example, Blumer and Heilbronn (1989) observed that chronic pain patients consistently reported pre-pain 'ergomania'. Ergomania refers to a pre-pain history of constant activity (workaholism), excessive work performance, and excessive self-sacrifice for the well being of the family.

Similar observations are made by VanHoudenhove (1986), who examined the medical and psychiatric records of 255 patients with chronic pain of no known organic cause. He looked for evidence of premorbid hyperactivity defined as: starting work early; inability to relax; engaging in sports or heavy work; and combining multiple jobs or activities. He found that 44 percent of the patients would have been classified premorbidly as hyperactive. Furthermore, VanHoudenhove,

Stans, and Verstraeten (1987) found that chronic non-organic pain patients described themselves retrospectively (i.e., pre-pain) as very active, with a pre-pain history of physical overburdening. While this is an interesting observation, not much can be made of this because we do not know about base rates of these characteristics in the population at large. Research needs to compare the presence of APS characteristics in a population of chronic pain patients to that of the general population.

1.3.3 APS Characteristics and Pain Outcome

APS Characteristics and Physical Difficulties: Shapiro and Teasell (in press) argue that post-injury, patients high in APS characteristics may have great difficulty dealing with the pain due to their need to maintain their high pre-pain levels of activity and productivity in accordance with their high standards. These patients may be at a greater risk for experiencing more long-term (chronic) and more severe levels of pain disability and pain intensity because of their behavioural response to the pain. That is, APS pain patients may push themselves (i.e. leading to pain exacerbation) in an attempt to maintain their inordinately high levels of pre-pain activity and productivity. Failing to rest in the face of pain (i.e., not listening to their body) and pushing themselves physically can contribute to long-term muscle and tissue damage. This view of the chronic pain patient as a "striver" is in stark contrast to the more "traditional" views which characterize the chronic pain patients as malingerers who are resistant to increasing (as opposed to decreasing) their levels of activity.

Due to the recent development of the theory about the APS personality, there is thus far no empirical literature that has directly tested it. This thesis, in fact, represents the first such attempt. However, indirect support for this theory does comes from research performed on sign language

interpreters who had been injured and had continued to work. Those sign language interpreters who strived to maintain the full range of hand and arm movement necessary for each word, despite painful injuries (i.e., were perfectionistic), suffered more long term (chronic) upper extremity pain disorders than did those who did not strive for such perfection (Feuerstein, Carosell, Burrell, Marshell, & DeCaro, 1997).

Research has also demonstrated that within the chronic pain population the most severe pain cases report the most "APS like" characteristics prior to their injury. For example, Gamsa and Vikis-Freibergs (1991) compared 244 chronic pain sufferers from various settings (e.g., specialised pain clinics, general practitioners, and physiotherapists). When demographic variables such as sex, language, occupational status, and education level were covaried out, the findings revealed that patients in specialised pain clinics (i.e., the most severe pain cases) reported being more active (i.e., ergomania) before their injury than did the other pain patients. Thus, there is a tendency for severe pain patients to report the presence of these characteristics premorbidly.

APS Characteristics and Emotional Distress: An increased incidence of depression and anxiety has been found among chronic pain patients (Haley, Turner, & Romano, 1985; Trief, Elliot, Stein, & Frederickson, 1987). Whereas traditional psychogenic views propose that the pain is a result of emotional distress, the APS theory proposes that emotional distress is secondary to the chronic pain disorder. Research supports the notion that pain precedes emotional distress. A longitudinal study to examine the causal relationship between pain and depression was performed by Brown (1990) in the normal population. Measures of pain and depressive symptomatology were taken at 6-month intervals for 3 years. Self-report data from the first 12 months of the study did not support a causal relationship in either direction. However, a causal relationship was found during

the last 12 months of the study, wherein pain predicted depression over a 6 month period, even after controlling for prior levels of depression.

APS individuals may be particularly vulnerable to experiencing greater emotional distress after the injury because they cannot maintain their pre-pain levels of activity, productivity, high standards, and caring for others. Not being able to perform tasks according to their pre-pain ability may be particularly distressing for APS pain patients, whose self-esteem may be tied to how well they perform (Shapiro & Teasell, in press). Notably, perfectionistic tendencies have also been linked to depression and anxiety in the normal population (Frost, Marten, Lahart, and Rosenblate, 1990).

1.3.4 APS CHARACTERISTICS AND COPING

Coping strategies may mediate the relationship between APS personality and pain outcome. Researchers have acknowledged that personality variables are important in determining how individuals will cope with the physical constraints brought on by the pain (Keefe, Salley, & Lefebvre, 1992). It may be the case that individuals high in APS characteristics adopt maladaptive coping strategies to deal with the pain (e.g., inappropriate goal setting, repeated attempts to 'push through' the pain). These maladaptive coping mechanisms may result in the individual experiencing greater emotional difficulties adjusting to the pain, and it may be these individuals who experience more pain intensity and disability after the initial injury.

Brandtstadter and Renner (1990) examined goal setting and identified two complementary modes of coping when faced with a critical life transition (e.g., living with pain). Assimilative coping involves active attempts to alter an unsatisfactory situation in a way that preserves the original set of goals. In contrast, accommodative coping involves the flexible adjustment of goals to

current situational limitations. A perceived threat to obtaining these goals (e.g., chronic pain) will trigger one of these two coping responses. Research has shown that goal modification (i.e., accommodative coping strategy) is associated with better emotional adjustment in chronic pain patients (Schmitz, Saile, and Nilges, 1996).

One might predict that chronic pain patients high in *APS* characteristics would be inclined to use assimilative (rather than accommodative) coping strategies as a result of their perfectionistic tendencies. Research has shown that perfectionism is related to high goal setting, with an emphasis placed on obtaining these goals (Ferguson & Rodway, 1994; Alden, Bieling, & Wallace, 1994). When faced with an obstacle such as chronic pain, it may be the case that patients high in *APS* characteristics refuse to accept the pain, and hence do not deviate from their original high standards and goals. This would constitute a maladaptive form of coping, as the patients cannot achieve what they could pre-pain, due to uncontrollable limitations in their everyday functioning brought on by their physical impairments. In keeping with this prediction, *APS* characteristics were found to be positively correlated with tenacious goal pursuit ($r = .51$, $p<.001$), and negatively correlated with flexible goal adjustment ($r = -.27$, $p<.001$) in an undergraduate sample (Kim, 1998).

1.4 DEVELOPMENT OF THE APS QUESTIONNAIRE

The constellation of APS characteristics share some, but not all traits associated with pre-existing personality constructs such as Type A and Perfectionism. The cluster of traits Shapiro and Teasell (in press) have observed has not been directly assessed by other known personality measures. Accordingly, proper assessment of the APS theory of chronic pain required the construction of a scale to specifically capture the essence of the "APS" trait constellation.

A 58 item APS Questionnaire was constructed and psychometric analyses were performed on the total scale scores with a population of 202 undergraduates at the University of Western Ontario (Kim, 1998). The APS questionnaire demonstrated high internal consistency (Cronbach's Alpha=.88) and demographic variables (age, sex and education level) were not found to be significantly correlated with total scale scores. It should be noted, however that the lack of correlation between APS total scores and demographic variables may have been due to the restricted range of these demographic variables (i.e., age and education level) in this particular sample of undergraduates.

The APS questionnaire also demonstrated good convergent and discriminant validity (see Tables 1 & 2). This will be discussed in detail below.

Convergent Validity: The presence of an Activity component to the APS was supported by positive correlations between APS scores and the "Energy Level" subscale of the Jackson Personality Inventory ($r = .45$), and to a lesser degree, the "Speed & Impatience" subscale of the Student Jenkins Activity Survey ($r = .15$). The presence of a Productivity component to the APS questionnaire was supported by positive correlations between scores on the APS questionnaire and the "Organization" subscale of Jackson's Personality Inventory ($r = .60$), the "Organization" subscale of Multidimensional Perfectionism Scale ($r = .55$), and the overall score of the Student Jenkins Activity Survey ($r = .68$). Furthermore, APS scores were negatively correlated with the Lay Procrastination Scale ($r = -.46$). The presence of a Personal Standards component was supported through positive correlations between APS scores and the overall score on the Multidimensional Perfectionism Scale ($r = .57$), the "Concern over Mistakes" ($r = .38$) and "Personal Standards" ($r = .61$) subscales of the Multidimensional Perfectionism Scale. Scores on the APS questionnaire were also positively correlated with the "Hard-driving/competitive" subscale of the Student Jenkins

Table 1

Convergent and Discriminant Validity of the APS Questionnaire total scale scores in a Population of Undergraduates

Measure	r	N
Multidimensional Perfectionism Scale		
Total	.57***	193
Concern over Mistakes	.38***	193
Organization	.55***	199
Parental Criticism	.09	198
Personal Standards	.61***	199
Doubts about Action	.07	161
Parental Expectations	.29***	198
Student Jenkins Activity Survey		
Total	.68***	196
Hard-driving/Competitive	.68***	196
Speed/Impatience	.15*	199
Jackson Personality Inventory		
Energy Level	.45***	192
Organization Level	.60***	196
PANAS		
Positive Affect	.23***	199
Negative Affect	.02	199
Cook-Medley Hostility Scale	.01	161
Lay Procrastination	-.46***	194
SCL-90-R		
Obsessive-Compulsivity	-.01	198
Anxiety	.06	198
Depression	.05	199
Hostility	-.10	199
Somatization	.01	198

***p<.001, **p<.01, *p<.05

Table 2

Convergent and Discriminant Validity of the APS Questionnaire total scale scores in a Population of Undergraduates (using Behavioural Measures)

Behavioural Measure	r	N
Time to complete questionnaire	-.22**	117
Hours Spent (school days)		
Studying	.24***	197
Paid work	.15*	196
Volunteer work	.10	197
Hobbies/activities	.06	197
Eating	-.15*	195
Relaxing alone	-.14*	197
Socializing	-.26***	197
Sleeping	-.04	197
Hours Spend (Non-school days)		
Studying	.17*	189
Paid Work	.17**	188
Volunteer Work	.11	189
Hobbies/activities	.04	189
Eating	-.11	189
Relaxing alone	-.18**	189
Socializing	-.13*	189
Sleeping	-.06	190
Academic Grades		
Incoming	.23***	198
Expected	.27***	198

***p<.001 **p<.01 *p<.05

Activity Survey (r=.68). Measures that would directly confirm the presence of a Subjugation of Needs component to the APS questionnaire were not administered in this study.

Behavioural Validation of the APS scale provided further support for the convergent validity of the APS questionnaire. A significant relationship was found between APS scores and the number of hours spent studying (r = .24) and performing paid work (r = .15), (i.e., Productive tasks). A significant negative relationship was found between APS scores and the amount of time spent eating (r = -.15), relaxing (r = -.14), and socializing (r = -.26), (all non-productive tasks). A significant positive relationship was found between incoming (r = .23) and expected grades (r = .27), (i.e., High Standards), and APS scores. Finally, a significant negative relationship was found for *APS* scores and the amount of time to complete the questionnaires (r = -.22), (i.e., Activity level).

Discriminant Validity: As would be predicted, *APS* scores were not significantly correlated with cynical hostility (as measured by the Cook-Medley Hostility Scale), parental criticism, and doubts about action (measured by the Multidimensional Perfectionism Scale). Furthermore, *APS* scores were not significantly associated with obsessive-compulsive behaviour, depression, anxiety, or somatization as measured by the SCL-90-R. Finally, *APS* scores were not significantly associated with negative affect.

Factor Structure of the APS Questionnaire: The factor structure of the APS questionnaire was also examined within this sample of undergraduate students (Kim, 1998). Many of the items of the APS questionnaire were written to incorporate two or more components of the APS (Activity, Productivity, Standards and Subjugation of Needs). For example, the item, "When I watch TV, I usually do something else at the same time" is an indicator of both 'activity' and 'productivity'.

Accordingly, Kim (1998) predicted that only one overall factor would emerge when factor analytic procedures were applied. However, a single factor did not emerge and two, three and four factor solutions were not interpretable. Kim (1998) did not examine the structure beyond a four factor solution. Thus, a more detailed analysis of the factor structure of the APS questionnaire should be conducted.

1.5 GOALS OF THE PRESENT RESEARCH

Two studies were conducted to test the APS theory of chronic pain. The first study was designed to determine whether severe chronic pain patients did in fact possess more APS characteristics than non-pain population controls.

The second study was designed to: 1) further verify the psychometric properties of the APS questionnaire in a sample of pain patients; 2) examine the predicted relationships between APS questionnaire scores and measures of pain intensity, disability, and emotional distress; 3) examine the role of goal adjustment in the relationship between scores on the APS questionnaire and pain outcome.

Before testing the APS theory of chronic pain, however, a more detailed investigation of the factor structure of the APS questionnaire was conducted, using data from the undergraduate population (collected by Kim, 1998).

CHAPTER 2: PILOT STUDY I – FACTOR STRUCTURE OF THE APS QUESTIONNAIRE

2.1 INTRODUCTION

A 58 item APS Questionnaire was constructed and preliminary analyses of the factor structure was performed on data from a population of 202 undergraduates at the University of Western Ontario (Kim, 1998). Based on the fact that many of the items of the APS questionnaire were written to incorporate two or more components of the APS (Activity, Productivity, Standards and Subjugation of Needs), these researchers predicted the presence of one overall factor. However, a single factor solution failed to emerge when factor analytic procedures were employed. Moreover, two, three and four factor solutions were also not interpretable, and Kim (1998) did not go beyond a four factor solution. Thus, a more detailed analysis of the factor structure of the APS questionnaire should be conducted.

Accordingly, the present study will involve a more thorough examination of the factor structure of the APS questionnaire using data collected by Kim (1998). The results of the factor analysis will be used to guide the construction of APS 'subscales'. In addition, the convergent and discriminant validity of these emergent subscales will be examined. The measures used to assess the convergent and discriminant validity will be those, which are presumed to be similar (for convergent validity) or unrelated (for discriminant validity) to Activity, Productivity and High Standards, factors that, 'a priori', it was assumed would emerge.

Predicted Convergent Validity: Subscales of the APS questionnaire are expected to be positively correlated with aspects of perfectionism (personal standards, organization, concern over mistakes), the propensity for high levels of activity, impatience and time urgency, high goal setting

and assimilative coping skills. Specific subscales are expected to be positively related to incoming and expected grade average (a possible indicator of high productivity and personal standards) as well as the average amount of time spend on "productive" tasks (paid/volunteer work, studying, hobbies, and extra-curricular activities). A strong negative relationship is also expected with procrastination and flexible goal adjustment. A negative relationship is expected between non-productive tasks (socializing, relaxing, watching TV) and the subscale scores of the APS questionnaire. A negative relationship is also expected between APS subscale scores and the amount of time required to complete the questionnaire.

Predicted Discriminative Validity: Subscale scores on the APS questionnaire are not expected to be related to measures of cynical hostility, negative affect, obsessive-compulsiveness, anxiety, depression and somatization.

2.2 METHOD

2.2.1 PARTICIPANTS

Two hundred and two participants were recruited from the University of Western Ontario introductory psychology subject pool (72 men) in partial fulfillment of J. Kim's psychology honours thesis (see Appendix A for Ethics Approval). The mean age was 19.48 (SD = 1.80, range = 17-32) and mean years of education was 14.82 (SD = 1.32). English was the first language for 95% of the participants.

2.2.2 MEASURES

2.2.2.1 Demographic Information

Demographic variables such as the age, gender, years of education and first language were assessed.

2.2.2.2 APS Questionnaire

The APS questionnaire contains 58 items, which were designed to measure the presence of APS characteristics. These characteristics include a high activity level, high productivity level, high standards and subjugation of needs. The items on the questionnaire are rated on a scale of 1 (extremely inaccurate) to 7 (extremely accurate). Demographic variables (age, sex, and education level) were not found to be significantly correlated with scale scores (Kim, 1998; see Appendix B).

2.2.2.3 Perfectionism

The Multidimensional Perfectionism Scale (MPS; Frost, Marten, Lahart, & Rosenblate, 1990) is designed to measure various aspects of perfectionism. It consists of 6 subscales, which include: concern over mistakes, doubts about action, parental expectations, personal standards, parental criticism, and organization. There are 35 self-descriptive statements in total, rated on a 5-point scale (1 = strongly disagree, 5 = strongly agree). Sample items include "If I do not set the highest standards for myself, I am likely to end up a second-rate person" (Personal Standards scale) and "I try to be an organized person" (Organization scale). This questionnaire has been shown to display good internal consistencies, with reported ranges from 0.77 to 0.93 for the six subscales (Frost, Marten, Lahart, & Rosenblate, 1990).

2.2.2.4 Lay Procrastination Scale

The Lay Procrastination Scale (Lay, 1986) is a 20 item questionnaire designed to measure the degree to which true/false questions such as "I generally delay before starting on work I have to do" and "I usually have to rush to complete a task on time" are endorsed. Good internal consistency has been reported for this scale, with Cronbach's alpha=.82 (Lay, 1986).

2.2.2.5 Jackson Personality Inventory (Energy Level and Organization Subscales)

The "energy level" and "organization" scales of the Jackson Personality Inventory (JPI; Jackson, 1977) were used. Each of these scales consists of 20 true/false questions such as "I like to be constantly active" and "My time is too valuable to be wasted". Internal consistency for both the "energy level" and "organization" subscales is moderate (Cronbach's alpha = .76 and .79 respectively) (Jackson, 1994).

2.2.2.6 Type A Characteristics

The Student Jenkins Activity Survey (SJAS: Glass, 1977) is a widely utilized 44 item self-report questionnaire that measures Type A behaviour traits. There is a total Type A score and two subscale scores: Hard-driving/Competitive and Speed/Impatience. Those individuals who obtain high scores on the Hard-driving/Competitive subscale are thought to be more responsible, precise and exert more effort on tasks than average students. Those individuals who score high on the Speed/Impatience subscale indicate that they have a tendency to eat too fast, rush others, and perform tasks in a hurry. Internal consistency for both subscales is moderate (ranging from .57 to .81) and are generally higher than for the total Type A scale (ranging from .40 to .62) (Glass, 1977).

2.2.2.7 Cook-Medley Hostility Scale:

The Cook-Medley Hostility scale was derived from the Minnesota Multidimensional Personality Inventory (MMPI; Cook and Medley, 1954). This scale is utilized to assess the degree to which a person has cynically hostile attitudes. Fifty self descriptive statements such as "Most people are honest chiefly through the fear of getting caught" and "No one cares much about what happens to you" make up the Cook-Medley Hostility questionnaire. Participants circle true or false in response to these questions. Higher scores indicate higher levels of cynical hostility. Good internal consistency has been reported for this scale, with Cronbach's alpha=.86 (Cook & Medley, 1954).

2.2.2.8 Dispositional Mood State

The Positive and Negative Affect Schedule (PANAS) consists of 2 (10 item) subscales, measuring positive affect and negative affect. Participants are asked to rate to what extent they generally experience each mood state (e.g., scared, nervous, excited, proud) on a 5 point scale (0=very slightly or not at all, 5=extremely). Good internal consistency has been reported for each of the subscales with Cronbach's alpha ranging from 0.84 to 0.87 (Watson, Clark, & Tellegen, 1988).

2.2.2.9 Symptom Checklist-90-R

The Symptom Checklist-90-R (SCL-90-R) is a self-report questionnaire consisting of 90 items and 9 subscales. This measure quantifies physical and psychological symptomatology experiences in the past two weeks (e.g., poor appetite, crying easily). Participants indicate the amount of distress that the symptoms caused them on the basis of a five point scale (0=not at all,

5=extremely) (Derogatis, 1983). Test-retest stability and internal consistency coefficients have been reported to range from .077 to .90 (Derogatis, 1983).

2.2.2.10 Global Coping Strategies

The global coping strategy questionnaire consists of two subscales (15 items in each), measuring tenacious goal pursuit (e.g. I can be very obstinate in pursuing my goals) and flexible goal adjustment (e.g., I can adapt quite easily to changes in a situation) (Brandtstadter and Renner, 1990). Items are rated on a scale of 0 (strongly disagree) to 4 (strongly agree). Cronbach's alpha level is 0.83 for the flexible goal adjustment scale and 0.80 for the tenacious goal pursuit scale.

2.2.2.11 Behavioural Measures

Participants were covertly timed with respect to how long it took them to complete the questionnaire. This information provided an indirect measure of speed and energy level. Students were asked to report their incoming and expected academic grades. Participants were also asked to accurately estimate the average number of hours that they spend on a variety of tasks on a typical school or non-school day (see Appendix C).

2.2.3 PROCEDURE

Participants completed the 1- 1 ½ hour testing procedure in groups of two to fifteen. Participants were given an information sheet and an informed consent form to complete before any measures were administered (see Appendices D & E).

Participants were randomly given one of three orderings of the questionnaire package so as to counteract order effects. Upon completion of the questionnaires, participants were fully debriefed (see Appendix F), given their research credits, and thanked for their participation.

2.3 RESULTS

2.3.1 Factor Analysis

A principal components factor analysis was performed to investigate the relationship among the 58 APS items. The main premise for this procedure is that any given measure of an individual difference variable can be thought of as being made up of a number of components. By studying the relationships among a set of measures (i.e. APS items) it is possible to identify these various components. These components can be thought of as latent variables while the measures themselves can be thought of as indicator variables (Gardner, 1997). In this study the indicator variables are the participants' scores on the individual APS items and the factor analysis is being used to find the underlying components. Factor analysis was run on the 58 items completed by all 202 participants.

The factor analysis generated 18 factors with eigenvalues > 1.0. Figure 2 contains the scree plot of the eigenvalues for the factors identified in the analysis. Eigenvalues represent the total variance explained by each factor. Inspection of this plot would suggest the presence of 6-7 interpretable factors, based on Cattell's (1966) method of looking for the 'elbow' in the curve. The factors were interpreted using a Varimax rotation by considering each factor and determining what was common to all the variables that loaded highly (above .50) on a factor and not common to all the variables obtaining low loadings. This rather strict cut-off value was chosen to control for Type 1 error, due to the large number of items in the APS questionnaire relative to the sample size

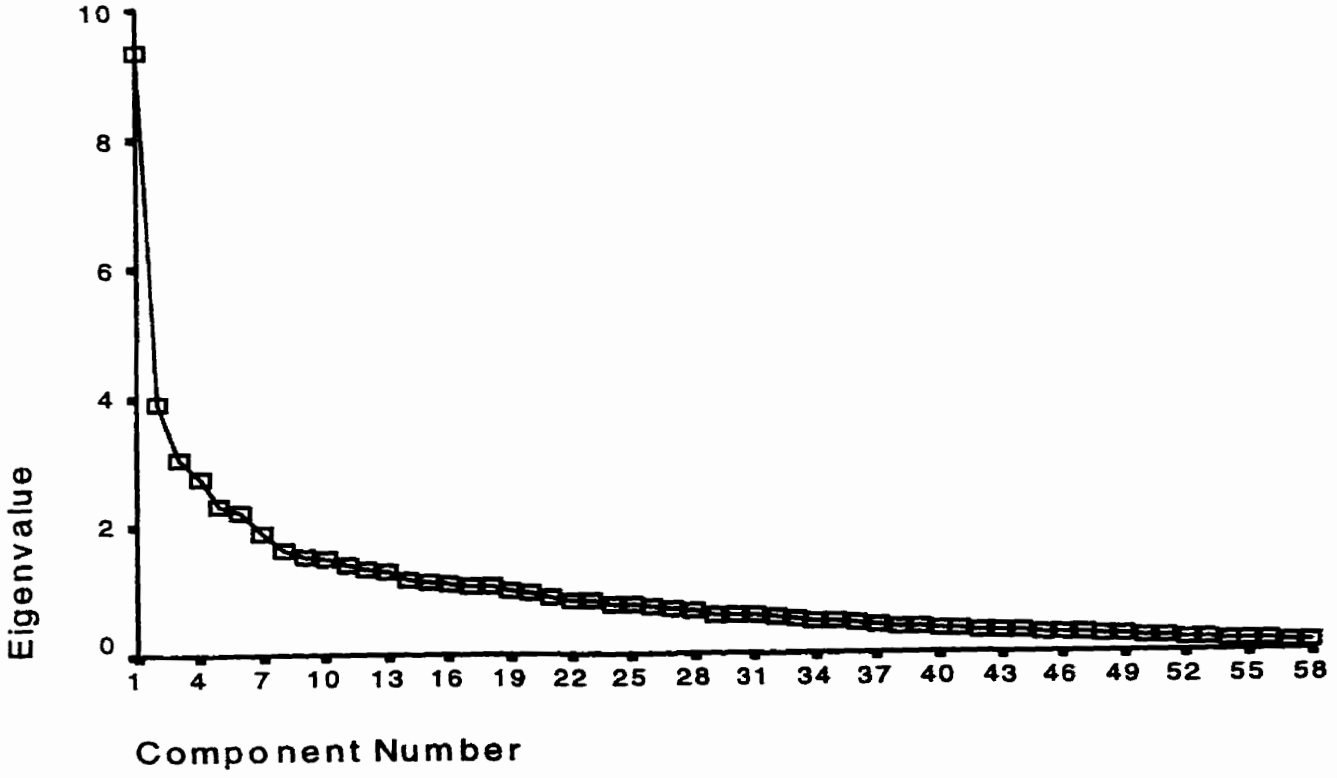

Figure 2. Scree plot of the eigenvalues for the APS factors.

(Stevens, 1996). A 6-factor solution proved to be the most interpretable of the 5-8 factorial solutions tested, accounting for 40.62% of the variance of the variables analyzed. The six factors include: Autonomy/Personal Standards; Orderliness/Tidiness; Hard-driving/Productive; Activity; Subjugation of Needs, and Personal Control. Table 3 summarizes the factors, variables, factor loading and percent of variance accounted for.

2.3.2 Selection of Subscale Items

Having conducted the factor analysis, we then selected the items that would remain in the final APS subscales by using the same criteria adopted for the interpretation of the factor. That is, an item's highest factor loading had to exceed 0.50, and its next highest loading had to be at least .15 lower than its highest loading. This rather strict inclusion criterion was adopted to control for Type 1 error and to ensure that the subscales would be distinct. APS questionnaire subscales include: Autonomy/Personal Standards; Orderliness/Tidiness; Hard-driving/Productive; Activity and Subjugation of Needs. A scale based on factor 6 (Personal Control) was not included as an APS subscale due to the fact that it had only 2 items and thus was deemed less reliable than the other 5 factors (Guadagnoli and Velicer, 1988) (see Table 3).

2.3.3 Descriptive Statistics and Psychometric Properties of the APS Questionnaire

The intercorrelations among the APS subscale scores are presented in Table 4. APS subscales were moderately to highly correlated with total APS scores. The APS subscale scores were not highly correlated. A multistage Bonferroni procedure was used to correct for the probability of making a Type I error when more than one hypothesis is tested (i.e., more than one correlation coefficient is tested for significance). The multistage Bonferroni procedure was chosen

Table 3

The Varimax 6-Factor Solution of the 58 APS Items

Items	Fact1 Autonomy/ Personal Standards 16.08%	Fact 2 Orderliness/ Tidiness 6.73%	Fact 3 Hard-driving/ Productive 5.28%	Fact4 Activity 4.72%	Fact 5 Subjugation of needs 3.99%	Fact 6 Personal Control 3.82%
1. I dislike asking others for assistance.	**.61**	-.06	.11	-.05	.08	-.02
2. Other people sometimes question why I keep trying to improve something that they think is already "good enough".	**.60**	-.06	.27	.04	-.05	.05
3. People see me as someone who can overcome any problem without needing help.	**.58**	-.11	-.07	.31	.04	.23
4. I do not ask others for help if I can somehow manage on my own, even if the task is extremely difficult.	**.56**	.05	-.12	.14	.26	.05
5. When it comes to meeting my own standards, I do not compromise.	**.56**	.08	.12	.04	-.03	.29
6. I prefer to do things myself because other people often don't do them properly.	**.54**	.06	-.03	.20	-.05	-.03
7. I think that people worry too much about keeping things neat and tidy.*	-.02	**.78**	.15	.05	.05	-.03
8. I usually keep things orderly and in their place.	.17	**.78**	-.07	.11	.02	.15
9. Other people often comment on how clean and tidy my house or apartment is.	.12	**.77**	-.02	.12	.02	.08
10. I think that people are too concerned with having a place for everything and everything in its place.*	-.13	**.69**	.23	.11	.18	-.10
11. When visiting, I am more comfortable in a house that is a little messy than in a house that is completely clean and tidy.*	-.10	**.69**	.10	.01	.09	.07
12. I often forget where I have put things, because I'm not very organized.*	.13	**.65**	.13	.00	.03	.41

* Negatively keyed items.

Note: Items for which the factor loadings are underlined met the criterion for interpretation (i.e., highest factor loading > .50). Items for which the factor loadings are bolded are APS subscale items.

Table 3 (continued)

The Varimax 6-Factor Solution of the 58 APS Items

Items	Fact 1 Autonomy/ Personal Standards 16.08%	Fact 2 Orderliness/ Tidiness 6.73%	Fact 3 Hard-driving/ Productive 5.28%	Fact 4 Activity 4.72%	Fact 5 Subjugation of needs 3.99%	Fact 6 Personal Control 3.82%
13. I usually work at an easy pace and avoid long hours.*	.05	.11	**.65**	.07	.04	.07
14. When working, I try not to miss my lunch and coffee breaks because I like having quiet time to relax and do nothing.*	-.07	-.03	**.56**	.23	.03	-.23
15. It is usually easy for me to "turn my mind off" at the end of the day, even if there are still things that need to be done.*	.19	.07	**.55**	-.01	.12	-.22
16. I often think that people place way too much importance on getting a lot done in a day.*	-.03	.22	**.55**	.23	.05	-.10
17. I prefer to do whatever is most convenient, even if it sometimes means that I have to compromise my standards.*	-.01	-.04	**.51**	-.12	.24	.21
18. I like to be busy and "on the go" most of the time.	.08	.05	.16	**.76**	.09	.14
19. I get bored easily when I am not busy.	-.03	-.11	-.04	**.62**	.12	-.18
20. When it comes to getting things done I have two speeds -- fast and faster.	.24	.23	.11	**.59**	-.05	.01
21. My best way of reducing stress is through physical activity and keeping busy.	.06	.01	-.19	**.57**	-.18	.12
22. I usually schedule as much into my day as I possibly can.	-.01	.23	.29	**.55**	.07	.06
23. I avoid doing more favours for other people than they do for me.*	-.18	.08	-.08	-.02	**.61**	.07
24. I usually insist on getting my fair share even if it means that someone else has to do without.*	-.19	.05	.13	-.15	**.58**	-.19

* Negatively keyed items.

Note: Items for which the factor loadings are underlined met the criterion for interpretation (i.e., highest factor loading > .50). Items for which the factor loadings are bolded are APS subscale items.

Table 3 (continued)

The Varimax 6-Factor Solution of the 58 APS Items

Items	Fact1 Autonomy/ Personal Standards 16.08%	Fact 2 Orderliness/ Tidiness 6.73%	Fact 3 Hard-driving/ Productive 5.28%	Fact4 Activity 4.72%	Fact 5 Subjugation of needs 3.99%	Fact 6 Personal Control 3.82%
25. I usually let others do the planning for important events, because I can't be bothered with all the details.*	-.04	.05	.21	.18	**.57**	.23
26. I usually give more to people than I take back in return.	.34	.02	-.17	-.06	**.51**	-.10
27. I often rely on others to remind me about little details that I would otherwise forget to look after. *	.04	.32	.11	-.03	.27	.58
28. I rarely need to say the words "I can't".	.23	-.22	-.04	.17	-.06	.50
29. Even when I am relaxing, my mind is often thinking about things that need to get done.	.39	.23	.20	.14	-.03	.55
30. I do not spend time continuing to work on something that is already "good enough".*	.23	.11	.49	-.02	-.04	.29
31. When I am sick, I let other people take over my usual responsibilities so that I can rest.*	.20	-.07	.20	.38	-.01	.06
32. People have sometimes told me that I am too honest.	.07	-.04	-.01	.14	.19	.14
33. When I watch TV I usually do something else (e.g., ironing, reading, knitting, paying bills, exercising) at the same time.	.18	.22	.06	.24	.14	.13
34. I often do things at a slower pace than other people do them.*	.05	.17	.07	.27	.21	.39
35. I always learned to push myself hard to overcome obstacles.	.27	-.03	.31	.42	-.06	.11
36. I am comfortable saying "no" when people ask for assistance.*	.19	-.03	.12	-.23	.41	-.28

*Negatively keyed items.

Note: Items for which the factor loadings are underlined met the criterion for interpretation (i.e., highest factor loading > .50). Items for which the factor loadings are bolded are APS subscale items.

Table 3 (continued)

The Varimax 6-Factor Solution of the 58 APS Items

Items	Fact1 Autonomy/ Personal Standards 16.08%	Fact 2 Orderliness/ Tidiness 6.73%	Fact 3 Hard-driving/ Productive 5.28%	Fact4 Activity 4.72%	Fact 5 Subjugation of needs 3.99%	Fact 6 Personal Control 3.82%
37. Other people sometimes call me a "perfectionist".	.47	.19	.47	.19	-.16	.18
38. I am usually the one to take responsibility for helping relatives or friends when they are ill or upset.	.31	.13	-.10	-.08	.41	.22
39. Some people would describe me as a "couch potato".*	.07	.23	.33	.39	.05	.21
40. I take pride in how much I can accomplish in a short period of time.	.07	.21	-.06	.49	-.19	-.02
41. I usually put a lot of pressure on myself to be successful at what I do.	.47	.19	.39	.21	-.18	08
42. I enjoy relaxing in front of the television, even when there is still work to be done.*	.12	.28	.40	.19	.13	05
43. I feel uncomfortable whenever I put my own needs first.	.22	-.10	-.06	-.02	.24	-.36
44. I am comfortable with some minor mistakes in my work, as long as I know that others will not notice.*	.10	.05	.45	.08	.04	[illegible]
45. I often take time to sit down, do nothing, and not think about anything in particular.*	.16	.25	.39	.37	.12	[illegible]
46. At work I usually look for more tasks to do if all my work is done.	.15	.20	.18	.28	.07	[illegible]
47. When I am in a hurry to get things done, it is usually because I have put them off until the last minute.*	-.11	.39	.46	.05	.03	[illegible]
48. Other people often tell me to slow down and relax.	.37	.17	.20	.31	.03	-.08
49. I always stay on top of the projects I am working on.	.10	.34	.35	.09	-.16	.36
50. I prefer to set goals that are fairly easy to reach.*	.22	-.06	.33	.12	.36	-.02

* Negatively keyed items

Note: Items for which the factor loadings are underlined met the criterion for interpretation (i.e., highest factor loading > .50). Items for which the factor loadings are bolded are APS subscale items.

Table 3 (continued)

The Varimax 6-Factor Solution of the 58 APS Items

Items	Fact 1 Autonomy/ Personal Standards 9.32%	Fact 2 Orderliness/ Tidiness 3.91%	Fact 3 Hard-driving Productive 3.06%	Fact 4 Activity 2.74%	Fact 5 Subjugation of needs 2.31%	Fact 6 Personal Control 2.22%
51. Usually I am not critical of myself when I make mistakes.*	.28	.04	.23	-.04	.38	-.01
52. I don't like to relax until everything is done.	.43	.42	.28	.04	-.04	-.17
53. I generally prefer slow-paced and restful activities.*	-.02	-.03	.33	.45	.32	.22
54. I am not a very competitive person.*	-.12	.12	-.28	-.35	.02	-.21
55. When there is an unpleasant job to be done, I am usually the one who ends up doing it.	.47	.07	-.26	.06	.27	-.15
56. I usually ask others to help when I feel that I am doing more than my share.*	.32	.05	.21	.13	.32	-.10
57. I believe that a job has to be done just right or else not at all.	.43	.19	.13	.42	-.02	.00
58. When I start a task, I usually work until it is finished even if it means not taking time for rest and relaxation.	.46	-.09	.34	.16	.02	-.18

* Negatively keyed items.

Note: Items for which the factor loadings are underlined met the criterion for interpretation (i.e., highest factor loading > .50). Items for which the factor loadings are bolded are APS subscale items.

Table 4

Intercorrelations among APS scores in the Pilot Study

	Total APS score	Autonomy/ Personal Stand.	Orderliness/ Tidiness	Hard-driving/ Productive	Activity
Total APS score					
Autonomy/ Personal Standards	**.58****				
Orderliness/ Tidiness	**.56****	.08			
Hard-driving/ Productive	**.57****	.18	.18		
Activity	**.56****	**.21****	**.20***	.17	
Subjugation of Needs	**.30****	.06	.10	.12	.01

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

**p_{FW}<.05; p_T<.003.

*p_{FW}<.05; p_T<.005.

for its ability to control Type I error while maintaining appropriate power for each test of significance. The Bonferroni procedure was thus used in this thesis wherever multiple comparisons were being made.

The descriptive statistics and the internal consistency for the total APS scores (i.e., all 58 items) and each of the five APS subscales is presented in Table 5. The internal consistency of the 58-item APS measure was high. The internal consistency of the subscale scores ranged from moderate to high.

2.3.4 Demographic Correlates

None of the demographic variables (age, gender and years of education) were significantly correlated with APS scores (total and subscale scores).

2.3.5 Convergent and Discriminant Validity of the APS subscales

Reliabilities and descriptive statistics (sample sizes, means and standard deviations) for each of the measures used in the study are presented in Table 6.

The measures used to assess the convergent and discriminant validity of the APS subscales are listed in Tables 7-10. As predicted, none of the five subscales were significantly correlated with Obsessive-Compulsivity, Anxiety, Depression, Hostility and Somatization, indicating the discriminant validity of the subscales.

Autonomy/Personal Standards: "Autonomy/personal standards" scores were most highly correlated with the overall score on the Multidimensional Perfectionism Scale ($r=.44$, $p<.001$), the "personal standards" subscale of the MPS ($r=.51$, $p<.001$) and the "concern over mistakes" subscale of the MPS ($r=.42$, $p<.001$).

Table 5

Descriptive statistics and Internal Consistencies of APS scores in the Pilot Study

APS scores	Mean	SD	# of Items	Cronbach's Alpha
Total APS score	250.61	31.10	58	.88
APS Subscales				
Autonomy/Personal Standards	27.45	5.31	6	.72
Orderliness/Tidiness	25.31	7.39	6	.86
Hard-driving/Productive	20.32	4.79	5	.64
Activity	21.68	4.79	5	.67
Subjugation of Needs	20.10	3.53	4	.52

Table 6

Internal Consistencies and Descriptive Statistics for each of the Measures used in the Pilot Study for the Purpose of Assessing the Convergent and Discriminant Validity of the APS questionnaire subscales

Measure	M	SD	# of items	Alpha Coefficients
Multidimensional Perfectionism Scale				
Total	99.1	17.99	35	.90
Concern over Mistakes	20.7	6.70	9	.87
Organization	21.7	5.26	6	.93
Parental Criticism	8.6	3.55	4	.78
Personal Standards	22.9	4.56	7	.78
Doubts about Action	10.5	3.11	4	.71
Parental Expectations	15.0	4.41	5	.81
Student Jenkins Activity Survey				
Total	28.0	6.32	21	.77
Hard-driving/Competitive	10.3	2.93	10	.69
Speed/Impatience	4.6	2.14	7	.62
Jackson Personality Inventory				
Energy Level	10.1	4.04	20	.78
Organization Level	10.9	4.13	20	.77
Global Coping Strategies				
Tenacious Goal Pursuit	50.2	7.41	15	.82
Flexible Goal Adjustment	48.4	7.49	15	.79
PANAS				
Positive Affect	32.7	5.96	10	.84
Negative Affect	19.6	6.23	10	.84
Cook-Medley Hostility Scale	22.2	7.77	50	.84
Lay Procrastination	63.2	11.29	20	.86
SCL-90-R				
Obsessive-Compulsivity	1.1	.67	10	.81
Anxiety	1.0	.67	10	.78
Depression	0.7	.70	13	.87
Hostility	0.8	.66	6	.75
Somatization	1.0	.79	12	.82

Table 7

Convergent and Discriminant Validity of Autonomy/Personal Standards & Orderliness/Tidiness subscales

Measures	Autonomy/ Personal Standards	Orderliness/ Tidiness
Multidimensional Perfectionism Scale		
Total	**.44***	**.36***
Concern Over Mistakes	**.42***	.09
Organization	.15	**.81***
Parental Criticism	.16	.06
Personal Standards	**.51***	.18
Doubts About Action	.17	-.07
Parental Expectations	.20	.16
Student Jenkins Activity Survey		
Total	**.34***	**.31***
Hard-driving/Competitive	**.24***	**.39***
Speed/Impatience	.16	.04
Jackson Personality Inventory		
Energy Level	.17	.21
Organization Level	.17	**.65***
Global Coping Strategies		
Tenacious Goal Pursuit	**.32***	.07
Flexible Goal Adjustment	**-.27***	-.12
PANAS		
Positive Affect	.06	.09
Negative Affect	.07	-.05
Cook-Medley Hostility Scale	**.27***	-.06
Lay Procrastination Scale	-.05	**-.39***
SCL-90-R		
Obsessive-Compulsivity	.13	-.01
Anxiety	.13	-.06
Depression	.10	-.04
Hostility	.00	-.07
Somatization	.10	-.01

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate treating each subscale as a family; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.002

Table 8

Convergent and Discriminant Validity of Autonomy/Personal Standards & Orderliness/Tidiness subscales using Behavioural Measures

Behavioural Measures	Autonomy/ Personal Standards	Orderliness/ Tidiness
Time to complete questionnaire	-.06	-.06
Hours Spent (school days)		
Studying	.00	.13
Paid work	.10	.05
Volunteer work	.04	-.05
Hobbies/activities	.08	.03
Eating	-.08	-.12
Relaxing alone	.02	-.09
Socializing	-.09	-.11
Sleeping	.06	-.07
Hours Spend (Non-school days)		
Studying	-.08	.08
Paid Work	.05	.16
Volunteer Work	.00	.09
Hobbies/activities	-.01	.09
Eating	-.09	-.13
Relaxing alone	-.09	-.15
Socializing	-.01	-.06
Sleeping	.05	-.09
Academic Grades		
Incoming	.20	-.02
Expected	.15	.08

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate treating each subscale as a family; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.0026

Table 9

Convergent and Discriminant Validity of Hard-driving/Productive, Activity and Subjugation of needs subscales

Measure	Hard-Driving/ Productive	Activity	Subjugation of needs
Multidimensional Perfectionism Scale			
Total	.25*	.28*	.06
Concern Over Mistakes	.23*	.14	-.03
Organization	.10	.28*	.09
Parental Criticism	-.04	.04	.06
Personal Standards	.34*	.33*	.01
Doubts About Action	.11	-.02	-.01
Parental Expectations	.11	.22*	.15
Student Jenkins Activity Survey			
Total	.45*	.46*	-.02
Hard-driving/Competitive	.42*	.43*	.04
Speed/Impatience	.10	.10	-.16
Jackson Personality Inventory			
Energy Level	.24*	.47*	.10
Organization Level	.25*	.32*	.07
Global Coping Strategies			
Tenacious Goal Pursuit	.42*	.32*	.16
Flexible Goal Adjustment	-.25*	.02	.13
PANAS			
Positive Affect	.10	.30*	.08
Negative Affect	-.14	-.07	-.01
Cook-Medley Hostility Scale	-.03	.00	-.27*
Lay Procrastination Scale	-.20	-.31*	-.13
SCL-90-R			
Obsessive-Compulsivity	.08	-.11	-.13
Anxiety	.07	-.03	-.02
Depression	.11	-.07	.00
Hostility	.08	-.11	-.11
Somatization	.05	-.08	-.07

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate treating each subscale as a family; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.002

Table 10

Convergent and Discriminant Validity of Hard-driving/Productive, Activity and Subjugation of needs subscales using Behavioural Measures

Behavioural Measure	Hard-Driving/ Productive	Activity	Subjugation of needs
Time to complete questionnaire	-.07	**-.27***	.08
Hours Spent (school days)			
Studying	.17	.06	-.04
Paid work	.11	.10	.12
Volunteer work	.17	-.02	.05
Hobbies/activities	.09	.17	-.06
Eating	-.06	.02	-.04
Relaxing alone	-.02	-.13	-.11
Socializing	-.19	-.03	-.00
Sleeping	-.09	-.10	.01
Hours Spend (Non-school days)			
Studying	.12	.02	.09
Paid Work	.13	.10	-.04
Volunteer Work	.11	.04	.10
Hobbies/activities	.00	.09	-.02
Eating	-.00	.01	-.10
Relaxing alone	-.01	-.10	-.07
Socializing	-.15	.02	.03
Sleeping	-.14	.03	.06
Academic Grades			
Incoming	.11	.08	.05
Expected	**.24****	.03	-.04

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate treating each subscale as a family; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.0026

"Autonomy/personal standards" scores were also correlated with the overall score of the Student Jenkins Activity Survey (r=.34, p<.001), the "hard-driving/competitive" subscale of the SJAS (r=.24, p<.001), the "Tenacious Goal Pursuit" and the "Flexible Goal Adjustment" subscales of the Global Coping Strategies Questionnaire (r=.32, r=-.269, p<.001 respectively) and the Cook-Medley Hostility Scale (r=.27, p<.001).

"Autonomy/personal standards" subscale scores were not significantly correlated with Positive Affect, Negative Affect, Lay's Procrastination Scale, the "energy level" or "organization" subscales of the JPI and the "speed/impatience" subscale of the SJAS. It was also not significantly correlated with the "organization", "parental criticism", "doubts about action" or "parental expectations" subscales of the MPI. "Autonomy/personal standards" subscale scores were not significantly correlated with any of the behavioural measures.

Orderliness/Tidiness: As would be expected, "orderliness/tidiness" subscale scores were most highly correlated with the "organization" subscale of the MPS (r=.81, p<.001) and the "organization" subscale of the JPI (r=.65, p<.001).

"Orderliness/tidiness" subscale scores were also correlated with the total score on the Student Jenkins Activity Survey (r=.31, p<.001), the "hard-driving/competitive" subscale of the SJAS (r=.39, p<.001), the 'total perfectionism score" of the MPS (r=.36, p<.001) and the Lay Procrastination Scale (r=-.39, p<.001).

"Orderliness/tidiness" subscale scores were not significantly correlated with Positive and Negative Affect, Cook-Medley Hostility Scale, Tenacious Goal Pursuit, Flexible Goal Adjustment, the "speed/impatience" subscale of the SJAS, or the "doubts about action", "parental criticism", "personal standards", "parental expectations" and "concern over mistakes" subscales of the MPS.

"Orderliness/tidiness" subscale scores were not significantly correlated with the "energy level" subscale of the JPI or any of the behavioural measures.

Hard-driving/Productive: As would be expected, "hard-driving/productive" subscale scores were most highly correlated with the total Student Jenkins Activity Survey score (r=.45, p<.001), the "hard-driving/competitive" subscale of the SJAS (r=.42, p<.001) and the Tenacious Goal Pursuit" subscale of the Global Coping Strategies Questionnaire (r=.42, p<.001).

The "Hard-driving/productive" subscale scores were also correlated with the "personal standards" (r=.34, p<.001), the "concern over mistakes" (r=.23, p<.001) and the total perfectionism score (r=.25, p<.001) of the MPS. It was also correlated with the "energy level" and "organization" subscales of the Jackson Personality Inventory (r=.24, r=.251, p<.001 respectively). "Hard-driving/Productive" scores were negatively correlated with "Flexible Goal Adjustment" (r=-.25, p<.001). "Hard-driving/productive" scores were positively correlated with "expected incoming grades" (r=.24, p<.001).

"Hard-driving/productive" subscale scores were not significantly correlated with the "organization", "parental criticism", "parental expectations" and "doubts about action" subscales of the MPS, and were not significantly correlated with the "speed/impatience" subscale of the SJAS, positive affect, negative affect, Lay Procrastination scale nor the Cook-Medley Hostility scale.

Activity: As would be expected, the "activity" subscale scores were most highly correlated with the "energy" subscale of the JPI (r=.47, p<.001). "Activity" was also correlated with the total Type A score (r=.46, p<.001) and the "hard-driving/competitive" subscale of the SJAS.

"Activity" was also correlated with the total perfectionism score (r=.28, p<.001), the "organization" (r=.28, p<.001), the "personal standards" (r=.33, p<.001), and the "parental expectations" (r=.22, p<.001) subscales of the MPS. Moreover, it was also correlated with the

"organization" subscale of the Jackson Personality Inventory (r=.32, p<.001), Tenacious Goal Pursuit (r=.32, p<.001), Positive Affect (r=.30, p<.001) and the Lay Procrastination Scale (r=-.31, p<.001). "Activity" was negatively correlated with the time to complete the questionnaire (r=-.27, p<.001).

"Activity" was not significantly correlated with the "doubts about action", "parental criticism", or "concern over mistakes" subscales of the MPS, nor did it correlate with the "speed/impatience" subscale of the SJAS, negative affect, the Cook-Medley Hostility Scale and Flexible Goal Adjustment.

Subjugation of Needs: "Subjugation of needs" subscale scores were negatively correlated with the Cook-Medley Hostility scale (r=-.27, p<.001). It did not correlate with any other measure.

2.4 DISCUSSION

2.4.1 Summary of Findings

The purpose of the present study was to investigate the factor structure of the APS questionnaire. The results suggest the presence of five reliable factors. These include: Autonomy/Personal Standards; Orderliness/Tidiness; Hard-driving/Productive; Activity and Subjugation of Needs. APS subscales were developed from these five factors. These subscales are independent from one another, as items do not appear on more than one subscale, and the intercorrelations among the subscales are low to moderate. The internal consistency for each of the five subscales ranged from moderate to high. Subscale scores do not correlate with demographic variables. Moreover, correlations of the subscale scores with a variety of measures that tap related and unrelated constructs support the convergent and discriminant validity of each of the five subscales.

2.4.2 Findings Meriting Further Discussion

The convergent and discriminant validity for each of the five subscales will de discussed in detail below. It should be noted that as predicted, none of the five subscales were significantly related to psychiatric symptomatology (i.e., Obsessive-Compulsivity, Anxiety, Depression, Hostility and Somatization) and negative affectivity.

Autonomy/Personal Standards: The convergent validity of this subscale was supported. The relationship between "autonomy/personal standards" scores and the "personal standards" and "concern over mistakes" subscales of the MPS supports the notion that individuals with high scores are those who have perfectionistic standards or ideals. It should be noted that none of the personality measures directly examined the "Autonomy" component of this subscale.

In support of the discriminant validity, "autonomy/personal standards" subscale scores were not related to "organization", "doubts about actions", "parental criticism" or "parental expectations" aspects of perfectionism.

Orderliness/ Tidiness: The convergent validity of this subscale was supported. The relationship between "orderliness/tidiness" subscale scores and the "organization" subscales of the MPS and JPI supports the notion that individuals with high scores are highly organized.

From a discriminant validity standpoint, "orderliness/tidiness" was not related to any other aspects of perfectionism (i.e., doubts about action, parental criticism, concern over mistakes, personal standards and parental expectations).

Hard-driving/Productive: The convergent validity of this subscale was supported. The relationship between "hard-driving/productive" scores and the "hard-driving/competitive" subscale of the SJAS, the total Type A score of the SJAS, and the Tenacious Goal Pursuit measure supports

the notion that individuals who score high are indeed hard-driving and competitive, and do not adjust their goals when faced with obstacles.

In support of the discriminant validity, "hard-driving/productive" subscale scores were not related to the "speed/impatience" or "hostility" aspects of Type A behaviour.

Activity: The convergent validity of this subscale was supported. The relationship between "activity" subscale scores and the "energy level" subscale of the JPI supports the notion that individuals who score high are energetic. These individuals also possess Type A and perfectionistic characteristics. They pursue their goals when faced with obstacles, and are not procrastinators.

In support of the discriminant validity of the "activity" subscale, scores were not related to the "doubts about action", "parental criticism", or "concern over mistakes" aspects of perfectionism, or the "speed/impatience" and "hostility" aspects of Type A behaviour.

Subjugation of Needs: Individuals who score high on the "subjugation of needs" subscale are less likely to display cynical hostility (as measured by the Cook-Medley). This lends some support to the convergent validity of this subscale. That this subscale score only correlated with one measure is understandable, given that none of the personality measures used in this study were chosen to directly tap "subjugation of needs".

2.4.3 Limitations of the Study

Since part of the goal of this study was to determine the convergent and discriminant validity of the five subscales, it would have been more beneficial to include measures that were more related to some of the proposed subscales. For example, measures that directly tap "Autonomy" and "Subjugation of Needs" were not included in the battery of questionnaires administered. This is due to the fact that the factor analysis was performed subsequent to the

completion of the undergraduate thesis (from which this data was collected). Measures that were included to assess the convergent and discriminant validity of the APS questionnaire were those that tapped the "Activity", "Productivity" and "High Standards" components of the APS – components that were obviously defined a priori.

2.4.4 Strengths of the Study

The APS questionnaire is still in the beginning stages of development. The present study examined the factor structure of the APS questionnaire in a large and diverse sample of individuals. Factor analysis has allowed the researchers to examine the underlying components, which make up the APS questionnaire and compare this to what it was designed to measure (i.e., Activity, Productivity, High Standards and Subjugation of Needs). The factors that emerged are consistent with what the questionnaire was designed to assess.

2.4.5 Study Implications

An understanding of the factor structure of the APS questionnaire will aid future research. For example, knowledge of the underlying components which make up the APS questionnaire will aid in understanding which aspects of the APS questionnaire account for its proposed relationship with pain outcome measures in Study II.

2.4.6 Suggestions for Future Research

Future research needs to be performed to examine the convergent and discriminant validity of the APS questionnaire and the factor structure within a pain population.

CHAPTER 3: STUDY I –APS CHARACTERISTICS IN A TERTIARY CARE PAIN SAMPLE COMPARED TO NON-PAIN CONTROLS

3.1 INTRODUCTION

As noted earlier, Shapiro and Teasell (in press) clinically observed that chronic pain patients in tertiary pain clinics report that prior to the onset of their pain they were extremely Active, Productive, had High Standards, and high Subjugation of Needs (APS personality characteristics). There is some research to date to support the notion that pain patients do indeed possess characteristics similar to *APS* prior to the onset of pain. However, the APS questionnaire has yet to be used to directly examine the exact APS constellation of traits in a population of pain patients. Furthermore, researchers have yet to compare the base rates of APS characteristics in chronic pain patients with that of the population at large.

This study compared APS characteristics within a population of tertiary care chronic pain patients to that of non-pain controls. The population of tertiary care chronic pain patients was chosen to directly empirically validate Shapiro and Teasell's (in press) clinical observations that tertiary care pain patients retrospectively describe themselves as possessing more pre-pain APS characteristics than are present in the general population.

It is hypothesized that chronic pain patients retrospectively report higher pre-pain characteristics and also report currently possessing higher APS characteristics than the general population. Due to the fact that the APS is presumed to be a stable personality trait, it is hypothesized that scores on the APS questionnaire will remain constant from pre-pain to post pain. Scores on the APS questionnaire are not expected to be significantly correlated with any demographic variables (i.e., age, gender and years of education).

3.2 METHOD

3.2.1 PARTICIPANTS

The Chronic Pain participants were 62 (17 male, 45 females) patients recruited from the Tertiary Care Centre located at University Hospital in London, Canada (see Appendix G Ethics Approval). All patients were new referrals to the tertiary care clinic. The mean age was 41.89 years (SD=9.92). The mean years of education was 14.15 (SD=3.55). English was the first language for 58 (94%) of the participants. Of those approached to participate, 10% declined.

The non-Pain control group consisted of 69 individuals (28 males, 41 females) recruited from the local bus station in London, Canada. The mean age was 37.26 years (SD=14.41). The mean years of education was 15.37 (SD=3.24). English was the first language for 61 (88%) of the participants. Of those approached to participate, 20% declined.

3.2.2 MEASURES

3.2.2.1 Demographic Information

Demographic variables such as the age, gender, years of education and first language were assessed.

3.2.2.2 APS Questionnaire

The APS questionnaire contains 58 items that were designed to measure the presence of APS characteristics. These characteristics include a high activity level, high productivity level, high standards and subjugation of needs. The APS questionnaire consists of 5 subscales: Autonomy/Personal Standards; Orderliness/Tidiness; Hard-driving/Productive; Activity and Subjugation of needs (see Appendices B & H). The questionnaire was administered to each

participant from the tertiary care pain center twice. Once it was completed with respect to how they were before their pain (i.e., retrospective) and then once with respect to their current status. Non-pain controls completed the questionnaire only with respect to their current status. The items on the questionnaire are rated on a scale of 1 (extremely inaccurate) to 7 (extremely accurate).

3.2.3 PROCEDURE

Patients were approached in the waiting room and were given a letter of introduction and an information sheet (see Appendices I & J) and asked if they would participate in the study. Participants were randomly given one of two orderings of the questionnaire package (either completing the Current APS questionnaire first, or the Retrospective APS questionnaire first). Those participants who did not complete the questionnaires before being called for their appointment stayed after their appointment to complete them. Completion of the questionnaire took approximately 25 minutes. Upon completion of the questionnaires, participants were fully debriefed verbally and thanked for their participation.

3.3 RESULTS

3.3.1 Descriptive Statistics and Psychometric Properties of the APS Questionnaire

The intercorrelations among the retrospective APS scores for the pain group are presented in Table 11. The intercorrelations among the current APS scores for the pain group are presented in Table 12. The intercorrelations among the current APS scores for the non-pain group are presented in Table 13. Taken together, the results suggest that the APS subscales are moderately correlated with one another, and highly correlated with APS total scores. The intercorrelations among the APS

Table 11

Intercorrelations Among the Retrospective APS scores for the Pain Group in Study I

	APS Total	Autonomy/ Personal Stand.	Orderliness/ Tidiness	Hard-driving/ Productive	Activity
APS Total					
Autonomy/ Personal Standards	**.71***				
Orderliness /Tidiness	**.63***	.28			
Hard-driving /Productive	**.77***	**.52***	**.44***		
Activity	**.71***	**.61***	.25	**.41***	
Subjugation Of Needs	**.55***	.26	.19	**.45***	.27

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.003

Table 12

Intercorrelations Among the Current APS scores for the Pain Group in Study I

	APS Total	Autonomy/ Personal Stand.	Orderliness/ Tidiness	Hard-driving/ Productive	Activity
APS Total					
Autonomy/ Personal Standards	.74**				
Orderliness /Tidiness	.72**	.40**			
Hard-driving /Productive	.76**	.42**	.56**		
Activity	.83**	.60**	.53**	.57**	
Subjugation Of Needs	.66**	.50**	.29*	.39**	.53**

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

**p_{FW}<.05; p_T<.003

*p_{FW}<.05; p_T<.05

Table 13

Intercorrelations Among the APS scores for the Non-Pain Control Group in Study I

	APS Total	Autonomy/ Personal Stand.	Orderliness/ Tidiness	Hard-driving/ Productive	Activity
APS Total					
Autonomy/ Personal Standards	**.64***				
Orderliness /Tidiness	**.48***	.16			
Hard-driving /Productive	**.58***	.10	.21		
Activity	**.57***	**.52***	.07	.04	
Subjugation Of Needs	**.48***	.01	.12	**.47***	.07

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.003

subscales were higher among the pain sample compared to the non-pain controls. Within the pain sample, APS subscales were more highly intercorrelated among the current reports compared to the retrospective reports. The internal consistency of the 58-item APS measure and subscales are presented in Table 14. The internal consistency of APS total scores was high. The internal consistencies of the subscales were moderate.

3.3.2 Demographic Correlates

A correlation matrix was derived to determine the extent to which demographic variables (age, gender and years of education) were related to total APS scores and subscale scores. In the pain group, none of the demographic variables (age, gender and years of education) were found to be significantly correlated with total APS scores (both retrospective and current). Age was negatively correlated with the "hard-driving/productive" subscale administered in the current tense (r=-.40, p<.001). None of the other subscale scores (both retrospective and current) were significantly correlated with any of the demographic variables. In the non pain group, none of the demographic variables were found to be significantly correlated with total APS scores or subscales.

3.3.3 Demographic Comparisons across Groups

A comparison of demographics across groups was performed using an independent t-test and chi-square analyses. The pain sample (M=41.89, SD=9.92) was significantly older than the non-pain controls (M=37.26, SD=14.41), t (129)=2.12, p<.05. Moreover, the mean years of education of the pain sample (M=14.15, SD=3.55) was significantly lower than that of the non-pain controls (M=15.37, SD=3.4), t (129)=-2.03, p<.05. Accordingly, preliminary analyses were conducted testing for age and education effects on APS scores. When entered into a regression

Table 14

Internal Consistencies for APS Questionnaire scores in Study I

Measure	# of items	Alpha Coefficients
Pain Patients (n=62)		
Retrospective:		
APS Total Score	58	.94
Autonomy/Personal Standards	6	.73
Orderliness/Tidiness	6	.77
Hard-driving/Productive	5	.62
Activity	5	.70
Subjugation of Needs	4	.44
Current:		
APS Total Score	58	.94
Autonomy/Personal Standards	6	.66
Orderliness/Tidiness	6	.73
Hard-driving/Productive	5	.42
Activity	5	.72
Subjugation of Needs	4	.49
Non-pain Control (n=69)		
APS Total Score	58	.88
Autonomy/Personal Standards	6	.66
Orderliness/Tidiness	6	.69
Hard-driving/Productive	5	.59
Activity	5	.59
Subjugation of Needs	4	.64

equation, age and education did not interact with total APS scores to predict group membership (i.e., pain or non-pain group). Accordingly, all subsequent data analyses were collapsed across age and education.

The proportion of females in the pain group was not significantly different from that of the non-pain controls (27% vs. 41% respectively, $\underline{x}^2(1)=2.51$,$\underline{p}=.113$). The proportion of individuals whose first language is English in the pain population was not significantly different from that of the non-pain controls (94% and 88% respectively, $\underline{x}^2(1)=1.04$,$\underline{p}=.308$). Accordingly, all subsequent data analyses were collapsed across gender and language.

3.3.4 A Comparison of APS Scores across Groups

A comparison of APS scores across groups was performed using an independent t-test. Retrospective pain patients' APS scores were compared to those of non-pain controls (see Table 15). It was found that the average retrospective (i.e., pre-pain) scores on the APS questionnaire (total and subscales) for the chronic pain patients were significantly higher than those in the normal population.

Pain patients' current APS scores were compared to those of the non-pain controls (see Table 16). It was found that the average current total scores on the APS questionnaire were not significantly higher than those in the normal population. Moreover, the average current APS subscale scores on the APS questionnaire were not significantly different from those in the normal population, with the exception of lower levels of "activity".

Table 15

A Comparison of Retrospective Pain Patients' APS scores to those of Non-Pain Controls

	M	SD	N	t
Total APS scores				
Pain-Retrospective	322.48	40.29	62	
Control	271.87	33.06	69	**7.89****
Autonomy/Personal Standards				
Pain - Retrospective	34.27	4.90	62	
Control	29.13	5.67	69	**5.52****
Orderliness/Tidiness				
Pain - Retrospective	31.48	6.15	62	
Control	26.36	6.31	69	**4.70****
Hard-driving/Productive				
Pain - Retrospective	25.90	5.45	62	
Control	21.94	5.09	69	**4.30****
Activity				
Pain - Retrospective	29.71	4.69	62	
Control	24.28	4.94	69	**6.44****
Subjugation of Needs				
Pain - Retrospective	22.52	3.87	62	
Control	20.67	4.36	69	**2.56***

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

**p_{FW}<.05; p_T<.008
*p_{FW}<.05; p_T<.05

Table 16

A Comparison of Current Pain Patients' APS scores to those of Non-Pain Controls

	M	SD	N	t
Total APS scores				
Pain-Current	263.87	46.57	62	
Control	271.87	33.06	69	-1.14
Autonomy/Personal Standards				
Pain – Current	28.39	5.68	62	
Control	29.13	5.67	69	-.75
Orderliness/Tidiness				
Pain – Current	26.82	6.45	62	
Control	26.36	6.31	69	.41
Hard-driving/Productive				
Pain – Current	21.19	4.81	62	
Control	21.94	5.09	69	-.86
Activity				
Pain – Current	21.47	6.28	62	
Control	24.28	4.94	69	**-2.86****
Subjugation of Needs				
Pain – Current	20.52	3.91	62	
Control	20.67	4.36	69	-.21

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.008

3.3.5 A Comparison of Retrospective and Current APS scores Within the Pain Population

A comparison of current and retrospective APS scores was performed using a paired t-test (see Table 17). Current scores on the APS questionnaire (total and subscales) were significantly lower than retrospective (pre-pain) scores for the chronic pain patients.

3.4 DISCUSSION

3.4.1 Summary of Findings

As predicted, tertiary care chronic pain patients obtained higher retrospective (i.e., pre-pain) APS total and APS subscale scores than non-pain controls. Contrary to prediction, tertiary care chronic pain patients report higher total and subscale scores on the APS questionnaire prior to injury compared to their levels now. Moreover, contrary to prediction, the tertiary care pain patients' current APS questionnaire scores (total and subscale scores) were not significantly different from those of the normal population, with the exception of lower levels of "activity".

3.4.2 Findings Meriting Further Discussion

3.4.2.1 APS Characteristics in Retrospective Pain Reports vs. Controls

Tertiary care chronic pain patients report higher total and subscale scores on the APS questionnaire prior to injury than non-pain controls. These findings provide empirical support for the clinical observations made by Shapiro and Teasell (in press), that patients retrospectively report that pre-injury they would insist on "doing it all", and did things at a much faster pace than others around them, driven, in part by their high standards. The patients report that they seldom took help from others, and rarely took breaks in their daily activities (Koster, Teasell, Kim, Swartzman, Shapiro, & Ashton, 1999).

Table 17

A Comparison of Retrospective and Current APS scores within the Population of Pain Patients

	M	SD	N	t
Total APS scores				
Retrospective	322.48	40.29	62	
Current	263.87	46.57	62	**9.97***
Autonomy/Personal Standards				
Retrospective	34.27	4.90	62	
Current	28.39	5.68	62	**7.98***
Orderliness/Tidiness				
Retrospective	31.48	6.15	62	
Current	26.82	6.45	62	**6.38***
Hard-driving/Productive				
Retrospective	25.90	5.45	62	
Current	21.19	4.81	62	**6.27***
Activity				
Retrospective	29.71	4.69	62	
Current	21.47	6.28	62	**10.18***
Subjugation of Needs				
Retrospective	22.52	3.87	62	
Current	20.52	3.91	62	**3.71***

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.008

The findings of the present study also support similar research in the field. Blumer and Heilbronn (1989) clinically observed that chronic pain patients consistently reported a pre-pain history of constant activity, excessive work performance, and excessive self-sacrifice for the well being of the family. VanHoudenhove (1986) examined the medical and psychiatric records of 255 patients with chronic pain of no organic cause. He found that 44 percent of the patients would have been classified premorbidly as hyperactive. Furthermore, VanHoudenhove, Stans, and Verstraeten (1987) found chronic non-organic pain patients described themselves retrospectively (i.e., pre-pain) as very active, with a pre-pain history of physical overburdening. The present study expands on present research in the field by being the first to compare APS characteristics in a population of chronic pain patients to those characteristics in the population at large.

3.4.2.2 APS Characteristics in Current Pain Reports

The results of the study suggest that tertiary care chronic pain patients report higher total and subscale scores on the APS questionnaire retrospectively (i.e., prior to injury) compared to their current levels. These patients' current scores on the APS questionnaire do not differ from non-pain controls, with the exception of lower levels of 'activity'.

It may simply be the case that current APS scores are significantly lower than retrospective (i.e., pre-pain) scores because the APS questionnaire is not measuring stable "personality characteristics", but rather, may simply be measuring these patients' perceived "competence or ability" to maintain APS characteristics. High pre-pain scores may thus be due to the fact that patients were able to maintain higher activity, productivity, standards and subjugation of needs prior to their pain injury. Patient's lower current APS scores may represent their decreased 'perceived ability' to perform tasks according to their pre-pain ability as a result of the physical limitations

brought on by the pain. It should be noted that while these patients are not able to perform what they could pre-pain, they are still able to maintain the same levels currently as non-pain controls (with the exception of activity levels). This suggests that these patients may be pushing themselves despite the pain.

Alternately, it may be the case that the APS questionnaire is indeed measuring "personality characteristics". After years of living with severe and debilitating pain, these patients' "personality" may have changed, and they no longer have a "need or desire" to maintain high levels of activity, productivity, standards and subjugation of needs.

It may also be the case that tertiary care chronic pain patients are exaggerating their pre-pain ability in an attempt to legitimize the veracity of their present pain complaints. Chronic pain is still viewed by many medical professionals as a physical manifestation of underlying psychological problems (i.e., depression, somatization, and hypochondriasis). Pain patients may also be viewed as malingerers. These accusations may cause the chronic pain patient to (consciously or unconsciously) exaggerate their level of ability prior to pain to counteract the accusation that they are malingerers.

3.4.3 Limitations of the Study

There are a few limitations in the present study. Given the fact that this was an initial pilot study, measures that may have been useful (such as length of time patients had chronic pain) were not included.

Given that the APS questionnaire is a self-report measure, one cannot be sure that patients are not exaggerating their pre-pain ability in an attempt to legitimize the veracity of their present

pain complaints. It may also be difficult for these patients (who have had pain for a long time) to provide accurate retrospective self reports.

The tertiary care chronic pain population seen at the LHSC (Physical Medicine & Rehabilitation) likely represents a biased sample, selected for high levels of pain, disability, and emotional distress. This may result in a restricted range of scores, hence reducing the magnitude of the correlations among the variables (Crook & Tunks, 1986). It was for this reason that the proposed relationship between APS characteristics and pain outcome (pain intensity, disability and emotional distress) was not examined in this sample.

3.4.4 Strengths of the Study

The present study was the first of its kind to attempt an empirical validation of Shapiro and Teasell's (in press) clinical observations that tertiary care chronic pain patients report that prior to injury, they maintained high levels of Activity, Productivity, Standards and Subjugation of needs.

Moreover, the present study was the first to compare the presence of APS characteristics in a population of chronic pain patients to the base rate of APS characteristics in the population at large.

3.4.5 Study Implications

Tertiary care chronic pain patients retrospectively report that prior to injury, they maintained inordinately high APS characteristics compared to the population at large. This is consistent with clinical observations (Shapiro and Teasell, in press) and with the APS theory of chronic pain. However, contrary to the APS theory of pain, the present study found that these APS characteristics (i.e., scores on the APS questionnaire) do not remain constant from retrospective (i.e., pre-pain) to

current self-reports. This raises the question as to whether the APS questionnaire is measuring a stable personality characteristic, or is driven, in part by fluctuating factors (such as functional disability).

3.4.6 Suggestions for Future Research

Future research needs to examine whether or not the APS questionnaire is measuring stable "personality characteristics" or merely reflects "functional disability".

The nature of the relationship between APS characteristics and pain outcome (i.e., pain intensity, pain disability and emotional distress) remains to be examined, as do the proposed mediational roles of maladaptive coping strategies, in a more heterogeneous sample of pain patients. That is, a sample of pain patients with a wide range of pain severity and pain-related disability. This was the focus of Study II.

CHAPTER 4: STUDY II - APS CHARACTERISTICS IN NEW REFERRAL PAIN PATIENTS

4.1 INTRODUCTION

The APS theory of chronic pain proposes that APS personality characteristics may interact with the initial physical injury to place some patients at risk for developing more severe physical and emotional difficulties secondary to the organic pain condition. Moreover, maladaptive coping strategies may mediate the relationship between APS personality and adjustment to pain.

The APS theory of pain remains to be empirically validated. Furthermore, the convergent and discriminant validity of the APS questionnaire in a sample of pain patients remains to be

performed. Accordingly, the present study will focus on answering questions in the following three areas.

Part 1: The present study will expand on research which investigated the convergent and discriminant validity of the *APS* questionnaire (total and subscale scores) using a population of undergraduate students (Kim, 1998). The present study will examine the discriminant and convergent validity within a clinical pain population.

Based on the findings of Kim (1998), which were previously discussed, the following predictions are made. Scores on the *APS* questionnaire are expected to be positively correlated with the overall scores on a perfectionism measure, and specific subscales of this measure (i.e., concern over mistakes, personal standards, and organization). *APS* scores are not expected to be related to "parental criticism", "parental expectations" and "doubts about action" subscales of the perfectionism measure.

Scores on the APS questionnaire are expected to be positively correlated with the overall Type A measure, the "speed/impatience" and the "hard-driving/competitive" subscales of the Type A measure.

Furthermore, scores on the *APS* questionnaire are not expected to be related to dispositional mood state (both positive and negative affectivity).

Retrospective and current self-reports will be compared on the *APS* questionnaire, and the psychometric properties of the scale will be examined.

Part 2: The relationship between scores on the APS questionnaire (total score and subscale scores) and outcome measures in chronic pain patients will be examined. More specifically, scores on the *APS* questionnaire, which are administered retrospectively (i.e., pre-pain) are expected to be positively related to current indices of depression, anxiety, pain intensity, and pain disability. It is

predicted that retrospective scores on the APS questionnaire will be more strongly related to outcome measures than current scores on the APS questionnaire and pre-existing personality measures administered retrospectively (e.g., Jenkins Activity Survey, PANAS, & Multidimensional Perfectionism Scale).

Part 3: The relationship between retrospective (i.e., pre-pain) scores on the *APS* questionnaire (total score and subscale scores) and coping will be examined. It is expected that *APS* characteristics will be positively correlated with assimilative coping (i.e.,tenacious goal pursuit), and negatively correlated with accommodative forms of coping (i.e., flexible goal adjustment). Furthermore, it is predicted that the tenacious goal pursuit and accommodative coping will mediate the relationship between APS characteristics and outcome measures.

4.2 METHOD

4.2.1 PARTICIPANTS

Eighty one patients (32 male) with musculoskeletal (strain, sprain) pain were recruited from the Regional Evaluation Center (REC) for Injured Workers and the Outpatient Pain Clinic at St. Joseph's Health Centre (see Appendix K for Ethics Approval). All patients were new referrals. The use of this pain population ensures a more heterogeneous sample than a tertiary-based chronic pain sample (Crook & Tunks, 1986). Of those approached to participate, 40% declined. An additional 10% did not finish the questionnaire, for an overall response rate of 50%.

The mean age of the sample was 44.81 years (SD=13.95). The mean years of education was 12.02 (SD=3.47). The mean number of years with pain was 6 years 3 months (SD=10 years 6 months). This distribution was positively skewed given that a few patients had had pain for 46 and 48 years. The majority of patients (55%) had suffered from pain for less than 2 years.

The mean number of additional medical conditions was 1.75, SD=1.29. The circumstances under which pain first began are as follows: accident at work (44%); motor vehicle accident (7%); following surgery (6%), accident at home (3%); following illness (1%); other (19%), can't relate it to anything (15%); missing (5%).

4.2.2 MEASURES

4.2.2.1 Demographic Information

Sociodemographic variables (i.e., years of education, number of children, relationship status) and medical history were assessed. In addition, pain related factors (i.e., onset, localization and circumstances upon which the pain first began) were measured (see Appendix L).

4.2.2.2 APS Questionnaire

The APS questionnaire contains 58 items, which were designed to measure the presence of APS characteristics. These characteristics include a high activity level, high productivity level, high standards, and subjugation of needs. The APS questionnaire consists of 5 subscales: Autonomy/Personal Standards, Orderliness/Tidiness, Hard-driving/Productive, Activity and Subjugation of needs (see Appendices B & H). The questionnaire was administered to each participant twice. Once it was completed with respect to how they were before their pain (i.e., retrospective) and then once as they were currently. The items on the questionnaire are rated on a scale of 1 (extremely inaccurate) to 7 (extremely accurate).

4.2.2.3 Perfectionism

The Multidimensional Perfectionism Scale (MPS) is designed to measure various aspects of perfectionism. It consists of 6 subscales, which include: concern over mistakes, doubts about action, parental expectations, personal standards, parental criticism, and organization. There are 35 self-descriptive statements in total, rated on a 5-point scale (1 = strongly disagree, 5 = strongly agree). This questionnaire has been shown to display good internal consistencies, with reported ranges from 0.77 to 0.93 for the six subscales (Frost, Marten, Lahart, & Rosenblate, 1990). Sample items include "If I do not set the highest standards for myself, I am likely to end up a second-rate person" (personal standards subscale) and "I try to be an organized person" (organization subscale). Patients answered all 6 subscales retrospectively, that is, with respect to how they were before their pain. In addition, participants answered three APS subscales (personal standards, organization, and doubts about action) with respect to their current status.

4.2.2.4 Type A Characteristics

Jenkins Activity Survey (JAS; Jenkins, Zyzanski, & Rosenman, 1979) is a widely used self-administered questionnaire to measure Type A behaviour. This questionnaire has been proven both reliable and valid (Jenkins et al., 1979; Homes, 1979). Good internal consistency has been reported for each of the subscales, with Cronbach's alpha ranging from 0.80 to 0.85 (Jenkins et al., 1979). The questionnaire consists of 52 items in total. The present study administered 3 subscales of the JAS: Type A; Speed/Impatience; and Hard-Driving/Competitiveness. All 3 subscales were administered retrospectively (i.e., with respect to how they were before their pain). In addition, the Speed/impatience subscale was administered in the present context. This subscale was chosen based

on the strength of its predicted relationship with APS questionnaire scores, as shown in previous studies (Kim, 1998).

4.2.2.5 Dispositional Mood State

The Positive and Negative Affect Schedule (PANAS) consists of 2 (10 item) subscales, measuring positive affect, and negative affect. The participants are asked to rate to what extent they generally experience each mood state (e.g., scared, nervous, excited, proud) on a 5 point scale (0=very slightly or not at all, 5=extremely). For the present study, participants were asked to rate their dispositional mood state retrospectively (i.e., with respect to how they were before their pain). Good internal consistency has been reported for each of the subscales, with Cronbach's alpha ranging from 0.84 to 0.87 (Watson, Clark, & Tellegen, 1988).

4.2.2.6 Pain Intensity

Participants were asked to rate their worst, least, and average pain. They were also asked to rate their current level of pain, the level of pain on a typical "good" day and on a typical "bad" day. The numeric rating scale ranges from 0 (no pain) to 10 (pain as bad as you can imagine). The scores on all 5 scales were aggregated to obtain a total pain intensity score for each patient. This scale was obtained from the Brief Pain Inventory (Cleeland & Syrjala, 1992) and has been used by many researchers as an indicator of pain intensity (Schmitz et al., 1996).

4.2.2.7 Pain Disability

The Pain Disability Index (PDI) was used as a measure of the extent to which pain interferes with normal everyday activities (Tait, Pollard, Margolis, Duchkro, & Krause, 1987). Six different

domains were assessed. These include: family and home responsibilities, recreation, social activity, occupation, self care, and life-support activities. The present study eliminated one domain (i.e., sexual behaviour) from the original PDI scale as it has been the past experience of the present researchers that patients become offended by and refuse to answer this question. The scale ranges from 0 (no disability) to 10 (total disability). The scores on all 6 scales are aggregated to obtain a total measure of disability for each patient. The internal consistency of the scale has been shown to be high, with a Cronbach's alpha of 0.90 (Schmitz et al., 1996).

4.2.2.8 Depression

The Center for Epidemiologic Studies Depression Scale (CESD; Radloff, 1977) was used to measure depression. The scale measures the frequency of depressive symptoms over the past week (e.g., I felt sad, I felt that people dislike me). There are 20 questions rated on a scale of 0 (rarely or none of the time) to 3 (most or all of the time). This scale was chosen because of the absence of questions pertaining to somatic aspects of depression (often found in many depression questionnaires) which confound pain-related and depression-related features (Williams & Richardson, 1993). The scale has shown good internal consistency, with a Cronbach's alpha of 0.89 (Schmitz et al., 1996).

4.2.2.9 Anxiety

The SCL-90-R is a self-report measure of physical and psychological symptomatology experienced during the past two weeks. This questionnaire contains 9 subscales. The present study used only the Anxiety subscale. This subscales consists of 10 items rated on a 5 point scale (0=not

at all, 4=extremely)(Derogatis, 1983). Test-retest stability and internal consistency coefficients have been reported to range from 0.77 to 0.90 (Derogatis, 1983).

4.2.2.10 Global Coping Strategies

The Global Coping Strategy Questionnaire consists of two subscales (15 items in each), measuring tenacious goal pursuit (e.g. I can be very obstinate in pursuing my goals) and flexible goal adjustment (e.g., I can adapt quite easily to changes in a situation) (Brandtstadter and Renner, 1990). Each item is rated on a scale of 0 (strongly disagree) to 4 (strongly agree). Cronbach's alpha level is 0.83 for the flexible goal adjustment scale and 0.80 for the tenacious goal pursuit scale.

4.2.3 PROCEDURE

Prospective patients were mailed a letter of introduction approximately two weeks prior to their appointment (see Appendices M & N). The letter of introduction briefly explained the study, and indicated that participation was voluntary. Approximately one week prior to their appointment, participants were called and asked if they had any questions pertaining to the study. It is at this point that non-English speaking patients were excluded from the study.

If the patients choose to participate, they were asked to fill out questionnaires that were sent in the mail. The questionnaires assessed demographics, pain intensity, pain disability and global coping strategies. Completion of these questionnaires took approximately 30 minutes in total. Participants were asked to bring the completed questionnaires with them to their appointment at the REC. Participants were also asked to arrive for their appointment one half-hour prior to the scheduled time. Once they arrived, they were asked to sign the informed consent form (Appendix O), and were then asked to complete questionnaires in a room set up for the study. Participants then

attended their appointment at the regular scheduled time. Following their appointment, participants completed any remaining questionnaires that were not done prior to the appointment. Completion of the clinic questionnaires took approximately one hour in total.

Upon completion of the questionnaires, participants were asked if they would be willing to be contacted in 6 months to complete a follow-up questionnaire (designed to assess the outcome measures at a later point in time), ninety percent of the participants agreed. Those who agreed were asked to sign a consent form (see Appendix P).

4.3 RESULTS

4.3.1 Descriptive Statistics and Psychometric Properties

Descriptive statistics (sample sizes, means and standard deviations) and internal consistencies for each of the measures used in the study are presented in Table 18.
The internal consistency of the total APS score was high (for both retrospective and current). The internal consistency for the APS subscale scores ranged from moderate to high, with the internal consistencies being higher for the current subscales than for the retrospective subscales. The intercorrelations among APS scores (both retrospective and current) are presented in Tables 19 & 20 respectively. The subscale scores (both retrospective and current) were highly correlated with total APS scores and moderately correlated with one another.

4.3.2 Demographic Correlates

A correlation matrix was derived to determine the extent to which demographic variables (age, gender, years of education, duration of pain) were related to total APS scores and subscale

Table 18

Descriptive Statistics and Internal Consistencies for each of the Questionnaires used in Study II

Measure	M	SD	# of items	Alpha Coefficients
APS Questionnaire				
Prepain:				
APS Total Score	294.56	37.91	58	.86
Autonomy/Personal Standards	29.60	5.76	6	.66
Orderliness/Tidiness	29.44	6.08	6	.77
Hard-driving/Productive	24.36	7.13	5	.38
Activity	26.33	4.77	5	.61
Subjugation of Needs	22.99	3.29	4	.43
Current:				
APS Total Score	257.50	47.41	58	.93
Autonomy/Personal Standards	27.47	5.92	6	.66
Orderliness/Tidiness	27.38	6.80	6	.80
Hard-driving/Productive	20.73	5.53	5	.59
Activity	21.92	6.08	5	.75
Subjugation of Needs	20.51	4.39	4	.57
Multidimensional Perfectionism Scale				
Prepain:				
Total	112.89	20.72	35	.89
Concern over Mistakes	31.51	8.55	9	.77
Organization	15.0	6.85	6	.93
Parental Criticism	14.25	4.55	4	.81
Personal Standards	21.18	5.36	7	.73
Doubts about Action	14.0	3.67	4	.72
Parental Expectations	17.45	5.36	5	.46
Current:				
Personal Standards	21.37	5.35	7	.75
Organization	23.19	4.64	6	.76
Doubts About Action	10.22	2.99	4	.78
Jenkins Activity Survey				
Prepain:				
Total	222.86	74.83	21	.76
Hard-driving/ Competitive	129.81	30.93	20	.75
Speed/Impatience	152.73	63.59	21	.78

Table 18 (continued)

Measure	M	SD	# of items	Alpha Coefficients
Jenkins Activity Survey				
Current:				
Speed & Impatience	144.71	56.94	21	.80
Global Coping Strategies				
Tenacious Goal Pursuit	52.01	8.93	15	.55
Flexible Goal Adjustment	52.17	7.66	15	.77
PANAS				
Positive Affect	38.32	7.47	10	.71
Negative Affect	20.46	8.01	10	.74
Pain Intensity Composite Score	34.94	8.37	6	.89
Pain Disability Index	32.32	12.60	6	.86
SCL-90-R				
Anxiety	11.31	8.50	10	.76
Center for Epidemiological Studies Depression Scale	21.46	12.54	20	.76

Table 19

Intercorrelations among Retrospective APS scores in Study II

	APS Total	Autonomy/ Personal St.	Orderliness/ Tidiness	Hard-driving/ Productive	Activity
APS Total					
Autonomy/ Personal Standards	**.54***				
Orderliness /Tidiness	**.54***	.07			
Hard-driving /Productive	**.60***	.11	.22		
Activity	**.64***	**.37***	.24	.22	
Subjugation Of Needs	**.44***	.13	.18	.26	.17

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.003.

Table 20

Intercorrelations among Current APS scores in Study II

	APS Total	Autonomy/ Personal St.	Orderliness/ Tidiness	Hard-driving/ Productive	Activity
APS Total					
Autonomy/ Personal Standards	**.62***				
Orderliness /Tidiness	**.54***	.15			
Hard-driving /Productive	**.67***	.19	.26		
Activity	**.79***	**.54***	.29	**.45***	
Subjugation Of Needs	**.54***	**.44***	.15	.24	**.44***

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.003.

scores. Age, gender, years of education and duration of pain were not significantly correlated with either the retrospective or current total APS scores or subscale scores.

4.3.3 Convergent and Discriminant Validity of the APS Questionnaire

The relationship between the retrospective APS questionnaire scores (total and subscale scores) and related personality measures (also administered retrospectively) was examined and will be presented below. The relationship between the current APS questionnaire scores (total and subscales) and related personality measures (administered in the present tense) was examined and will also be presented below. As predicted, none of the APS scores (total and subscale scores) were significantly correlated with positive or negative affect.

Autonomy/Personal Standards: The retrospective "autonomy/personal standards" subscale scores were not significantly correlated with any of the subscales of the Multidimensional Perfectionism Scale. "Autonomy/personal standards" was significantly correlated with the total Jenkins Activity Survey score ($r=.48$, $p<.004$), and the "hard-driving/competitive" ($r=.40$, $p<.004$) subscale, but not the "speed/impatience" subscale of the JAS (see Table 21).

Current "autonomy/personal standards" scores were significantly correlated with the "personal standards" ($r=.51$, $p<.01$) and "organization" ($r=.28$, $p<.01$) subscales of the MPS, but not with the "doubts about action" subscale of the MPS and the "speed/impatience" subscale of the JAS (see Table 22).

Orderliness/Tidiness: The retrospective "orderliness/tidiness" subscale scores were significantly correlated with the "organization" subscale of the MPS ($r=-38$, $p<.004$), but not with the total MPS score or any of the other MPS subscales. Retrospective "orderliness/tidiness"

Table 21

Convergent and Discriminant Validity of the Retrospective "Autonomy/Personal Standards" and "Orderliness/Tidiness" APS subscale score.

Measures	Autonomy/ Personal Standards	Orderliness/ Tidiness
Multidimensional Perfectionism Scale		
Total	-.26	-.15
Concern Over Mistakes	-.23	.03
Organization	.16	**-.38***
Parental Criticism	-.29	-.02
Personal Standards	-.07	-.08
Doubts About Action	-.27	.07
Parental Expectations	-.14	-.09
Jenkins Activity Survey		
Total	**.48***	**.34****
Hard-driving/Competitive	**.40***	.24
Speed/Impatience	.28	.12
PANAS		
Positive Affect	.23	.06
Negative Affect	.21	.02

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate treating each subscale as a family; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.0042.

Table 22

Convergent and Discriminant Validity of the Current "Autonomy/Personal Standards" and "Orderliness/Tidiness" APS subscale score.

Measure	Autonomy/ Personal Standards	Orderliness/ Tidiness
Multidimensional Perfectionism Scale		
Organization	**.28****	**.68****
Personal Standards	**.51****	**.26***
Doubts About Action	.04	**-.30****
Jenkins Activity Survey		
Speed/Impatience	.07	-.01

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate treating each subscale as a family; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

**p_{FW}<.05; p_T<.0125.

*p_{FW}<.05; p_T<.025

subscale scores were significantly correlated with the total JAS scores (r=.34, p<.004), but not with the "speed/impatience" and "hard-driving/competitive" subscales of the JAS (see Table 21).

Current "orderliness/tidiness" subscale scores were significantly correlated with the "organization" (r=.68, p<.01), "personal standards" (r=.26, p<.025) and "doubts about action" (r=-.30, p<.01) subscales of the MPS, but not with the "speed/impatience" subscale of the JAS (see Table 22).

Hard-driving/Productive: The retrospective "hard-driving/productive" subscale scores were not significantly correlated with the Multidimensional Perfectionism Scale total score or any of the subscales, nor was it significantly correlated with the Jenkins Activity Survey total score or the "hard-driving/competitive" subscale of the JAS. It was significantly correlated with the "speed/impatience" subscale (r=.33, p<.004) of the JAS (see Table 23).

The current "hard-driving/productive" subscale score was significantly correlated with the "personal standards" (r=.46, p<.01) subscale of the MPS. It was not correlated with the "organization" and "doubts about action" subscales of the MPS, nor the "speed/impatience" subscale of the JAS (see Table 24).

Activity: The retrospective "activity" subscale score was not significantly correlated with the Multidimensional Perfectionism Scale total score nor with its subscales. The retrospective "activity" subscale score was significantly correlated with the Jenkins Activity Survey total score (r=.39, p<.004) and the "hard-driving/competitive" subscale (r=.33, p<.004), but not the "speed/impatience" subscale (see Table 23).

The current "activity" score was significantly correlated with the "personal standards" (r=.50, p<.01) subscale of the MPS, but not with the "doubts about action" or "organization" subscales of the MPS, nor the "speed/impatience" subscale of the JAS (see Table 24).

Table 23

Convergent and Discriminant Validity of the Retrospective "Hard-driving/Productive" and "Activity" APS subscale score.

Measure	Hard-driving/ Productive	Activity
Multidimensional Perfectionism Scale		
Total	.04	-.13
Concern Over Mistakes	.08	-.03
Organization	-.01	-.10
Parental Criticism	-.02	-.06
Personal Standards	.00	-.02
Doubts About Action	.07	.02
Parental Expectations	.13	-.13
Jenkins Activity Survey		
Total	.25	**.39***
Hard-driving/Competitive	.16	**.33***
Speed/Impatience	**.33***	.18
PANAS		
Positive Affect	.09	.32
Negative Affect	-.03	.03

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate treating each subscale as a family; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.0042.

Table 24

Convergent and Discriminant Validity of the Current "Hard-driving/Productive" and "Activity" APS subscale score.

Measure	Hard-driving/ Productive	Activity
Multidimensional Perfectionism Scale		
Organization	.15	.28
Personal Standards	**.46***	**.50***
Doubts About Action	-.08	-.10
Jenkins Activity Survey		
Speed/Impatience	.24	.02

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate treating each subscale as a family; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.0125.

Subjugation of Needs: The retrospective "subjugation of needs" subscale scores were not significantly correlated with either the total scores or subscale scores of neither the Multidimensional Perfectionism Scale nor the Jenkins Activity Survey (see Table 25).

Current "subjugation of needs" subscale scores were not significantly correlated with any of MPS or JAS subscales (see Table 26).

Total APS questionnaire score: The retrospective total APS scores were not significantly correlated with the Multidimensional Perfectionism Scale "total score" or any of the subscale scores. Retrospective APS total scores were significantly positively correlated with the total Jenkins Activity Survey score (r=.54, p<.004), and the "hard-driving/competitive" (r=.34, p<.004) and "speed/impatience" (r=.36, p<.004) subscales (see Table 25).

Current APS total scores were significantly correlated with "personal standards" and "organization" subscales of the MPS (r=.57, r=.42 respectively, p<.01), though scores were not significantly related to the "doubts about action" subscale of the MPS or the "speed/impatience" subscale of the JAS (see Table 26).

4.3.4 Comparison of Retrospective and Current Reports

A paired samples t-test was used to compare retrospective and current questionnaire scores. The results are presented in Table 27. Retrospective (i.e., pre-pain) APS questionnaire scores were significantly higher than current scores. This was true for the APS total scores as well as for all five subscale scores.

Retrospective and current reports on the "doubts about action", "organization" and "personal standards" subscales of the MPS were also compared. The "organization" subscale was higher currently than pre-pain, and "doubts about action" was higher pre-pain than currently. The

Table 25

Convergent and Discriminant Validity of the Retrospective "Subjugation of Needs" subscale and APS total score.

Measure	Subjugation of Needs	APS Questionnaire
Multidimensional Perfectionism Scale		
Total	.12	-.26
Concern Over Mistakes	.20	-.11
Organization	-.04	-.15
Parental Criticism	-.00	-.22
Personal Standards	-.02	-.15
Doubts About Action	.17	-.08
Parental Expectations	.11	-.08
Jenkins Activity Survey		
Total	.18	**.54***
Hard-driving/Competitive	.12	**.34***
Speed/Impatience	.00	**.36***
PANAS		
Positive Affect	.09	.25
Negative Affect	-.18	.03

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate treating each subscale as a family; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.0042.

Table 26

Convergent and Discriminant Validity of the Current "Subjugation of Needs" subscale and APS total scores.

Measure	Subjugation of Needs	APS Questionnaire
Multidimensional Perfectionism Scale		
Organization	.15	**.42***
Personal Standards	.17	**.57***
Doubts About Action	-.26	-.16
Jenkins Activity Survey		
Speed/Impatience	-.15	.11

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate treating each subscale as a family; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.0125.

Table 27

A Comparison of Retrospective and Current Self-Reports in Study II

	M	SD	N	t
MPS: Doubts about Action				
Pre-pain	14.03	3.67	79	
Current	10.22	2.99	79	**6.42***
MPS: Organization				
Pre-pain	14.87	6.80	79	
Current	23.19	4.64	79	**-8.54***
MPS: Personal Standards				
Pre-pain	21.14	5.38	79	
Current	21.37	5.35	79	-.27
JAS: Speed & Impatience				
Pre-pain	153.39	63.71	79	
Current	144.71	56.94	79	1.60
APS: Total Score				
Pre-pain	294.56	37.91	80	
Current	257.50	47.41	80	**7.42***
Autonomy/Personal Standards				
Pre-pain	29.60	5.76	77	
Current	27.47	5.92	77	**2.99***
Orderliness/Tidiness				
Pre-pain	29.44	6.08	77	
Current	27.38	6.80	77	**3.80***
Hard-driving/Competitive				
Pre-pain	24.36	7.13	73	
Current	20.73	5.53	73	**4.62***
Activity				
Pre-pain	26.33	4.77	75	
Current	21.92	6.08	75	**6.08***
Subjugation of Needs				
Pre-pain	22.99	3.29	73	
Current	20.51	4.39	73	**5.51***

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.005

"personal standards" subscale did not differ from pre to post. The "speed/impatience" subscale of the JAS completed retrospectively and currently did not differ.

4.3.5 APS questionnaire scores and pain outcome measures

The relationship between scores on the *APS* questionnaire (retrospective and current), and pain intensity, pain disability, anxiety and depression was examined.

4.3.5.1 Pearson Correlation Coefficients

Contrary to prediction, scores on the APS questionnaire administered retrospectively did not significantly correlate with any of the outcome variables. Scores on the current APS questionnaire were significantly correlated with pain disability, anxiety and depression, though in the opposite direction than was predicted. That is, higher scores on the APS questionnaire were associated with lower rather than higher levels of pain disability, anxiety and depression. Current APS scores did not correlate with pain intensity. The results are presented in Tables 28 & 29, will be discussed in detail below.

Pain Intensity: None of the current APS subscale scores and APS total scores correlated with pain intensity.

Pain Disability: The APS (current) total score was significantly correlated with pain disability (r=-.33, p<.004). The "activity" subscale was significantly correlated with pain disability (r=-.33, p<.004). None of the other subscales were correlated with pain disability.

Anxiety: The APS (current) total score was not significantly correlated with anxiety. The "subjugation of needs" subscale was significantly correlated with anxiety (r=-.41, p<.004). None of the other subscales were correlated with anxiety.

Table 28

The relationship between APS scores and Pain

Measure	Pain Intensity	Pain Disability
Retrospective (Pre-pain)		
APS Total Score	.08	-.07
Autonomy/Personal Standards	-.08	-.12
Orderliness/Tidiness	.27	.14
Hard-driving/Productive	-.03	.00
Activity	.03	-.20
Subjugation of Needs	.20	-.07
Current		
APS Total Score	-.19	**-.33***
Autonomy/Personal Standards	-.14	-.14
Orderliness/Tidiness	.12	-.03
Hard-driving/Productive	-.17	-.30
Activity	-.20	**-.33***
Subjugation of Needs	-.18	-.25

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate treating each pain outcome variable as a family; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.0042.

Table 29

The Relationship between APS scores and Emotional Distress

Measure	Anxiety	Depression
Retrospective (Pre-pain)		
APS Total Score	.13	.17
Autonomy/Personal Standards	.08	.00
Orderliness/Tidiness	.20	.27
Hard-driving/Productive	-.02	.13
Activity	.16	.15
Subjugation of Needs	-.08	.04
Current		
APS Total Score	-.23	**-.32***
Autonomy/Personal Standards	-.20	-.25
Orderliness/Tidiness	-.02	-.02
Hard-driving/Productive	-.06	-.10
Activity	-.26	**-.36***
Subjugation of Needs	**-.41***	**-.48***

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate treating each pain outcome variable as a family; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.0042.

Depression: The total current APS score was significantly correlated with depression (r=-.32, p<.004). The "activity" and "subjugation of needs" subscales were significantly correlated with depression (r=-.36, p<.001; r=-.48, p<.004 respectively). None of the other subscales were correlated with depression.

4.3.5.2 Mediational Analyses

A mediating variable acts as the mechanism through which the independent variable influences the dependent variable (Baron and Kenny, 1986). A series of regression equations is used to test for mediation. According to Baron and Kenny (1986), for a variable to act as a mediator between the independent variable and the dependent variable, the following conditions must be met: (1) the independent variable must be correlated with the mediator, (2) the independent variable must be correlated with the dependent variable, (3) the mediator must be correlated with the dependent variable, and (4) the correlation between the independent variable and the dependent variable must be significantly reduced when the mediator is partialled out.

Therefore, a mediational relationship is present when all of the aforementioned correlations ($r_{IV,M}$; $r_{IV,DV}$; $r_{M,DV}$) are statistically significant but the Beta value of the independent variable on the dependent variable is no longer significant or is greatly reduced, after the mediator has been entered. Mediational analyses were used to examine whether total APS scores exert its impact on pain disability and depression through specific APS subscale scores (Autonomy/Personal Standards, Orderliness/Tidiness, Hard-driving/Productive, Activity and Subjugation of Needs). Mediational analyses for pain intensity and anxiety were not examined, as these outcome measures were not significantly correlated with total current APS scores.

The mediational analyses for pain disability are presented in Table 30. The "activity" subscale of the APS questionnaire partly reduces the impact of current total APS scores on pain disability.

The mediational analyses for depression are presented in Table 31. The impact of current total APS scores on depression is almost entirely accounted for by the "activity" and "subjugation of needs" subscales of the APS questionnaire.

4.3.6 The Relationship between Traditional Personality Measures and Pain Outcome

The relationship between traditional personality measures and outcome variables were examined. More specifically, the Jenkins Activity Survey, the Multidimensional Perfectionism Scale, and the PANAS were examined in terms of their relationship to pain intensity, pain disability, anxiety and depression.

None of the traditional personality measures were significantly correlated with pain intensity, pain disability and depression. The "doubts about action" subscale of the MPS (administered currently) was the only measure to significantly correlate with anxiety ($r=.37$, $p<.003$).

4.3.7 APS characteristics and Coping

The relationship between APS scores and global coping strategies was examined. The results are presented in Table 32. As predicted, retrospective and current *APS* scores were positively correlated with assimilative coping (i.e.,tenacious goal pursuit). Contrary to prediction, tenacious goal pursuit was not significantly correlated with pain intensity, pain disability, anxiety, or depression. Therefore, contrary to prediction, the relationship between *APS* characteristics and

Table 30

The Effect of Current total APS Questionnaire scores on Pain Disability as Mediated by Subscale Scores

Mediator	$r_{M,DV}$	$r_{M,IV}$	$r_{IV,DV}$	$Beta_{IV}$
Autonomy/ Personal Standards	-.14	.62*	-.33*	-.40*
Orderliness/ Tidiness	-.03	.54*	-.33*	-.45*
Hard-driving/ Productive	-.30	.67*	-.32*	-.21
Activity	**-.33***	**.79***	**-.32****	**-.16**
Subjugation Of Needs	-.25	.54*	-.31*	-.25

Note: -Correlations with asterisks are those which are significant at the .05 level when controlling the type 1 error familywise using multistage Bonferroni procedure. α_{FW}=.05 is the familywise Type 1 error rate; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977). *p_{FW}<.05; p_T<.003.
-Bold indicates that the criteria for mediation have been met.
-All correlations presented in column 3 (between the IV and DV) are not identical because of missing data for some of the mediating variables.

Table 31

The Effect of Current total APS Questionnaire scores on Depression as Mediated by Subscale Scores

Mediator	$r_{M,DV}$	$r_{M,IV}$	$r_{IV,DV}$	$Beta_{IV}$
Autonomy/ Personal Standards	-.25	.62*	-.30*	-.24
Orderliness/ Tidiness	-.02	.54*	-.30*	-.41*
Hard-driving/ Productive	-.10	.67*	-.27*	-.38*
Activity	**-.36***	**.79***	**-.29***	**-.00**
Subjugation Of Needs	**-.48***	**.54***	**-.29***	**-.05**

Note: -Correlations with asterisks are those which are significant at the .05 level when controlling the type 1 error familywise using multistage Bonferroni procedure. $\alpha_{FW}=.05$ is the familywise Type 1 error rate; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977). $*p_{FW}<.05$; $p_T<.003$.
-Bold indicates that the criteria for mediation have been met.
-All correlations presented in column 3 (between the IV and DV) are not identical because of missing data for some of the mediating variables.

Table 32

The Relationship between APS Scores and Global Coping Strategies

Measure	Tenacious Goal Pursuit	Flexible Goal Adjustment
Retrospective (Pre-pain)		
APS Total Score	**.42****	-.07
Autonomy/Personal Standards	.21	-.27
Orderliness/Tidiness	.16	.07
Hard-driving/Productive	.27	-.08
Activity	.18	-.03
Subjugation of Needs	**.36****	.20
Current		
APS Total Score	**.36****	.05
Autonomy/Personal Standards	.14	-.22
Orderliness/Tidiness	.16	.08
Hard-driving/Productive	.26	-.12
Activity	.27	.07
Subjugation of Needs	**.34****	.13

Note: A multistage Bonferroni procedure was used to obtain the data. α_{FW}=.05 is the familywise Type 1 error rate treating each coping strategy (i.e., tenacious goal pursuit & flexible goal adjustment) as a family; α_T is the type 1 error rate per test (Larzelere & Mulaik, 1977).

*p_{FW}<.05; p_T<.004.

outcome measures was not mediated by tenacious goal pursuit (according to the guidelines of Baron & Kenny, 1986), given that tenacious goal pursuit was not associated with any of the outcome variables.

Contrary to prediction, retrospective and current scores on the APS questionnaire were not significantly correlated with the tendency to flexibly adjustment goals (see Table 32). Similarly, contrary to prediction, flexible goal adjustment was not significantly related to pain intensity, pain disability, anxiety, or depression. Therefore, accommodative forms of coping do not mediate the relationship between APS characteristics and outcome measures (according to the guidelines of Baron & Kenny 1986).

4.4 DISCUSSION

4.4.1 Summary of Findings

The psychometric properties of the APS questionnaire were examined. The convergent and discriminant validity of the APS questionnaire was only slightly supported through its relationship with related personality constructs. The internal consistency of the total APS scores was high. The internal consistencies of the individual subscales ranged from moderate to high. The internal consistencies of the current APS scores were higher than those of the retrospective scores. The intercorrelations were low among the retrospective subscales and moderate among the current subscales. A comparison of retrospective and current APS scores revealed that pain patients report significantly higher pre-pain APS scores (both total and subscale scores).

The relationship between APS scores and pain outcome (pain intensity, pain disability, anxiety and depression) was examined. Contrary to prediction, scores on the APS questionnaire administered retrospectively were not significantly correlated with any of the outcome variables.

Scores on the current APS questionnaire were significantly correlated with pain disability and depression, however, in the opposite direction than predicted, with higher scores associated with better outcome. None of the other personality measures (Multidimensional Perfectionism Scale, Jenkins Activity Survey and PANAS) were correlated more highly with the pain outcome variables than were scores on the current APS questionnaire. The relationship between current total APS scores and pain disability was mediated in part by the "activity" subscale. The relationship between current total APS scores and depression was mediated almost entirely by the "activity" and "subjugation of needs" subscales. "Subjugation of needs" subscale scores were significantly correlated with anxiety. None of the APS scores were significantly correlated with pain intensity.

The relationship between APS scores and global coping strategies was examined. Although the APS total scores (current and retrospective) were associated with tenacious goal pursuit, goal pursuit did not predict any of the outcomes. Flexible goal adjustment was not correlated with APS scores or pain outcome. Accordingly, it is not possible for the association between APS and outcome variables to be mediated by flexible goal adjustment or tenacious goal pursuit.

4.4.2 Findings Meriting Further Discussion

4.4.2.1 Convergent and Discriminant Validity of the APS Questionnaire

The convergent and discriminant validity of the APS questionnaire was slightly supported through its relationship with related personality constructs. As predicted, none of the APS scores were significantly related to positive or negative affect. The convergent validity of the retrospective APS scores (total and subscales) were not as strong as that of the current scores (total and subscales). For example, the convergent validity of the "autonomy/personal standards" subscale was supported in its relationship with the "personal standards" component of the Multidimensional

Perfectionism Scale, whereas the retrospective "autonomy/personal standards" subscale was not related to this component of the MPS. Similarly, the convergent validity of the current "organization" subscale was supported by its positive relationship with the "organization" component of the Multidimensional Perfectionism Scale, whereas the retrospectively administered "organization" subscale was negatively correlated with the MPS "organization" scale, failing to support its convergent validity. The convergent validity of the retrospective "hard-driving/productive" subscale was also not supported due to a lack of relationship with the "hard-driving/competitive" component of the Type A measure. The convergent validity of the retrospective "activity" subscale was somewhat supported in its relationship with Type A. The convergent validity of the retrospective total APS score was supported in its relationship with Type A. However, contrary to prediction, retrospective total APS scores were not significantly related to measures of perfectionism. It should be noted that as predicted, APS total scores administered in the current tense were significantly related to perfectionism.

The fact that the convergent validity of the retrospective APS scores were not as strong as that for the current APS scores (with the exception of the "activity" subscale) suggests that individuals may have had difficulty reporting retrospectively how they were before their pain. This may have been especially difficult for those patients who had had pain for many years. Moreover, the internal consistencies of the current APS scores were consistently higher than those of the retrospective scores, further suggesting that patients are reporting more consistently on items in the current tense than in the past tense.

Moreover, the convergent validity of the Autonomy and Subjugation of needs subscales could not be directly assessed because measures tapping related constructs were not administered. This is due to the fact that the factor analysis was performed subsequent to the data collection in the

present study (as the undergraduate thesis from which the factor analytic data was collected was running concurrently with the present master's thesis). Measures included to assess the convergent and discriminant validity of the APS questionnaire were those related to "Activity", "Productivity" and "High Standards".

Future research needs to re-examine the convergent and discriminant validity of the APS questionnaire in a population of chronic pain patients, by including instruments that tap "Autonomy" and "Subjugation of needs". One such instrument is the Personality Research Form (Jackson, 1989) which provides measures of both Autonomy and Succorance (arguably the opposite to "subjugation of needs").

4.4.2.2 The Relationship between APS scores and pain outcome

APS Characteristics and Physical Difficulties: The APS theory of pain predicts that patients high in APS characteristics may have great difficulty dealing with the pain due to their need to maintain their high pre-pain levels of Activity and Productivity in accordance with their high Standards. These patients are proposed to be at a greater risk for experiencing more severe levels of pain disability and pain intensity because of their behavioural response to the pain. That is, it is thought that APS pain patients may push themselves (i.e., leading to pain exacerbation) in an attempt to maintain their inordinately high levels of pre-pain activity and productivity (Shapiro & Teasell, in press), possibly to the point of re-injury.

Contrary to prediction, scores on the APS questionnaire (retrospective and current) were not related to pain intensity. Similarly, scores on the APS questionnaire administered retrospectively were not related to pain disability. These particular results are not in keeping with previous findings

that, within the chronic pain population, the most severe pain cases report being more active prior to their injury (Gamsa & Vikis-Freibergs,1991) than those with less severe pain.

Scores on the APS questionnaire answered with respect to one's current status, however, were significantly related to levels of pain disability, though in the direction opposite to that predicted. That is, patients with high APS questionnaire scores displayed the lowest levels of pain disability. Moreover, "activity' subscale scores partly mediated the relationship between APS questionnaire scores and pain disability.

Why might this have been so? It may be the case that the negative effect of APS on pain outcome may not manifest itself until the later stages of chronic pain, and might actually be protective earlier on. It should be noted that the majority of patients in the present study have had pain for less than two years.

Alternatively, it may be the case that the APS questionnaire may not be measuring these patient's "needs or desire" to maintain pre-pain activity, but rather, may simply be measuring patients' perceived "competence" or "ability" to maintain a certain level of activity (i.e., functional status). That is, patients who are more disabled would be expected to report lower levels of "ability or competence" to maintain a certain level of activity. This would account for the negative relationship found between APS "activity" subscale scores and pain disability.

A comparison of retrospective and current APS scores revealed that pain patients report significantly higher pre-pain (retrospective) APS scores (for both total and subscale scores). This may be due to the fact that patients were able to maintain higher activity, productivity, standards and subjugation of needs prior to their pain injury. Patient's lower current APS scores may represent their decreased "competence" or "perceived ability" to perform tasks according to their pre-pain levels.

It is interesting that of the comparisons from pre to post pain, the "organization" subscale of the MPS was the only subscale to be significantly higher currently than retrospectively. This may be due to the content of the items. The items in the "organization" subscale of the MPS ask how "important" neatness or organization is to the individual. They also ask about whether or not the individual "tries" to be neat and organized. It may be the case that the importance of organization increases as a result of the pain and those individuals "try" to be more organized. This MPS subscale is slightly different from the APS "orderliness/tidiness" subscale that examines both the "importance" and the "ability" of the patient to be organized. It may be the case that while the "need" to be organized increases after pain, the "ability" decreases.

APS Characteristics and Emotional Distress: The APS theory of pain predicts that individuals high in APS characteristics may be particularly vulnerable to experiencing greater emotional distress because they cannot maintain their pre-pain levels of activity, productivity, high standards, and subjugation of needs. That is, not being able to perform tasks according to their pre-pain ability may be particularly distressing for APS pain patients. The belief that an inability to live up to previous standards constitutes a failure, and their self-esteem being tied to how well they perform, often leads to this distress (Shapiro & Teasell, in press).

Contrary to prediction, scores on the APS questionnaire administered retrospectively failed to be significantly related to depression and anxiety. Scores on the APS questionnaire administered in the present tense were significantly related to levels of depression, but, contrary to prediction, patients with high APS questionnaire scores displayed the lowest levels of depression. Moreover, "activity" and "subjugation of needs" subscales mediated almost entirely the relationship between APS questionnaire scores and depression.

As previously noted, the "activity" subscale may be measuring these patients' perceived "competence" or "ability" to maintain a certain level of activity (i.e., functional disability). Hence, it may be the case that those individuals who perceive themselves as less functionally disabled are, as a result, less depressed.

The finding that high "subjugation of needs" is related to a lower level of depression is interesting, as is the finding that "subjugation of needs" is also related to lower levels of anxiety. Thus, continued ability to help others appears to lead to better adjustment (i.e., less emotional distress). It is possible that these 'acts of altruism' may provide the patient with a sense of worth or purpose, which may inadvertently lead to less depression and anxiety.

4.4.2.3 The Relationship between APS scores and coping

Brandtstadter and Renner (1990) examined goal setting and identified two complementary modes of coping people can use when faced with a critical life transition (e.g., living with pain). Tenacious goal pursuit involves active attempts to alter an unsatisfactory situation in a way that preserves the original set goals. In contrast, flexible goal adjustment involves adjusting goals to current situational limitations. A perceived threat to obtaining these goals (e.g., chronic pain) is thought to trigger one of these two coping responses.

The APS theory of pain predicts that when individuals high in *APS* characteristics are faced with pain, they may adopt maladaptive coping mechanisms (i.e., tenacious goal pursuit) as a result of their perfectionistic tendencies. In support of this prediction, both retrospective and current APS scores were significantly related to tenacious goal pursuit. These findings also support previous research which has shown that perfectionism is related to high goal setting, with an emphasis placed on obtaining these goals (Ferguson & Rodway, 1994; Alden, Bieling, & Wallace, 1994).

Furthermore, Kim (1998) found that *APS* characteristics were positively correlated with tenacious goal pursuit ($r = .51$, $p<.001$) in an undergraduate non-pain sample.

The APS theory of pain further predicts that tenacious goal pursuit may act as a maladaptive coping mechanism. That is, tenacious goal pursuit may lead the individual to experience greater emotional difficulties adjusting to the pain, and it may be these individuals who experience more pain intensity and disability after the initial injury. The present research failed to support this notion, in that no relationship was found between tenacious goal pursuit and any of the outcome variables (pain intensity, pain disability and emotional distress).

Flexible goal adjustment was not associated with pain outcome (pain intensity, disability, or emotional distress). This is contrary to previous research showing that flexible goal adjustment is associated with better emotional adjustment in chronic pain patients (Schmitz, Saile, and Nilges, 1996). Flexible goal adjustment was not related to APS characteristics. This finding is opposite to that of Kim (1998) who found flexible goal adjustment to be significantly correlated with scores on the APS questionnaire in an undergraduate non-pain sample ($r = -.27$, $p<.001$).

4.4.3 Limitations of the Study

The present study had a few limitations, which may have had an impact on the results. The APS questionnaire is a self-report measure. As previously discussed, it may be difficult for these patients (particularly those who have had pain for a long time) to provide accurate retrospective self reports.

The convergent validity of some of the subscale scores (i.e., "autonomy" and "subjugation of needs") could not be directly measured as questionnaires tapping these constructs were not administered.

As previously mentioned, current scores on the APS questionnaire may be measuring patients' perceived "competence" to maintain a certain level of ability (i.e., functional disability), rather than measuring stable "personality characteristics" (i.e., patients' needs or desires to maintain APS characteristics). This leads to interpretative difficulties when examining the relationship between APS scores and pain outcome variables.

4.4.4 Strengths of the Study

The present study was the first of its kind to directly examine the purported relationship between APS characteristics and pain outcome (i.e., pain intensity, pain disability and emotional distress) in a heterogeneous sample of pain patients. Moreover, the proposed mediational role of maladaptive coping strategies in the relationship between APS characteristics and pain outcome was also examined. The present study was also the first to examine the convergent and discriminant validity of the APS questionnaire within a sample of pain patients.

4.4.5 Study Implications

The present findings fail to support the APS theory of pain. Contrary to prediction, patients high in APS characteristics do not experience greater levels of pain intensity, pain disability and emotional distress. In fact, the present study suggests that patients with high 'current' APS scores reported lower levels of pain disability, depression and anxiety. Furthermore, contrary to prediction, the relationship between APS characteristics and pain outcome is not mediated by maladaptive coping strategies (i.e., inability to adjust goals). The failure of the present study to support the APS theory of pain may be due to previously mentioned limitations. For example, it is unclear as to whether the APS questionnaire is measuring stable "personality characteristics" or is, in part,

influenced by "functional disability". If the questionnaire is not measuring stable "personality characteristics", then a direct examination of the APS theory of pain has not been performed.

4.4.6 Suggestions for Future Research

Future research should examine the APS questionnaire. An examination of the factor structure of the APS questionnaire in a population of pain patients should be performed, to confirm the factor structure found in a population of undergraduates. Future research should also re-examine the convergent and discriminant validity of the APS questionnaire in a population of pain patients using measures that tap all five of the subscales of the APS questionnaire.

An ideal examination of the APS theory of pain would involve following individuals before the initial injury, through to the acute phase of injury, and into the chronic phase. This would allow for a direct examination of the progression of pain related factors (i.e., pain disability, pain intensity and emotional distress) and their relationship to APS characteristics over time. This may be possible if one targets a work environment with a high injury rate, or targets individuals immediately post motor vehicle accidents. This type of follow-up would also enable one to determine whether the APS questionnaire measures stable "personality" features or "functional disability".

A follow-up study is currently being conducted, wherein patients who participated in the present study will be contacted at one and two year follow-up. This will enable one to address in part, some of the questions generated by this study. For example, by measuring functional disability and APS characteristics at time one and at follow-up, the researchers will be able to disentangle the relationship among the two (i.e., covary out the effects of "functional disability").

CHAPTER 5: GENERAL DISCUSSION

5.1 PSYCHOMETRIC PROPERTIES OF THE APS QUESTIONNAIRE

The APS questionnaire is still in the beginning stages of development. The present group of studies examined the psychometric properties of the APS questionnaire across different populations. These results will be discussed below.

The purpose of the pilot study was to investigate the factor structure of the APS questionnaire. The results suggest the presence of five reliable factors: Autonomy/Personal Standards; Orderliness/Tidiness; Hard-driving/Productive; Activity, and Subjugation of needs. These factors are consistent with what the questionnaire was designed to measure. Future research needs to confirm the factor structure of the APS questionnaire in a population of pain patients. The factor structure of the APS questionnaire was used to derive subscales.

An interesting observation across studies is that the intercorrelations among the subscales changes across populations. In the population of undergraduates (Pilot study) and non-pain controls (Study I), the subscales were relatively independent from one another. However, in the population of pain patients, the subscales become less orthogonal (i.e., less independent). Within the population of pain patients, current APS subscale scores are more highly correlated with one another than are retrospective scores. Furthermore, tertiary care (Study I) pain patients' APS subscale scores are more highly intercorrelated than the population of individuals from the Regional Evaluation Centre (Study II). This pattern of results suggests that the APS construct (i.e., the relationship among the APS characteristics) is dependent upon the population for which it is administered. In a non-pain population, APS characteristics are orthogonal. However, in a pain population, these characteristics become inter-related. It is unclear to why this pattern of

observations emerge. Analyses suggest that the magnitude of the intercorrelations of subscale scores among the pain patients is not related to pain intensity or disability.

The internal consistencies of the total APS questionnaire scores across studies are high (for both retrospective and current). The internal consistencies of APS subscale scores (both retrospective and current) ranged from moderate to high across all studies. "Orderliness/Tidiness" displayed the highest internal consistency across studies. The internal consistencies of the current subscales were generally higher than that of the retrospective subscales.

The convergent and discriminant validity of the APS subscales scores was supported in the population of undergraduates (Pilot study). The convergent and discriminant validity of the APS subscale scores was not as strong in the heterogeneous sample of pain patients (Study II). Interestingly, in Study II, the convergent validity of the 'current' subscale scores was stronger than that of the 'retrospective' subscale scores (with the exception of the "activity" subscale) in the population of pain patients.

Taken together, the stronger validity (convergent and discriminant) and the higher internal consistencies in the current APS scores compared to the retrospective scores suggests that retrospective self-reports were less accurate than current reports. It may be the case that individuals had great difficulty remembering back to how they were before their pain. This may have been especially difficult for those patients who have had pain for a long duration of time (i.e., many years).

Pain patients in Studies I and II report significantly higher retrospective (i.e., pre-pain) APS characteristics compared to currently. However, the APS theory of pain would predict that APS characteristics (i.e., scores on the APS questionnaire) remain constant from retrospective (i.e., pre-pain) to current self-reports. Higher retrospective compared to current APS scores in the present

studies may be due to a number of factors. For example, it may be the case that patients are exaggerating their pre-pain proclivity to be active and productive, in an attempt to legitimize their current pain and not be seen as malingerers. It may also be the case that patients had difficulty accurately describing themselves retrospectively. Alternatively, it may be the case that the APS questionnaire is measuring "functional disability" instead of stable "personality characteristics". Research is needed to further examine these possibilities.

5.2 APS THEORY OF PAIN

The APS theory of chronic pain proposes that APS personality characteristics may interact with the initial physical injury to place some patients at risk for developing more severe physical and emotional difficulties secondary to the organic pain condition. Taken together, the present findings fail to support the APS theory of pain. Contrary to prediction, patients high in APS characteristics do not experience greater levels of pain intensity, pain disability and emotional distress, but rather, reported lower levels of pain disability, depression and anxiety. Furthermore, contrary to prediction, the relationship between APS characteristics and pain outcome is not mediated by maladaptive coping strategies (i.e., inability to adjust goals).

The failure of the present study to support the APS theory of pain may be due to limitations in the study, and should not lead to a premature abandonment of the construct. Recall that other investigators have observed that pain patients do indeed possess similar characteristics of APS prior to the onset of pain (VanHoudenhove, 1986; VanHoudenhove *et al.*, 1987). Furthermore, preliminary evidence suggests that these characteristics may render the patient vulnerable to more severe physical and emotional difficulties secondary to the pain (Feuerstein *et al.*, 1997; Gamsa & Vikis-Freibergs, 1991). As previously discussed, it may be the case that the APS questionnaire is

not measuring stable 'personality characteristics', but rather 'functional disability', in which case a direct examination of the APS theory would not have been performed. It may also be the case that these patients had difficulty providing accurate retrospective self-reports.

Future research approaches should include following individuals ideally before (or immediately after) the initial injury, through to the acute phase of injury, and into the chronic phase. This would allow for a direct examination of the progression of pain related factors (i.e., pain disability, pain intensity and emotional distress) and their relationship to APS characteristics over time. This type of follow-up would also provide clues into the APS questionnaire and whether it is measuring stable "personality" features or "functional disability".

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Appendix A

Ethics Approval (Pilot Study)

1997-98

THE UNIVERSITY OF WESTERN ONTARIO
LONDON ONTARIO
Department of Psychology

PSYCHOLOGY 485 THESIS PROJECT: ETHICS REVIEW - HUMAN RESEARCH

NAME OF STUDENT: Jean Kim

SHORT NAME OF THESIS PROJECT: APS Questionnaire.

SUPERVISOR: L. Swartzman

1. ETHICAL REVIEW ELSEWHERE: Your thesis project has been referred to the Psychology Department Chair or appropriate ethics committee for further consideration. See Dr. Kuiper for updates on status of your ethics protocol (these updates will be posted on the door of Room 7428). Please ensure you retain this ethics review report and bring it along if you meet with Dr. Kuiper. Do not yet proceed with your project.

Date: _____

2. IMPORTANT INFORMATION MISSING AND/OR SIGNIFICANT CHANGES REQUIRED: Please read the comments provided below (and on the back of this page). Respond after you have consulted with your supervisor. Provide Dr. Kuiper with a written copy of the information requested and/or changes that you have made to your project to address these concerns. Be sure to include the date, your name, project title, and your supervisor's name on your written response to Dr. Kuiper, and attach this ethics review report as the first page. Do not yet proceed with your project.

Date: Oct 27/97

please come to discuss.

3. MINOR INFORMATION MISSING AND/OR MINOR CHANGES REQUIRED: Please read the comments provided below (and on the back of this page) and respond. You may need to consult with your supervisor. Provide Dr. Kuiper with a written copy of the information requested and/or changes that you have made to your project to address these concerns. Be sure to include the date, your name, project title, and your supervisor's name on your written response to Dr. Kuiper, and attach this ethics review report as the first page. Do not yet proceed with your project.

Date: _____

4. YOUR PROJECT HAS RECEIVED ETHICAL APPROVAL. Your thesis project has now been ethically approved for Psychology 485. Please make sure that you retain this ethics review report as you will need it for further reference and use (e.g., access to the subject pool). You may now proceed with your project.

Date: Nov 6/97

Signature: N A Kuiper (N. A. Kuiper, Ph.D.)

GRADE 4.30/5 (only given after final approval has been obtained)

Appendix B

APS Questionnaire (Current Form)

Listed below are statements that a person might use to describe himself or herself. Please rate how accurately each statement describes your **CURRENT** thoughts and behaviors. Circle only one number for each statement:

1 - extremely inaccurate
2 - very inaccurate
3 - somewhat inaccurate
4 - neither accurate nor inaccurate
5 - somewhat accurate
6 - very accurate
7 - extremely accurate

	Extremely Inaccurate (1)						Extremely Accurate (7)
1. Even when I am relaxing, my mind is often thinking about things that need to get done.	1	2	3	4	5	6	7
2. I do not spend time continuing to work on something that is already "good enough".	1	2	3	4	5	6	7
3. I usually schedule as much into my day as I possibly can.	1	2	3	4	5	6	7
4. When I am sick, I let other people take over my usual responsibilities so that I can rest.	1	2	3	4	5	6	7
5. People have sometimes told me that I am too honest.	1	2	3	4	5	6	7
6. It is usually easy for me to "turn my mind off" at the end of the day, even if there are still things that need to be done.	1	2	3	4	5	6	7
7. I rarely need to say the words "I can't".	1	2	3	4	5	6	7
8. When I watch TV I usually do something else (e.g., ironing, reading, knitting, paying bills, exercising) at the same time.	1	2	3	4	5	6	7
9. I usually give more to people than I take back in return.	1	2	3	4	5	6	7
10. I often do things at a slower pace than other people do them.	1	2	3	4	5	6	7

HOW ARE YOU CURRENTLY

	Extremely Inaccurate (1)						Extremely Accurate (7)
11. I often rely on others to remind me about little details that I would otherwise forget to look after.	1	2	3	4	5	6	7
12. I always learned to push myself hard to overcome obstacles.	1	2	3	4	5	6	7
13. I am comfortable saying "no" when people ask for assistance.	1	2	3	4	5	6	7
14. I like to be busy and "on the go" most of the time.	1	2	3	4	5	6	7
15. I prefer to do whatever is most convenient, even if it sometimes means that I have to compromise my standards.	1	2	3	4	5	6	7
16. I take pride in how much I can accomplish in a short period of time.	1	2	3	4	5	6	7
17. Other people sometimes call me a "perfectionist".	1	2	3	4	5	6	7
18. I am usually the one to take responsibility for helping relatives or friends when they are ill or upset.	1	2	3	4	5	6	7
19. Some people would describe me as a "couch potato".	1	2	3	4	5	6	7
20. When visiting, I am more comfortable in a house that is a little messy than in a house that is completely clean and tidy.	1	2	3	4	5	6	7
21. I usually work at an easy pace and avoid long hours.	1	2	3	4	5	6	7
22. My best way of reducing stress is through physical activity and keeping busy.	1	2	3	4	5	6	7
23. I usually put a lot of pressure on myself to be successful at what I do.	1	2	3	4	5	6	7
24. I enjoy relaxing in front of the television, even when there is still work to be done.	1	2	3	4	5	6	7
25. I feel uncomfortable whenever I put my own needs first.	1	2	3	4	5	6	7
26. I am comfortable with some minor mistakes in my work, as long as I know that others will not notice.	1	2	3	4	5	6	7

HOW ARE YOU CURRENTLY

	Extremely Inaccurate (1)						Extremely Accurate (7)
27. I often take time to sit down, do nothing, and not think about anything in particular.	1	2	3	4	5	6	7
28. Other people sometimes question why I keep trying to improve something that they think is already "good enough".	1	2	3	4	5	6	7
29. At work I usually look for more tasks to do if all my work is done.	1	2	3	4	5	6	7
30. I do not ask others for help if I can somehow manage on my own, even if the task is extremely difficult.	1	2	3	4	5	6	7
31. I usually keep things orderly and in their place.	1	2	3	4	5	6	7
32. When I am in a hurry to get things done, it is usually because I have put them off until the last minute.	1	2	3	4	5	6	7
33. Other people often tell me to slow down and relax.	1	2	3	4	5	6	7
34. I always stay on top of the projects I am working on.	1	2	3	4	5	6	7
35. I prefer to set goals that are fairly easy to reach.	1	2	3	4	5	6	7
36. Usually I am not critical of myself when I make mistakes.	1	2	3	4	5	6	7
37. I get bored easily when I am not busy.	1	2	3	4	5	6	7
38. I usually let others do the planning for important events, because I can't be bothered with all the details.	1	2	3	4	5	6	7
39. Other people often comment on how clean and tidy my house or apartment is.	1	2	3	4	5	6	7
40. I avoid doing more favours for other people than they do for me.	1	2	3	4	5	6	7
41. When it comes to meeting my own standards, I do not compromise.	1	2	3	4	5	6	7
42. I think that people are too concerned with having a place for everything and everything in its place.	1	2	3	4	5	6	7
43. I don't like to relax until everything is done.	1	2	3	4	5	6	7

HOW ARE YOU CURRENTLY

	Extremely Inaccurate (1)						Extremely Accurate (7)
44. I prefer to do things myself because other people often don't do them properly.	1	2	3	4	5	6	7
45. People see me as someone who can overcome any problem without needing help.	1	2	3	4	5	6	7
46. I generally prefer slow-paced and restful activities.	1	2	3	4	5	6	7
47. I am not a very competitive person.	1	2	3	4	5	6	7
48. When working, I try not to miss my lunch and coffee breaks because I like having quiet time to relax and do nothing.	1	2	3	4	5	6	7
49. When there is an unpleasant job to be done, I am usually the one who ends up doing it.	1	2	3	4	5	6	7
50. I often forget where I have put things, because I'm not very organized.	1	2	3	4	5	6	7
51. I usually ask others to help when I feel that I am doing more than my share.	1	2	3	4	5	6	7
52. When it comes to getting things done I have two speeds -- fast and faster.	1	2	3	4	5	6	7
53. I usually insist on getting my fair share even if it means that someone else has to do without.	1	2	3	4	5	6	7
54. I believe that a job has to be done just right or else not at all.	1	2	3	4	5	6	7
55. When I start a task, I usually work until it is finished even if it means not taking time for rest and relaxation.	1	2	3	4	5	6	7
56. I often think that people place way too much importance on getting a lot done in a day.	1	2	3	4	5	6	7
57. I dislike asking others for assistance.	1	2	3	4	5	6	7
58. I think that people worry too much about keeping things neat and tidy.	1	2	3	4	5	6	7

Appendix C

Behavioural Measures

Please answer the following questions concerning general information in the spaces provided.

1. Age: _____ 2. Date of birth: _____ _____ _____
Day Month Year

3. Sex: M____ F____

4. Academic Status: Full-time _____ Part-time _____

Academic Year (circle one): U1 U2 U3 U4

5. What faculty are you in? _____

6. Incoming average grade (last year of high school) _____%

Expected average grade for this academic year _____%

7. Are you currently employed? Yes _____ No _____

If yes, is it full-time _____ or part-time _____?
(check one)

8. For the chart below, please indicate the **number of hours** you spend on each of the following activities **on an average school day and non-school day**. If there are two or more of the listed activities that you do at the same time, split the amount of time according to the total amount you think you spend on each on in a full day. Note: total hours should add up to 24 hours.

Daily Activity	No. of hours on a **school day**	No. of hours on a **non-school** day
Attending classes		
Studying		
Paid work (i.e. job)		
Volunteer work		
Eating		
Relaxing on your own		
Hobbies/extra-curricular activities		
Socializing / spending time with friends		
Sleeping		
Other (specify)_____		
Total no. of hours	**24**	**24**

Appendix D

Study Information Sheet (Pilot Study)

Psychomotor Performance and Personality Measures

Participation in this study involves a trail-making task that requires connecting dots in numerical order within a prescribed time period. It has been shown that this task requires a high level of attention, persistence and speed of mental processing. We are interested in how this task relates to other personality measures. You will be asked to complete a number of questionnaires that assess various personality variables and general health. You may find these questionnaires to be similar or redundant. This is intentional, since we wish to compare the various measures.

The total time of participating in this study will be approximately 2 hours. You will receive 2 research credits for appearing for this study, regardless of whether or not you choose to participate. Note that you are free to withdraw at ANY TIME during this study, for any reason, and without any penalties. For any portion of this study, you may omit any items that you do not wish to respond to, without any penalty. The data you provide is STRICTLY CONFIDENTIAL and will be used for research purposes only. There are no known physical or psychological risks of participating in this study. At the conclusion of the study, you will be debriefed and be given further information on how to obtain the results of the completed study. If, after reading this information, you are still interested in participating in this study, please complete the attached informed consent form. Please feel free to keep this information sheet further reference. If you have any questions about the study, do not hesitate to contact Jean Kim or Dr. Leora Swartzman:

Jean Kim
4th Year Honors Student
(519) 432-6273

Thesis Supervisor: Dr. Leora Swartzman
Social Sciences 6426
(519) 679-2111 ext. 4654
Swartzman@sscl.uwo.ca

Appendix E

Consent Form (Pilot Study)

Psychomotor Performance and Personality Measures

I, _____, have read and understand the information presented
(print name)

in the STUDY INFORMATION SHEET, and agree to participate in the study

described therein.

Name (print) _____

Signature _____ Date

Appendix F

Debriefing Form (Pilot Study)

Psychomotor Performance and Personality Measures

DEBRIEFING SHEET

Thank you for your participation in this study! There are two main objectives of this study. The first is to validate a new APS personality measure and to examine how it relates to various established measures of perfectionism, procrastination, Type A behavior, and general health. The APS Questionnaire was created by information obtained on chronic pain patients. Many of these patients seemed to be characterized by extreme ACTIVITY and PRODUCTIVITY as well as maintenance of extremely high STANDARDS for themselves. The APS Questionnaire is the first measure to assess this proposed personality structure. The goal of administering the APS Questionnaire along with the other questionnaires is to see how similar or dissimilar it is to other personality and health variables.

The second goal of the study is to see certain behavioral measures relate to the results of the APS Questionnaire. Those who score high on the APS measure are expected to have greater difficulty concentrating on the breathing task. High scorers are also expected to set high goals for themselves on the trail-making task and NOT lower their goals for subsequent trials, because of the tendency to maintain very high goals for themselves.

Your participation in this study will help us to further understand various personality variables, how they relate to pain and coping, and hopefully, ultimately assist in helping individuals live a more happy and productive life.

For your interest, here are some related readings that you may find in the Weldon library:

Flett, G.L., Blankstein, P.L., Hewitt, P.L. & Koledin, S. (1991). Components of perfectionism and procrastination in college students. Social Behavior and Personality, 20, 85-94.

Frost, R.O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. Cognitive Therapy and Research, 14, 449-468.

Landy, F.J., Rastegary, H., Thayer, J. & Colvin, C. (1991). Time urgency: The construct and its measurement. Journal of Applied Psychology, 76, 644-657.

Shapiro, A.P. (Manuscript in preparation). Psychological intervention for the "at risk" patient: Dismantling the barriers to work re-entry. (available at the office number listed below)

If you have any questions or concerns about this study, please do not hesitate to contact Jean Kim or Professor Leora Swartzman:

Jean Kim
4th Year Honors Student
(519) 432-6273

Thesis Supervisor: Dr. Leora Swartzman
Social Sciences 6426
(519) 679-2111 ext. 4654
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Appendix G

Ethics Consent (Study I)

REVIEW BOARD FOR HEALTH SCIENCES RESEARCH INVOLVING HUMAN SUBJECTS

1997-98 CERTIFICATION OF APPROVAL OF HUMAN RESEARCH

ALL HEALTH SCIENCES RESEARCH INVOLVING HUMAN SUBJECTS AT THE UNIVERSITY OF WESTERN ONTARIO IS CARRIED OUT IN COMPLIANCE WITH THE MEDICAL RESEARCH COUNCIL OF CANADA "GUIDELINES ON RESEARCH INVOLVING HUMAN SUBJECT."

1997-98 REVIEW BOARD MEMBERSHIP

1) Dr. B. Borwein, Assistant Dean-Research - Medicine (Chairman) (Anatomy/Ophthalmology)
2) Ms. S. Hoddinott, Director of Research Services (Epidemiology)
3) Dr. R. Gagnon, St. Joseph's Health Centre Representative (Obstetrics & Gynaecology)
4) Dr. F. Rutledge, London Health Sciences Centre - Victoria Campus Representative (Critical Care - Medicine)
5) Dr. D. Bocking, London Health Sciences Centre - University Campus Representative (Physician - Internal Medicine)
6) Dr. L. Heller, Office of the President Representative (French)
7) Mrs. E. Jones, Office of the President Representative (Community)
8) Ms. S. Fincher-Stoll, Office of the President Representative (Legal)
9) Dr. D. Freeman, Faculty of Medicine & Dentistry Representative (Clinical)
10) Dr. D. Sim, Faculty of Medicine & Dentistry Representative (Basic)(Epidemiology)
11) Dr. M.I. Kavaliers, School of Dentistry Representative (Dentistry-Oral Biology)
12) Dr. H. Laschinger, School of Nursing Representative (Nursing)
13) Faculty of Health Sciences Representative
14) Ms. R. Bullas, London Clinical Research Association Representative
15) Research Institutes Representative
16) Mrs. R. Yohnicki, Administrative Officer

Alternates are appointed for each member.

THE REVIEW BOARD HAS EXAMINED THE RESEARCH PROJECT ENTITLED:
"The development of a questionnaire examining activity styles of individuals with medical illness."

REVIEW NO: E6224

SUBMITTED BY: Dr. L. Swartzman, Psychology, Social Science Centre

AND CONSIDERS IT TO BE ACCEPTABLE ON ETHICAL GROUNDS FOR RESEARCH INVOLVING HUMAN SUBJECTS UNDER CONDITIONS OF THE UNIVERSITY'S POLICY ON RESEARCH INVOLVING HUMAN SUBJECTS.

APPROVAL DATE: 03 December 1997 (UWO Protocol, Letter of Information & Consent)

AGENCY:

TITLE:

Bessie Borwein, Chairman

c.c. Hospital Administration

Appendix H

APS Questionnaire (Retropective Form)

Listed below are statements that a person might use to describe himself or herself. Please rate how accurately each statement describes your thoughts and behaviors **BEFORE YOUR PAIN.** Circle only one number for each statement:

1 - extremely inaccurate
2 - very inaccurate
3 - somewhat inaccurate
4 - neither accurate nor inaccurate
5 - somewhat accurate
6 - very accurate
7 - extremely accurate

	Extremely Inaccurate (1)						Extremely Accurate (7)
1. Even when I was relaxing, my mind was often thinking about things that needed to get done.	1	2	3	4	5	6	7
2. I did not spend time continuing to work on something that was already "good enough".	1	2	3	4	5	6	7
3. I usually scheduled as much into my day as I possibly could.	1	2	3	4	5	6	7
4. When I was sick, I let other people take over my usual responsibilities so that I could rest.	1	2	3	4	5	6	7
5. People had sometimes told me that I was too honest.	1	2	3	4	5	6	7
6. It was usually easy for me to "turn my mind off" at the end of the day, even if there were still things that needed to be done.	1	2	3	4	5	6	7
7. I rarely needed to say the words "I can't".	1	2	3	4	5	6	7
8. When I watched TV I usually did something else (e.g., ironing, reading, knitting, paying bills, exercising) at the same time.	1	2	3	4	5	6	7
9. I usually gave more to people than I took back in return.	1	2	3	4	5	6	7
10. I often did things at a slower pace than other people did them.	1	2	3	4	5	6	7
11. I often relied on others to remind me about little details that I would have otherwise forgotten to look after.	1	2	3	4	5	6	7

HOW WERE YOU PRIOR TO YOUR PAIN

	Extremely Inaccurate (1)						Extremely Accurate (7)
12. I always pushed myself hard to overcome obstacles.	1	2	3	4	5	6	7
13. I was comfortable saying "no" when people asked for assistance.	1	2	3	4	5	6	7
14. I liked to be busy and "on the go" most of the time.	1	2	3	4	5	6	7
15. I preferred to do whatever was most convenient, even if it sometimes meant that I had to compromise my standards.	1	2	3	4	5	6	7
16. I took pride in how much I could accomplish in a short period of time.	1	2	3	4	5	6	7
17. Other people sometimes called me a "perfectionist".	1	2	3	4	5	6	7
18. I was usually the one to take responsibility for helping relatives or friends when they were ill or upset.	1	2	3	4	5	6	7
19. Some people would describe me as a "couch potato".	1	2	3	4	5	6	7
20. When visiting, I was more comfortable in a house that was a little messy than in a house that was completely clean and tidy.	1	2	3	4	5	6	7
21. I usually worked at an easy pace and avoided long hours.	1	2	3	4	5	6	7
22. My best way of reducing stress was through physical activity and keeping busy.	1	2	3	4	5	6	7
23. I usually put a lot of pressure on myself to be successful at what I did.	1	2	3	4	5	6	7
24. I enjoyed relaxing in front of the television, even when there was still work to be done.	1	2	3	4	5	6	7
25. I felt uncomfortable whenever I put my own needs first.	1	2	3	4	5	6	7
26. I was comfortable with some minor mistakes in my work, as long as I knew that others would not notice.	1	2	3	4	5	6	7

HOW WERE YOU PRIOR TO YOUR PAIN

	Extremely Inaccurate (1)						Extremely Accurate (7)
27. I often took time to sit down, do nothing, and not think about anything in particular.	1	2	3	4	5	6	7
28. Other people sometimes questioned why I kept trying to improve something that they thought was already "good enough".	1	2	3	4	5	6	7
29. At work I usually looked for more tasks to do if all my work was done.	1	2	3	4	5	6	7
30. I did not ask others for help if I could somehow manage on my own, even if the task was extremely difficult.	1	2	3	4	5	6	7
31. I usually kept things orderly and in their place.	1	2	3	4	5	6	7
32. When I was in a hurry to get things done, it was usually because I had put them off until the last minute.	1	2	3	4	5	6	7
33. Other people often told me to slow down and relax.	1	2	3	4	5	6	7
34. I always stayed on top of the projects I was working on.	1	2	3	4	5	6	7
35. I preferred to set goals that were fairly easy to reach.	1	2	3	4	5	6	7
36. Usually I was not critical of myself when I made mistakes.	1	2	3	4	5	6	7
37. I got bored easily when I was not busy.	1	2	3	4	5	6	7
38. I would usually let others do the planning for important events, because I couldn't be bothered with all the details.	1	2	3	4	5	6	7
39. Other people often commented on how clean and tidy my house or apartment was.	1	2	3	4	5	6	7
40. I avoided doing more favours for other people than they would do for me.	1	2	3	4	5	6	7
41. When it came to meeting my own standards, I did not compromise.	1	2	3	4	5	6	7
42. I thought that people were too concerned with having a place for everything and everything in its place.	1	2	3	4	5	6	7

HOW WERE YOU PRIOR TO YOUR PAIN

	Extremely Inaccurate (1)						Extremely Accurate (7)
43. I didn't like to relax until everything was done.	1	2	3	4	5	6	7
44. I preferred to do things myself because other people often didn't do them properly.	1	2	3	4	5	6	7
45. People saw me as someone who could overcome any problem without needing help.	1	2	3	4	5	6	7
46. I generally preferred slow-paced and restful activities.	1	2	3	4	5	6	7
47. I was not a very competitive person.	1	2	3	4	5	6	7
48. When working, I tried not to miss my lunch and coffee breaks because I liked having quiet time to relax and do nothing.	1	2	3	4	5	6	7
49. When there was an unpleasant job to be done, I was usually the one who ended up doing it.	1	2	3	4	5	6	7
50. I often forgot where I had put things, because I was not very organized.	1	2	3	4	5	6	7
51. I usually asked others to help when I felt that I was doing more than my share.	1	2	3	4	5	6	7
52. When it came to getting things done I had two speeds -- fast and faster.	1	2	3	4	5	6	7
53. I usually insisted on getting my fair share even if it meant that someone else had to go without.	1	2	3	4	5	6	7
54. I believed that a job had to be done just right or else not at all.	1	2	3	4	5	6	7
55. When I started a task, I usually worked until it was finished even if it meant not taking time for rest and relaxation.	1	2	3	4	5	6	7
56. I often thought that people placed way too much importance on getting a lot done in a day.	1	2	3	4	5	6	7
57. I disliked asking others for assistance.	1	2	3	4	5	6	7
58. I thought that people worried too much about keeping things neat and tidy.	1	2	3	4	5	6	7

Appendix I

Letter of Introduction (Study I)

Dear LHSC Patient,

This letter is to introduce Andrea Koster who is a member of a University of Western Ontario research team studying ways in which medical disorders affect people's lives. The research you are being asked to participate in involves completing a questionnaire which these researchers are developing as part of their efforts to assess the impact of illness and disability. This is an important research area and your participation would be greatly appreciated. You should note that your decision regarding participation is completely voluntary and will have no impact on the treatment you receive. Indeed, the questionnaires are anonymous (you do not put your name on them) and therefore I will not know whether or not you chose to participate.

Thank you for your time and interest in this research study.

Sincerely,

Dr. Robert Teasell, MD., FRCPC
Dept. of Physical Medicine and Rehabilitation

Telephone (519) 663-3000
University Campus • 339 Windermere Road, London, Ontario, Canada N6A 5A5

Appendix J

Information Sheet (Study I)

Investigator: Andrea Koster
Place of Research: University Hospital

The Development of a Questionnaire examining Activity Styles of Individuals with Medical Illness

Purpose of the Study

You are asked to take part in a questionnaire. The goal of this study is to develop a questionnaire that measures reported activity levels and behaviour of individuals with medical illnesses.

Procedure

If you agree to participate, you will be asked to complete two questionnaires relating to activity levels and behaviour. One questionnaire will concern pre-injury activity levels, while the other will measure post-injury activity levels. The questionnaires will take approximately 10 minutes each to complete, for a total of 20 minutes altogether.

Risks and Discomforts

There are no anticipated psychological risks which may arise from filling out this questionnaire.

Withdrawal

Participation in this study is voluntary. You may participate, or withdraw from the study at any time with no effect on your future care.

Confidentiality

All information will remain confidential as you will not be asked to put your names on the questionnaires.

Contact Person

If you have any questions call Andrea Koster at 434-0495, or Dr. Robert Teasell at 661-3235, or Dr. Leora Swartzman at 679-2111 (ext. 4654).

Your's sincerely,

Andrea Koster

Andrea Koster

Appendix K

Ethics Approval (Study II)

The UNIVERSITY *of* WESTERN ONTARIO

Vice-President (Research)
Ethics Review Board Dental Sciences Building

REVIEW BOARD FOR HEALTH SCIENCES RESEARCH INVOLVING HUMAN SUBJECTS
1997-98 CERTIFICATION OF APPROVAL OF HUMAN RESEARCH

ALL HEALTH SCIENCES RESEARCH INVOLVING HUMAN SUBJECTS AT THE UNIVERSITY OF WESTERN ONTARIO IS CARRIED OUT IN COMPLIANCE WITH THE MEDICAL RESEARCH COUNCIL OF CANADA "GUIDELINES ON RESEARCH INVOLVING HUMAN SUBJECT."

1997-98 REVIEW BOARD MEMBERSHIP

1) Dr. B. Borwein, Assistant Dean-Research - Medicine (Chairman) (Anatomy/Ophthalmology)
2) Ms. S. Hoddinott, Director of Research Services (Epidemiology)
3) Dr. R. Gagnon, St. Joseph's Health Centre Representative (Obstetrics & Gynaecology)
4) Dr. R. McManus, London Health Sciences Centre - Victoria Campus Representative (Endocrinology & Metabolism)
5) Dr. D. Bocking, London Health Sciences Centre - University Campus Representative (Physician - Internal Medicine)
6) Dr. L. Heller, Office of the President Representative (French)
7) Mrs. E. Jones, Office of the President Representative (Community)
8) Ms. S. Fincher-Stoll, Office of the President Representative (Legal)
9) Dr. D. Freeman, Faculty of Medicine & Dentistry Representative (Clinical)
10) Dr. D. Sim, Faculty of Medicine & Dentistry Representative (Basic)(Epidemiology)
11) Dr. T.M. Underhill, School of Dentistry Representative (Oral Biology)
12) Dr. H. Laschinger, School of Nursing Representative (Nursing)
13) Dr. W.S. Yovetich, Faculty of Health Sciences Representative (Communicative Disorders)
14) Ms. M. Lovell, London Clinical Research Association Representative
15) Research Institutes Representative
16) Mrs. R. Yohnicki, Administrative Officer

Alternates are appointed for each member.

THE REVIEW BOARD HAS EXAMINED THE RESEARCH PROJECT ENTITLED:
"The development of a questionnaire examining activity styles and coping in individuals with chronic pain."

REVIEW NO: E6449

AS SUBMITTED BY: Dr. L. Swartzman (A. Koster) - Psychology, Social Science Centre

AND CONSIDERS IT TO BE ACCEPTABLE ON ETHICAL GROUNDS FOR RESEARCH INVOLVING HUMAN SUBJECTS UNDER CONDITIONS OF THE UNIVERSITY'S POLICY ON RESEARCH INVOLVING HUMAN SUBJECTS.

APPROVAL DATE: 04 May 1998 (UWO Protocol, Letter of Information & Consent)

AGENCY:

AGENCY TITLE:

Bessie Borwein

Bessie Borwein, Chairman

c.c. Hospital Administration

London, Ontario • Canada • N6A 5C1 • Telephone: (519) 661-3036 • Fax: (519) 661-3875

Appendix L

Demographic Information (Study II)

1. Sex: male female (circle one)

2. Age (in years): _____ Date of Birth: _____

3. Do you have medical conditions other than your pain? Yes___ No___
If yes, briefly indicate what they are

_____

_____

4. How many years of education do you have? (Grade 1 through 12 would be 12 years. Add one year for each additional year beyond Grade 12):

_____ years of education

5. Your current relationship status.

____ Single
____ Married
____ Divorced
____ Separated
____ Widowed
____ Not married, but involved in a serious relationship

6. Number of children: _____ Their ages: _____

YOUR PAIN

1. When did your pain first begin? Month: ——— Year: ———

2. Under what circumstances did your pain first begin (Check one)

——— Accident at work
——— Motor vehicle accident
——— Following surgery
——— Other. Please Specify _____
——— Accident at home
——— Following illness
——— Can't relate it to anything

Appendix M

Letter of Information for R.E.C. (Study II)

ROBERT TEASELL
BSc MD FRCPC
Chief, Department of Physical Medicine and Rehabilitation
Associate Professor, University of Western Ontario

Dear REC Patient:

This letter is to request your participation in a research study being conducted by researchers at the University of Western Ontario. It involves completing a number of questionnaires being developed to better understand the impact of illness, pain, and disability on peoples' lives. This is an important research area and your participation would be greatly appreciated. You should note that your decision regarding participation is completely voluntary and will have no impact whatsoever on your medical assessment at the REC. Indeed, the questionnaires are anonymous (you do not put your name on them) and all information will remain strictly confidential and kept at the University of Western Ontario for research purposes only.

If you choose to participate, you will be asked to complete two questionnaire booklets relating to pain, work characteristics, activity styles, and coping. We have enclosed the first questionnaire (purple) booklet. If you decide to participate, please complete the questionnaires in this booklet and bring the completed booklet with you to the REC 30 minutes **BEFORE** your REC appointment. Your appointment is scheduled for _____ which means you would need to arrive at _____. When you arrive, a member of the university research team will have you complete the other questionnaire booklet prior to your REC appointment. If you are unable to finish all the questionnaires before it is time for your REC appointment, we will ask you to stay a short time after the REC evaluation to complete the second booklet. On average, we have found that most participants need to stay about 30 minutes (after the REC evaluation) to complete the questionnaires.

Unfortunately, our limited research funding does not allow us to compensate you for the time you spend helping us with this research. However, we will provide refreshments (juice, doughnuts, coffee) upon your arrival at the REC and we will reimburse you for any additional costs of parking you may incur as a result of your participation in the study. As well, all participants will be entered in a lottery draw with a chance to win one of two prizes of $150 each.

A member of our University of Western Ontario research team, Andrea Coster, will be contacting you by phone prior to your REC appointment. This will give you an opportunity to ask any questions you might have prior to deciding whether to participate in the study and/or to ask any questions regarding the questionnaire booklet.

Sincerely,

Dr. Robert Teasell
Chief and Acting Chairman
Department of Physical Medicine and Rehabilitation

Appendix N

Letter of Information for St. Joseph's Outpatient Clinic (Study II)

The UNIVERSITY *of* WESTERN ONTARIO

Faculty of Medicine & Dentistry • Department of Physical Medicine and Rehabilitation

Dear St. Joseph's Patient,

Thank you for agreeing to participate in a research study being conducted by researchers at the University of Western Ontario. It involves completing a number of questionnaires being developed to better understand the impact of illness, pain, and disability on peoples' lives. Your participation is greatly appreciated. You should note that the questionnaires are anonymous (you do not put your name on them) and all information will remain strictly confidential and kept at the University of Western Ontario for research purposes only.

You are asked to complete two questionnaire booklets relating to pain, work characteristics, activity styles, and coping. We have enclosed the first (blue) booklet. Please complete this booklet and bring it with you to your appointment at St. Joseph's Hospital. You will be required to arrive at your appointment 30 minutes early. Your appointment is scheduled for _____ which means you need to arrive at _____. When you arrive, a member of the university research team will have you complete the second booklet prior to your appointment. If you are unable to finish all the questionnaires before it is time for your appointment, we will ask you to stay a short time after the appointment to complete the second booklet. On average, we have found that most participants need to stay about 30 minutes (after the appointment) to finish completing the questionnaires.

We will gladly reimburse you for any additional costs of parking you may incur as a result of your participation in the study. As well, all participants will be entered in a lottery draw with a chance to win one of two prizes of $150 each.

This study is a joint project between the London Health Sciences Centre and the University of Western Ontario. If you have any questions concerning the study, please leave a message for Andrea Koster (study coordinator) at 679-2111 (ext. 4654) and she will be happy to return your call.

Once again, thank you for your participation.

Sincerely,

Dr. Robert Teasell
Chief and Acting Chairman
Department of Physical Medicine and Rehabilitation

London Health Sciences Centre - University Campus
339 Windermere Road
London, Ontario • Canada • N6A 5A5
Telephone: (519) 663-3000

Appendix O

Consent Form (Study II)

CONSENT FORM

The Development of a Questionnaire Examining Activity Styles and Coping in Individuals with Chronic Pain

I have read the letter of information, and have had the nature of the study explained to me, and I agree to participate. All questions have been answered to my satisfaction.

I agree to participate in the present study.

_____ _____

Date Signature

Appendix P

Supplementary Consent Form (Study II)

I agree to participate in a subsequent study where I will be contacted at 1 year and 2 years post-injury for a brief follow-up.

_____ _____

Date Signature

Name: _____

Phone Number: _____

Address: _____

_____

_____

In case you move, or your phone number changes, can you supply the name of a relative or family friend who will likely know how to reach you.

Name: _____

Phone Number: _____