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Coping with Headache: An Exploration into the role of

Headache Locus of Control, Dispositional Optimism, and Neuroticism

by

Lisa M. Jarrett

A thesis submitted to the Faculty

of Graduate Studies in partial fulfilment of the

requirements for the degree of

Master of Arts

Department of Psychology

University of Manitoba

Canada

THE UNIVERSITY OF MANITOBA

FACULTY OF GRADUATE STUDIES
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LISA M. JARRETT©1999

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Table of Contents

List of Tables

Abstract

Headaches account for over 18 million outpatient visits each year, amounting to millions of dollars annually in health care costs. Despite the frequency of headache-related health care usage, researchers have discovered that many headache sufferers, including those who suffer from severe headaches, never seek medical care for their head pain. Recent research suggests that, controlling for level of pain, an important difference between those who seek help and those who do not is related to their ability to cope with headaches. The aim of this investigation was to further our understanding of the factors involved in effectively coping with headache by exploring the role of a number of personality factors in the coping process. Participants were 277 university students who completed a series of personality, headache, and coping questionnaires. Analyses of covariance revealed that neuroticism, optimism, and chance headache locus of control were all significantly related to one's ability to cope with recurrent headaches, while internal headache locus of control was not. A discriminant analysis found the pain coping strategy, catastrophizing, to be the single most important determinant of headache coping. Implications and suggestions for future research are discussed.

Coping with Headache: An Exploration into the role of

Headache Locus of Control, Dispositional Optimism, and Neuroticism

Headaches are a major public health concern. A recent study of headache

prevalence found that 57% and 67% of males and females, respectively, reported

experiencing at least one headache per month (Linet, Stewart, Celentano, Ziegler, &

Sprecher, 1989). In another community survey, it was found that only 16% of females

and 17% of males had never suffered from headaches (Ziegler, Hassanein, & Couch,

1977). In his 1985 Nuprin Pain Survey, Sternbach (1986) found headaches to be the most

common pain complaint in the general population, with 73% of respondents reporting one

or more headaches in the last 12 months. In their 1977 survey, Ziegler, Hassanein and

Couch found that 40-45% of respondents reported having experienced severe or disabling

headaches at some time in their life. It has been estimated that as much as 30% of the

general population suffers from chronic headaches (Feuerstein, Labbé, & Kuczmierczyk,

1986).

In addition to their high frequency, the large economic burden placed on society

by headaches also constitutes a public health problem. Headaches account for more than

18 million outpatient visits each year (Ries, 1986). Hospitalization, medication, and

expensive medical tests incur further costs to the medical system. While few studies of

the economic impact of headache on the health care system exist, one author has

estimated it amounts to many millions of dollars annually (Ziegler, 1990). Additional

costs include headache-related absenteeism and loss of productivity at work, which in the

United States alone amounts to an estimated $30 billion annually (Ries). No monetary

value can be assigned to the large personal toll headaches exact on individuals' lives.

Despite the high frequency of headache-related health care usage, researchers have observed that a large proportion of headache sufferers have never sought medical care for their headache pain (Linet, Celentano, & Stewart, 1991; Linet et al., 1989; Ekbom, Ahlborg, & Schele, 1978). What distinguishes those who seek medical help for their headaches from those who do not? While it may be tempting to conclude that those who seek help suffer from more severe headaches, such differences in health-care usage cannot be explained solely on the basis of pain severity. Ziegler & Paolo (1996) noted that, *even after controlling for pain severity*, headache sufferers who sought medical help reported more dysfunction as a result of their headaches than headache sufferers who had not sought such assistance. Since coping involves the ability to prevent an identified stressor from interfering with functional ability (Kirsch, Blanchard, & Parnes, 1989), higher levels of disability among those who seek medical care for their headaches as opposed to those who do not suggest individual differences in the ability to cope with headache. This also suggests that efforts to reduce the number of headache-related medical services should include attempts to increase headache-coping ability. In addition, there are indications that coping may be an important determinant of the presence or absence of depression in individuals with chronic illness (Sullivan, Mikail, & Weinshenker, 1997; Felton & Revenson, 1984). Thus, study of factors that underlie individual differences in the ability to cope with the effects of recurrent headache is an important area of research.

Researchers have increasingly looked to the role of personality and psychological factors in explaining individual differences in the ability to cope with chronic pain and other stressors (Suls, David, & Harvey, 1996; Jensen, Turner, Romano, & Karoly, 1991).

Indeed, some authors have defined coping as "personality in action under stress." (Bolger, 1990, p. 525). Few studies, however, have explored personality variables as they relate specifically to coping with chronic headache. Thus, study of the role of personality variables in the process of coping with headache is an area of research needing further investigation. This general use of the term "coping" is to be differentiated from the academic use which defines coping as purposeful efforts aimed at managing stressful demands (Folkman, 1984). The difference between these two definitions is that the former has come to imply managing or succeeding, while the latter emphasizes effort independent of outcome (Folkman). When possible confusion may arise, the term "adjusting" to headache will be substituted for the former meaning of coping (Jensen, Turner, Romano, & Karoly, 1991).

The aim of this investigation, then, is to increase our understanding of factors involved in successful headache coping by exploring the relationship between a number of personality constructs and one's ability to cope with recurrent headaches. For the purpose of this study, coping with headache is defined as the ability to maintain lifestyle activities without undue interference from headache pain. Based on previous research which has found relationships between locus of control, dispositional optimism, neuroticism, and coping, the possible role of these personality variables in coping with headache will be explored. In the following pages, relevant research on headache, coping, and personality is reviewed.

Headache

In 1988, the International Headache Society (IHS) introduced new classification and diagnostic criteria for headache disorders. According to the new system, headaches

can be divided into three primary categories: migraine headaches (with and without aura), episodic tension-type headaches, and cluster headaches (Olesen, 1990). Migraines are characterized by a 4 to 72 hour duration, are of moderate to severe intensity, possess a pulsating quality and unilateral location, and are frequently accompanied by nausea and/or vomiting and heightened sensitivity to light and sound. Episodic tension-type headaches last from 30 minutes to 7 days, possess a nonpulsating quality, are located bilaterally, are of mild to moderate intensity, and generally are not accompanied by nausea or vomiting or sensitivity to light and sound. Cluster headaches are defined as unilateral orbital, supraorbital, and/or temporal pain that lasts from 15 to 180 minutes. The headache must be accompanied by at least one of eight associated symptoms such as drooping of the upper eyelid, nasal congestion, and eyelid swelling on the side of the head pain.

Of the three primary headache types, tension-type headaches are reported to be the most common (Forgays, Rzewnicki, Ober, & Forgays, 1993; Kudrow, 1976). They have also been found to cause the most interference with lifestyle activities when experienced chronically, though migraines are generally more severe (Scharff, Turk, & Marcus, 1995). Due to their high prevalence and relatively disabling nature, tension-type headaches are the focus of this study.

As a social group, it appears that students suffer the most frequent and most severe headaches (Mitsikostas et al., 1996; Attanasio & Andrasik, 1987). This is generally attributed to the high level of floating tension and stress within university environments (Ogunyemi, 1984). A number of studies have examined the presentation of headaches in university populations. Andrasik, Holroyd, and Abell (1979) surveyed

headache prevalence among 1161 Ohio University students. They found that over 50% of the population experienced at least one to two headaches per week, the majority of which (67.5%) were tension-type headaches. Twenty percent of students reported experiencing headaches three or more times per week. Seventy-three percent of the students rated their headaches as at least moderately painful, with females rating their headaches as significantly more intense and of longer duration than males. On average, over half the students reported that their headaches lasted at least two to four hours.

At State University of New York (SUNY)-Albany, Attanasio and Andrasik (1987) found similar results to the earlier Ohio University study (Andrasik et. al, 1979). Forty-eight percent of subjects reported experiencing one or more headaches per week, and 69% rated this pain as at least moderately painful. Disruption of planned activities as a result of their headaches was reported by 35-45% of participants. Again, females reported their headaches to be more frequent and more painful than males. Overall, the nature of the pain was described as always or mostly throbbing by 46% of subjects, always or mostly deep and steady by 34%, and as mixed by 15% of those surveyed.

Martin and Nathan (1987) studied headache prevalence among University of Western Australia (UWA) students. Though the figures were still relatively high, they were three to four times lower than those in the Andrasik et al. (1979, 1987) studies. The authors attributed these differential rates to a number of factors including a greater incidence of stressors and more deficient social support systems among the North American students.

In an attempt to reconcile the observed differences in the three studies previous cited, Forgays, Rzewnicki, Ober, and Forgays (1993) measured headache prevalence at a

third American campus, the University of Vermont (UVM), and then compared the data of all four university populations. Compared to the Suny-Albany, UWA, and Ohio University students, UVM students reported the greatest headache frequency, intensity, and duration. Sixty-three percent of students experienced one to two headaches per week, while 24.6% reported three or more headaches per week. More than three quarters of the students rated their headaches as moderately or more painful, and 62.7% had headaches of two to four hours' duration or longer. There was a significant gender difference in terms of females reporting greater levels of the headache parameters than males. The authors explain the reported differences in level of headache activity among the campuses in terms of procedural differences in data collection (testing took place at different times of the year for all studies, suggesting that stress levels may differ over the course of a school year), and participant differences across campuses (some subjects may have been more stressed in certain studies due to differences in social support, tuition fees, and extra-curricular employment).

Despite slight differences in procedure and reported prevalence rates, these studies suggest that tension headache is a frequent pain experience among university populations and that, on average, most students experiencing headaches consider them to be at least moderately painful. Based on these findings, participants in the current study were drawn from a university student population.

As also indicated by these studies, a strong gender bias exists in the experience of headache. Females of all ages and social groups consistently report more frequent and more severe headaches, headaches of a longer duration, more disability as a result of their headaches, more headache-related physician consultations, and more medication use in

order to alleviate their headaches (Kryst & Scherl, 1994; Linet et al., 1989; Sternbach, 1986). While the cause of these gender differences is not yet known, a number of hypotheses have been proposed (Celentano, Linet, & Stewart, 1990). The socialization hypothesis suggests that society teaches children at a young age that it is socially more acceptable for females to discuss symptoms, illnesses, and treatment-related topics than males. This, in turn, argue supporters, encourages women to be more attendant to any changes in their bodies and makes them more readily interpret these changes as symptoms. A second hypothesis proposes that women may report more frequent and more severe headaches because they actually experience headaches differently than men due to gender differences in the physiological mechanisms underlying the experience of headache. A third and related hypothesis proposes an association between headache and hormonal factors. Some evidence for this theory comes from the research which has found linkages between headache attack occurrence and pregnancy, use of oral contraceptives, and the stage of one's menstrual cycle. If hormones do account, at least in part, for the differences between men and women in the experience of headache, the exact pathophysiological mechanism involved remains unknown. Finally, another hypothesis that enjoyed considerable popularity in the past is the role obligation hypothesis. It posits that higher rates of headache and other illnesses among women reflect lower role demands and fewer time constraints, making it easier for women to adopt the sick role. This hypothesis, however, has received little support from the literature. In fact, there is growing evidence to suggest that excess role demands placed on women today better account for the higher rates of headache experienced by women.

Though it is unclear at this time which theoretical model, or models, best explain the observed gender differences in the experience of headache, such differences remain one of the most consistent findings in the headache literature. Therefore, it is expected in the current study that females will, on average, report longer headaches, more severe and frequent headaches, more physician visits, and greater headache-related disability than males.

The Coping Process

While many different models of coping exist, one of the most famous has been that proposed by Lazarus and Folkman (1984). In their cognitive theory of stress and coping, Lazarus and Folkman define coping as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p. 141). This definition highlights three key features of Lazarus and Folkman's model. First, their model of coping is relational in that stress is defined as a relationship between the person and the environment that is appraised by the person as taxing. Second, their model is process-oriented in that the relationship between the person and the environment is constantly changing, with the person and the environment continually influencing each other. Third, cognitive appraisal is an important part of the coping process (Folkman, 1984).

Cognitive appraisal involves two stages or processes: primary and secondary appraisal. Primary appraisal refers to the significance or meaning one assigns to an event, while secondary appraisal addresses the question "what can I do about it?" (Lazarus & Folkman, 1984). There are three types of primary appraisal that can be made: irrelevant (neutral), benign-positive (positive), and stressful (negative). Irrelevant appraisals mean

the event is judged as having no significance for well-being. Benign-positive appraisals are made if the event is considered positive in that it promises to preserve or enhance well-being. Stressful appraisals are of particular interest in coping paradigms because they are the ones that require the mobilization of coping efforts. Stressful appraisals involve harm/loss, threat, or challenge. In harm/loss, some damage to the person has already been done, such as loss of a limb, damage to a friend, or loss of self-esteem. Threat refers to harms or losses which have not yet occurred but are anticipated. Challenge appraisals focus on the potential for growth, mastery, or gain from an event.

Once a primary appraisal of harm/loss, threat, or challenge has been made, secondary appraisals are made to evaluate one's ability to handle the situation by weighing one's physical, social, and psychological coping resources with the demands of the situation (Folkman, 1984). Two types of coping strategies, emotion-focused and problem-focused, have long been recognized by numerous investigators (e.g., Endler & Parker, 1990; Cohen, 1987; Lazarus & Folkman, 1984; Pearlin & Schooler, 1978). Emotion-focused coping includes efforts aimed at alleviating the emotional distress associated with a problem. Some emotion-focused coping strategies include avoidance, minimizing, detachment, fantasy, and meditating. Problem-focused coping, on the other hand, involves efforts aimed at altering the internal or environmental demands that create a threat. Problem-focused strategies include efforts to redefine the problem, generate alternative solutions, weigh the alternatives in terms of their costs and benefits, choose from among them, and act (Lazarus & Folkman). In general, problem-focused strategies tend to be more adaptive in stressful situations, especially when the stressor can be ameliorated by the subject's responses (Zeidner & Endler, 1996).

In the chronic pain literature, the problem-focused/emotion-focused dichotomy of coping strategies has generally been re-defined in terms of active and passive coping, though other categories of classification have been developed, such as cognitive versus behavioral and attentional versus avoidant (Katz, Ritvo, Irvine, & Jackson, 1996). Active coping strategies (e.g., exercise, deliberate distraction, information-seeking) consist of the person in pain intentionally initiating some activity in an attempt to alleviate or manage the pain. Passive coping strategies (e.g., restricting activity, praying, wishful thinking) involve withdrawal or giving up control to someone or something else (Jensen et al., 1991). Others have built on these definitions by specifying that active strategies are attempts by the individual to deal with the pain using his/her resources, while passive strategies involve helplessness and/or reliance on others (Nicholas, Wilson, & Goyen, 1992). Passive coping strategies have been associated with increased pain, depression, disability, psychological distress, and poorer psychological adjustment (Brown, Nicassio, & Wallston, 1989; Parker et al., 1989; Snow-Turek, Norris, & Tan, 1996; Brown & Nicassio, 1987), and hence are considered more maladaptive coping responses (Brown & Nicassio). Active coping efforts, on the other hand, have been related to better adjustment in terms of decreased psychological distress, disability, and depression (Snow-Turek, Norris, & Tan, 1996; Brown & Nicassio, 1987; Holmes & Stevenson, 1990), and as such have been labeled more adaptive pain coping strategies (Brown & Nicassio). Based on this research, it is expected in the current study that adjustment to headache will be positively associated with the use of active pain coping strategies and inversely related to the use of passive strategies.

Coping and Locus of Control.

Which type of coping strategy is relied on, whether emotion-focused or problem-focused, active or passive, depends in large part on how the event is appraised (Folkman 1984). Appraisal of an event's controllability is an important influence on how a person confronts a stressful situation. When an event is viewed as more controllable, individuals are more likely to use active problem-focused coping strategies, while events viewed as uncontrollable are more likely to be passively approached with emotion-focused coping (Lazarus & Folkman, 1984). Rotter (1966) has referred to those who generally believe that outcomes are under their control as having an internal locus of control, while the belief that events are not contingent upon one's own behaviour but rather controlled by factors such as chance, luck, and powerful others reflects an external locus of control. A wealth of literature has found an internal locus of control orientation to be related to greater use of problem-focused coping behaviours and fewer emotion-centred behaviours, and therefore is considered more adaptive in the face of a variety of stressors (Compas, Banez, Malcarne, & Worsham, 1991).

In view of the finding that having an internal locus of control is adaptive in dealing with other types of stressors, it might be expected that among chronic pain sufferers, individuals with an internal locus of control would believe that their own behaviour can affect the future course of their pain, and therefore would be more likely to develop and use active coping strategies to deal with their pain. Those with an external locus of control may be expected to employ a different, more passive set of pain coping strategies due to their belief that they have little control over the course of their pain (Crisson & Keefe, 1988). Some research does exist supporting a relationship between

locus of control and adjustment to pain. Exploring general locus of control beliefs and pain experience, Skevington (1983) observed that among back pain patients, those with a more external locus of control experienced greater depression and pain-related distress, while internal attributions of control were negatively associated with these measures. General attributions of internal control have also been associated with good adjustment to breast cancer (Taylor, Lichtman, & Wood, 1984). In addition to these more global locus of control beliefs, studies have also assessed the relationship between patients' health locus of control beliefs - or their endorsement of external (chance or powerful others) and internal sources of control over health and illness - and adjustment to pain. Crisson and Keefe administered the Multidimensional Health Locus of Control Scales to 62 chronic pain patients. As expected, they found that among their pain patients (mostly low back pain), having an external/chance orientation toward health locus of control was associated with the use of more maladaptive pain coping strategies, low ratings of the ability to control pain, and greater overall psychological distress in response to their pain.

Since beliefs about the relative role of internal and external factors may differ from stressor to stressor, especially between general problems such as health and more specific problems such as headaches, a recent trend has been toward the development of locus of control measures for specific disorders (Martin, Holroyd, & Penzien, 1990). The Headache-Specific Locus of Control (HSLC) Scale is one such example. Developed in 1990 by Martin and her colleagues, the HSLC Scale assesses the degree to which individuals believe that control of their headache problems and headache relief is internal (resides within the individual) or external (either resides with health care professionals or is controlled by chance factors). Due to the scale's relative recency, to my knowledge

only two studies have explored the relationship between headache locus of control and measures of adjustment.

Scharff, Turk, and Marcus (1995) administered the HSLC Scale to 225 migraine, mixed, and tension headache patients referred to a headache clinic. Based on their responses to the Multidimensional Pain Inventory, subjects were divided into three groups: (1) "dysfunctional", characterized by a high level of psychological distress, (2) "interpersonally distressed", characterized by the perception of inadequate support from significant others, and (3) "adaptive copers", characterized by relatively low levels of psychological distress and perceived pain interference. The authors found that dysfunctional and interpersonally distressed copers were more likely to endorse chance factors and health care professionals as being in control of their headaches. Pain intensity was also positively related to these two external scales. Interestingly, although the adaptive copers were less likely to attribute headaches to external sources of control than those highly disabled by their pain, they did not show higher levels of internal attribution for control of headache. This led the authors to conclude that internal headache locus of control is not simply the inverse of external headache locus of control, and that it may be more important *not* to have an external locus of control than to *have* an internal one when dealing with headaches.

Martin, Holroyd, and Penzien (1990) also administered the HSLC Scale to 207 recurrent tension, migraine, and mixed headache sufferers from a college population. They found that the belief that headache problems and relief are determined by chance factors was associated with higher levels of depression, physical complaints, reliance on maladaptive pain coping strategies, and greater headache-related disability. The belief

that headache problems and relief are influenced primarily by the ministrations of health care professionals was associated with higher levels of medication use, greater disability, and preference for medical treatment. The belief that the occurrence of headaches is influenced by the headache sufferer's behaviour was associated with preference for self-regulation treatments. Consistent with the findings of Scharff, Turk, and Marcus (1995), the authors noted that having an internal headache locus of control was also positively related, though more weakly, with depression, physical complaints, and disability. The explanation offered by the authors for these results is that when an event is chronically unresponsive to attempts at self-control, believing that one has control and engaging in control-oriented strategies may actually be maladaptive and lead to increased distress and disability.

The two studies cited above support the frequently reported disadvantage of having an external locus of control toward stressors, but do not support the reported adaptive advantage of having an internal locus of control orientation. Martin et al.'s (1990) explanation for this discrepancy is in accordance with Folkman's (1984) insistence on the importance of a match between the cognitive appraisal and physical reality of an event's controllability. When a truly uncontrollable event is wrongly appraised as controllable, the person is likely to engage in problem-focused coping strategies that get the person nowhere, and as a consequence lead to frustration, disappointment, and distress. This is relevant for the two studies previously studied because many of their subjects were migraine sufferers. The etiology of migraines is believed to be primarily physiological (Barolin & Sperlich, 1969), suggesting that migraines may in fact be largely uncontrollable. Having an internal headache locus of

control for these types of headaches, then, may be maladaptive as it would likely lead to active, problem-focused coping strategies that would be ineffective with this type of disorder. The etiology of tension-type headaches, on the other hand, is believed to involve a large psychological component. As many as 80% of tension headaches are stress-related (Holm, Holroyd, Hursey, & Penzien, 1986; Friedman, 1979). This suggests that tension headaches may be significantly more controllable than migraines, and thus an internal locus of control that leads to the use of active coping strategies may be more adaptive. It is therefore hypothesized in the current study that individuals with an internal headache locus of control will show better adjustment to headache, while individuals with an external headache locus of control will show poorer adjustment. It is also expected that internal headache locus of control will be positively related to ratings of controllability of pain and the use of active pain coping strategies, and external headache locus of control will be negatively related to these variables and positively related to the use of more passive coping strategies.

<u>Coping and Optimism</u>.

Optimism can be defined as "an inclination to... anticipate the best possible outcome" (Scheier & Carver, 1987, p. 169). Optimism appears to be a highly stable personality trait in that it is generally consistent across time and situations. That is, optimists generally expect things to go their way and believe that good rather than bad things will happen to them (Scheier & Carver, 1985). People's actions are greatly affected by their beliefs about the probable outcomes of those actions, called generalized outcome expectancies. According to Scheier and Carver's (1985) model of dispositional optimism, those with more favorable generalized outcome expectancies (optimists) are

more likely to conclude that difficulties facing them can be overcome and therefore are expected to respond to difficulty and stress directly and with greater effort. Pessimists, on the other hand, are more likely to give up in the face of adversity or disengage from the problem, as they expect a negative outcome of their efforts.

A number of studies have found optimism to be a prospective predictor of successful adaptation to stressful encounters (Scheier & Carver, 1992; Peterson & Bossio, 1991; Scheier, Weintraub, & Carver, 1986). For example, Scheier and Carver (1985, Study 3) compared the coping success of optimistic and pessimistic undergraduates during a highly stressful period: final examinations. Assuming that (1) most students would encounter a number of problems in self-management as they attempted to prepare for their exams, and (2) success at coping with these impediments would be reflected in the frequency with which students developed and were bothered by common physical symptoms during the assessment period, the authors assessed coping success by measuring the extent to which subjects reported being bothered by these physical symptoms. The results revealed that optimistic subjects reported being less bothered by the development of physical symptoms over the course of the assessment period than did subjects who were less optimistic. Scheier and Carver interpreted this finding as evidence that optimism is a positive predictor of adaptive coping.

Scheier et al. (1989) examined the effects of dispositional optimism on recovery from coronary artery bypass surgery. Fifty-four patients participated in the study. Dispositional optimism was assessed one day prior to the surgery using the Life Orientation Test (Scheier & Carver, 1985). Mood, coping style, and a measure of social support was then taken six to eight days following surgery. Final contact occurred six

months postoperatively. The authors found that, compared to pessimists, optimists showed fewer signs of intraoperative complications and evidenced a significantly faster rate of recovery. Optimism has also been positively related to adjustment to arthritis (Long & Sangster, 1993; Brenner, Melamed, & Panush, 1994), breast cancer (Carver et al., 1993), and childbirth (Carver & Gaines, 1987).

How does having a positive outlook affect one's ability to cope with stressors? While the exact mechanism which underlies this relationship remains unknown, a number of possibilities have been proposed. Firstly, primary appraisal, as described earlier in Lazarus and Folkman's (1984) model of stress and coping, assesses the threat of an event to one's well-being by assigning a positive, negative, or neutral meaning to the event. It is thus conceivable that optimists could be more likely to judge events as positive or neutral, while pessimists may be more likely to view an event more negatively and therefore as more stressful. A second possibility is that optimism influences the secondary appraisal process, which asks "Do I have the resources to cope effectively with this stressor?". As optimists have been described as more likely to persist in the face of a challenge than pessimists, optimists may respond to stressors by mobilizing their resources and confronting the problem, whereas pessimists may appraise the situation as one beyond their resources and respond by giving up or stopping at that stage in the coping process (Chang, 1998). A third possibility that has been proposed to explain the beneficial effect of optimism on adjustment is that optimists use more effective, active coping strategies than pessimists in dealing with stressors (Scheier, Weintraub, & Carver, 1986).

In an attempt to test the former two proposals, Chang (1998) examined the influence of optimism and cognitive appraisals on coping and adjusting to the stress of college examinations among students. Despite the better physical and psychological adjustment of the optimists, he found that both optimists and pessimists rated the same stressor as equally significant and threatening, thus providing little support for the primary appraisal hypothesis. He did, however, find significant differences between optimists and pessimists on the secondary appraisal process. Compared with pessimists, optimists appeared to experience greater thoughts of control and effectiveness for dealing with the exam, which led them to begin considering their coping options; pessimists were more likely to give up or withdraw from the situation.

In contrast to the limited research on the first two hypotheses, a great deal of research exists supporting the proposition that the key to the optimism-coping relationship is the type of coping strategies used. In general, optimists tend to use more effective, active coping strategies to deal with stressors than pessimists (Scheier, Weintraub, & Carver, 1986). For example, studying 420 undergraduate students' strategies for coping with stress, Fontaine, Manstead, and Wagner (1993) found that optimism was positively associated with the use of positive reinterpretation, growth, and active coping and inversely related with the use of focusing on and venting of emotion, behavioural disengagement, and denial as measured by the COPE inventory. Using a sample of rheumatoid and osteoarthritis patients, Long and Sangster (1993) observed that pessimism was associated with poor adjustment and greater use of wishful thinking coping, while optimism was associated with better adjustment and problem-solving coping. Chang (1998) reported that among his student population, optimists used

significantly more cognitive restructuring strategies to deal with stress, while pessimists were found to employ more wishful thinking, self-criticism, and social withdrawal strategies. Finally, in two separate studies comparing optimists and pessimists on the strategies they use to cope with stressors, Scheier, Weintraub, and Carver (1986) reported that optimism was positively associated with the use of problem-focused coping, positive reinterpretation, and seeking of social support, and inversely associated with the use of denial and distancing as coping mechanisms as measured by the Ways of Coping Checklist. Interestingly, they also observed that optimism was associated with acceptance as a coping technique, but only when the stressful event was construed by the subject as being uncontrollable.

This observed relationshiop between optimism and the use of more active or problem-focused coping strategies may be due to the heightened feelings of control and effectiveness optimists experience compared to pessimists during the secondary appraisal process. Differences in controllability between optimists and pessimists has overtones similar to the construct locus of control as discussed in the previous section. Positive moderate correlations between internality of locus of control and dispositional optimism (Scheier & Carver, 1985) suggest that the two variables are conceptually related. However, in a study investigating the relation of locus of control and optimism to control appraisals for three different stressors, Peacock and Wong (1996) found that these two constructs contributed independently and equally to the prediction of control appraisals, suggesting that, practically, they are two distinct factors. Reker and Wong (1984) illustrate this distinction by explaining that one could have optimistic expectations due to

belief in one's own efficacy (internal locus of control) or due to belief in good fortune or God's favour (external locus of control).

Consistent with Scheier and Carver's (1985) conclusion that "optimists employ the approach to coping that in most life circumstances is most adaptive, least dysfunctional" (p. 241), it is hypothesized in the current study that optimism will be positively associated with adjustment to headache, as well as ratings of pain controllability and the use of active pain coping strategies. Pessimism is expected to be negatively associated with these variables.

Headache and Neuroticism

Over the years, much personality research has been conducted with headache sufferers. Early descriptive studies characterized these patients as repressing hostility, rigid, perfectionistic, obsessive, ambitious, and inhibited in emotional expressiveness (Touraine & Draper, 1934; Wolff, 1937; Fromm-Reichmann, 1937). While most of these studies involved migraineurs, subsequent authors reported similar descriptions for tension headache sufferers (Martin, Rome, & Swenson, 1967; Martin, 1972). Many of these studies have been criticized and their findings questioned, however, due to their use of non-standardized measurement tools (e.g., the psychiatric interview) and their lack of headache-free comparison groups (Harrison, 1975). More recent attempts to link personality with headache have relied on the use of standardized personality tests including the Eysenck-Maudsley Questionnaires and the Minnesota Multiphasic Personality Inventory (MMPI) in particular. A recurring theme from these studies is the observation of elevated neuroticism scores among most categories of headache sufferers, especially tension headache subjects. The underlying assumption behind this line of

research is that observed characterological personality traits such as neuroticism are related to the etiology of head pain (Arena, Andrasik, & Blanchard, 1985). After a review of several such studies involving tension headache sufferers, however, an alternative interpretation of the findings that relates neuroticism to coping will be offered.

Howarth (1965) studied a sample of 72 tension headache subjects referred to a neurological clinic on account of their headaches. Using the Maudsley Personality Inventory (MPI), Howarth found that although his subjects did not differ from the general population on the Extraversion (E) scale, their Neuroticism (N) scores were significantly elevated. They were significantly less neurotic, however, than a group of hospitalized patients diagnosed with psychosomatic disorders.

Martin, Rome, and Swenson (1967) administered a neurologic examination and psychiatric interview, including the MMPI, to 25 severe tension headache patients at the Mayo Clinic. The MMPI scores typically showed elevations of the neurotic triad (hypochondriasis, depression, and hysteria). Twelve of the 22 women and one of the three men showed the "conversion V" pattern of the neurotic triad, with the depression score 10 or more points lower than hysteria or hypochondriasis. A conversion V profile is suggestive of someone who converts psychological conflicts into bodily complaints (Groth-Marnat, 1990).

Martin (1972) also used a psychiatric interview and the MMPI to assess 100 tension headache patients. Like the previous study, their MMPI profiles revealed elevations of the neurotic triad. The conversion V pattern was also common.

Kudrow and Sutkus (1979) compared the MMPI profiles of six different categories of headache sufferers: migraine, cluster, tension, mixed (migraine plus

tension), post-traumatic (P-T), and conversion headache. The profiles revealed increasingly neurotic patterns among the headache groups, with migraine and cluster subjects scoring the lowest, tension and mixed subjects intermediately, and P-T and conversion subjects highest on the neuroticism scales of the MMPI.

Andrasik and his colleagues (1982) administered the MMPI, State-Trait Anxiety Inventory, Form X (STAI-X), Psychosomatic Symptom Checklist (PSC), and a number of other psychological scales to a group of migraine, tension, mixed, and cluster headache subjects, as well as a group of nonheadache controls. Control subjects revealed no meaningful elevations on any of the measures. On the MMPI, headache subjects revealed moderate elevations on the hypochondriasis, depression, hysteria, psychasthenia, and paranoia scales. Like Kudrow and Sutkus (1979), the authors found that cluster subjects revealed the lowest elevations of all the headache groups, and statistical testing revealed they did not differ significantly from controls. Migraine, mixed, and tension headache subjects revealed increasingly elevated scores. On the STAI-X, mixed and tension subjects displayed significantly higher levels of trait anxiety than control or cluster subjects. Migraine subjects scored midway between these two groupings, but did not differ significantly from either grouping. Finally, on the Psychosomatic Symptom Checklist, migraine, mixed, and tension subjects displayed a greater number of psychosomatic symptoms than control subjects, with cluster subjects falling in-between these two groupings.

In a study similar to that of Kudrow and Sutkus (1979), Sternbach, Dalessio, Kunzel, and Bowman (1980) also reported a continuum of neuroticism within headache disorders, with tension headache subjects having the most neurotic findings on the

MMPI, migraine subjects having the least, and the mixed headache group falling somewhere in the middle. The authors attribute the observed inter-group differences to the frequent and long pain-free intervals migraineurs experience between headaches. Tension headache sufferers often do not receive such respites from their pain, and hence the authors suggest that their greater neuroticism is due to their greater pain "density". It can be inferred from this explanation that the authors believe personality abnormalities in headache sufferers are a consequence of and not, as traditionally thought, a cause of the disorder. Other researchers have since supported this contention (see Ellertsen, 1992; Blanchard, Kirsch, Appelbaum, & Jaccard, 1989).

Despite cross-study differences in diagnostic criteria, inclusion and type of control groups, and measurement tools used, a pattern has emerged from these varied studies suggesting that, as a group, tension headache sufferers display higher levels of neuroticism (hypochondriasis, depression, hysteria, and anxiety) than non-headache sufferers as well as other diagnostic categories of headache. Many of the authors seem to interpret this finding as evidence that neuroticism is somehow a function, whether cause or consequence, of the headache syndrome. However, since most of these studies were conducted on patient populations, and it was argued in the introduction that those who seek help for headaches are generally poorer copers than those who do not seek help, this suggests an alternative interpretation of the findings: Is neuroticism related to the ability to *cope* with headache rather than to the syndrome itself?

Some support for the latter hypothesis comes from the few studies that have included subjects who have not sought medical help for their headaches in their comparisons. Henryk-Gutt and Rees (1973) found a difference in neuroticism scores on

the Eysenck Personality Inventory between migraine clinic patients and non-clinic migraine sufferers, with non-clinic subjects scoring significantly lower than clinic subjects. Despite slight differences in headache duration and frequency between the two groups, their headaches were considered equally incapacitating. Consistent with this finding, in a study of psychological determinants of physician consultation for headache, Ziegler and Paolo (1995) found that, when the effects of headache severity were controlled for, subjects seeking medical assistance scored higher on the neurotic scales of the MMPI-2 than those not seeking help. While these results may be interpreted as evidence of a relationship between neuroticism and medical-seeking behaviour rather than coping ability, when the neuroticism scores of these same subjects were held constant, those attending the clinic showed higher disability ratings when compared with those not seeking such help (Ziegler & Paolo, 1996). Taken together, these studies suggest that neuroticism may be in some way inversely related to the ability to cope with headaches, rather than to the etiology of headaches, as traditionally believed.

Also in support of the proposed relationship between neuroticism and headache-coping ability, neuroticism has been linked to the use of more maladaptive coping strategies in response to various stressors (Hewitt & Flett, 1996), less frequent use of active pain coping strategies (Miró & Raich, 1992) and poorer adjustment to other types of pain (Jess & Bech, 1994). Studying strategies for coping with experimentally induced pain, Miró and Raich observed that subjects low in neuroticism acknowledged using more coping strategies to deal with their pain than highly neurotic subjects. In their study of duodenal ulcer patients, Jess and Bech noted a strong relationship between improvements in illness-related disability and distress and decreases in neuroticism

scores following treatment. As a result of their findings, these authors concluded that "neuroticism, then, should be considered as a coping with illness dimension rather than an etiological factor of illness." (Jess & Bech, p.174). Hence, it is hypothesized in the current study that neuroticism will be negatively associated with adjustment to headache and positively associated with the use of less effective, passive pain coping techniques.

Hypotheses

In this study, the potential influence of three personality variables – headache locus of control, dispositional optimism, and neuroticism – on headache coping will be examined. It is hypothesized that internal headache locus of control, high levels of optimism, and low levels of neuroticism will be associated with better headache coping as determined by scores on a pain disability index. External headache locus of control (i.e., chance or health care professional), low levels of optimism, and high levels of neuroticism are expected to be associated with poorer headache coping. Furthermore, it is predicted that these relationships are mediated by the type of pain coping strategy used. It is expected that headache disability will be positively related to reliance on passive pain coping strategies, and negatively related to the use of active coping strategies.

Some significant correlations are also expected among the independent variables. It is expected that internal headache locus of control will be positively related to ratings of pain controllability and the use of active coping strategies. Optimism is also expected to be positively correlated with these variables. External headache locus of control, pessimism, and neuroticism are expected to be correlated with lower pain controllability ratings and the use of more passive pain coping strategies.

Finally, based on the discussion of gender differences in headache, it is expected that females will report more severe and more frequent headaches, headaches of longer duration, more headache-related physician visits, and more disability as a result of their headaches than males.

Method

Participants

Five hundred and forty-six introductory psychology students ranging from 16 to 45 years of age participated in the initial screening phase of this study. Subjects received credit towards their final grade for their participation. To be included in the final analyses, subjects had to report on their health questionnaire that they experienced a minimum of one headache per week and at least four headaches per month. Two hundred and twenty-two participants were eliminated because they did not experience sufficiently frequent headaches to meet these criteria. An additional seven were removed from the study because they did not complete enough questions to make their data useful in the analyses.

Of those participants who met the headache frequency criteria, another 40 were eliminated because their reported headache symptoms matched the diagnostic criteria for migraines. The etiology of migraines is believed to be primarily physiological in nature (Appel, Kuritzky, Zahavi, Zigelman, & Askelrod, 1992; Barolin & Sperlich, 1969), and therefore the pain associated with these headaches may be qualitatively different than that of tension or cluster headaches. Subjects who responded with migraine-like profiles were therefore eliminated from the study. A checklist was developed based on the International Headache Society's Headache Classification System (Olesen, 1990) to aid

in this screening out process. Reports of headache symptoms were reviewed on an individual basis, and only those meeting all criteria were eliminated (see Table 1).

The proportion of frequent headache sufferers identified in this study (51% of the total sample) is consistent with previous studies which have explored the prevalence of recurrent headaches among university populations (Forgays, Rzewnicki, Ober, & Forgays, 1993; Ogunyemi, 1984; Attanasio & Andrasik, 1987; Andrasik, Holroyd, & Abell, 1979). The number of subjects who were found to experience recurrent headaches (at least one to two headaches per week) in these studies ranged from 47.5% to 63.1%. The proportion of frequent headache sufferers who experienced migrainous headaches in this study (13% of the total headache sample) is also consistent with the studies cited above, which have reported prevalence rates for migraine headaches ranging from 6.1% to 16% of the headache samples.

Table 1

Criteria Used for the Classification of Migraine Headaches

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1. Headache attacks last 4-72 hours (untreated or unsuccessfully treated)

2. Headache has at least two of the following characteristics:

    (a). Unilateral location
    (b). Pulsating quality
    (c). Moderate to severe intensity
    (d). Aggravation by walking stairs or similar routine physical activity

3. During headache at least one of the following:

    (a). Nausea and/or vomiting
    (b). Sensitivity to light and/or sound

Assessment Instruments

Subjects completed a series of questionnaires including 1) the Pain Disability

Index (Pollard, 1984), 2) the hysteria, depression, and hypochondriasis scales of the

Minnesota Multiphasic Personality Inventory - 2 (Butcher, Dahlstrom, Graham, Tellegen,

& Kaemmer, 1989), 3) the Headache-Specific Locus of Control Scale (Martin, Holroyd,

& Penzien, 1990), 4) the revised Life Orientation Test (Scheier, Carver, & Bridges,

1994), 5) the Coping Strategies Questionnaire (Rosenstiel & Keefe, 1983), and 6) a

measure of headache activity and demographic information (see Appendix A). The

demographic questionnaire contained the headache checklist intended to screen out

migraine sufferers.

The Pain Disability Index. The Pain Disability Index (PDI; Pollard, 1984) (see

Appendix B) assesses the degree to which chronic pain interferes with daily functioning

in seven broad areas: family/home responsibilities, recreation, social activity, occupation,

sexual behavior, self-care, and life-support activity. These ratings are made on a ten-

point Likert scale (0 = no disability to 10 = total disability). The PDI has been found to

be internally consistent (alpha reliability = .87) with a test-retest reliability of .44 (Tait,

Chibnall, & Krause, 1990). Its validity is supported by the fact that it has been found to

differentiate highly disabled inpatient groups from minimally disabled outpatient groups

(Tait, Pollard, Margolis, Duckro, & Krause, 1987). Scores on the PDI have also been

found to relate significantly to patient reports of pain-related psychological distress (Tait,

Chibnall, & Krause). Some of the wording of the scale was slightly altered for this study

so as to instruct participants to consider their disability due to headaches specifically

rather than pain in general, as well as to make some of the examples more relevant to a

student (rather than working adult) population (e.g., for the category "occupation", the example of "schoolwork" was added in addition to the example of regular paid work).

The Minnesota Multiphasic Personality Inventory - 2. The Minnesota Multiphasic Personality Inventory - 2 (MMPI-2; Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989) (See Appendix C) is the current revision of the original MMPI created by Hathaway and McKinley in 1940. The MMPI-2 is a 567-item true/false measure of general personality functioning for adults 18 years of age and older. It consists of three validity scales and ten clinical or personality scales. Test-retest reliabilities over an average period of 8.58 days range from .67 (scale 6) to .92 (scale 0) for males, and from .58 (scale 6) to .91(scale 0) for females (Butcher et al., 1989). The inventory's construct validity is supported by the myriad clinical studies which have found the MMPI's two- and three-point profile code types to be predictive of specific problem areas (Groth-Marnat, 1990). Three of the clinical scales - hypochondriasis, depression, and hysteria; also known as the "neurotic triad" – comprising a total of 113 questions, were used in the current study.

The Headache-Specific Locus of Control Scale. The Headache-Specific Locus of Control (HSLC) Scale was developed by Martin, Holroyd, and Penzien (1990) (see Appendix D). It is a 33-item questionnaire that assesses the degree to which individuals endorse internal, chance, or health care professional control over their headaches. Subjects respond to statements regarding control of headache onset and headache relief by using a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The HSLC Scale has been shown to be a valid and reliable tool for use with both student (Martin et al.) and patient (VandeCreek & O'Donnell, 1992) populations of

headache sufferers. The three subscales have good internal consistency reliability, with alpha coefficients ranging from .84 (Chance Control) to .88 (Health Care Professional Control), and adequate test-retest reliability, with correlations ranging from .72 (Chance) to .78 (Health Care Professionals). The three subscales are minimally correlated with each other, and significant correlations with theoretically relevant criterion variables such as disability, depression, and treatment preference support the scale's construct validity (Martin et al.).

The revised Life Orientation Test. Designed by Scheier and Carver in 1985 and revised by the authors in 1994, the revised Life Orientation Test (LOT-R; see Appendix E) measures individual differences in dispositional optimism/pessimism. There are six items (e.g., "In uncertain times, I usually expect the best") plus four filler items (e.g., "It's easy for me to relax"). Of the six items, three are keyed in a negative direction and are reverse coded before scoring. The filler items are intended to better disguise the underlying purpose of the test and are not included in scoring. Respondents use a five-point Likert scale (0 = strongly disagree to 4 = strongly agree) to rate their agreement to the items. Higher scores on the LOT-R generally reflect a more optimistic outlook. A Cronbach's alpha of .76 and a test-retest reliability of .79 (over four weeks) was found with the original LOT, as well as acceptable convergent and discriminant validity (Scheier & Carver, 1985). The more brief LOT-R has been found to correlate .95 with the original version (Scheier, Carver, & Bridges, 1994).

The Coping Strategies Questionnaire. The Coping Strategies Questionnaire (CSQ; Rosenstiel & Keefe, 1983) (See Appendix F) is the most widely used measure of coping strategies related to chronic pain (Novy, Nelson, Hetzel, Squitieri, & Kennington,

1998). The CSQ contains 42 items assessing seven pain coping strategies: diverting

attention, reinterpreting pain sensations, coping self-statements, ignoring pain sensations,

praying or hoping, catastrophizing, and increasing activity level. In an attempt to assess

subjects' perceived effectiveness of their pain coping strategies, two additional one-item

scales ask patients to rate their ability to control and decrease their pain. The response

format for how often respondents use each coping strategy when they experience pain is a

seven-point Likert scale, where 0 = never, 3 = sometimes, and 6 = always. Subjects were

instructed to indicate how often they used each strategy when experiencung a headache

specifically. Responses to the effectiveness scales are also measured using a seven-point

scale, where 0 = no control/ability to decrease pain, 3 = some control/ability to decrease

pain, 6 = complete control/ability to decrease pain. Reliability alphas for the scales range

from .71 to .85, suggesting good internal consistency (Rosenstiel & Keefe). The scale

also shows adequate test-retest reliability, with correlations for the scales ranging from

.68 to .93 (Main & Waddell, 1991). The CSQ's concurrent and discriminant validity has

been supported in numerous studies (Main & Waddell; Rosenstiel & Keefe; Turner &

Clancy, 1986; Snow-Turek, Norris, & Tan, 1996). A two-factor structure of the CSQ,

consistent with the active/passive coping dichotomy, has been supported by numerous

factor analytic studies (Snow-Turek, Norris, & Tan; Beckham, Keefe, Caldwell, &

Roodman, 1991; Gil, Abrams, Phillips, & Keefe, 1989).

Procedure

Questionnaires were administered during special research sessions (one hour)

outside of the normal class period. The subjects signed a consent form before completing

the questionnaires which informed them about the confidentiality of their responses and

invited them to participate in future headache research (see Appendix G). The

questionnaires were placed in counterbalanced order. Upon completion of the study,

subjects received a handout that explained the purpose of the study and provided them

with instructions about how to receive more information about the study or about

headaches and headache treatment (see Appendix H).

<div align="center">Results</div>

Demographic Information

A total of 277 participants were selected for the frequent headache sample. This

group was comprised of 75 males and 202 females with a mean age of 20.18 years. Of

the 277 frequent headache subjects, the majority (67.9%) checked their religious

affiliation as Christian. Twenty-one percent claimed no religious affiliation. Ninety-one

percent were single and 67.5% were living with their family.

Headache Experience

The sample reported an average of 2.46 headaches per week and 8.77 headaches

in the month prior to the experiment. These headaches lasted an average of 2.13 hours

and had a mean intensity rating of 5.17 (moderately painful) on a scale from one (very

mild pain) to nine (excruciating pain). Subjects reported having experienced these

headaches for an average of 4.95 years, indicating that most subjects experienced their

headaches chronically based on the widely accepted six-month definition of chronicity.

Fourteen percent of subjects had consulted their doctor at least once for their headaches in

the past two years. Nineteen subjects were currently receiving treatment such as

physiotherapy, chiropractic, or prescription medication for their headaches. Sixty-five

percent of participants stated that they took non-prescription medication (e.g., Tylenol,

Advil, Aspirin) for their headaches. On average, they rated the effectiveness of such medication as 6.06 (moderately effective) on a scale from one (not at all effective) to nine (extremely effective). Seventeen percent of participants reported using nontraditional methods of treatment, such as herbal teas, acupuncture, meditation, and reflexology, for their headaches.

Over half of the subjects attributed their headaches to stress and tension. This was by far the most commonly cited cause. Other attributed causes and their frequencies are reported in Table 2. In addition to their headaches, 20.6% of participants reported experiencing pain regularly in other areas of their body. Table 3 shows a breakdown of the types of pain reported.

Table 2

Subjects' Perceptions Regarding the Cause of their Headaches

	Subjects Reporting	
Cause	Number	Percentage
Stress/tension	185	66.8
Fatigue/lack of sleep	65	23.5
Lack of food/poor diet	26	9.4
Sinus/allergic reaction	14	5.1
Eye strain	13	4.7
Don't know	13	4.7
Hormones/menstruation	9	3.2
Neck problems	6	2.2
Genetics	3	1.2
Other	7	2.5

Table 3

Other Types of Pain Reported by Subjects

	Subjects Reporting	
Type of Pain	Number	Percentage
Back	125	45.1
Neck	98	35.4
Cramps	89	32.1
Muscle	63	22.7
Joint	60	21.7
Stomach	44	15.9
Earache	36	13.0
Tooth	23	8.3
Chest	17	6.1
Nausea	16	5.8
Other	3	1.1

Comparison of the Forms

Two different versions of the test booklet were administered in which the order of the tests were counterbalanced. Comparisons between Forms A and B revealed no significant differences on any of the major variables except for one: health care professional headache locus of control. A t-test showed that subjects who were administered Form A endorsed a health care professional headache locus of control orientation significantly more than those who were given Form B (Form A M=23.76; Form B M=19.97; t=3.668, p<.001). An inspection of the data did not reveal any errant scores or suspect data. It is unclear why this difference emerged, particularly when the other two scales of the Headache Locus of Control Scale showed no significant differences between the forms. However, in light of this finding, all subsequent analyses involving this variable must be interpreted with extreme caution since any resulting differences could be due to the observed difference between the forms.

Male/Female Comparisons

Means and standard deviations for males and females on the major variables can be found in Table 4. As predicted, females reported more frequent, longer, and more intense headaches than males, as well as more headache-related disability and doctor visits. Of these comparisons, however, only headache intensity and the number of physician consultations were statistically significant using one-tailed t-tests. For the number of physician consultations comparison, Levene's Test for Equality of Variances indicated that the variances were not equal (F=3.872, p=.05), and therefore a Welch's t-test was performed. This revealed that females consulted their doctors about their headaches significantly more often than males.

Nondirectional t-tests revealed significant gender differences on a number of other major variables under investigation. Overall, females were more likely than males to use passive pain coping strategies. There were no significant gender differences found, however, for active coping. Women also scored significantly higher on the hypochondriasis, depression, hysteria, and neuroticism scales than males. While the results indicate that females also had significantly lower health care professional headache locus of control scores than males, this scale's poor performance on the counterbalancing tests preclude any meaningful interpretation of this result.

Table 4

Male/Female Means and Standard Deviations of the Major Variables

Variable	Males		Females		T-test	
	M	SD	M	SD	t	p (1-tailed)
DUR	2.12	2.08	2.14	2.08	-0.127	0.450
FRE	2.24	1.64	2.54	1.73	-1.308	0.096
INT	4.87	1.44	5.27	1.32	-2.195	0.015*
DOC	0.49	1.37	1.08	3.53	-2.005	0.023*
DIS	18.77	12.69	20.87	13.39	-1.175	0.121

Variable	Males		Females		T-test	
	M	SD	M	SD	t	p (2-tailed)
PAS	12.85	10.80	15.93	11.79	-1.970	0.050*
ACT	70.00	26.12	69.62	24.06	0.114	0.909
CON	3.76	1.17	3.55	0.98	1.471	0.142
DEC	3.60	1.35	3.50	1.08	0.672	0.502
HYP	9.57	4.55	11.63	5.73	-2.802	0.005**
DEP	19.56	5.16	22.56	5.73	-3.975	0.000***
HYS	23.37	5.29	26.44	5.49	-4.172	0.000***
NEU	52.51	12.39	60.63	13.94	-4.438	0.000***
INT	39.04	6.59	38.85	7.54	0.196	0.845
CHA	26.37	7.53	25.36	7.58	0.989	0.324
HEA	23.60	8.22	19.88	7.01	3.739	0.000***
OPT	14.93	4.63	15.21	4.39	-0.456	0.649

Note: DUR = duration of headaches; FRE = frequency of headaches; INT = intensity of headaches; DOC = number of doctor visits; DIS = level of headache disability; PAS = passive coping strategies; ACT = active coping strategies; CON = perceived level of control over headaches; DEC = perceived ability to decrease headaches; HYP = hypochondriasis; DEP = depression; HYS = hysteria; NEU = neuroticism; INT = internal headache locus of control; CHA = chance headache locus of control; HEA = health care professional headache locus of control; OPT = optimism.

*$p \leq$. 05; **$p \leq$ .01; ***$p \leq$ .001

Correlations Among the Independent Variables

Pearson product-moment correlations were obtained to test the relationships among

the independent variables. Table 5 shows this correlation matrix. Correlations between .19

and .29 were interpreted as low, .30 and .39 as moderate, and .40 and above as high.

As can be seen in the table, there were a number of significant relationships. The use

of passive pain coping strategies was negatively associated with optimism ($r = -.17$) and

positively associated with neuroticism ($r = .32$) as well as the two external headache loci of

control (chance $r = .27$; health care professional $r = .26$). Therefore, people who used

passive pain coping strategies tended to be more neurotic, less optimistic, and endorsed more

of an external headache locus of control orientation. The use of passive coping was also

negatively associated with perceived control over one's headache pain ($r = -.18$), indicating

that those who used passive pain coping strategies tended to feel less in control of their

headache pain. Active pain coping strategies, on the other hand, were positively associated

with optimism ($r = .14$), internal headache locus of control ($r = .17$), and ratings of pain

controllability ($r = .16$). Thus, individuals who relied on more active pain coping strategies

tended to be more optimistic, have more of an internal headache locus of control, and feel

more in control of their head pain.

In addition to being related to pain coping strategies, ratings of pain controllability

were also strongly related to chance headache locus of control ($r = -.42$) and moderately

related to optimism ($r = .22$) and neuroticism ($r = -.26$). Individuals who were more

neurotic, less optimistic, and had more of an external locus of control reported feeling less

control over their pain.

Table 5

Intercorrelations Among the Major Variables

Variable	1	2	3	4	5	6	7	8	9
1. Passive	--								
2. Active	.15*	--							
3. Control	-.18**	.16**	--						
4. Internal	.06	.17**	.10	--					
5. Chance	.27**	-.02	-.42**	-.19**	--				
6. Profess	.26**	.08	-.01	.00	.38**	--			
7. Neuroticism	.32**	-.08	-.26**	.09	.16**	-.03	--		
8. Optimism	-.17**	.14*	.22**	-.06	-.12*	.05	-.30**	--	
9. Disability	.34**	-.06	-.22**	.10	.20**	.09	.28**	-.19**	--

Note: Passive = passive coping; Active = active coping; Control = pain controllability; Internal = internal headache locus of control; Chance = chance headache locus of control; Profess = health care professional headache locus of control.

$n = 277$; * $p < .05$; ** $p < .01$

There was a highly significant negative correlation between internal headache locus of control and chance headache locus control ($r = -.19$) and between chance locus of control and health care professional locus of control ($r = .38$). In other words, as one's internality increased, his/her externality decreased and vice versa. In addition, an increase in one form of external locus of control tended to be matched by an increase in the other. A chance headache locus of control was also related to neuroticism ($r = .16$) and optimism ($r = -.12$). Therefore, those who endorsed an external/chance orientation tended to be more neurotic and less optimistic. There was also a highly significant moderate correlation between these latter two personality variables ($r = -.30$). Highly neurotic individuals tended to be less optimistic in their outlook.

Correlations between the Independent Variables and Coping

A number of variables were also significantly related to one's level of coping or disability. There was a significant moderate correlation between the use of passive pain coping strategies and level of headache disability ($r = .34$) such that those who reported using passive coping also reported the most disability. Ratings of pain controllability were negatively related to disability ($r = -.22$), suggesting that those who were most disabled by their headaches also reported feeling the least control over their headaches. Finally, the three personality variables chance headache locus of control ($r = .20$), neuroticism ($r = .28$), and optimism ($r = -.19$) were also significantly related to disability. Thus, those coping poorly with their headaches tended to be more neurotic, pessimistic, and have a greater chance locus of control toward their headaches.

Analyses of Variance

To test the hypotheses that those high in internal headache locus of control, optimism, and low in neuroticism would be coping significantly better than those high in external headache locus of control, neuroticism, and low in optimism, participants were divided into high and low groups on the personality variables by dividing their scores into thirds. Using SPSS 9.0 for Windows, a series of univariate analyses of variance and covariance were then performed on the top and bottom thirds of the personality variables and the dependent variable coping to test for significant personality effects. The variable "intensity of headaches" was used as a covariate since a correlation matrix between the headache variables and disability revealed a significant positive relationship between headache intensity and level of disability ($r = .34$). By covarying out this variable's influence, it was hoped that any observed effect on coping could be attributed to differences in personality and not to differences in headache severity.

Neuroticism.

A univariate analysis of variance comparing participants high and low in neuroticism on their level of headache disability showed that the two groups did significantly differ in their level of disability. Highly neurotic subjects reported more headache-related disability ($M = 24.14$) than subjects low in neuroticism ($M = 16.57$), F (1, 183) = 15.848, $p<.001$. Even when level of headache severity was controlled for, this difference remained significant, F (1, 182) = 5.376, $p<.05$. Thus, high levels of neuroticism were associated with poorer headache coping while low levels of neuroticism were related to better headache coping regardless of headache intensity.

Optimism.

A one-way ANOVA comparing the disability scores of subjects high and low on the variable optimism revealed that highly optimistic subjects reported significantly less headache-related disability (M = 17.38) than subjects low in dispositional optimism (M = 22.84), F (1, 203) = 8.838, p<.005. Again, even after controlling for the influence of headache intensity, this difference remained significant, F (1, 202) = 8.374, p<.005. These results indicate that optimism had a significant effect on coping such that high levels of optimism were associated with less disability while low levels of optimism were related to high levels of disability even after removing the effects of headache intensity.

Chance Headache Locus of Control.

An ANOVA comparing the disability scores of subjects high and low in chance headache locus of control also found a significant difference, with high chance scorers reporting significantly more headache-related disability (M = 23.61) than low chance scorers (M = 16.05), F (1, 182) = 16.116, p<.001. This result remained significant even after the influence of headache intensity was held constant, F (1, 181) = 7.866, p<.01. In other words, attributing headache onset and relief to factors such as chance and fate was associated with poorer headache coping for all levels of headache intensity.

Health Care Professional Headache Locus of Control.

An ANOVA revealed a significant difference in disability between those scoring high and low on the health care professional headache locus of control scale, with high scorers reporting more disability. This result, however, cannot be interpreted further as its poor performance on the counterbalancing tests questions the validity of any analyses involving this variable.

Internal Headache Locus of Control.

Finally, an ANOVA comparing the level of disability between subjects high and low on internal headache locus of control did not find any significant difference between the two groups (low $\underline{M}$ = 19.58; high $\underline{M}$ = 20.51), $\underline{F}$ (1, 196) = .229, $\underline{p}$=.633. Including headache intensity as a covariate did not alter this null finding, $\underline{F}$ (1, 195) = .525, $\underline{p}$=.470. Thus, internal headache locus of control was not found to be significantly associated with headache coping ability.

Discriminant Analysis

Because the purpose of this study was an exploratory investigation of variables that distinguish high headache copers from low headache copers, all variables were entered into a stepwise discriminant function analysis in order to determine the unique contribution of each variable to the classification of high versus low copers. For the purpose of the analysis, subjects were divided into high and low copers by dividing their disability scores into thirds. Subjects with disability scores in the top third (24 and above) were designated the low headache coping group, while subjects with disability scores in the bottom third (12 and below) became the high headache coping group. This division of copers was then used as the grouping variable in the discriminant analysis.

The analysis revealed a significant discriminant function [$\chi^2_{(3)}$ = 33.793, $\underline{p}$<.001] with a canonical correlation of .493. In total, three variables contributed significantly to the differentiation of the two coping groups: catastrophizing, ignoring pain sensations, and neuroticism. No other variables contributed significantly to the classification of coping beyond the variance accounted for by these three variables. The pain coping strategy, catastrophizing, entered in the first step of the analysis with a standardized

discriminant function coefficient of .580. This indicates that high copers engaged in less catastrophizing ($\underline{M}$ = 4.45) in response to their pain than low copers ($\underline{M}$ = 10.02). The second predictor entered in the equation, ignoring pain sensations, had a loading of -.520. In other words, low copers were less likely to ignore their pain ($\underline{M}$ = 16.46) than high headache copers ($\underline{M}$ = 21.16). Finally, the predictor neuroticism entered in the last step of the analysis with a loading of .395. High copers were less neurotic ($\underline{M}$ = 54.10) than low copers ($\underline{M}$ = 63.40). The discriminant function correctly classified 71.9% of the high copers and 72.3% of the low copers, with an overall correct classification rate of 72.1%. It should be noted, however, that stepwise discriminant analysis, like stepwise multiple regression, positively biases results, and so the true classification rate may be slightly lower.

Discussion

The results of this study provide support for the hypothesis that a number of personality variables are significantly associated with one's ability to cope with recurrent headaches. As predicted, individuals higher in neuroticism, lower in optimism, and with a greater external headache locus of control orientation appeared to be coping more poorly with their headaches than those lower on the variable neuroticism and higher in optimism. No support was found, however, for the hypothesis that an internal headache locus of control would be associated with better headache coping.

With respect to gender differences in headache, the hypotheses were only partially supported. It was hypothesized that females would report more severe and more frequent headaches, headaches of longer duration, more headache-related physician visits, and more disability as a result of their headaches than males. While the results generally

supported these predictions, only the intensity and physician consultation comparisons reached statistical significance, with females reporting more intense headaches and more doctor visits than males. The fact that these were the only two variables to be significant is surprising considering the consistency with which the predicted gender differences are found in the headache literature. This discrepancy may have been partially due, however, to the disproportionately small number of males (27%) in the headache sample compared with previous studies.

Exactly how personality influenced coping outcomes, whether directly or indirectly, is not clear from this study. However, consistent with the mediational model of personality and adjustment to stressors (Hewitt & Flett, 1996), it appears that the observed relationship between personality and coping in the present study may have been mediated by dispositional influences on the types of coping strategies the participants used in response to their pain. As expected, there was a highly significant positive relationship between the use of passive pain coping strategies and headache disability (r = .34). Though there was a negative relationship between the use of active coping strategies and disability, as hypothesized, this relationship was weak and did not reach statistical significance (r = .06). Neuroticism (r = .32), optimism (r = -.17), and external/chance headache locus of control (r = .27) were all significantly related to the use of passive coping strategies. Internal headache locus of control (r = .17) and optimism (r = .14) were the only two variables that were significantly related, though weakly, to the use of active coping strategies. Thus, these findings suggest that the personality variables under investigation may have influenced headache coping to the degree that they led to the use of certain, particularly passive, pain coping strategies. Indeed, several authors

(e.g., Snow-Turek, Norris, & Tan, 1996; Brown & Nicassio, 1987) have found passive coping to be more predictive of adjustment to pain than active coping, suggesting that "it's not what you do, it's what you don't do" (Snow Turek et al.).

Such a proposed link between personality, coping strategies, and subsequent adjustment to headache pain is consistent with previous research on other stressors. Bolger (1990), for example, found that among college students preparing to write a medical school entrance exam, the personality trait neuroticism led to the use of more passive/avoidant coping strategies, which he argued in turn led to increased distress. Studying the effects of optimism on women's adjustment to early stage breast cancer, Carver et al. (1993) found optimism to be linked to active coping efforts and pessimism to be linked to more avoidant strategies. They concluded that these different approaches to coping explained the better adjustment of the women higher in optimism. Anderson (1977) reported that among managers facing a particular stressor, internal locus of control predicted less distress and better adjustment based on its observed association with less emotion-focused or passive coping efforts.

How would neuroticism, optimism/pessimism, or locus of control influence one's use of passive or active coping strategies? The answer may lie in how personal dispositions shape a person's perceptions of a situation or stressor. According to Scheier and Carver's (1985) model of dispositional optimism, for example, optimists are more likely to appraise difficulties facing them as surmountable and therefore respond to stress with greater effort because they believe in the efficacy of their efforts. Such an outlook might cause these individuals to use more direct, active coping strategies in response to a stressor. Pessimists, on the other hand, expect a negative outcome of their efforts and

therefore may be more likely to disengage from a problem by using more passive coping

techniques as a result of their negative appraisal of the situation's controllability.

Similarly, a person high in internal locus of control may believe in their ability to change

a situation, and therefore would be more likely to expend the effort necessary for more

problem-focused or active coping. Those with a greater external orientation do not

believe that an event is contingent upon their own behaviour, and so would be more

likely to take a passive approach in dealing with the stressor.

The reason for a link between neuroticism and the use of passive coping strategies

is less readily apparent. Neuroticism as a personality trait refers to the degree with which

one experiences a cluster of negative emotions including anxiety, anger, depression, low

self-esteem, fearfulness, and irritability. Neurotic individuals tend to be overly vigilant

about bodily changes and are more apt to interpret unusual sensations as signs of illness

(Costa & McCrae, 1987). In response to experimentally induced pain, those scoring high

on neuroticism have lower pain thresholds and/or tolerance levels than those low on

neuroticism (Lynn & Eysenck, 1961; Shiomi, 1978). Together these results suggest that

individuals higher in neuroticism may overreact to or appraise a situation as more

stressful than less neurotic people (McCrae, 1990). This heightened reactivity may cause

neurotic individuals to experience a greater sense of helplessness/hopelessness compared

to individuals lower in neuroticism, which in turn may cause the former to rely on the use

of more passive coping strategies.

As can be seen in the above descriptions, it is difficult to disentangle the

individual effects that the personality variables have on coping as there is a great deal of

overlap among them. For example, all seem to involve the issue of control to a certain

degree. The current study found that believing that one has little control over his/her pain was significantly related to greater use of passive coping strategies. Therefore, since neuroticism, pessimism, and external headache locus of control were all negatively related to ratings of pain controllability among the participants, as predicted, this may partially explain their relationship with the use of passive pain coping strategies. Both pessimism and neuroticism also involve a negative emotionality factor, which may cause individuals high in this variable to passively dwell on their disability and losses. While discussions of control and negative emotionality suggest that the personality variables under investigation may be conceptually related, studies testing their discriminant validity have found that they do contribute independently to prediction analyses (Scheier, Carver, & Bridges, 1994; Peacock & Wong, 1996). Therefore it is of practical importance that we study them as distinct constructs.

The discriminant analysis finding that the passive pain coping strategy, catastrophizing, independently explained the most variance in individual differences in coping ability among the participants is supported by numerous studies on chronic pain which have found one's tendency to catastrophize to be an important determinant of adjustment. Jensen, Turner, Romano, and Karoly (1991) concluded from their extensive review of the pain coping literature that one of the few and most consistent findings is that those who refrain from catastrophizing about their pain function far better than those who catastrophize. Wells (1994) found that among a sample of 71 chronic pain patients, catastrophizing explained the largest amount of variance in distress and disability, with higher levels of catastrophizing being related to greater distress and disability. Main and Waddell (1991) reported similar results with low back pain patients. Rosenstiel and

Keefe (1983) observed a relationship between the tendency to catastrophize and poorer

adjustment among their sample of chronic low back pain patients, which led them to

assert that "... success in dealing with pain is more a function of refraining from use of a

catastrophizing strategy than use of any particular coping strategy." (p. 43). Similarly,

Flor, Behle, and Birbaumer (1993) found that improvements in functioning among pain

patients following treatment were associated with reductions in the use of catastrophizing

but not increases in the use of adaptive coping strategies. This reinforces the proposition

that it may be more important for patients' adjustment that they not engage in passive

coping strategies such as catastrophizing in response to their pain than actively engage in

adaptive strategies.

Considering the wealth of literature reporting the relative adaptiveness of having

an internal locus of control orientation and the relative maladaptiveness of having an

external locus of control in response to stressors, it is somewhat surprising that although

an external locus of control was associated with poorer headache coping in this study, an

internal headache locus of control was not found to benefit headache coping ability.

Scharff, Turk, and Marcus (1995) also noted that dysfunctional and interpersonally

distressed headache patients scored higher on the external headache locus of control

scales than adaptive copers, but that adaptive copers did not score higher on the internal

headache locus of control scale than the other two groups. A possible explanation for

these null findings may lie in the chronicity of the subjects' headaches (the average length

of time subjects had been experiencing their headaches was 4.95 years in the present

study and 12.6 years in the Scharff et al. study). As an acute pain problem becomes

chronic, attempts at self-control may become less effective, and therefore maintaining a

belief in internal control may not be beneficial. Thus, for those dealing with the pain of chronic headaches, it may be more important not to strongly endorse external factors as being in control of the onset and relief of headache episodes than to believe in self-control, similar to the finding with the use of passive versus active copings strategies.

The finding that neuroticism was significantly associated with one's ability to cope with headaches holds implications for the interpretation of past studies in this area. Historically, personality studies with headache sufferers have reported a general elevation in neuroticism scores among this group. As discussed earlier, this was usually interpreted as evidence of the etiological role of neuroticism in headache, and led to the proposal of a "headache personality", in which neuroticism played a prominent role (Arena, Andrasik, & Blanchard, 1985; Blaszczynski, 1984). The current study, however, found varying levels of neuroticism among the frequent headache sufferers, with the higher levels being associated mainly with those most disabled by their headaches. The mean score of the subjects lower in neuroticism was well within the normal range. Since early studies in this area were conducted mostly on populations of headache sufferers who had sought treatment for their headaches – individuals who have been found to report more disability than those who do not seek help (Ziegler & Paolo, 1996) – this suggests that the findings of these studies may have been based on a biased sample and therefore challenges their conclusions regarding the existence of a neurotic headache personality.

Conclusion

The findings of this study can be summarized as follows. First, there is a relationship between personality and one's ability to cope with recurrent headaches. Second, this relationship may be mediated by the association between certain traits and

the use of more adaptive or maladaptive pain coping strategies. Third, refraining from the use of passive pain coping strategies such as catastrophizing may be more important to coping than actively engaging in strategies such as diverting attention or using coping self-statements.

Such findings have important clinical implications for the assessment and treatment of headaches. For example, knowing that a patient is high in neuroticism, pessimism, or chance headache locus of control might be an indication that the person is also at a high risk for engaging in a maladaptive pattern of coping efforts, and in this way such knowledge may "flag" us as to how well the person is likely to be coping. Furthermore, if personality factors do affect one's ability to cope with headaches, then therapeutic interventions customized to target those specific factors that may be hampering an individual should be more effective than generic treatments where the treatment is provided to all patients based on diagnosis rather than individual patient characteristics (Scharff, Turk, & Marcus, 1995). Finally, if certain traits are found to engender more adaptive coping, then to the degree that personality is a relatively enduring quality, research on the formation of these beneficial traits in childhood may be an important step to understanding how we can inoculate and develop resilience in our children (Brenner, 1994).

There are a number of potential limitations to this study that are worth noting. First, this type of research is correlational in nature and therefore no causality can be inferred. We cannot determine from these results, for example, whether having a neurotic personality leads to the experience of greater disability in the face of headaches or if perhaps greater disability modified their responses to the MMPI. The latter possibility

seems less likely considering the extensive body of literature on the stability of personality – particularly the trait neuroticism – over time, despite the increased illness and disability that we experience as we get older (Costa & McCrae, 1987). However, only well-designed prospective studies will be able to appropriately answer the causality question. Second, the participants in this study were mainly first year university students who suffered from tension headaches of moderate intensity. Therefore, the results may have limited generalizability to other populations, headaches of greater severity, and different types of pain. Third, the discriminant analysis had a less than 10:1 subject-to-variable ratio, which suggests that its results should be accepted cautiously until they can be replicated with a larger sample. Finally, due to time constraints on the study, all data were collected using self-report methods, which are less ideal than direct observation or even interview techniques since subjects' self-reports may be inherently biased. Despite these drawbacks, however, the findings of this study warrant further research. Future studies in this area might address what other personality variables may prove to be important in this process, if such a framework can be extended to coping with other chronic pain conditions, and how such knowledge can be utilized to develop effective therapeutic interventions.

In sum, this study presents support for the hypothesis that certain personality traits may help or hinder a person in his/her attempts to cope with the pain of recurrent headaches. For those high in the traits that tend to exacerbate the experience of disability, psychological approaches that aim to alter the negative cognitions associated with these traits, which in turn lead to the use of more maladaptive pain coping strategies, may be a more effective form of treatment than pharmacology or other medical interventions.

Given the substantial costs to society that headache sufferers incur each year through

health care services and lost industrial productivity, improving our ability to treat these

patients is not only of great humanitarian value, but of economic value as well.

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<u>Appendix A</u>

DEMOGRAPHIC AND HEALTH SURVEY

Code No. _____

Date of Birth: Year: ____ Month: ____ Day: ____
Current Age: _____

1. Sex: a) male   b) female

2. Religion: a) Christian   b) Jewish   c) Islam
              d) Buddhist   e) no religion   f) other _____

3. Marital Status: a) single   b) married   c) separated
                   d) divorced   e) widowed   f) commonlaw

4. Living: a) with spouse   b) commonlaw   c) alone
             d) with family   e) with friend   f) other _____

5. On average, how many headaches do you experience per week?

   _____

6. On average, how long do your headaches last? (please specify how many hours or minutes)

   _____ hours _____ minutes

7. On average, how would you rate the painfulness of your headaches? (circle one)

   Very mild   Moderate   Excruciating
     pain   pain   pain
     1   2   3   4   5   6   7   8   9

8. How long have you been experiencing these headaches? (please specify how many years or months)

   ___ years ___ months

9. How many times have you consulted a doctor for your headaches in the last two years?

   _____ times

10. Have your headaches been diagnosed by a physician as one of the following? (circle one)

    tension   migraine   cluster   no diagnosis

11. How painful would a headache have to be before you...

    (a) take medication (such as aspirin) for it?

Minimal pain				Moderate pain			Most pain possible (Excruciating)	
1	2	3	4	5	6	7	8	9

    (b) lay down?

Minimal pain				Moderate pain			Most pain possible (Excruciating)	
1	2	3	4	5	6	7	8	9

    (c) cancel appointments?

Minimal pain				Moderate pain			Most pain possible (Excruciating)	
1	2	3	4	5	6	7	8	9

12. Are you currently receiving treatment for you headaches?

    yes   no

    If yes, what treatment? _____

13. Do you take any medication (prescription or non-prescription) for your headaches?

    yes   no

    If yes, what is the name of the medication? _____

14. If you answered "no" to question 13, please go on to question 15. If you answered "yes", how effective would you rate the medication in helping you to cope with your headaches?

Not at all effective				Moderately effective			Extremely effective	
1	2	3	4	5	6	7	8	9

15. Do you use any nontraditional methods of treatment for your headaches?

       yes   no

       If yes, what: _____

16. Please check the following which best describe your headaches (you may check more than one)

    _____ unilateral location (one side of the head only)
    _____ bilateral location (both sides of the head)
    _____ headache has a pulsating quality
    _____ headache has a pressing/tightening (nonpulsating) quality
    _____ mild to moderate intensity
    _____ moderate to severe intensity
    _____ headache is aggravated by walking stairs or similar routine physical activity
    _____ no aggravation by walking stairs or similar routine physical activity
    _____ during the headache you experience nausea and/or vomiting
    _____ no nausea or vomiting
    _____ during the headache you experience photophobia (sensitivity to light) or phonophobia (sensitivity to sound)
    _____ no sensitivity to light or sound

17. What do you think is the major cause of your headaches?

_____

18. Do you suffer from any other regular forms of pain? (please check any that apply)

    _____ neck pain   _____ joint pain
    _____ back pain   _____ tooth pain
    _____ muscle pain   _____ nausea
    _____ chest pain   _____ cramps
    _____ stomach pain   _____ earaches
                         _____ other (please specify)

19. Approximately how many headaches have you had in the last month?

    _____ headaches

20. Was this typical for you in terms of number of headaches? (please circle one)

    yes   no

    If no, do you usually experience more or fewer headaches? _____

21. Would you say that you experience frequent headaches? (please circle one)

    yes   no

<div align="center">

Appendix <u>B</u>

Pain Disability Index

</div>

INSTRUCTIONS: The rating scales below are designed to measure the degree to which several aspects of your life are presently disrupted by headaches. In other words, we would like to know how much your headaches are preventing you from doing what you would normally do, or from doing it as well as you normally would. Respond to each category by indicating the *overall* impact of headache in your life, not just when the pain is at its worst.

For each of the 7 categories of life activity listed, please circle the number on the scale which describes the level of disability you typically experience. A score of 0 means no disability at all, and a score of 10 signifies that all of the activities in which you would normally be involved have been totally disrupted or prevented by your headaches.

(1) Family/home responsibilities

This category refers to activities related to the home or family. It includes chores or duties performed around the house (e.g., yard work) and errands or favors for other family members (e.g., picking up groceries at the store).

0	1	2	3	4	5	6	7	8	9	10
No disability										Total disability

(2) Recreation

This category includes hobbies, sports, and other similar leisure time activities.

0	1	2	3	4	5	6	7	8	9	10
No disability										Total disability

(3) Social activity

This category refers to activities which involve participation with friends and acquaintances other than family members. It includes parties, theater, concerts, dining out, and other social functions.

0	1	2	3	4	5	6	7	8	9	10
No disability										Total disability

(4) Occupation

This category refers to activities that are a part of or directly related to one's work. This includes non-paying jobs as well, such as that of a student, housewife, or volunteer worker.

0	1	2	3	4	5	6	7	8	9	10
No disability										Total disability

(5) Sexual behaviour

This category refers to the frequency and quality of one's dating or sex life.

0	1	2	3	4	5	6	7	8	9	10
No disability										Total disability

(6) Self-care

This category includes activities which involve personal maintenance and independent daily living (e.g., taking a shower, driving, getting dressed, etc.).

0	1	2	3	4	5	6	7	8	9	10
No disability										Total disability

(7) Life-support activity

This category refers to basic life-supporting behaviours such as eating, sleeping, and breathing.

0	1	2	3	4	5	6	7	8	9	10
No disability										Total disability

Scoring

A general disability score ranging from a minimum score of 0 to a maximum score of 70 is computed by summing the ratings of the seven categories.

Appendix C

Minnesota Multiphasic Personality Inventory - 2

INSTRUCTIONS: For the following questions, please record your answers on the answer sheet provided at the end of the questionnaire. You may detach the answer sheet for ease of recording, but please be sure to insert it among these pages when you hand your booklet in.

Below are a number of statements. Read each statement and decide whether it is true *as applied to you* or false *as applied to you*. If a statement is **true** or **mostly true** for you, blacken or put an "x" in the first box, under T. If a statement is **false** or **not usually true** for you, blacken or put an "x" in the second box, under F. Some statements may seem difficult to answer, but try to respond to every statement. When you respond to a given item, do not spend too much time thinking about the item, but express the attitude that comes first to you mind. Be sure to answer all the items, even if they seem difficult and you have to guess. There are no right or wrong answers.

1). I have a good appetite.

2). I wake up fresh and rested most mornings.

3). I am easily awakened by noise.

4). I like to read newspaper articles on crime.

5). My hands and feet are usually warm enough.

6). My daily life is full of things that keep me interested.

7). I am about as able to work as I ever was.

8). There seems to be a lump in my throat much of the time.

9). I enjoy detective or mystery stories.

10). I work under a great deal of tension.

11). I am troubled by attacks of nausea and vomiting.

12). I am very seldom troubled by constipation.

13). I feel that it is certainly best to keep my mouth shut when I'm in trouble.

14). I am bothered by an upset stomach several times a week.

15). At times I feel like swearing.

16). I find it hard to keep my mind on a task or job.

17). I seldom worry about my health.

18). At times I feel like smashing things.

19). I have had periods of days, weeks, or months when I couldn't take care of things because I couldn't "get going."

20). My sleep is fitful and disturbed.

21). Much of the time my head seems to hurt all over.

22). My judgement is better than it ever was.

23). Once a week or oftener I suddenly feel hot all over, for no real reason.

24). I am in just as good physical health as most of my friends.

25). I prefer to pass by school friends, or people I know but have not seen for a long time, unless they speak to me first.

26). I am almost never bothered by pains over my heart or in my chest.

27). I am a very sociable person.

28). Parts of my body often have feelings like burning, tingling, crawling, or like "going to sleep."

29). I sometimes keep on at a thing until others lose their patience with me.

30). I wish I could be as happy as others seem to be.

31). I hardly ever feel pain in the back of my neck.

32). I think a great many people exaggerate their misfortunes in order to gain the sympathy and help of others.

33). I am troubled by discomfort in the pit of my stomach every few days or oftener.

34). Most of the time I feel blue.

35). I sometimes tease animals.

36). I am certainly lacking in self-confidence.

37). I usually feel that life is worthwhile.

38). It takes a lot of argument to convince most people of the truth.

39). I think most people would lie to get ahead.

40). I have little or no trouble with my muscles twitching or jumping.

41). I don't seem to care what happens to me.

42). I am happy most of the time.

43). There seems to be a fullness in my head or nose most of the time.

44). Some people are so bossy that I feel like doing the opposite of what they request, even though I know they are right.

45). Often I feel as if there is a tight band around my head.

46). I seem to be about as capable and smart as most others around me.

47). Most people will use somewhat unfair means to gain profit or an advantage rather than to lose it.

48). I have a great deal of stomach trouble.

49). The sight of blood doesn't frighten me or make me sick.

50). Often I can't understand why I have been so irritable and grouchy.

51). I have never vomited blood or coughed up blood.

52). I do not worry about catching diseases.

53). I often wonder what hidden reason another person may have for doing something nice for me.

54). I believe that my home life is as pleasant as that of most people.

55). Criticism or scolding hurts me terribly.

56). My conduct is largely controlled by the behaviour of those around me.

57). I certainly feel useless at times.

58). At times I feel like picking a fist fight with someone.

59). I have often lost out on things because I couldn't make up my mind soon enough.

60). Most nights I go to sleep without thoughts or ideas bothering me.

61). During the past few years I have been well most of the time.

62). I have never had a fit or convulsion.

63). I am neither gaining nor losing weight.

64). I cry easily.

65). I cannot understand what I read as well as I used to.

66). I have never felt better in my life than I do now.

67). The top of my head sometimes feels tender.

68). I resent having anyone trick me so cleverly that I have to admit I was fooled.

69). I do not tire quickly.

70). What others think of me does not bother me.

71). I have never had a fainting spell.

72). I frequently have to fight against showing that I am bashful.

73). I seldom or never have dizzy spells.

74). My memory seems to be all right.

75). I am worried about sex.

76). I find it hard to make talk when I meet new people.

77). I am afraid of losing my mind.

78). I frequently notice my hand shakes when I try to do something.

79). I can read a long while without tiring my eyes.

80). I feel weak all over much of the time.

81). I have very few headaches.

82). Sometimes, when embarrassed, I break out in a sweat which annoys me greatly.

83). I have had no difficulty in keeping my balance in walking.

84). I do not have spells of hay fever or asthma.

85). I wish I were not so shy.

86). I enjoy many different kinds of play and recreation.

87). I like to flirt.

88). In walking I am very careful to step over sidewalk cracks.

89). I hardly ever notice my heart pounding and I am seldom short of breath.

90). I have at times stood in the way of people who were trying to do something, not because it amounted to much but because of the principle of the thing.

91). I get mad easily and then get over it soon.

92). I brood a great deal.

93). I have periods of such great restlessness that I cannot sit long in a chair.

94). I dream frequently about things that are best kept to myself.

95). I believe I am no more nervous than most others.

96). I have few or no pains.

97). Sometimes without any reason or even when things are going wrong I feel excitedly happy, "on top of the world."

98). I can be friendly with people who do things which I consider wrong.

99). I have difficulty in starting to do things.

100). I sweat very easily even on cool days.

101). It is safer to trust nobody.

102). When in a group of people I have trouble thinking of the right things to talk about.

103). When I leave home I do not worry about whether the door is locked and the windows closed.

104). I have numbness in one or more places on my skin.

105). I do not blame a person for taking advantage of people who leave themselves open to it.

106). My eyesight is as good as it has been for years.

107). I drink an unusually large amount of water every day.

108). I do not often notice my ears ringing or buzzing.

109). Once in a while I laugh at a dirty joke.

110). I am always disgusted with the law when a criminal is freed through the arguments of a smart lawyer.

111). I am likely not to speak to people until they speak to me.

112). I have periods in which I feel unusually cheerful without any special reason.

113). At times I am all full of energy.

Scoring

Hypochondriasis:

True = 11, 14, 20, 28, 33, 43, 45, 48, 67, 80, 104

False = 1, 2, 5, 7, 12, 24, 26, 31, 40, 51, 61, 63, 69, 73, 79, 81, 83, 89, 96, 106, 108

Depression:

True = 3, 10, 11, 16, 19, 20, 25, 30, 36, 41, 51, 55, 57, 64, 65, 77, 80, 84, 92, 99

False = 1, 6, 7, 12, 15, 17, 18, 22, 24, 27, 29, 35, 37, 38, 42, 46, 52, 58, 60, 61, 62, 63, 66, 74, 82, 86, 87, 90, 94, 95, 97, 100, 103, 105, 109, 112, 113

Hysteria:

True = 8, 11, 16, 20, 21, 23, 34, 45, 75, 78, 80, 93, 98

False = 1, 2, 4, 5, 6, 7, 9, 13, 15, 24, 26, 32, 38, 39, 40, 42, 44, 47, 49, 50, 53, 54, 56, 59, 61, 66, 68, 69, 70, 71, 72, 73, 76, 79, 81, 83, 85, 88, 89, 91, 96, 101, 102, 106, 107, 110, 111

Appendix D

The Headache-Specific Locus of Control Scale

INSTRUCTIONS: This is a questionnaire designed to determine the way in which people view certain important headache-related issues. Each item is a belief statement with which you may agree or disagree. Below each statement are numbers which correspond to a scale on which you may rate the extent to which you agree or disagree with each item. The values range from "Strongly Disagree" = 1 to "Strongly Agree" = 5. Circle the number that represents the extent to which you disagree or agree with the statement. Please make sure that you <u>answer every item</u> and that you circle <u>only one</u> number per item. This is a measure of your personal beliefs; there are no right or wrong answers.

**1 = strongly disagree; 2 = moderately disagree; 3 = neutral;
4 = moderately agree; 5 = strongly agree**

1. When I have a headache, there is nothing I can do to affect its course.

   1   2   3   4   5

2. I can prevent some of my headaches by avoiding certain stressful situations.

   1   2   3   4   5

3. I am completely at the mercy of my headaches.

   1   2   3   4   5

4. I can prevent some of my headaches by not getting emotionally upset.

   1   2   3   4   5

5. If I remember to relax, I can avoid some of my headaches.

   1   2   3   4   5

6. Only my doctor can give me ways to prevent my headaches.

   1   2   3   4   5

7. My headaches are sometimes worse because I am overactive.

   1   2   3   4   5

8. My headaches can be less severe if medical professionals (doctors, nurses, etc.) take proper care of me.

   1   2   3   4   5

9. My headaches are beyond all control.

   1   2   3   4   5

**1 = strongly disagree; 2 = moderately disagree; 3 = neutral;
4 = moderately agree; 5 = strongly agree**

10. My doctor's treatment can help my headaches.

    1 2 3 4 5

11. When I worry or ruminate about things, I am more likely to get headaches.

    1 2 3 4 5

12. Just seeing my doctor helps my headaches.

    1 2 3 4 5

13. No matter what I do, if I am going to get a headache, I will get a headache.

    1 2 3 4 5

14. Having regular contact with my physician is the best way for me to control my headaches.

    1 2 3 4 5

15. When I have headaches, I should consult a medically trained professional.

    1 2 3 4 5

16. Following the doctor's medication regimen is the best way for me not to be laid-up with a headache.

    1 2 3 4 5

17. When I drive myself too hard, I get headaches.

    1 2 3 4 5

18. Luck plays a big part in determining how soon I will recover from a headache.

    1 2 3 4 5

19. By not becoming agitated or overactive, I can prevent many headaches.

    1 2 3 4 5

20. My not getting headaches is largely a matter of good fortune.

    1 2 3 4 5

21. My actions influence whether I have headaches.

    1 2 3 4 5

22. I usually recover from a headache when I get proper medical help.

    1 2 3 4 5

**1 = strongly disagree; 2 = moderately disagree; 3 = neutral;
4 = moderately agree; 5 = strongly agree**

23. I'm likely to get headaches no matter what I do.

    1 2 3 4 5

24. If I don't have the right medication, my headaches will be a problem.

    1 2 3 4 5

25. Often I feel that no matter what I do, I will still have headaches.

    1 2 3 4 5

26. I am directly responsible for getting some of my headaches.

    1 2 3 4 5

27. When my doctor makes a mistake, I am the one to suffer with headaches.

    1 2 3 4 5

28. My headaches are worse when I'm coping with stress.

    1 2 3 4 5

29. When I get headaches, I just have to let nature run its course.

    1 2 3 4 5

30. Health professionals keep me from getting headaches.

    1 2 3 4 5

31. I'm just plain lucky for a month when I don't get headaches.

    1 2 3 4 5

32. When I have not been taking proper care of myself, I am likely to experience headaches.

    1 2 3 4 5

33. It's a matter of fate whether I have a headache.

    1 2 3 4 5

Scoring

Internal = Σ (items # 2, 4, 5, 7, 11, 17, 19, 21, 26, 28, 32)
Chance = Σ (items # 1, 3, 9, 13, 18, 20, 23, 25, 29, 31, 33)
Health Care Professional = Σ (items # 6, 8, 10, 12, 14, 15, 16, 22, 24, 27, 30)

All three scales have a minimum score of 11 and a maximum score of 55.

Appendix E

The Revised Life Orientation Test

INSTRUCTIONS: Below is a list of statements. Please indicate the degree to which you agree with each of the items using the response format shown. Please be as accurate and honest as you can throughout, and try not to let your answers to one question influence your answers to other questions. There are no right or wrong answers.

0 = strongly disagree; 1 = disagree; 2 = neutral;
3 = agree; 4 = strongly agree

1) In uncertain times, I usually expect the best.

    0   1   2   3   4

2) It's easy for me to relax.

    0   1   2   3   4

3) If something can go wrong for me, it will.

    0   1   2   3   4

4) I'm always optimistic about my future.

    0   1   2   3   4

5) I enjoy my friends a lot.

    0   1   2   3   4

6) It's important for me to keep busy.

    0   1   2   3   4

7) I hardly ever expect things to go my way.

    0   1   2   3   4

8) I don't get upset too easily.

    0   1   2   3   4

9) I rarely count on good things happening to me.

    0   1   2   3   4

10) Overall, I expect more good things to happen to me than bad.

    0   1   2   3   4

Scoring

Filler items = items 2, 5, 6, and 8. These are not included in scoring.

Negatively-framed items = items 3, 7, and 9. These items are reverse coded before scoring. Responses to these items are then summed with the participant's responses to items 1, 4, and 10 to compute an overall optimism score. Thus, scores can range from 0 to 24.

Appendix F

Coping Strategies Questionnaire

INSTRUCTIONS: Individuals who experience pain have developed a number of ways to cope, or deal, with their pain. These include saying things to themselves when they experience pain, or engaging in different activities. Below are a list of things that individuals have reported doing when they feel pain. For each activity, we want you to indicate, using the chart below, how much you engage in that activity when you have a headache, where a 0 indicates you never do that when you are experiencing a headache, a 3 indicates you sometimes do that when you are experiencing a headache, and a 6 indicates you always do it when you are experiencing a headache. Remember, you can use any point along the scale.

0	1	2	3	4	5	6
Never do that			Sometimes do that			Always do that

When I have a headache...

_____ 1) I try to feel distant from the pain, almost as if the pain was in somebody else's body.

_____ 2) I leave the house and do something, such as going to the movies or shopping.

_____ 3) I try to think of something pleasant.

_____ 4) I don't think of it as pain but rather as a dull or warm feeling.

_____ 5) It's terrible and I feel it's never going to get any better.

_____ 6) I tell myself to be brave and carry on despite the pain.

_____ 7) I read.

_____ 8) I tell myself that I can overcome the pain.

_____ 9) I count numbers in my head or run a song through my mind.

_____ 10) I just think of it as some other sensation, such as numbness.

_____ 11) It's awful and I feel that it overwhelms me.

_____ 12) I play mental games with myself to keep my mind off the pain.

_____ 13) I feel my life isn't worth living.

_____ 14) I know someday someone will be here to help me and it will go away for a while.

0	1	2	3	4	5	6
Never do that			Sometimes do that			Always do that

When I have a headache...

_____ 15) I pray to God it won't last long.

_____ 16) I try not to think of it as my body, but rather as something separate from me.

_____ 17) I don't think about the pain.

_____ 18) I try to think years ahead, what everything will be like after I've gotten rid of the pain.

_____ 19) I tell myself it doesn't hurt.

_____ 20) I tell myself I can't let the pain stand in the way of what I have to do.

_____ 21) I don't pay any attention to the pain.

_____ 22) I have faith in doctors that someday there will be a cure for my pain.

_____ 23) No matter how bad it gets, I know I can handle it.

_____ 24) I pretend it's not there.

_____ 25) I worry all the time about whether it will end.

_____ 26) I replay in my mind pleasant experiences in the past.

_____ 27) I think of people I enjoy doing things with.

_____ 28) I pray for the pain to stop.

_____ 29) I imagine that the pain is outside of my body.

_____ 30) I just go on as if nothing happened.

_____ 31) I see it as a challenge and don't let it bother me.

_____ 32) Although it hurts, I just keep on going.

_____ 33) I feel I can't stand it anymore.

_____ 34) I try to be around other people.

_____ 35) I ignore it.

_____ 36) I rely on my faith in God.

_____ 37) I feel like I can't go on.

_____ 38) I think of things I enjoy doing.

_____ 39) I do anything to get my mind off the pain.

0	1	2	3	4	5	6
Never do that			Sometimes do that			Always do that

When I have a headache...

____ 40) I do something I enjoy, such as watching TV or listening to music.

____ 41) I pretend it's not a part of me.

____ 42) I do something active, like household chores or projects.

43) Based on all the things you do to cope, or deal with, your headache pain, on an average day, how much control do you feel you have over it? Please circle the appropriate number. Remember, you can circle any number along the scale.

0	1	2	3	4	5	6
No control			Some control			Complete control

44) Based on all the things you do to cope, or deal with, your headache pain, on an average day, how much are you able to decrease it? Please circle the appropriate number.

0	1	2	3	4	5	6
Can't decrease it at all			Can decrease it somewhat			Can decrease it completely

Scoring

Active coping = Σ (items # 1, 2, 3, 4, 6, 7, 8, 9, 10, 12, 16, 17, 19, 20, 21, 23, 24, 26, 27, 29, 30, 31, 32, 34, 35, 38, 39, 40, 41, 42)

Passive coping = Σ (items # 5, 11, 13, 14, 15, 18, 22, 25, 28, 33, 36, 37)

Diverting attention = Σ (items # 3, 9, 12, 26, 27, 38)

Reinterpreting pain sensations = Σ (items # 1, 4, 10, 16, 29, 41)

Coping self-statements = Σ (items # 6, 8, 20, 23, 31, 32)

Ignoring pain sensations = Σ (items # 17, 19, 21, 24, 30, 35)

Praying or hoping = Σ (items # 14, 15, 18, 22, 28, 36)

Catastrophizing = Σ (items # 5, 11, 13, 25, 33, 37)

Increasing activity level = Σ (items # 2, 7, 34, 39, 40, 42)

Appendix G

Code No. _____

Coping and Headache

Headache is a common, painful, and often debilitating experience for university students. Researchers in the Psychology Department at the University of Manitoba are interested in how different variables impact the experience of headache among this population.

I hereby agree to take part in this project on the understanding that the information I provide will be kept strictly confidential and that I can withdraw from this project at any time without penalty.

_____

Your name (please print)

_____   _____

Your signature   Date

* * * *

On the basis of your participation in this study you may be contacted and invited to participate in a related study in the future, but not this year. If you would be willing to be contacted for such a study, please write your phone number below.

_____

Phone number

Appendix H

Feedback on Headache and Coping

Headaches have become a major public health problem. Prevalence studies indicate that as much as 30% of the general population suffers from chronic headaches. Over 18 million outpatient visits a year are related to headaches. Headaches can be extremely disabling, especially the more severe forms. And yet researchers have observed that among individuals who suffer from headaches of relatively equal severity, there are large individual differences in the degree of disability caused by those headaches. It appears that some people cope better with recurrent headache pain than others. In this research, we are interested in exploring some factors that may account for these inter-individual differences in disability and coping. In particular, we are looking at how a number of different personality variables and different pain coping strategies affect a person's ability to cope with the pain of recurrent headaches. In participating in this project you have contributed in an important way to the continuation of such search for relevant variables to the overall experience of headache. Thank you for your time, and if you have any questions at all about the study, or about headaches and headache treatment, please do not hesitate to ask the researcher running the session, or contact Lisa Jarrett or Dr. Michael Thomas at the Psychological Service Centre at 474-9222.