

Stress, Coping and Headache: An
Investigation into the Role of Coping in the
Relationship between Stress and Headache

by

Pamela J. Chenhall

A thesis submitted to the Faculty
of Graduate Studies in partial fulfilment of the
requirements for the degree of
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Abstract

Canonical correlation analysis was performed to determine if coping was associated with stress and headache in a university population. Subjects were 320 first year university students between the ages of 18 and 20. The subjects completed a series of questionnaires which measured stress, coping, headache frequency, intensity and duration, and demographic variables like sex, income, and marital status. It was found that subjects who reported more headache pain also reported more negatively-weighted stress and greater use of emotion-focused coping strategies. It was found that females reported more stress, more headache frequency and intensity, and reported the use of more emotion-focused coping strategies than males. Finally, subjects who moved away from home concurrently with entering university did not report more negatively-weighted stress, more headache intensity and duration, or more emotion-focused coping strategies than those who did not. They did, however, report more headache frequency.

Stress, Coping and Headache: An
Investigation into the Role of Coping in the
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Recent research has identified a unique phenomenon in complaints of pain. It seems that younger persons are complaining of more pain than are older persons (Taylor & Curran, 1985; Thomas, Roy, & Makarenko, 1989). This phenomenon of younger persons reporting more pain than older individuals is especially pronounced for headache pain, a phenomenon yet unexplained, both physiologically and psychologically. Within a university population, headache is the most frequently reported pain (Thomas, Roy, & Cook, 1991; Roy, Thomas, & Cook, 1991; Roy, Thomas, & Makarenko, 1990). Headaches occur as a result of numerous different factors or combination of factors. Some variables that have been linked to headache onset are illness, stress, and physiological or neurological disturbances. Stress, as a variable, has been consistently associated with headache as both a causative factor and a contributing factor. It is typically difficult to identify the specific causes for

a particular headache, but given the frequency of complaints of headache pain in a university population it is important to try to understand the interaction between hypothesized factors that may be underlying these complaints. Without a clearer etiological understanding of headache in young adults, appropriate treatment is hindered.

While stress is defined in many ways, one source of stress is transition periods, through which we all pass several times during our lives. Most transition periods entail considerable adjustment and are defined by physical changes (for example in adolescence), social changes (for example marriage in young adulthood), career changes (for example relocation due to employment), or environmental changes (for example moving from high school to university). These events may create stress in the lives of the persons involved, whether those persons consider the events desirable or undesirable. The method by which people cope with a particular transition may play a part in how they meet the challenges that accompany that particular transition. For example, the way people cope with the

transition to university may have an effect on their marks, their happiness, or their homesickness (if they have moved away from home at the same time).

The purpose of the present research was to examine the role of coping in mediating the relationship between stress and the frequency, intensity and duration of headache in a university population in transition. In the following pages the principle research on stress, coping, and headache are reviewed in detail.

Transition Periods

As indicated previously, the university students involved in the present research were considered to be in a transition period, adjusting to the move from high school to university. Transition periods create a vulnerability in those persons experiencing the transition and during this period of vulnerability people are more likely to be affected by stressors than during periods of stability (Compas, Wagner, Slavin, & Vannatta, 1986). Their coping capacities may be severely overloaded resulting in the increased possibility of psychological and somatic

symptomatology. The perceived desirability of the transition may serve to mediate its impact, leaving the person better equipped to deal with other stressful events.

The adjustment to changed expectations and new challenges of a university environment can be stressful. If the move to university also involved moving from the family home, an additional transition is created that involves dealing with separation from loved ones and the potential for homesickness.

Transition periods involve change, loss, or disruption of the prior order in people's lives that may overload their coping capacities, which in turn can lead to psychological or somatic distress. Persons in transition may have so much with which to deal that additional stressors, like daily hassles, may wreak havoc in their lives. Compas et al. (1986) found that the association of symptoms with prior life events was highest when students had both recently entered a new school and living environment. This data further exemplifies the potential for increased distress when two transitions are being dealt with concurrently.

Fisher and Hood (1987) found that all students who had just entered university reported a rise in psychological disturbance and absent-mindedness. They noted that homesick students had lower scores on a college adaptation questionnaire than nonhomesick students. Fisher and Hood (1988) further identified that the total effect of the transition to university was worse for females when compared to males. The experience of dealing with the transition to university is not a unique but a common experience which is dealt with differently because of the difference in personal resources. Fisher and Hood (1987) identified sex differences in one dimension but the potential for differences in other variables such as socioeconomic classes, religious groups, etc. are there.

Perceived desirability of life change events plays a role in how transition is negotiated. In a study of the desirability of life change events (Newcomb, Huba, & Bentler, 1986), females perceived life change events as more undesirable than males, except for increased autonomy which females perceived more positively. Stark, Spirito, Williams, & Guevremont (1989) noted a

similar pattern in their research.

Coping

Coping is defined as a person's constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the person's resources (Folkman, Lazarus, Dunkel-Schetter, DeLongis & Gruen, 1986). There are three key features to this definition of coping. First, coping is considered process oriented which implies that coping focuses on what a person is thinking and what a person is doing during a stressful encounter, and how these behaviours change throughout the duration of that encounter. Second, coping is influenced by a person's appraisal of the demands of a stressful encounter and the resources available to manage those demands. Finally, coping is not considered good or bad but is viewed as a person's efforts to manage the demands of a stressful situation. Value judgements are not placed on coping responses, rather coping is simply recognized as a moderator of a stressful situation. The general aim of a coping response is to remove an imbalance between existing

demands and capacities (Krohne, 1986). Central to this concept is "the fundamental assumption that people are actively responsive to the forces that impinge upon them" (Pearlin & Schooler, 1978). People do not generally passively allow the forces of life to act upon them, rather they act, whether consciously or unconsciously, to make "forces" more manageable.

Coping is a dynamic process, in which a person may rely more heavily on one form of coping than another under certain circumstances (Folkman & Lazarus, 1980). Coping is not a unidimensional behaviour but a behaviour that includes functions at several levels. It is a combination of a variety of behaviours, cognitions, and perceptions (Pearlin & Schooler, 1978). Coping varies as to the demands of a changing situation.

Coping style can be construed as a generalized strategy used in approaching problems. This strategy is used irrespective of the source or nature of the problems (Patterson & McCubbin, 1987). A strategy is a plan of action and a process of elimination that has worked effectively in the past and is likely to

work again in the future. It is a combination of many different coping methods that are activated by environmental cues. Experience provides both the cues and the skills necessary to manage the stress of a given situation. Employment of a strategy depends to a certain degree on the demands of a situation and there are times when a coping strategy is inconsistent with the demands of the environment. The degree of efficacy of a coping strategy depends on the interaction between the specific characteristics of the situation and the context of the strategy being used (Krohne, 1986).

Appraisal is an important part of the coping process. It is a cognitive process that evaluates an event on two levels: what is at stake and what resources and options are available. The former is known as primary appraisal and the latter as secondary appraisal (Folkman & Lazarus, 1980). There are three possible judgements that can be made after a primary appraisal has been made: irrelevant, benign-positive, or stressful. An irrelevant encounter is one that is considered to have no significance for well-being while a benign-positive encounter does not exceed a person's

resources and seems to indicate only positive consequences. Stressful encounters have three distinct classifications (Folkman, 1984): harm-loss refers to the damage that has already occurred due to the stressor; threat refers to harm or loss that could potentially occur; and challenge refers to an opportunity for mastery or gain (Folkman & Lazarus, 1980).

Primary appraisal is shaped by beliefs and commitments, and by situational factors, like the nature of the harm or threat and what the expected outcome is (Folkman, 1984). Primary appraisal is not a function of the personal world or the situation singly but occurs in the context of both. The two "worlds" are intimately linked together. Not all successful conclusions are reached by satisfying both "worlds" but the personal backlash can be lessened by doing so.

During secondary appraisal, coping resources are evaluated in terms of the demands of the situation. Coping resources are drawn from the physical, social, psychological and material assets realms. Situational appraisals of control are also part of the secondary

appraisal process (Folkman, 1984). The degree to which a situation is considered controllable plays a part in determining how a person confronts the stressful situation. Variability in coping is partially a function of primary and secondary appraisal (Folkman et al., 1986). Coping in two seemingly similar events may in fact be very different due to factors influencing primary and secondary appraisal at any given moment.

Two types of coping, emotion-focused and problem-focused, have been defined by many researchers (e.g., Cohen, 1987; Endler & Parker, 1990; Folkman & Lazarus, 1980; Pearlin & Schooler, 1978). Problem-focused coping strategies deal with internal or environmental demands that create a threat situation. Emotion-focused coping strategies involve the management of the emotional distress that accompanies the stressful situation (Cohen, 1987). Problem-focused coping is used in the control of the troubled person-environment relationship, control which is achieved through problem-solving, decision-making, or direct action. Problem-focused strategies are qualitatively different from emotion focused strategies (Folkman, 1984).

Problem-focused strategies aim to deal directly and actively with the factors causing the stressful situation. The emotion-focused approach involves alleviating the distress and upset accompanying the stressful situation, in lieu of confronting the stressor. Compas (1987) notes that the utilization of both problem- and emotion-focused coping are important in successful adaptation to stress and effective coping is generally characterized by flexibility and change.

While there are many ways of coping within any given problem situation there are five approaches that have been consistently identified (Cohen, 1987). The first one is information-seeking which involves trying to gather as much information about the situation and what can be done to modify it. Second, direct action is any behavioural act chosen to deal with the problem situation. Inhibition of action is the third identified way of coping and refers to the ability to resist taking action in a situation where this action may increase the risk of harm, danger, or conflict with moral restraints. Inhibition of action can be likened to avoidance or ignoring that the situation exists.

The fourth way of coping occurs through the use of intrapsychic processes that involve different ways of reappraising the problem situation. Finally, turning to others for support enables some to deal more effectively with the problem situation. However, there is no consensus as to which of the coping strategies is most effective in terms of resolving problems, preventing further difficulties, or relieving emotional distress (Aldwin & Revenson, 1987).

The literature has identified some differences in the use of coping methods between the sexes and between different age groups. Folkman and Lazarus (1980) found that in a middle-aged community sample the expected gender differences in coping were not found. Men were expected to use more problem-focused coping than women, and women more emotion-focused coping than men. In fact, men were noted to use more problem-focused coping than women, but this was true only at work and in situations appraised to require acceptance and more information.

Pearlin and Schooler (1978) investigated the structure of coping and found that men possessed

psychological attributes or employed responses that were more likely to inhibit stressful outcomes. In contrast, women were more likely to employ a response that resulted in more stress. In developing their adolescent coping measure, Patterson and McCubbin (1987) found that adolescent females tended to report the use of a broader range of coping patterns than males. Billings and Moos (1984) showed that women made significantly greater use of information seeking and emotional discharge as ways of coping with problem situations. Another investigation of coping strategies found that women are more likely to avoid confrontation, self-blame and turn to social support networks (Labouvie-Vief, Hakim-Larson, & Hobart, 1987). Men were found to engage in planful problem solving. But, neither of these findings reached statistical significance. Finally, Billings and Moos (1981) noted that women were more likely to use avoidance coping. This strategy was associated with greater impairment of functioning.

Pearlin and Schooler (1978) noted that younger age groups are more likely to be self-denigrating but also

will entertain a sense of mastery. In another study looking at a cross-sectional comparison of adaptive coping in adulthood, Irion and Blanchard-Fields (1987) noted that middle-aged and older adults were less inclined to endorse hostile, escape avoidance, and self-blame strategies when compared to adolescents and young adults. Adolescents, when encountering a threat situation, tended to use confrontive coping and distancing more often. Their conclusion was that young adults used more planful problem solving but only in a threat situation. Labouvie-Vief et al. (1987) noted that younger individuals used fewer mature strategies despite their assessment of perceived controllability. Older participants varied their strategy use with respect to levels of controllability.

It is important to note that discussed differences between sexes and age groups may parallel recognized sex differences and age differences in headache complaint reports. Perhaps coping is the missing piece of the puzzle that helps explain the discrepancies between groups. Differences in styles of coping between men and women may be linked to differences in

headache pain complaints. Women may be experiencing headaches more frequently and more intensely because their style of coping may be less efficient, allowing stress to exact its consequences. Specifically, women's slight tendency to favour emotion-focused coping may be less effective in controlling stress and thus result in increased headache pain complaints.

Unfortunately, no simple relationship has been established between coping strategies and health status in general. It has been suggested that coping is a moderator between stress and illness (Nowack, 1989), but this has not as yet been proven. In a study of appraisal, coping, health and symptoms, Folkman, Lazarus, Gruen, and DeLongis (1986) found that the more subjects had at stake and the more they coped, the more they rated themselves as having a poorer health status. In their book (Lazarus & Folkman, 1984), the authors suggested that coping might adversely affect somatic health status in three ways: (1) coping could influence the frequency, intensity, duration, and patterning of neurochemical responses; (2) when coping involves use (in excess) of alcohol, drugs, and tobacco or

activities in which there is high risk of life and limb for the person; or (3) certain coping strategies may interfere with adaptive health/illness-related behaviour. Aldwin and Revenson (1987) found that the causal relationship between coping and mental health is bidirectional. They felt that for some people, the greater the initial level of emotional distress and the greater the severity of the problem, the more likely these persons are to cope using maladaptive strategies. This results in increased emotional distress and possibly an increased probability of problems in the future.

Adolescents and Coping. In recent years, adolescent coping has increasingly become a topic of interest. Investigators are interested in the stability of coping over the adolescent period, the type of coping skills used by adolescents, and whether or not adolescents and adults can be compared in terms of coping style. Patterson and McCubbin (1987) described four sources from which adolescents learn how to cope with life's stresses. First, previous experience in similar situations provides a pattern

from which the adolescent designs his or her response. The second source is vicarious experience, which involves observing the success or failure of others, especially family members. Third, perceptions of the adolescents' own physiology and the inferences they make concerning their vulnerability influence how they learn to cope. Finally, social persuasion or influence is a source of coping behaviours. The authors felt that coping style in adolescence is not situation or role specific but more rigid, characterized by a pattern of coping responses designed to deal with any stressful experience.

Wagner and Compas (1990) reported that adolescent females, like adult females, may be at more risk than males for experiencing stress related to negative events in their lives. In their study, adolescent females reported more negative life events than males. The authors noted that in general the academic setting puts adolescents in a position of vulnerability. "Academic events represented the domain with the greatest potential psychological costs for college students, because the threats of academic work are

particularly salient for those older adolescents who are attending college and presumably have invested themselves in academic achievement."

In a study of coping strategies with older children and younger adolescents, Compas, Malcarne, and Fondacaro (1988) found that generation of emotion-focused problem solutions increased from grade six to grade eight. The same was not true for problem-focused solutions, the generation of problem-focused solutions remained nearly consistent. Subjects were noted to considered the causes of academic stressors as more controllable (compared to causes of social stressors) and therefore tended to generate more problem-focused solutions in academic situations. The authors also noted that the number of generated problem-focused solutions for social stressors interacted with the perceived controllability of these events in relation to self-reported emotional and behavioral problems. Specifically, more problems were associated with a mismatch between perceived control and perceived attempts at coping.

One other point of interest is that coping in

adolescence can act as a source of strain (Patterson & McCubbin, 1987). Adolescent coping may take the form of drug and alcohol use, running away from home, or other similar behaviours, that cause more problems than solutions (Labouvie, 1986). This is a factor that must be considered when working with adolescents experiencing stressful situations.

Coping Measures. Coping can be assessed in one of two ways: as a disposition (or trait) or as an episodic indicator (Cohen, 1987). Coping dispositions are the tendency to use a certain type of coping across many different stressful situations. This tendency is normally assessed by a questionnaire or projective measure designed to indicate the coping behaviour used in a stressful situation. Generally, trait measures are poor predictors of coping processes (Folkman & Lazarus, 1980).

Episodic coping is defined as the strategies that a person uses to cope with a particular situation (Cohen, 1987). The Ways of Coping Scale (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986) used in the present research is an example of such a

measure. Subjects respond to a checklist in terms of a stressful situation that they specify or that is specified for them. The other measure used was the Coping Inventory for Stressful Situations (Endler & Parker, 1990), which assessed the extent to which one uses a particular strategy upon encountering a difficult, stressful, or upsetting situation. Either measure would have been sufficient to survey coping skills, however using both measures provided an opportunity to compare the two measures and assessed whether they were measuring the same theoretical dimensions of coping. It also enabled the determination of which measure was more useful in the prediction of the relationship between stress and headache.

Stress and Coping. Stress is defined "as a relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and as endangering well-being" (Folkman et al., 1986; p. 572). A stressful encounter is considered a dynamic, unfolding process, not a static, unitary event (Folkman & Lazarus, 1985).

Stress is not a property of the person or a property of the environment. It is not a stimulus or a response but a specific relationship between the person and their environment (Folkman, 1984). Stress can be differentiated into two categories: (1) physical stressors and physical injuries, and (2) psychosocial stressors (Endler, 1988).

Whether a given situation is perceived as personally threatening is determined by several factors that range from the general mood of the person to memories triggered by the current situation (Endler, 1988). It is here that appraisal (mentioned earlier) plays a role. Primary appraisal determines how the event is perceived.

An ongoing debate concerns the impact of major versus daily stressful events. Current research seems to indicate that major events result in psychological symptoms through daily events. Wagner, Compas, & Howell (1988) investigated this pathway with adolescents, and found that "the effects of major life events on psychological symptoms were shown to be mediated by negative daily events. Major events led to

an increase in daily stress, which, in turn, led to increased psychological symptoms." DeLongis, Coyne, Dakof, Folkman, and Lazarus (1982) found that daily hassles were more closely related to health status than major life events. Specifically the frequency and intensity of hassles was found to have a positive correlation with the degree of somatic illness. Therefore the measures used in the present research assessed both these types of stressful events.

These measures were the Adolescent Perceived Events Scale (Compas, Davis, Forsythe, & Wagner, 1987) and the Student Life Event Survey (Makepeace, 1983). The Adolescent Perceived Events Scale is a combination of major life event and daily hassle items. Subjects determine the desirability (positive rating) or undesirability (negative rating) of an event. The Student Life Events Survey is made up of major life events considered important to students. The four scales which result from this measure are predetermined and disregard student feeling about the event. Using both measures provided data which was used in determining which provided a better predictor of

headache pain, a major life events scale or a combination scale that reflects student perception of stress.

Summary of Stress and Coping Literature

Coping is a multifaceted behaviour employed in different ways for different reasons. No two people will use the same coping method because of differences in their personal worlds and the cues they perceive from the stressful situation. Coping can take many forms but generally falls into two broad categories: problem-focused and emotion-focused coping. Problem-focused coping is generally considered more adaptive but each serves a specific purpose in the coping process. Coping is also influenced by the perceived controllability of a given situation. For instance, if the situation is perceived to be within people's control, they may be more inclined to use problem-focused coping. If the situation is perceived as uncontrollable, alleviation of distress through emotion-focused coping may be considered the most viable plan of action.

Adolescents as a group are of particular interest

because they are less flexible in their coping style and because of their academic involvement much more vulnerable to the stress of that environment. The transition to university from high school can create a host of stressors with which adolescents must deal. In terms of the definition of stress, the transition can be considered the major life event and the demands of the university environment as daily hassles. Coping skills are considered to be a mediator that attenuates the impact of stress (Billings & Moos, 1984). Stated simply, coping skills play a role in how a person deals with the stress of a transition. It is for these reasons that on one of the coping measures, the stressful situation was designated as the move from high school to university. Stress also was assessed by two stress measures specifically designed for this age group, university freshman between the ages of 18 and 20.

Headache

The Headache Classification Committee of the International Headache Society (1988) created a new classification system for headache that codes headaches on a hierarchical system (Olesen, 1990). The most frequently investigated primary headaches are the migraine headache (with and without aura), the episodic tension-type headache, and the cluster headache. Migraine headaches are characterized by a duration of four to 72 hours, unilateral location, pulsating quality and frequently accompanied by nausea and/or vomiting and sensitivity to light and sound. Episodic tension-type headaches last from 30 minutes to seven days, have a nonpulsating quality of mild to moderate intensity and are located bilaterally. The cluster headache is characterized by severe unilateral, orbital supraorbital or temporal pain. Attack frequency ranges from one every other day to eight per day and attacks are accompanied by a range of symptoms on the pain side like nasal congestion and swollen eyelids. Of these three types of headache, episodic tension-type headache has been identified as the most common form of head

pain complaint in adults (Friedman, 1979; Kudrow, 1976; Lance, 1978; Martin, 1972;). The etiology of tension headaches is considered to be largely psychophysiological (Woods, 1988). This means that tension headaches originate as the result of a combination of psychological and physiological factors.

Headache prevalence in a university student population has been examined by many investigators. Andrasik, Holroyd, and Abell (1979) examined the prevalence of headache within a college student population and found that 20.0% of this population experienced a headache three to four or more times per week. Seventy-three percent of those students experiencing headache considered them to be at least moderately painful and females judged their headaches to be more intense than males. On average, 28.4% of students reported that their headaches lasted four to eight hours. Attanasio and Andrasik (1987) replicated these findings at another university. In this study they investigated the nature of the reported pain and found that 46% reported pain as always or mostly throbbing, 34% as always or mostly deep and steady, and

15% as mixed.

Ogunyemi (1984) looked at headache prevalence among Nigerian university students. He found that 61% of the females and 59% of the males suffered from recurrent headache. The muscle contraction-vascular headache (mixed) was the most common type of headache recorded, with 24.4% of females and 33.2% of the males experiencing that type of headache. Ogunyemi also noted that 60% of the students interviewed developed recurrent headache after admission to University.

In another study of headache prevalence, Martin and Nathan (1987) found that 20.4% of students questioned experienced one to two or more headaches per week and 5.5% experienced three to four per week or more and females were found to experience more frequent headaches than males. When asked to rate the intensity of their headache, 51.1% rated headache intensity as at least moderately painful. Females, again, reported more intense headaches than males, and as well, experienced longer headaches.

Headache and Stress. Typically headache onset is perceived as gradual and seems to be associated with or

follows emotional or situational stresses (Woods, 1988). Clinical observation of recurrent tension headache sufferers suggest that stress is the most frequent precipitant (deBenedittis, Lorenzetti, & Pieri, 1990; Holm, Holroyd, Hursey, & Penzien, 1986; Nattero, deLorenzo, Biale, Torrie, & Ancona, 1986). Hovanitz, Chin, and Warm (1989) proposed that life stress plays two roles in the occurrence of headache. Acute stress (major life events) acts as the immediate precursor of a headache by competing for the attention given to one's internal state or requiring behaviour that makes attempts to return to a desired state difficult. Life event stress (daily hassles) serves to exacerbate the effect of acute stress. This occurs because life event stress requires a certain amount of attention, depleting the resources available to deal with acute stress.

The Nuprin Pain Report was published in 1985 and provided some useful information on pain prevalence. The surveyors gathered information on stress and pain, in addition to numerous other variables (Sternbach, 1986). The results indicated that high levels of

stress were more likely to be associated with pain experience than low levels of stress. Eighty-four percent of subjects experiencing high levels of stress reported headaches on one or more days and 25% on 31 or more days. Many of the respondents indicated that unspecified stress was the cause of their pain and it was noted that individuals with high scores on a hassles scale were more likely to experience pain more frequently than low scorers on the same scale.

In a study of the role of stress in recurrent tension headache, Holm, Holroyd, Hursey, and Penzien (1986) found that while headache sufferers reported experiencing only one more stressful life event in the past year than the headache-free controls, they experienced seven more daily hassles in the last month when compared to the same group. Recurrent tension headache sufferers also experienced daily hassles and life events as more stressful. Within this group, females experienced these events as significantly more stressful than males.

Similarly, deBenedittis, Lorenzetti, & Pieri (1990) found that persons experiencing chronic primary

headache reported a greater number of life change units in the year prior to headache onset than headache-free controls. Patients also reported a higher negative change score, specifically a higher incidence of exits, interpersonal arguments and difficulties, and work events as compared to the control group.

Finally, in a study referred to earlier, Ogunyemi (1984) made a speculation about why university students may be evidencing a higher prevalence of recurrent headache. He referred to the possibility that "a high level of "floating" tension and stress within the University environment" (p.130) may contribute to the higher prevalence rates. However, to date this speculation remains unsubstantiated and in fact, very little has been done to identify the specific precursors of headache in such a population.

Summary of Headache Research

The above literature identified that headache is a common pain experience among university students. Episodic tension-type headache is the most frequently reported type of headache. On average, most students experiencing headaches considered them to be at least

moderately painful, although the quality of pain differed. A consistent sex bias was also reported; females experienced headaches more often, experienced headaches as more intense, and experienced headaches longer than males.

The literature presented also identifies a link between stress and headache occurrence. The stress, which seems to precipitate headache pain, involves a combination of acute stress (major life events) and life stress (hassles). Clearly, stress and headache are linked, but the nature and the direction of this association has not been firmly established. It is conceivable that while stress may cause headache, the reverse also may be true, that headache may cause stress. The question to be addressed is why do some people under high levels of stress experience headache while others do not? What protects some people from headache pain and not others is a matter of speculation but it is conceivable that coping, which helps in the management of stress, also may mediate between stress and one of its common physiological symptoms, headache.

Stress, Coping, and Headache

A study looking at the role of stress in recurrent tension headache noted that recurrent headache sufferers use less effective coping strategies than headache free controls (Holm, Holroyd, Hursey, & Penzien, 1986). Specifically, recurrent headache sufferers reported a greater use of avoidance, self criticism, and less use of social contact. Recurrent headache sufferers judged their coping strategies to be less effective. For these reasons it is important to continue to explore the role of coping as it relates to the relationship between stress and headache pain. It is particularly important to do so in a population that frequently cites headache as a pain complaint. If it is true that coping plays a role in managing the stress of transition then an intervention program on coping with transition can be designed for this group.

Based on the above discussion of stress, coping, and headache, the following hypotheses are made:

Hypothesis 1: High headache pain complaints as measured by frequency, intensity and duration of headache will be associated with high stress and emotion-focused

style of coping.

Hypothesis 2: Females will report more stress, more headache pain, and use more emotion-focused coping than males.

Hypothesis 3: Subjects who moved away from home at the time of entering university will report more stress, more headache pain, and use more emotion-focused coping than those subjects who did not.

Method

Subjects

The subjects for this study were 320 first year university students between the ages of 18 and 20. These students completed a series of questionnaires including the 1) Revised Ways of Coping Scale (WCS-R; Folkman, Lazarus, Dunkel-Schetter, DeLongis & Gruen, 1986), 2) the Coping Inventory for Stressful Situations (CISS; Endler & Parker, 1990), 3) Adolescent Perceived Events Scale (Compas, Davis, Forsythe, & Wagner, 1987), 4) the Students Life Events Schedule (SLES; Makepeace, 1983), 5) a measure of headache frequency, intensity and duration, and 6) demographic information (see

Appendix A for items five and six). The demographic questionnaire contained a headache checklist to aid in the diagnosis of migraine headache sufferers. Migraine research is pointing to migraine as a neurological disorder and as such may not be influenced by the psychological variables under investigation. (For examples of such research see Appel, Kuritzky, Zahavi, Zigelman, & Askelrod, 1992; Spierings, 1991; and Welch, D'Andrea, Tepley, Barkley, & Ramadan, 1990). The headache checklist was taken from Olesen (1990) and is similar to a checklist used by a local pain clinic.

Assessment Instruments

Two measures were utilized to gain an objective estimate of the current degree of stress each subject was experiencing. Both measures are designed specifically for the age group under consideration. It should be noted that the items under considerations are those incidents or episodes that are most relevant to this age group. These items may not all be relevant at later stages of the life cycle. However, I felt that other available measures like the Social Readjustment Rating Scale (Holmes & Rahe, 1967) and the Life

Experiences Survey (Sarason, Johnson, & Siegel, 1978) did not contain sufficient life experiences relevant to this age group.

The Adolescent Perceived Events Scale. The Adolescent Perceived Events Scale (APES) (see Appendix B) was developed by Compas, Davis, Forsythe, and Wagner (1987) in response to a number of criticisms levied against other life events checklists developed for children and adolescents. The authors developed the measure as an adequate assessment of major and daily stressful events during the adolescent period specifically. Items on the scale were drawn from the open-ended responses of adolescents. They are considered representative of major events and daily stressors (Wagner, Compas, & Howell, 1988). It consists of a checklist to which the subjects indicate first whether each event (a) had occurred within the past three months or (b) had never occurred or occurred prior to this three month period. Second, the subjects rate the events that had occurred during the past three months on age appropriate cognitive scales. These cognitive scales are desirability, impact, and

frequency of occurrence of events. These scales are rated on nine point Likert scales: desirability (-4 = extremely undesirable; 0 = neither desirable nor undesirable; +4 = extremely desirable); impact (1 = no impact; 9 = very extreme impact); and frequency (1 = only once in your life; 9 = everyday). The scale has three versions based on chronological age. These three groups are young adolescent (12-14 years), middle adolescent (15-17 years), and older adolescent (18-20 years). In the present study, the older adolescent version was used. Older adolescents rate each event with respect to desirability, impact, and frequency of occurrence of events. The authors feel that the reliability of the APES exceeds most adult measures and is sufficiently stable so as not to be affected by memory lapses or the fabrication of events. Test-retest reliability of event occurrence was 89% agreement over two weeks and concurrent validity was 82% agreement (through corroboration with close friends) for the older adolescent group (Wagner, Compas, & Howell, 1988).

The Student Life Events Schedule. The Student

Life Events Schedule (SLES; Makepeace, 1983) (see Appendix C) is a 49 item checklist to which the subject responds (A) the event has occurred in the past year or (B) the event has not happened. Each item is designated as desirable (D); undesirable, not health related (UNH); undesirable, health related (UH); or neutral (N).

The Revised Ways of Coping Scale. The Revised Ways of Coping Scale is a 66 item inventory that describes cognitive and behavioral strategies used to manage stressful encounters, both internally and externally (Folkman et al., 1986) (see Appendix D). Subjects were asked to rate to what extent they use the different listed strategies to manage a current stressful situation. These ratings are made on a four point Likert scale (0 = does not apply and/or not used; 1 = used somewhat; 2 = used quite a bit; 3 = used a great deal). Factor analysis conducted on the original sample revealed eight factors that comprise the eight scales on the WCS. These scales are, in order, confrontive coping ($\alpha = .70$), distancing ($\alpha = .61$), self-control ($\alpha = .70$), seeking social support ($\alpha =$

.76), accepting responsibility ($\alpha = .66$), escape-avoidance ($\alpha = .72$), planful problem-solving ($\alpha = .68$), and positive reappraisal ($\alpha = .68$). These eight scales account for 46.2% of the variance. Because the WCS is conceptualized as a process that changes over time, the concept of test-retest reliability is somewhat difficult to apply (Tennen & Herzberger, 1985). Intercorrelations between the scales range from -.04 to .39.

The Coping Inventory for Stressful Situations.

The Coping Inventory for Stressful Situations (Endler & Parker, 1990) (see Appendix E) is a 48-item inventory with three subscales; "task-oriented coping," "emotion-oriented coping," and "avoidance-oriented coping." Items in the inventory are rated on a five-point Likert scale (1 = not at all to 5 = very much). Endler and Parker (1990) reported alpha reliabilities ranging from .69 to .91. Test-retest reliabilities range from .51 to .73. Factor structures were identical for males and females in both the undergraduate and adult samples (Endler & Parker, 1990). Initial investigations into the construct validity of the CISS have been positive.

Overall, the authors feel that recent studies have established that "the CISS is a valid, reliable, and useful measure of three basic coping styles or strategies: task-oriented coping, emotion-oriented coping, and avoidance-oriented coping" (Endler & Parker, 1990; p. 2).

Procedure

Participants in the present research were obtained from the Introductory Psychology subject pool at the University of Manitoba. This was accomplished by entering the classes and requesting subjects in the appropriate classifications defined by the researcher. Specifically, subjects between the ages of 18 and 20 in their first year of university were selected. The questionnaires were filled out in one of the university classrooms on one of three days. The subjects signed a consent form before completing the questionnaire (see Appendix F). The questionnaires were placed in counterbalanced order.

Results

Subjects were 320 first year university students between the ages of 18 and 20. One subject was eliminated because of incorrect age. A further 25 were eliminated because the reported headache symptoms matched the criteria for migraine headaches (Olesen, 1990). The remaining 294 (92% of the original sample) were included in the following analysis.

Demographic Information

The average age of the subjects in this sample was 19.75 years. Fifty-one percent of the sample was male and 49% was female. The majority checked their religious affiliation as Christian (68.9%). All subjects were single and 81.3% reported living at home. Of the 74 students who had moved from home in the past year the largest percentage (29.7%) were living in university residence. The next largest percentage (25.7%) reported living in an apartment with roommates. Of those students who had moved, 51.4% moved from outside Winnipeg, 18.9% from out of province, 16.2% from within Winnipeg, and 13.5% from outside Canada. The average family of origin income reported for this

sample was \$62,000.00 and the average personal income \$4400.00. Forty-eight percent of the subjects were employed part-time and 50% were full-time students. The majority of the sample (66%) reported they received their income from salary.

Headache Experience

The sample reported an average of 1.4 headaches in the week prior to the experiment, lasting an average 3.2 hours and the headaches were rated 4.5 (moderately painful) on average on a scale from one (not at all painful) to ten (most painful possible) (intermediate points on the scale were not anchored). The reported average number of headaches experienced in a typical week was 1.2. See Table 1 for subject reports of headache diagnosis. Completed headache diagnostic checklists were reviewed utilizing current diagnostic criteria to confirm above subject reports of headache diagnosis. While such a checklist does not provide sufficient information to make an accurate diagnosis of headache experience, the checklist was used to separate those meeting migraine criteria from the remaining subjects. Each subject was reviewed individually using

both the checklist and the reported frequencies and durations of subjects' headaches. Only those subjects meeting all criteria were eliminated. Please see Table 2 for the results of this review. Only five subjects were currently in treatment for their headaches and all five were receiving medication. Finally, 24% of subjects reported a family history of headache.

Table 1

Diagnosis of Headaches as Reported by Subject

Diagnosis	Subjects Reporting	
	Number	Percentage
tension	54	17.2
cluster	19	6.1
migraine	15	4.8

Table 2

Diagnosis of Headache Based on Diagnostic Criteria

Headache Diagnosis	Number Identified
migraine	25
tension / cluster	294

When subjects were asked if they had noticed any changes in their headaches in the past six months, 104 subjects responded positively. Of these, 57.6% reported increased frequency, 16.3% increased pain, and 10.6% decreased frequency. The majority who reported change reported change of a negative type. Please refer to Table 3 for a summary of how subjects described their headaches. When asked to rate how much their headache pain interfered with their social life, 64.2% said not at all while the next highest percentage (19.2%) reported two on a scale of one (not at all) to five (extremely). When asked to rate how much their headache pain interfered with daily responsibilities

52.5% said not at all and the next highest percentage (26.7%) reported two on a scale of one (not at all) to five (extremely).

Table 3

Reported Headache Descriptors

Descriptor	Number Reported	
	Number	Percentage
throbbing	89	27.8
continuing	77	24.1
dull	62	19.4
pulsating	56	17.5
pounding	53	16.6
sharp	29	9.1
nauseating	24	7.5
intermittent	15	4.7
radiating	12	3.8
other	7	2.2
transient	1	0.3

Initial data screening involved factor analysis to examine whether some data reduction procedures would be desirable or possible with the multiple measures used for both coping and stress. Principal components analysis was performed on the six stress variables and eleven coping variables separately. Based on this analysis, a principal factor extraction with varimax rotation and Nfactor of 1 for the stress variables and Nfactor of 2 for the coping variables was performed through SAS. The one stress factor defined by this procedure was best described as a general stress factor. While the factor provided useful information for future consideration, it did not provided the necessary information to continue further analyses with respect to the hypotheses and thus was discarded.

(Please see Table 4 for a description of this factor.)

Of the two factors identified with the coping variables, the first factor was labelled instrumental or action-oriented coping. The second factor was determined to best represent the concept of task or problem-focused coping. However, as with the stress variables, the factors for coping did not load as

theoretically expected and while they provide useful information on the two measures used, it was decided they would serve no useful purpose with respect to the research questions. It was felt that entering each variable separately, as opposed to by factor, would provide the most useful information. (Please refer to Table 5 for a description of the factor loadings.)

Given the results of the factor analysis it was necessary to conduct analyses that would enable the selection of the variables with which to continue the analysis. A simple regression was conducted with all stress and coping variables on individual headache variables using SAS. None of the beta-weights in the three regressions were found to be significant. Please see Appendix G for the results of the simple regressions. Additionally, correlations were conducted on all variables to achieve an understanding of how they were related. The results of these analyses are found in Appendix H. After reviewing these analyses it was decided that stepwise regressions best served to provide the necessary information to continue analysis.

Table 4

Factor Structure for Stress Variables

Stress Variables	Factor Loadings	Communality Estimates
Undesirable, nonhealth related stress	.76	.58
Desirable stress	.73	.53
Negatively-weighted stress	.62	.38
No stress	.61	.37
Undesirable, health-related stress	.42	.17
Positively-weighted stress	.40	.16

Note: Variance explained factor = .02

Table 5

Factor Structure for Coping Variables

Coping Variables	Factor Loadings	Communality Estimates
Factor 1 *		
Escape Avoidance	.88	.78
Emotion-focused coping	.77	.60
Accepting responsibility	.72	.61
Self-controlling	.68	.60
Confrontive coping	.61	.54
Distancing	.58	.34
Avoidance-oriented coping	.36	.18

Table 5 (continued)

Factor 2 **

Planful problem		
solving	.84	.76
Task-oriented coping	.80	.65
Positive reappraisal	.76	.65
Seeking social		
support	.62	.46
Confrontive coping	.41	.54
Self-controlling	.37	.60
Accepting		
responsibility	.31	.61

Note: Variance explained by each factor =

* .03

** .03

Stepwise regressions with selected demographic variables and all stress and coping variables with headache pain variables as the dependent measures were conducted using SAS. When examining all six stress variables and the three headache variables: frequency,

intensity and duration, it was found that negatively weighted stress (from the Adolescent Perceived Events Scale (APES)) best predicted all three headache variables. (See Table 6.) The stepwise regressions with the coping variables revealed emotion-focused coping (from the Coping Inventory for Stressful Situations (CISS)) as the best predictor of frequency and intensity of headache. (See Table 7.) It is recognized that these results, similarly with results to follow, have the R^2 values that are weak and significant due to sample size. However, they do provide the information necessary to continue analysis with respect to the hypotheses.

When examining all coping and stress variables, negatively-weighted stress was most strongly related to intensity and duration of headache and emotion-focused coping the most strongly related to frequency. (See Table 8.) However, these results account for very little of the variance (2.9% - 8.1%).

Table 6

Stepwise Regressions with Stress and Headache Variables

	Beta-weight	R ²	F-value	Prob>F
Negatively-weighted stress and headache frequency	.001	.05	13.23	0.0003
Negatively-weighted stress and headache intensity	.002	.08	23.33	0.0001
Negatively-weighted stress and headache duration	.002	.03	6.91	0.0091

Table 7

Stepwise Regressions with Coping and Headache

	Beta-weights	R ²	F-value	Prob>F
Emotion-focused coping and headache frequency	.03	.07	21.85	0.0001
Emotion-focused coping and headache intensity	.03	.06	17.80	0.0001

Stepwise regressions for the demographic and headache variables revealed that 1) interference with responsibilities, 2) six month change in headache, and 3) interference with social activities were significant predictors of headache frequency (see Table 9). The second stepwise regression revealed that 1) interference with responsibilities and 2) interference with social activities were significantly related to headache intensity (see Table 10). A final

stepwise regression with demographic variables revealed that 1) interference with social activities and 2) where one is living after moving from home were significantly related to headache duration (see Table 11). Again these variables account for little of the variance and as such may be considered inconsequential.

Table 8

Stepwise Regressions with Stress, Coping and Headache

	Beta-weight	R ²	F-value	Prob>F
Emotion-focused coping and headache frequency	.02	.07	18.59	0.0001
Negatively-weighted stress and headache intensity	.001	.08	22.32	0.0001
Negatively-weighted stress and headache duration	.002	.03	7.06	0.0084

Finally, stepwise regressions performed with all independent variables revealed that interference with social activities was significantly related to headache frequency, interference with responsibilities and negatively-weighted stress were significantly related to headache intensity, and interference with social activities was significantly related to headache duration. Refer to Tables 12 through 14 for the above stepwise results.

Table 9

Stepwise Regressions with Demographic Variables and
Headache Frequency

	Beta-weight	R ²	F-value	Prob>F
Interference with responsibilities	.32	.15	31.46	0.0001
Six month change in headache	.13	.04	10.03	0.0018
Interference with social activities	.26	.02	3.93	0.0490

Table 10

Stepwise Regressions with Demographic Variables and
Headache Intensity

	Beta-weight	R ²	F-value	Prob>F
Interference with responsibilities	.83	.25	61.78	0.0001
Interference with social activities	.42	.03	6.83	0.0097

Table 11

Stepwise Regressions with Demographic Variables and
Headache Duration

	Beta-weight	R ²	F-value	Prob>F
Interference with social activities	1.14	.11	20.56	0.0001
Where living after move from home	.47	.02	3.98	0.0476

Table 12

Stepwise Regressions with all Independent Variables and
Headache Frequency

	Beta-weight	R ²	F-value	Prob>F
Interference with social activities	.32	.15	30.39	0.0001
Six month change in headache	.14	.06	12.24	0.0006
Confrontive coping	.06	.02	5.04	0.0261
Interference with responsibilities	.25	.02	3.95	0.0486

Table 13

Stepwise Regressions with all Independent Variables and
Headache Intensity

	Beta-weight	R ²	F-value	Prob>F
Interference with responsibilities	.87	.26	58.56	0.0001
Negatively-weighted stress	.002	.06	13.75	0.0003
Where living after move from home	-.11	.02	4.71	0.0314

Table 14

Stepwise Regressions with all Independent Variables and Headache Duration

	Beta-weight	R ²	F-value	Prob>F
Interference with				
social activities	.87	.11	18.30	0.0001
Escape Avoidance	-.21	.03	6.19	0.0139
Negatively-weighted				
stress	.00	.03	4.90	0.0284

Hypothesis 1: Stress, Coping, and Headache

Hypothesis one predicted that high headache pain complaints as measured by frequency, intensity and duration of headache would be associated with high stress and emotion-focused coping. Before investigating this relationship analyses were run to determine whether results of individual components of this hypothesis were comparable to existing literature. First, analyses were run to determine if high stress

was associated with high headache pain complaints. Previous analyses determined that negatively-weighted stress was significantly related to the headache variables. Therefore, negatively-weighted stress was operationally defined as the stress variable and used to test the above hypothesis. Scores on negatively-weighted stress were divided into two groups using a median split ($M = 262$). High scores on negatively-weighted stress defined high stress, while low scores on negatively-weighted stress defined low stress. While previous regression analyses pointed to a positive relationship between high stress and high headache pain complaints, t-tests confirmed this relationship. Significant differences were noted between high and low stress groups on all three headache variables (frequency: $t = 3.48$, $p = .0008$; intensity: $t = 4.50$, $p = .0000$; and duration: $t = 2.64$, $p = .0086$).

Next, a t-test was conducted to determine whether high and low stress subjects differed in their use of coping skills, specifically, whether increasing stress was associated with emotion-focused coping (defined as

emotion-focused coping (from the CISS)). This t-test found a significant difference between the high/low stress groups. Subjects reporting high negatively-weighted stress had higher scores on the measure of emotion-focused coping ($t = 8.0986$, $p = .0001$). This implied that high stress, as measured by high scores on negatively-weighted stress, may be associated with a tendency to utilize more emotion-focused coping strategies. This confirmed the findings of the stepwise regressions with respect to this question.

Canonical correlation was performed between the set of stress and coping variables and the set of headache variables with the use of SAS. The stress and coping variable set included the six stress variables and eleven coping variables mentioned previously. The headache variable set included headache frequency, headache intensity and headache duration. The first canonical correlation was .37 (14% of the variance); the second was .32 (10% of the variance); and the third was .22 (5% of the variance). However, of these three only the first accounted for a significant relationship between the two sets of variables ($p < .05$).

Data on the first canonical correlation is shown in Table 15. Shown in the table are correlations between the variables and the canonical variates, standardized canonical variate coefficients, within-set variance accounted for by the canonical variates, redundancies and canonical correlations. Given the total percent of the variance, at best the canonical variates are only moderately correlated.

With a cutoff correlation of .3, the variables in the stress and coping set that were correlated with the canonical variate were escape avoidance, negatively-weighted stress, and emotion-focused coping. Among the headache variables, headache frequency and headache intensity correlated with the canonical variate. The canonical variate indicated that those who utilize escape avoidance and emotion-focused coping and experienced high negatively weighted stress tended to report high headache frequency and high headache intensity.

Table 15

Canonical Correlation Analyses with Stress, Coping and Headache Variables

	Canonical Variate	
	Correlation	Coefficient
Stress and Coping Set		
CONCOP	-.04	-.12
DISTANC	-.04	-.12
SELFCONT	-.03	-.10
SOCSUPP	-.03	-.12
ACCRESP	.08	.22
ESCAVOID	.07	.35
PLANPROB	.06	.19
PREAPP	-.06	-.24
PWEIGHTS	.00	.13
NWEIGHTS	.00	.49
TSKCOP	-.00	-.02
EMOCOP	.03	.35
AVOCOP	.00	.02

Table 15 (continued)

DESSTRES	.08	.19
UDESNH	-.12	-.29
UDESHSTR	-.20	-.11
NOSTRESS	.33	.18
Percent of Variance	.05	
Redundancy	.007	
Headache set		
AVWKHEAD	.35	.41
LHEADTIM	.01	.03
PAINFUL	.43	.78
Percent of Variance	.26	
Redundancy	.04	
Canonical Correlation	.38	

Hypothesis Two: Gender, Stress, Coping and Headache

Hypothesis two predicted that females would report more stress, more headache pain, and use more emotion-focused coping than males. T-tests were conducted with these variables. The first t-test with

gender and stress revealed that females reported more negatively weighted stress than males ($t = 3.25$, $p = .001$). The second t-test on gender and headache variables revealed further interesting information. Females reported more frequent headaches ($t = 3.94$, $p = .0001$) and more painful headaches ($t = 4.66$, $p = .0001$). However, there was no significant differences between males and females with respect to headache duration ($t = .98$, $p = .33$). The final t-test conducted with gender and coping found a significant difference between males and females on a measure of emotion-focused coping ($t = 3.11$, $p = .002$). This result implies that females utilize emotion-focused coping strategies more often than males, as reflected by high scores on a measure of emotion-focused coping. Therefore, with the exception of headache duration, hypothesis two was found to be supported.

Hypothesis Three: Move, Stress, Coping, and Headache

Hypothesis three predicted that subjects who had moved from home in the past six months would report more stress, more headache pain, and utilize more emotion-focused coping than those subjects who did not

move from home. T-tests conducted on these variables revealed no significant differences on any measure except that of headache frequency, where subjects who had moved reported more headaches than subjects who had not ($t = 2.08, p < .05$). Therefore hypothesis three was found to be supported only with respect to headache frequency.

Discussion

The present research documented support for all but one of the hypotheses. High stress subjects did report greater frequency, intensity, and duration of headaches when compared to low stress subjects. This finding corroborates existing evidence on stress and headache. Stress is commonly cited by headache sufferers as a cause of their pain (Sternbach, 1986). In a study of headache prevalence in medical and dental students, 38.8% of the total sample cited mental stress as the cause of their headache (Blau, 1990).

Passchier, Schouten, van der Donk, and van Romunde (1991) found that subjects who experienced frequent headaches reported more stressful life events on Paykel's life event scale. Further evidence for the relationship between stress and headache can be found in deBenedittis, Lorenzetti, and Pieri (1990) and Nattero, De Lorenzo, Biale, Torrie, and Ancona (1986).

The finding that subjects who reported high stress also reported high scores on a measure of emotion-focused coping is reasonable. Given that emotion-focused coping serves to alleviate the accompanying

emotions to the stressor, the stressor is not being dealt with directly and as such will continue to exact its effect. Aldwin and Revenson (1987) found similar results when looking at coping and mental health. They found that escapism, a measure of emotion-focused coping, was positively related to symptoms, as measured by the Lagner 22-Item Screening Score.

As noted in the results section, factor analysis of the two stress measures and the two coping measures did not contribute to further analysis with respect to the hypotheses, but the results are noteworthy for future consideration. The two stress measures, one a major life events checklist (SLES) and the other a measure combining life events, daily hassles, and student perception (APES), combined to form a general stress factor. This result was not unexpected. From this and the stepwise regressions it was noted that negatively-weighted stress, from the (APES), was the best predictor of the headache variables and loaded most strongly on the general stress factor. This finding is similar to that of deBenedittis, Lorenzetti, and Pieri (1990), who noted that life stress is most

appropriately conceptualized in terms of negative life changes. Evaluating the merits of the two measures is difficult and beyond the scope of this study. However, it should be noted that the APES, while a relatively new measure, made an important contribution to the results. This measure has no preset item scales nor life change units attached to stressful items. Rather it allows the individual respondent to select those items which affect him or her and rate them as to their personal impact, either positive or negative.

Therefore each score generated by the measure has personal relevance to each subject and reflects a combination of daily hassles and life events which have impacted on the subject in the past three months. Also considering the extensiveness of the item content in the APES, it is this author's opinion that the APES is a valuable measure which is relevant to the adolescent population under investigation.

With respect to the coping measures, as noted in the results section, the factor loadings did not meet theoretical expectations. From the literature describing the content of both measures utilized in the present

research, it was expected that at least two factors would emerge. One of these factors was expected to represent problem-focused coping and the other represent emotion-focused coping. The factor structure that emerged identified the former but not the latter. The second factor was determined to represent action-oriented coping. At present no research has been published comparing these two measures, so it is difficult to explain the results from within such a framework. However, Parkes (1984) when factor analysing the Ways of Coping Scale (WCS) found three factors, two of which correspond to the present factor results: 1) a general tendency to use cognitive and behaviour coping strategies and 2) problem-focused strategies. Folkman and Lazarus (1980) found that their scale, the WCS, revealed the two theoretical factors, and Endler and Parker (1990) found three factors with the CISS, two of which were the theoretical factors. It was expected that the two measures should correlate along these dimensions. However, other researchers currently using the WCS have found that the factor structure (eight factors) is not

stable. This could serve to partially explain the current results but a detailed item analysis may serve to provide future information concerning the comparability of the two scales. The stepwise regression indicated that the emotion-focused coping scale from the CISS served as the best predictor of headache variables and was utilized in the analysis of the hypotheses.

One of the major findings from the present research was the association between stress, coping and headache. Canonical correlation revealed that negatively-weighted stress, emotion-focused coping, and escape-avoidance were associated with headache frequency and intensity. This finding showed that not only was stress related to headache, which has been previously established, but coping methods were as well. As stated earlier, emotion-focused coping and to the same extent, escape-avoidance, can be considered less effective coping strategies because they do not deal directly with the stressor. Because the relationship between stress and headache exists, an emotion-focused or escape avoidance style of coping

would not serve to lessen the impact of the stressor, and thus allow stress to exact its consequences on headache frequency and intensity. Theoretically, this relationship may occur due to the nature of the above coping styles. Neither confronts the stressor but rather avoids the existence of the stressor and its impact or deals only with the emotional consequences of that stressor. As such, neither is effective in lessening the impact of the stressor, the effect of which may still be experienced.

Unfortunately, although the relationships between variables were significant, the amount of variance accounted for was low. In fact the results were significant only due to the size of the sample. While these results are disappointing, their insignificance is significant. Although stress and coping are associated with headache, they are not the most important variables influencing headache and perhaps their only influence occurs as a result of subject perception. Because tension headaches remain difficult to explain in terms of research, the lay person must also be perplexed by their occurrence and may lay blame

on the most likely cause - stress. Stress seems to be the catch-all excuse for unexplained physiological phenomena, like headaches, rashes, and general malaise. Given that stress is difficult to define and even more difficult to measure, perhaps the relationship between stress and physical ailments is overrated. However, because people are quick to associate such physical problems to stress, it is important to attend to the phenomenon and continue to work to understand its relationship to problems like tension headache.

While headache frequency and intensity were associated with stress and coping variables in the present research, headache duration was not. The question is, what theoretically could be making up the remainder of the variance in the headache variables? Hatch, Schoenfield, Boutros, Seleshi, Moore, and Cyr-Provost (1991) found that episodic tension headache sufferers were mildly anxious and depressed when compared to headache free controls. The authors noted that headache sufferers were prone to feelings of resentment, suspicion, mistrust, and antagonism in their interpersonal relations, and are aroused to anger

more often than headache-free controls. In other research, the investigators noted that intensity of head pain was associated with headache-related distress while duration of head pain was associated with a greater tendency to deny the influence of stress and worry on headaches (Demjen, Bakal, & Dunn, 1990). These authors also noted that duration was associated with difficulty expressing emotions.

These variables are primarily psychological in origin. What if tension headaches, like migraines, are more within the physiological domain as opposed to the psychological? Twenty-four percent of the current sample reported a family history of headache. The existence of family history of headaches, and pain in general, have been noted elsewhere (Roy, Thomas, & Cook, 1991). In a study of familial variables and pain, tension headache sufferers reported having more headache models and more intense headache models than headache-free controls (Ehde, Holm, and Metzger (1991). Existing research has provided no clear conclusions as to the role of stress in headache, for example whether it serves as a trigger or whether it exacerbates

headaches. If stress does serve as a trigger for headache, there must be an underlying mechanism for it to trigger. The probability of physiological predispositions for headache must be kept in mind when doing headache research.

It is important to note that even if headache is primarily a physiological disorder, all the variables discussed above have some relationship to the phenomenon and, as such, may prove useful in headache prevention and intervention. In the year 1977-1978, headache was the principal cause of an estimated ten million office-based physician visits in the United States (Ziegler, 1990). If headache could be brought under control with attention to its psychological components, savings in the health care system could be substantial. Gender differences as predicted in regards to headaches were found. Females reported more stress, more headache frequency and intensity, and higher scores on a measure of emotion-focused coping. These findings are corroborated by existing research like that of Holm, Holroyd, Hursey and Penzien (1986) in their study of the role of stress in recurrent

tension headache where female reports of more negative stress were noted. The results with respect to headache frequency and intensity correspond to findings like those of Martin and Nathan (1987), Attanasio and Andrasik (1987), and Andrasik, Holroyd, and Abell (1979). However, the above three studies noted that females reported longer duration of headache than males not found by the present study. This finding remains unexplained as headache frequencies and intensities of the present study were almost identical to those in the aforementioned studies. In fact, in other analyses previously discussed, duration remained relatively independent of predictors, predicted only by negatively-weighted stress and interference with social activities by the stepwise regressions (each variable accounted for approximately 2.8% of the variance in duration). Duration of headache may be controlled more by physiological mechanisms than affected by psychological variables.

Finally, with respect to sex differences in coping style, females were found to score higher on a measure of emotion-focused coping than males. Previous

research conducted has not been successful in establishing the tendency of females to utilize emotion-focused coping strategies more frequently. Some researchers (Labouvie-Vief, Hakim-Larson, & Hobart, 1987; Billings & Moos, 1981) have found gender differences in the use of coping strategies, although weak ones. However, the weak but significant differences noted in the present research contradict those of Folkman & Lazarus (1980), whose results provided no evidence for gender differences in coping strategy use. This contradiction to the present findings may simply have been a chance occurrence and the present findings combined with the above research provide credence to Pearlin and Schooler's (1978) conclusion that women are more likely to employ a response that results in more stress. These findings have to be replicated before a firm conclusion can be made as to gender differences in coping strategies.

The predicted effects of the added stress of a move from home with the transition to university were not born out by the present research. It may be that the expected adjustment stresses of the transition did

not exist. Because there was no control group of students not in their first year, it is difficult to determine more precisely the lack of impact of "moving" as a stressor. As noted in the results section, 104 of 294 subjects noted a six month change for the worse in their headache experience. However, when comparing those subjects who had moved to those who had not, only a difference in headache frequency was noted. Perhaps some clarification can be provided by the results of the Student Affairs Report published by Housing and Student Life at the University of Manitoba (October and November, 1991). The results showed that first year students reported less stress resulting from university than they had expected when still in high school. Given that the majority of students who had moved, moved into University Residence, the following finding from the above report is of interest. Students living in University residence, as compared to students living at home or off-campus, reported less stress in forming new friendships. Therefore, it is credible to assume that students in University Residence may have a stronger support system which served to buffer the

stress of the transition from high school and moving from home.

The present study provided new information with respect to stress, coping, and headache, and while the results were not strong, they point the way for further investigations. First, and foremost, the results of the present research need to be replicated and refined. There needs to be further consideration of other variables, like anger and hostility, and their role in headache. While the large number of subjects were useful as far as statistical analysis is concerned, Rasmussen, Jensen, and Olesen (1991) noted that questionnaire data did not reveal as reliable information with respect to headache as did interviews. Therefore, a smaller sample would allow for both questionnaire data and interviews with subjects, providing more useful information and leaving less room for ambiguities in the data.

In conclusion, stress, coping and headache are associated with one another, but the nature of this association remains unclear and is weak. Utilization of this information in combination with that of other

researchers, could perhaps shed light on the direction of research with respect to cognitive and behavioral correlates of headaches. This information could further be used in the treatment and prevention of the headache phenomenon which is so widespread in today's society.

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Appendix A (continued)

The following categories must be present on the pain side:

- _____ conjunctival injection
- _____ lacrimation (watering of the eye)
- _____ nasal congestion
- _____ runny nose (rhinorrhea)
- _____ forehead or facial sweating
- _____ miosis (excessive contraction of the pupil)
- _____ ptosis (drooping of upper eyelid)
- _____ eyelid edema (swollen eyelid)

Appendix B

Adolescent Perceived Events Scale

Instructions: On the following pages are a list of events which may or may not have happened to you. Please read each item carefully. If the event has not happened to you in the past three months, put an "X" on the line marked NEVER HAPPENED OR HAPPENED MORE THAN THREE MONTHS AGO and go on to the next item. If the event has happened to you in the past three months, put an "X" on the line marked HAPPENED WITHIN LAST THREE MONTHS. For each item that has happened in the last three months, please fill in the following three ratings:

Desirability Rating: Desirable events are ones which are pleasant or enjoyable while undesirable events irritate, annoy, or upset people. Using the following scale, write down in the blank space marked DESIRABILITY RATING the number which best describes how desirable the event was when it happened to you.

- 4 Extremely Undesirable
- :
- 3 Very Undesirable
- :
- 2 Somewhat Undesirable
- :
- 1 Slightly Undesirable
- :
- 0 Neither Desirable Nor Undesirable
- :
- +1 Slightly Desirable
- :
- +2 Somewhat Desirable
- :
- +3 Very Desirable
- :
- +4 Extremely Desirable

Impact Rating: The impact of an event is how much the event affected your life or how much it led to changes in your health, your relationships with other people, or how you feel about yourself. Using the following scale, write down in the blank space marked IMPACT RATING the number which best describes how much of an impact this event had when it happened to you.

Appendix B (continued)

- 1 No Impact
- :
- 2 Very Slight Impact
- :
- 3 A Little Impact
- :
- 4 Some Impact
- :
- 5 Moderate Impact
- :
- 6 Much Impact
- :
- 7 Great Impact
- :
- 8 Extreme Impact
- :
- 9 Very Extreme Impact

Frequency Rating: The frequency of an event is how often the event has occurred in your life. Using the following scale, write down in the blank space marked FREQUENCY RATING the number which best describes how often this event has occurred in your life.

- 1 Only Once in Your Life
- :
- 2 Several Times in Your Life
- :
- 3 About Once a Year
- :
- 4 Several Times a Year
- :
- 5 About Once a Life
- :
- 6 Several Times a Month
- :
- 7 About Once a Week
- :
- 8 Several Times a Week
- :
- 9 Every Day

Appendix B (continued)

The DESIRABILITY, IMPACT, and FREQUENCY scales are copied here for your use. Please remove this sheet from the rest of the questionnaire and use it to help make your ratings.

How desirable was this event when it happened to you?

- 4 Extremely Undesirable
- 3 Very Undesirable
- 2 Somewhat Undesirable
- 1 Slightly Undesirable
- 0 Neither Desirable nor Undesirable
- +1 Slightly Desirable
- +2 Somewhat Desirable
- +3 Very Desirable
- +4 Extremely Desirable

How much impact did this event have on your life when it happened to you?

- 1 No Impact At All
- 2 Very Slight Impact
- 3 A Little Impact
- 4 Some Impact
- 5 Moderate Impact
- 6 Much Impact
- 7 Great Impact
- 8 Extreme Impact
- 9 Very Extreme Impact

How Frequently has this event happened to you?

- 1 Only Once In Your Life
- 2 Several Times In Your Life
- 3 About Once A Year
- 4 Several Times A Year
- 5 About Once A Month
- 6 Several Times A Month
- 7 About Once A Week
- 8 Several Times A Week
- 9 Every Day

Appendix B (continued)

Please complete these ratings for
each event that has happened to you in the past three months.

NEVER HAPPENED OR HAPPENED MORE THAN THREE MONTHS AGO - 0 or > 3

HAPPENED WITHIN LAST THREE MONTHS - < 3

DESIRABILITY RATING - DR

IMPACT RATING - IR

FREQUENCY RATING - FR

0 or > 3 < 3

DR IR FR

___	___	Doing well on an exam or paper	___	___	___
___	___	Death of a relative	___	___	___
___	___	Worry about nuclear war	___	___	___
___	___	Doing household chores	___	___	___
___	___	Being assaulted	___	___	___
___	___	Being unemployed	___	___	___
___	___	Death of a friend	___	___	___
___	___	Going to church	___	___	___
___	___	Worry about school performance	___	___	___
___	___	Death of a family member	___	___	___
___	___	Going to bed/sleeping	___	___	___
___	___	Worry about sports performance	___	___	___
___	___	Doing things/spending time with family members	___	___	___
___	___	Worry about performance in extracurricular activities (music, arts, etc.)	___	___	___
___	___	Going to parties, dances or concerts	___	___	___

Appendix B (continued)

0 or > 3	< 3		DR	IR	FR
_____	_____	Minor physical ailments or illnesses (headaches, cuts, bruises, etc.)	_____	_____	_____
_____	_____	Being in love or in a relationship	_____	_____	_____
_____	_____	Being around people who are inconsiderate or offensive	_____	_____	_____
_____	_____	Doing poorly on an exam or paper	_____	_____	_____
_____	_____	Fight with or problems with a friend	_____	_____	_____
_____	_____	Being involved in a car accident	_____	_____	_____
_____	_____	Spending time at your apartment or dorm	_____	_____	_____
_____	_____	Menstruation	_____	_____	_____
_____	_____	Problems with roommates	_____	_____	_____
_____	_____	Doctor's or Dentist's appointments	_____	_____	_____
_____	_____	Major success or failure in sports	_____	_____	_____
_____	_____	Major success or failure in extracurricular activities (music, arts, etc.)	_____	_____	_____
_____	_____	Poor relationship between family members and friends	_____	_____	_____
_____	_____	Understanding classes/homework	_____	_____	_____
_____	_____	Discussions with parents	_____	_____	_____
_____	_____	Weight change	_____	_____	_____
_____	_____	Parent getting remarried	_____	_____	_____
_____	_____	Attending classes	_____	_____	_____
_____	_____	Parents getting divorced	_____	_____	_____

Appendix B (continued)

0 or > 3	< 3		DR	IR	FR
___	___	Arrest of a family member	___	___	___
___	___	Parent loses job	___	___	___
___	___	Hospitalization of a family or relative	___	___	___
___	___	Parents discover something you didn't want them to know	___	___	___
___	___	Pressures or expectations by parents	___	___	___
___	___	Receiving a gift	___	___	___
___	___	Good weather	___	___	___
___	___	Getting accepted at one or more colleges	___	___	___
___	___	Getting rejected by or not being able to attend college	___	___	___
___	___	Getting a car/motorcycle/truck, etc.	___	___	___
___	___	Getting a traffic ticket or parking ticket	___	___	___
___	___	Getting driver's license or learner's permit	___	___	___
___	___	Having braces removed	___	___	___
___	___	Hassles, arguments or fights with other students or peers	___	___	___
___	___	Joining the armed forces	___	___	___
___	___	Looking for a place to live	___	___	___
___	___	Making decisions about career or major	___	___	___
___	___	Marriage or becoming engaged	___	___	___
___	___	Moving away from parents home or living on own	___	___	___

Appendix B (continued)

0 or > 3	< 3		DR	IR	FR
___	___	Not getting along with parents or friends	___	___	___
___	___	Not attending your high school prom	___	___	___
___	___	Not getting driver's license or learner's permit	___	___	___
___	___	Personal achievement at work (getting a raise, promotion, etc)	___	___	___
___	___	Restrictions at home (having to be in at a certain time, etc)	___	___	___
___	___	Returning to live at parents' home	___	___	___
___	___	Returning to school after time off	___	___	___
___	___	Traffic or parking problems	___	___	___
___	___	Taking care of younger brothers or sisters	___	___	___
___	___	Visiting a parent that doesn't live with you	___	___	___
___	___	Wearing braces	___	___	___
___	___	Getting into trouble with the Dean's office	___	___	___
___	___	Change in privilege or responsibilities at home	___	___	___
___	___	Recovering from an accident or illness	___	___	___
___	___	Change in relationship with family member(s)	___	___	___
___	___	Change in number of friends (make new friends or lose friends)	___	___	___
___	___	Change in moral or religious beliefs	___	___	___

Appendix B (continued)

0 or > 3	< 3		DR	IR	FR
—	—	Change in health of a family member or relative	—	—	—
—	—	Problems or arguments with parents, siblings or family members	—	—	—
—	—	Belonging to a club or organization (fraternity, sorority, etc.)	—	—	—
—	—	Arguments or problems with boyfriend/girlfriend	—	—	—
—	—	Hassles with people of the opposite sex	—	—	—
—	—	Change in personal health or fitness	—	—	—
—	—	Not getting the classes you want	—	—	—
—	—	Being rejected by an organization (fraternity, sorority, etc.)	—	—	—
—	—	End of school year	—	—	—
—	—	Eating	—	—	—
—	—	Having a job	—	—	—
—	—	Trying to quit smoking	—	—	—
—	—	Taking showers	—	—	—
—	—	Taking medication	—	—	—
—	—	Having plans fall through (not going on a trip, etc)	—	—	—
—	—	Losing job (quitting, getting fired, laid off, etc.)	—	—	—
—	—	Making honor roll or other school achievement	—	—	—
—	—	Dating or doing things with people of the opposite sex	—	—	—

Appendix B (continued)

0 or > 3	< 3		DR	IR	FR
___	___	Making love or sexual intercourse	___	___	___
___	___	Having a good talk with a professor or other adult	___	___	___
___	___	Something good happens to a friend	___	___	___
___	___	Something bad happens to a friend	___	___	___
___	___	Work hassles (rude customers, unpleasant jobs, etc.)	___	___	___
___	___	Exercising	___	___	___
___	___	Sleeping late	___	___	___
___	___	Vacation, trip, or summer break	___	___	___
___	___	Spending time alone	___	___	___
___	___	Living space too small	___	___	___
___	___	Becoming more independent	___	___	___
___	___	High School graduation	___	___	___
___	___	Changing schools	___	___	___
___	___	Becoming a year older	___	___	___
___	___	Visiting with relatives	___	___	___
___	___	Drinking or drug use	___	___	___
___	___	Spending time/talking with boyfriend/girlfriend	___	___	___
___	___	Negative feelings or worry about personal health or fitness	___	___	___
___	___	Negative feelings or worry about your appearance	___	___	___
___	___	Friend(s) move away or you move away from friends	___	___	___

Appendix B (continued)

0 or > 3	< 3		DR	IR	FR
___	___	Friends getting drunk or using drugs	___	___	___
___	___	Friends getting married or engaged	___	___	___
___	___	Friends becoming pregnant or having a child	___	___	___
___	___	Friend or family member from illness or injury	___	___	___
___	___	Friend getting separated or divorced	___	___	___
___	___	Friend having emotional problems	___	___	___
___	___	Bad weather	___	___	___
___	___	Change in church attendance	___	___	___
___	___	Registering for classes	___	___	___
___	___	Change in alcohol or drug use	___	___	___
___	___	Not getting mail	___	___	___
___	___	Meeting a new roommate	___	___	___
___	___	Change in eating habits	___	___	___
___	___	Change in personal appearance	___	___	___
___	___	Not getting enough sleep	___	___	___
___	___	Change in sleep habits	___	___	___
___	___	Change in cigarette use	___	___	___
___	___	Problems at work	___	___	___
___	___	Change in health of a friend	___	___	___
___	___	Problems with transportation	___	___	___
___	___	Hobbies or activities (watching T.V., reading, playing an instrument, etc.)	___	___	___

Appendix B (continued)

0 or > 3	< 3		DR	IR	FR
_____	_____	People interrupting when you are trying to get work done	_____	_____	_____
_____	_____	Brother or sister getting engaged or married	_____	_____	_____
_____	_____	Change in relationship with friend(s)	_____	_____	_____
_____	_____	Change in relationship with boyfriend/girlfriend	_____	_____	_____
_____	_____	Having few or no friends	_____	_____	_____
_____	_____	Having bad classes or teachers	_____	_____	_____
_____	_____	Buying new clothes	_____	_____	_____
_____	_____	Losing virginity	_____	_____	_____
_____	_____	Taking care of daily appearance and hygiene	_____	_____	_____
_____	_____	Liking someone who doesn't like you	_____	_____	_____
_____	_____	Making a major purchase (stereo, bicycle, etc.)	_____	_____	_____
_____	_____	Having good classes or teachers	_____	_____	_____
_____	_____	Having teachers favor other students	_____	_____	_____
_____	_____	Spending time/relaxing/going out with friends	_____	_____	_____
_____	_____	Breaking up with or being rejected by a boyfriend/girlfriend	_____	_____	_____
_____	_____	Trouble with the law	_____	_____	_____
_____	_____	School interfering with other activities	_____	_____	_____
_____	_____	School or career change of family member (drops out of school, gets job, etc.)	_____	_____	_____

Appendix B (continued)

0 or > 3	< 3		DR	IR	FR
___	___	Getting a job	___	___	___
___	___	Getting mail	___	___	___
___	___	Putting things off	___	___	___
___	___	Getting bad grades or progress reports	___	___	___
___	___	Talking on the phone	___	___	___
___	___	Getting robbed	___	___	___
___	___	Feeling pressed for time	___	___	___
___	___	Getting punished by parents	___	___	___
___	___	Getting ready for school	___	___	___
___	___	Someone showing that they care	___	___	___
___	___	Getting or losing pet	___	___	___
___	___	Getting complimented	___	___	___
___	___	Entering college	___	___	___
___	___	Meeting new people	___	___	___
___	___	Helping other people	___	___	___
___	___	Feeling pressured by friends	___	___	___
___	___	Writing letters	___	___	___
___	___	Personal hospitalization	___	___	___
___	___	Getting up in the morning	___	___	___
___	___	Wearing contacts	___	___	___
___	___	Smoking cigarettes	___	___	___
___	___	Feeling too young	___	___	___
___	___	Listening to music	___	___	___
___	___	Getting good grades or progress reports	___	___	___

Appendix B (continued)

0 or > 3	< 3		DR	IR	FR
—	—	Waiting in lines, waiting for people, etc.	—	—	—
—	—	Dieting or keeping track of weight	—	—	—
—	—	Talking or sharing feelings with friends	—	—	—
—	—	Attending your high school prom	—	—	—
—	—	Abortion (or wife/girlfriend having a child)	—	—	—
—	—	Applying to/waiting to hear from colleges	—	—	—
—	—	Becoming (or making) pregnant or having child	—	—	—
—	—	Becoming financially independent	—	—	—
—	—	Car trouble	—	—	—
—	—	Change in birth control use	—	—	—
—	—	Driving	—	—	—
—	—	Getting braces	—	—	—
—	—	Holidays	—	—	—
—	—	Walking to class	—	—	—
—	—	Obligations at home	—	—	—
—	—	Not having a boyfriend/girlfriend	—	—	—
—	—	Getting divorced	—	—	—
—	—	Advancing a year in school	—	—	—
—	—	Participation in sports or recreation	—	—	—
—	—	Change in participation in extracurricular activities (music, arts, etc.)	—	—	—

Appendix B (continued)

0 or > 3	< 3		DR	IR	FR
—	—	People not respecting your privacy or property	—	—	—
—	—	Brother or sister getting separated or divorced	—	—	—
—	—	Falling in love or beginning relationship with boyfriend/girlfriend	—	—	—
—	—	Doing laundry	—	—	—
—	—	Roommate moving out	—	—	—
—	—	Homework or studying	—	—	—
—	—	Joining an organization (fraternity, sorority, etc.)	—	—	—
—	—	Alcohol or drug use of family members or relatives	—	—	—
—	—	Not spending enough time with family members or friends	—	—	—
—	—	Family move	—	—	—
—	—	Family member becoming pregnant or having a child	—	—	—
—	—	Family members, relatives, step-parents moving in or out of the house	—	—	—
—	—	Family member or relative having emotional problems	—	—	—
—	—	Living with only one parent	—	—	—
—	—	Having or taking care of pets	—	—	—
—	—	Having or making money	—	—	—
—	—	Arguments or fights between parents	—	—	—

Appendix C

Read over each event and think if this happened to you in the past year. If this event has happened to you, mark A for yes. If this event has not happened to you, mark B for no.

(A)	(B)
Yes	No

1. moved to a new home
2. studied abroad
3. began a new job
4. fired from a job
5. major financial setback
6. major financial gain
7. legal conviction
8. arrested
9. involved in a lawsuit
10. won a lawsuit
11. lost a lawsuit
12. changed schools
13. on academic probation
14. roommate problems
15. problems with major
16. problems with sports
17. unusual success in sports
18. excessive partying
19. formed important new friendship
20. breakup of an important friendship
21. separation from an important friend

Appendix C (continued)

22. serious alcohol/drug problem
23. significant positive alcohol/drug experience
24. outstanding personal achievement
25. major personal failure
26. revised personal habits
27. significant health improvement
28. major injury
29. major illness
30. major psychological problem
31. major positive change in family relationship
32. major negative change in family relationship
33. divorced
34. strong family objections
35. illness/injury of a family member
36. improved health of a family member
37. increased independence
38. new family member
39. started going steady
40. got engaged
41. breakup with boy/girlfriend
42. lost virginity
43. sexual problems
44. major religious change
45. major moral dilemma
46. major moral dilemma
47. death of family member

Appendix C (continued)

48. death of other close relative
49. death of close friend
50. death of other important relationship

Appendix D

Ways of Coping Questionnaire

Directions. Please read each item below and indicate, by circling the appropriate category, to what extent you used it in coping with your move from high school to university.

- 0 - not used
- 1 - used somewhat
- 2 - used quite a bit
- 3 - used a great deal

- | | | | | |
|---|---|---|---|---|
| 1. Just concentrated on what I had to do next - the next step. | 0 | 1 | 2 | 3 |
| 2. I tried to analyze the problem in order to understand it better. | 0 | 1 | 2 | 3 |
| 3. Turned to my work or substitute activity to take my mind off things. | 0 | 1 | 2 | 3 |
| 4. I felt that time would make a difference - the only thing to do was to wait. | 0 | 1 | 2 | 3 |
| 5. Bargained or compromised to get something positive from the situation. | 0 | 1 | 2 | 3 |
| 6. I did something which I didn't think would work, but at least I was doing something. | 0 | 1 | 2 | 3 |
| 7. Tried to get the person responsible to change his or her mind. | 0 | 1 | 2 | 3 |
| 8. Talked to someone to find out more about the situation. | 0 | 1 | 2 | 3 |
| 9. Criticized or lectured myself. | 0 | 1 | 2 | 3 |
| 10. Tried not to burn my bridges, but leave things open somewhat. | 0 | 1 | 2 | 3 |
| 11. Hoped a miracle would happen. | 0 | 1 | 2 | 3 |

Appendix D (continued)

12. Went along with fate; sometimes I just have bad luck.	0	1	2	3
13. Went on as if nothing had happened.	0	1	2	3
14. I tried to keep my feelings to myself.	0	1	2	3
15. Looked for the silver lining, so to speak; tried to look on the bright side of things.	0	1	2	3
16. Slept more than usual.	0	1	2	3
17. I expressed anger to the person(s) who caused the problem.	0	1	2	3
18. Accepted sympathy and understanding from someone.	0	1	2	3
19. I told myself things that helped me to feel better.	0	1	2	3
20. I was inspired to do something creative.	0	1	2	3
21. Tried to forget the whole thing.	0	1	2	3
22. I got professional help.	0	1	2	3
23. Changed or grew as a person in a good way.	0	1	2	3
24. I waited to see what would happen before doing anything.	0	1	2	3
25. I apologized or did something to make up.	0	1	2	3
26. I made a plan of action and followed it.	0	1	2	3
27. I accepted the next best thing to what I wanted.	0	1	2	3
28. I let my feelings out somehow.	0	1	2	3
29. Realized I brought the problem on myself.	0	1	2	3
30. I came out of the experience better than when I went in.	0	1	2	3

Appendix D (continued)

- | | | | | |
|--|---|---|---|---|
| 31. Talked to someone who could do something concrete about the problem. | 0 | 1 | 2 | 3 |
| 32. Got away from it for awhile; tried to rest or take a vacation. | 0 | 1 | 2 | 3 |
| 33. Tried to make myself feel better by eating, drinking, smoking, using drugs or medication, etc. | 0 | 1 | 2 | 3 |
| 34. Took a big chance or did something very risky. | 0 | 1 | 2 | 3 |
| 35. I tried not to act too hastily or to follow my first hunch. | 0 | 1 | 2 | 3 |
| 36. Found new faith. | 0 | 1 | 2 | 3 |
| 37. Maintained my pride and kept a stiff upper lip. | 0 | 1 | 2 | 3 |
| 38. Rediscovered what is important in life. | 0 | 1 | 2 | 3 |
| 39. Changed something so things would turn out all right. | 0 | 1 | 2 | 3 |
| 40. Avoided being with people in general. | 0 | 1 | 2 | 3 |
| 41. Didn't let it get to me; refused to think about it too much. | 0 | 1 | 2 | 3 |
| 42. I asked a relative or friend I respected for advice. | 0 | 1 | 2 | 3 |
| 43. Kept others from knowing how bad things were. | 0 | 1 | 2 | 3 |
| 44. Made light of the situation; refused to get too serious about it. | 0 | 1 | 2 | 3 |
| 45. Talked to someone about how I was feeling. | 0 | 1 | 2 | 3 |
| 46. Stood my ground and fought for what I wanted. | 0 | 1 | 2 | 3 |
| 47. Took it out on other people. | 0 | 1 | 2 | 3 |
| 48. Drew on my past experience; I was in a similar situation before. | 0 | 1 | 2 | 3 |

Appendix D (continued)

- | | | | | |
|---|---|---|---|---|
| 49. I knew what had to be done so I doubled my efforts to make things work. | 0 | 1 | 2 | 3 |
| 50. Refused to believe that it had happened. | 0 | 1 | 2 | 3 |
| 51. I made a promise to myself that things would be different next time. | 0 | 1 | 2 | 3 |
| 52. Came up with a couple of different solutions to the problem. | 0 | 1 | 2 | 3 |
| 53. Accepted it, since nothing could be done. | 0 | 1 | 2 | 3 |
| 54. I tried to keep my feelings from interfering with other things too much. | 0 | 1 | 2 | 3 |
| 55. Wished that I could change what had happened or how I felt. | 0 | 1 | 2 | 3 |
| 56. I changed something about myself. | 0 | 1 | 2 | 3 |
| 57. I daydreamed or imagined a better time or place than the one I was in. | 0 | 1 | 2 | 3 |
| 58. Wished that the situation would go away or somehow be over with. | 0 | 1 | 2 | 3 |
| 59. Had fantasies or wishes about how things might turn out. | 0 | 1 | 2 | 3 |
| 60. I prayed. | 0 | 1 | 2 | 3 |
| 61. I prepared myself for the worst. | 0 | 1 | 2 | 3 |
| 62. I went over in my mind what I would say or do. | 0 | 1 | 2 | 3 |
| 63. I thought how a person I admire would handle this situation and used that as a model. | 0 | 1 | 2 | 3 |
| 64. I tried to see things from the other person's point of view. | 0 | 1 | 2 | 3 |
| 65. I reminded myself how much worse things could be. | 0 | 1 | 2 | 3 |
| 66. I jogged or exercised. | 0 | 1 | 2 | 3 |

Appendix E

CISS

General Reactions Inventory

The following are ways of reacting to various difficult, stressful, or upsetting situations. Please circle a number from 1 to 5 on this sheet for each of the following items. Indicate how much you engage in these types of activities when you encounter a difficult, stressful, or upsetting situation.

	Not At All					Very Much				
1. Schedule my time better.	1	2	3	4	5					
2. Focus on the problem and how I can solve it.	1	2	3	4	5					
3. Think about the good-times I've had.	1	2	3	4	5					
4. Try to be with other people.	1	2	3	4	5					
5. Blame myself for procrastinating.	1	2	3	4	5					
6. Do what I think is best.	1	2	3	4	5					
7. Preoccupied with aches and pains.	1	2	3	4	5					
8. Blame myself for having gotten into this situation.	1	2	3	4	5					
9. Window shop.	1	2	3	4	5					
10. Outline my priorities.	1	2	3	4	5					
11. Try to go to sleep.	1	2	3	4	5					
12. Treat myself to a favorite food or snack.	1	2	3	4	5					
13. Feel anxious about not being able to cope.	1	2	3	4	5					
14. Become very tense.	1	2	3	4	5					

Appendix E (continued)

	Not At All			Very Much	
	1	2	3	4	5
15. Think about how I solved similar problems.	1	2	3	4	5
16. Tell myself that it is really not happening to me.	1	2	3	4	5
17. Blame myself for being too emotional about the situation.	1	2	3	4	5
18. Go out for a snack or meal.	1	2	3	4	5
19. Become very upset.	1	2	3	4	5
20. But myself something.	1	2	3	4	5
21. Determine the course of action and follow it.	1	2	3	4	5
22. Blame myself for not knowing what to do.	1	2	3	4	5
23. Go to a party.	1	2	3	4	5
24. Work to understand the situation.	1	2	3	4	5
25. "Freeze" and don't know to do.	1	2	3	4	5
26. Take corrective action immediately.	1	2	3	4	5
27. Think about the event and learn from my mistakes.	1	2	3	4	5
28. Wish that I could change what happened or how I felt.	1	2	3	4	5
29. Visit a friend.	1	2	3	4	5
30. Worry about what I am going to do.	1	2	3	4	5
31. Spend time with a special person.	1	2	3	4	5
32. Go for a walk.	1	2	3	4	5
33. Tell myself that it will never happen again.	1	2	3	4	5

Appendix E (continued)

	Not At All			Very Much	
34. Focus on my general inadequacies.	1	2	3	4	5
35. Talk to someone whose advice I value.	1	2	3	4	5
36. Analyze the problem before reacting.	1	2	3	4	5
37. Phone a friend.	1	2	3	4	5
38. Get angry.	1	2	3	4	5
39. Adjust my priorities.	1	2	3	4	5
40. See a movie.	1	2	3	4	5
41. Get control of the situation.	1	2	3	4	5
42. Make an extra effort to get things done.	1	2	3	4	5
43. Come up with several different solutions to the problem.	1	2	3	4	5
44. Take time off and get away from the situation.	1	2	3	4	5
45. Take it out on other people.	1	2	3	4	5
46. Use the situation to prove that I can do it.	1	2	3	4	5
47. Try to be organized so I can be on top of the situation.	1	2	3	4	5
48. Watch T. V.	1	2	3	4	5

Appendix F

Stress, Coping and Headache

Headache is a common experience for university students. Headache is related to stressful experiences. First year university students are experiencing what is known as a transition period from high school to university. Transition periods are normally associated with increased stress. Researchers in the Psychology Department at the University of Manitoba are interested in how different styles of coping impact on headache frequency, intensity and duration during this stressful time period. IF YOU ARE A FIRST YEAR UNIVERSITY STUDENT AND ARE BETWEEN THE AGES OF 18 AND 20 THEN YOU ARE ELIGIBLE TO PARTICIPATE IN THIS RESEARCH PROJECT.

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.

Code No. _____

Appendix G

Regression Results with Headache Frequency

Variable	Beta-weight	T for HO	Prob > T
INTERCEP	.64	1.25	.21
CONCOP	.03	.98	.33
DISTANC	-.02	-1.02	.31
SELFCONT	.02	.65	.51
SOCSUPP	-.00	-.33	.74
ACCRESP	.03	.72	.47
ESCAVOID	.02	.80	.42
PLANPROB	.03	.80	.43
PREAPP	-.02	-.63	.53
PWEIGHTS	.00	.49	.63
NWEIGHTS	.00	.74	.46
TSKCOP	-.00	-.91	.36
EMOCOP	.02	1.68	.10
AVOCOP	-.01	-1.55	.12
DESSTRES	.02	.42	.68
UDES NH	.01	.31	.75
UDES HSTR	-.23	-1.57	.12
NOSTRESS	-.04	-.30	.77

Appendix G (continued)

Regression Results with Headache Intensity

Variable	Beta-weight	T for HO	Prob > T
INTERCEP	2.39	2.97	.00
CONCOP	-.03	-.74	.46
DISTANC	.03	.70	.48
SELFCONT	-.03	-.62	.53
SOCSUPP	-.02	-.66	.51
ACCRESP	.04	.70	.49
ESCAVOID	.05	1.28	.20
PLANPROB	.02	.34	.73
PREAPP	-.03	-.81	.42
PWEIGHTS	.00	.78	.44
NWEIGHTS	.00	2.23	.03
TSKCOP	.00	.47	.64
EMOCOP	.01	.92	.36
AVOCOP	.00	.33	.74
DESSTRES	.08	1.30	.20
UDES NH	-.11	-1.80	.07
UDES HSTR	.02	.08	.93
NOSTRESS	.22	.94	.35

Appendix G (continued)

Regression Results with Headache Duration

Variable	Beta-weight	T for HO	Prob)T
INTERCEP	0.94	.71	.48
CONCOP	0.03	.39	.69
DISTANC	-0.04	-.50	.62
SELCONT	0.04	.53	.60
SOCSUPP	-0.04	-.69	.49
ACCRESP	0.08	.82	.42
ESCAVOID	-0.09	-1.47	.14
PLANPROB	0.03	.30	.76
PREAPP	-0.07	-1.19	.24
PWEIGHTS	-0.00	-.68	.50
NWEIGHTS	0.00	1.87	.06
TSKCOP	0.02	1.11	.27
EMOCOP	0.03	1.10	.27
AVOCOP	-0.01	-.69	.49
DESSTRES	0.07	.72	.47
UDES NH	0.04	.49	.63
UDES HSTR	-0.20	-.54	.59
NOSTRESS	-0.11	-.29	.77

Appendix H

Correlations between Stress and Coping Variables

	CONCOP	DISTANC	SELFCONT	SOCSUPP	ACCRESP	PLANPROB
CONCOP	1.00					
DISTANC	.27	1.00				
SELFCONT	.45	.45	1.00			
SOCSUPP	.46	.09	.28	1.00		
ACCRESP	.46	.31	.55	.33	1.00	
ESCAVOID	.52	.36	.54	.27	.53	1.00
PLANPROB	.43	.21	.51	.43	.42	.22
PREAPP	.40	.23	.44	.39	.42	.27
PWEIGHTS	.17	-.04	.10	.19	.09	.00
NWEIGHTS	.26	.08	.31	.16	.29	.48
TSKCOP	.19	.05	.22	.30	.16	-.05
EMOCOP	.41	.22	.43	.23	.51	.66
AVOCOP	.37	.19	.17	.27	.20	.30
DESSTRES	.18	.04	.18	.20	.15	.15
UDES NH	.25	.14	.31	.21	.25	.30
UDESHSTR	.15	.15	.20	.03	.10	.30
NOSTRESS	.20	.10	.20	.05	.16	.25

	PREAPP	PWEIGHTS	NWEIGHTS	TSKCOP	EMOCOP	AVOCOP
PWEIGHTS	.22	1.00				
NWEIGHTS	.07	.26	1.00			
TSKCOP	.44	.28	.05	1.00		
EMOCOP	.21	.05	.54	.09	1.00	
AVOCOP	.23	.23	.14	.20	.30	1.00
DESSTRES	.34	.31	.18	.26	.09	.24
UDES NH	.20	.16	.36	.07	.32	.19
UDESHSTR	.01	-.02	.24	-.06	.29	.10
NOSTRESS	.20	.04	.21	.10	.17	.18

	DESSTRES	UDES NH	UDESHSTR	NOSTRESS
DESSTRES	1.00			
UDES NH	.46	1.00		
UDESHSTR	.13	.25	1.00	
NOSTRESS	.38	.29	.27	1.00

Appendix H (continued)

Correlations Between Demographic and Headache Variables

	FAMINCOM	PERINCOM	AVWKHEAD	PAINFUL	LHEADTIM
FAMINCOM	1.00				
PERINCOM	.07	1.00			
AVWKHEAD	.03	-.05	1.00		
PAINFUL	.10	-.09	.32	1.00	
LHEADTIM	.08	-.03	.08	.27	1.00
REL	.09	.03	.10	-.01	-.00
LA	.19	-.05	.08	.01	.07
MOVE	.14	-.06	.12	.00	.06
SMCHNGE	-.02	-.10	.29	.19	.08
FAMHIST	.02	-.09	.19	.23	.07

	REL	LA	MOVE	SMCHNGE	FAMHIST
REL	1.00				
LA	.04	1.00			
MOVE	.05	.63	1.00		
SMCHNGE	.07	.02	.10	1.00	
FAMHIST	.01	.07	.09	.14	1.00