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Emotions and Health in Gifted and Non-Gifted Adolescents

by

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ABSTRACT

The present study explored intensity, duration, and frequency of emotion and frequency of illness in gifted and non-gifted adolescents. A pilot study involving male and female junior high students (n=30), investigated the AIM for its reliability when used with a young adolescent population, and the DAS for its validity as a duration of affect measure. The main study involved gifted and non-gifted, male and female students (n=81). Gifted criterion was based on CCAT scores, and Frequency of Illness was derived from a combination of self-report and school records. Relationships between variables and differences between groups were explored. The contribution of each of the variables to predicting illness was also explored.

With respect to the AIM, over 86% of subjects had no comprehension problems, and 90% of subjects indicated having no other questionnaire-related problems. With respect to the DAS, frequencies indicate the most frequent rating given by both raters across groups and questions was 1 (that the answer given in the recorded interview reflects the same point on the Likert Scale as the answer given on the written DAS). For the majority of questions, agreement among raters ranged between 80% and 100% with the greatest variability occurring in the grade 8 group, and concordance among raters was above .7000 in all groups.

Significant correlations support previous research with adults, but none of the correlations were strong suggesting possible differences between adolescents and adults in terms of either emotionality or physiological vulnerability. No strong correlation was found between frequency of illness and any of the other variables. Females scored higher than males on frequency of illness, but no significant differences were found between gifted and non-gifted individuals. With respect to emotionality, no gender differences were found. However, non-gifted males had the highest scores on intensity of emotion at the time of questionnaire administration. Findings do not support views that gifted are more emotional than non-gifted, and females are more emotional than males. Although gender and frequency of emotion, were found to be significant predictors of illness, the percentage variance accounted for by these variables was very small.

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DEDICATION

This thesis is dedicated to my children, Amber and Jessica, whose characteristics of resilience and ingenuity have made them stars in many ways and have inspired me to see new challenges as opportunities.

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CHAPTER ONE

INTRODUCTION

History

That disease may be associated with emotional stress is not a new concept. Cooper (1996) found numerous related references to such beliefs over the course of history including: Ayurvedic philosophy which emphasized such beliefs over 3,500 years ago; Galen who observed, in the early 1600's, that "... melancholy women were particularly prone to cancer of the reproductive organs..."; the English physician Gendron who concluded, in 1701, that cancer was caused by "...disasters of life as occasion much trouble and grief"; Burrows, of the late 1700's, who believed that disease was linked to unpleasant emotions of sustained duration; Walsh, in the mid-1800's, who attributed the cause of disease to "mental misery", "habitual gloomings of the temper", and "sudden reverses of fortune"; and at the end of the century, Snow who found a relationship between the loss of a near relative and cancer. Similarly Evans, a Jungian psychoanalyst, noted in 1926, that the loss of a significant relationship appeared to be linked to cancer, and LeShan, after conducting an extensive review of the literature and numerous interviews over 20 years during the 1950's and 1960's, concluded that loss of an important emotional relationship was the most significant factor preceding the onset of a malignancy (Cooper, 1996). Greene and Miller (1958) indicated the relationship between emotional loss and disease was most likely to occur when that loss engendered sustained feelings of anxiety, anger, sadness, or hopelessness, suggesting that duration of emotion may be an important factor contributing to disease onset. Schmale and Iker (1966) found women suffering feelings of helplessness or overwhelming frustration due to emotional loss or conflict, were prone to developing cancer. Their research suggests that intensity of emotion may be an important factor in the development of disease. Recently, there have been several references that link emotion with a concomitant reduction of natural killer (NK) cells and other immune system activities. For example depression has been found to be associated with reduced immune functioning (Irwin, Lacher, and Caldwell, 1992), feelings of helplessness and hopelessness have been linked to cancer (Mount, 1993), and

feelings of hostility have been associated with coronary heart disease (Powch & Houston, 1996; Denollet, Sys, & Brutsaert, 1995). In a study by Pettingale, Greer, & Tee (1977), breast cancer patients who suppressed their anger were found to have higher serum immune globulin-A levels which correlate with breast cancer metastases and mortality rates. As was the case in earlier studies, more recent studies are also finding that T cell mitogenic and NK cell activity is depressed during the 6 to 12 month period following a significant emotional loss such as the death of a spouse, divorce, marital separation, or even the loss of a job combined with continued unemployment (Irwin, Daniels, Smith, Bloom, & Weiner, 1987; Irwin, Lacher, & Caldwell, 1992; Marriott, Kirkwood, & Stough, 1994). Supporting the view that emotions influence immune system functioning is the low incidence of cancer in schizophrenic and certain other psychiatric patients who may not find loss/separation events distressing or who may be unable to experience feelings and emotions normally associated with loss and separation (Derogatis et al, 1983; Levitan, Levitan, & Levitan, 1980).

Today, the connection between emotions and health is becoming more established. Emotions have been found to trigger physiological responses that prepare the organism to cope with normal stressors (Lazarus, 1991, chap.4). Such physiological responses may play an important protective role in system adaptation to new or increased demands (Briski & Sylvester, 1987). However, research suggests that emotions can also place demands on the system that are so great that the result may be adaptation failure and susceptibility to disease (Gottfries et al, 1994). Researchers continue to find correlations between emotions and various disorders including: coronary heart disease (Denollet, Sys, & Brutsaert, 1995; Vitaliano, Scanlan, Krenz, Schwartz, & Marcovina, 1996); cancer (Cooper, 1996; Eysenck, 1991); multiple sclerosis (Grant et al, 1989; Warren, Warren, & Cockerill, 1991); and susceptibility to disease in general (Knapp et al, 1992; Licinio, Gold, & Wong, 1995).

Rationale

Generally, research findings suggest that our emotions trigger our physiological responses to stress. While these responses are normally adaptive, they can also be

maladaptive as when emotions produced during mental distress cause a disturbance great enough to deregulate the immune system (Hafen, Karren, Frandsen, & Smith, 1996, chap. 2). As suggested by previous research, this perspective suggests that intensity, duration, and frequency of emotional responses may determine the nature of physiological outcomes. If emotionality is involved in immune system regulation, we might expect that groups of individuals who have been identified as more emotional, such as females (Nolen-Hoeksema, & Girus, 1994) or the gifted (Silverman, 1993), may experience more physiological responses. As a result, more emotional groups might be expected to experience more illness than the normal population.

Purpose

This exploratory research will look for evidence of a relationship between intensity, duration, and frequency of emotion and frequency of illness in groups of male and female and gifted and non-gifted individuals. In addition, differences between males and females and between gifted and non-gifted individuals will be investigated with respect to intensity, duration, and frequency of emotion and frequency of illness. Finally, intensity, duration, and frequency of emotion will be investigated as a possible basis for predicting frequency of illness. To this end, the following research questions will be addressed:

Research Question One.

- (a) Are there relationships between affect intensity, duration of affect, frequency of affect, frequency of illness, gender, and gifted?
- (b) Is there a relationship between frequency of illness and affect intensity, duration of affect, frequency of affect, gender, and gifted?

Research Question Two.

- (a) Are there significant differences between females and males with respect to intensity, duration, and/or frequency of emotions, and frequency of illness?
- (b) Are there significant differences between gifted and non-gifted individuals with respect to intensity, duration, and/or frequency of emotions, and frequency of illness?

(c) Are there significant interactions between gender and gifted with respect to intensity, duration, and/or frequency of emotions, and frequency of illness?

Research Question Three.

Do intensity, duration, and/or frequency of emotion add to our ability to predict absenteeism?

CHAPTER TWO

LITERATURE REVIEW

Introduction

Considerable research has been conducted over many years regarding the relationship between emotions and health. This literature review briefly discusses the early research which provided a basis for more refined studies later and also reviews the more current research on this topic. Research findings leave little doubt that emotions impact the immune system but less clear is the nature of the emotions having this effect. However, it has been suggested that the emotions most likely to alter immune functioning are those that are more intense, more frequent, or more enduring. This review includes literature that discusses emotional intensity, frequency and duration and provides examples of research in each of these areas. Because certain groups, such as females and the gifted, have been labelled as more emotional than others, these groups may be more susceptible to illness than other less emotional groups. Therefore, this review of the literature also includes a discussion of group differences, gender and gifted, with respect to emotionality.

Emotions and Health - Looking Back

According to Ayurvedic Medicine, practised in India for the past five thousand years, disease occurs when there is an imbalance between body, mind, and soul (Krippner, 1995). Krippner describes one disease management technique used by Ayurvedic practitioners, Satvajaya; a method of improving the mind to reach a higher level of spiritual/mental functioning, accomplished through the release of psychological stress, emotional distress, and unconscious negative beliefs. Western researchers have also had an interest in the mind and its influence on the body for many years. Early documented observations ultimately led to more formal research and it is this early research that helped us gain a better understanding of cognitive and physiological interactions and how they translate into health status.

One of the earliest research studies was conducted in 1893 by Snow at the London Cancer Hospital. Snow questioned more than 250 patients about losses they had experienced prior to their diagnosis with cancer and found the loss of a near relative to be

an important factor in the development of breast and uterine cancer (Cooper, 1996).

Another early study by Greene and Miller (1958) involved 33 children and adolescents with leukemia. Thirty-one of these patients reported experiencing, during the six month period prior to the apparent onset of the disease, one or more events involving separation or threats of separation or loss, such as might be experienced with a change of home or school or with the loss of a significant person through death or illness. Because these experiences engender sustained feelings of anxiety, anger, sadness, and/or hopelessness, these findings lend support to the view that duration of emotion may contribute to disease onset.

More recently, a reduction of cytotoxic NK cell activity has been linked to depression. For example, Irwin, Lacher, and Caldwell (1992) discuss the reduction found in natural cytotoxicity in acutely depressed patients as compared to age-matched controls. They explain that cytotoxic activity has been found to be involved in the recognition and destruction of malignant and virus-infected cells. They add that previous studies of depressed patients found a correlation between severity of depression and NK activity during a depressive episode. Irwin, Lacher, and Caldwell's study looked at the temporal association of severity of depressive symptoms with reduced NK activity. Subjects included 27 pairs of depressed males and non-depressed controls, age- and gender-matched. Using a longitudinal case-control design, they measured NK activity at intake and found it to be significantly reduced in depressed subjects as compared to controls. Six months after discharge from the hospital, depression scores decreased significantly in depressed subjects receiving treatment, but did not change in the control subjects and NK activity increased in subjects to a level similar to controls. Their findings suggest that a reduction of NK cytotoxicity is temporally associated with the state of acute depression.

A relationship between emotional distress and physiological malfunctioning has also been observed in cardiac patients. Denollet, Sys, and Brutsaert (1995) examined the role of personality traits in mortality after myocardial infarction. One hundred and five male subjects aged 45 - 60 years were assessed on biomedical, psychosocial, and personality factors and followed up 2 to 5 years later. At followup, 15 subjects had died,

73% of whom had a distressed personality type. Subjects with distressed personality reported more life stress and more depressive cognitions, and more symptoms of somatization. Life stress and somatization were associated with total mortality. Denollet et al concluded that personality traits may play a role in the detrimental effect of emotional distress in subjects with myocardial infarction.

Studies involving schizophrenics also lend support to the view that there is a connection between emotion and immune system functioning. Derogatis et al (1983) conducted a study involving 101 subjects diagnosed with cancer. Subjects were assessed using the DSM-III, and 47% of the sample were found to have psychiatric disorders. Some patients' diagnoses fell into more than one diagnostic class. However, the diagnostic classes most represented were adjustment disorders (68%) and major affective disorders (13%). Other diagnostic classes that were represented include organic mental disorders (4%), personality disorders (3%), and anxiety disorders (2%). Schizophrenic or schizophreniform disorders, and manic forms of bipolar affective disorder were notably absent from observation. When diagnostic classes were pooled together, conditions that feature prominent depression, anxiety, or both had a prevalence rate of 50% and accounted for 85% of the cancer diagnoses. Based on these findings, it would appear that among cancer patients, individuals that are clinically diagnosed with psychiatric disorders that involve emotional suffering, such as the major affective disorders, are more highly represented than individuals with psychiatric disorders such as schizophrenia that involve an absence of affect.

Grant et al (1989) also found a relationship between distress and the onset or exacerbation of multiple sclerosis (MS). In their study, 39 subjects having experienced on average, symptom onset two years prior to entry into the study, were matched to non-patient controls. Subjects reported on events which occurred 1 to 3 years prior to the interview. Events were contextually rated as either marked difficulties or of insufficient importance to include in data analysis. Once included in the study, events were then rated as to degree of threat and duration of threat. A severely threatening event was one that was rated long-term and self-focussed. A marked difficulty was an event that was

contextually rated as 1, 2, or 3 out of 6 and a subject classified as experiencing marked adversity was one that reported a severely threatening event and/or a marked difficulty during a one year period prior to the onset of major symptoms. Results indicated that in the 6 months preceding onset of symptoms, 30 out of 39 MS patients (77%) experienced marked life adversity while only 14 out of 40 non-patients (35%) reported marked adversity in the same time period. Similarly, 24 out of 39 MS patients (62%) compared to 6 out of 40 controls (15%) reported a severely threatening event. Also, 19 out of 39 MS patients (49%) experienced more marked difficulties in the 6 months prior to onset of disease symptomology as compared to 8 out of 40 controls (20%). Grant et al suggest that such stressors might play a role in the onset of MS or in the timing of symptom exacerbation for some patients with MS, perhaps by perturbing an already unstable neuroimmunological system.

Emotions and Health - Current Views

Cognitions provide the knowledge necessary to make appraisals of person/environment relationships and those appraisals influence emotion (Lazarus, 1991, chap. 8). Each emotion is defined by a unique and specifiable meaning expressed in a core relational theme which summarizes personal harms and benefits in each person-environment relationship (Lazarus, 1991, chap. 8). Thus, thoughts are appraisal mechanisms whose purpose is to elicit an adaptive emotional response to environmental stimuli. Although emotional responses depend on the meaning of the appraisal, emotional responses also determine the nature of physiological responses, that is, the specific patterns of hormonal secretions that are needed to deal with the environmental stimuli as appraised (Lazarus, 1991, chap. 4). Altering hormonal balance affects every gland, organ, tissue, and cell in the body and regulates all body functions including immune function (Barasch, 1993, chap.12). Consequently, emotions play an important role in determining changes in physiological functioning.

Because thoughts, emotions, and physiology are in a relationship of communication that can produce physiological change, an understanding of how the mind and body communicate is an important part of understanding health and illness.

The Communication Network

During a stress response, the emotions and the brain interact to affect the body. Hafen, Karren, Frandsen, and Smith (1996) explain that the body's sensory receptors are initially stimulated by an external stimulus. These receptors respond by producing chemicals that inform the brain as to the nature of the stimulus. The limbic and higher centers of the brain respond to these chemicals by appraising the importance or potential threat of the stimulus. This appraisal produces an emotional response wherein the hypothalamus signals the pituitary gland to trigger a flood of hormones into various parts of the body thereby producing numerous responses including: rapid pulse, rising blood pressure, dilated pupils, and other physiological shifts that prepare you for action (chap. 2). Black (1994) points out that the hypothalamus and the pituitary gland produce both immune-enhancing and immune-suppressive effects thereby providing a mechanism for regulating the immune response in both magnitude and duration.

Candace Pert, a neurological scientist, in an interview with Horrigan (1995) explained that the hormones that govern communication between the brain and body cells are neuropeptides whose receptors are attached to cells throughout the body. She says that peptides are being released from cells and carrying information to other cells that are receiving that information so that neuropeptides and their receptors form an extensive but flexible information network that the body uses to communicate with itself. Pert refers to this network as the "biochemical substrate of emotions".

How does this exchange of information impact the body? Pert explains that when neuropeptides lock into their receptors, they cause physiological reactions and consequently, they run your physiology, your health, and your tendency toward disease (Horrigan, 1995). The way it works, according to Pert, is that emotional energy comes first and then peptides are released everywhere. She says, "Everywhere simultaneously the molecules are manifesting... Somehow the feeling is there first and then the molecules manifest themselves" (p. 72). She explains that the feelings actually create the peptides that inform the cells of the body (Horrigan, 1995). This view, that emotions run our physiology, suggests certain implications for individuals who are more emotional.

Miscommunications.

As indicated by Pert, the immune system is a delicately balanced organization of communication (Horrigan, 1995). Therefore, it is not surprising that malfunctions of the immune system can occur. Malfunctions may involve the suppression of immune responses thereby leaving an individual vulnerable to various infectious diseases, or may result in enhancement of immune responses so that antibodies react to normal body tissues as if they were foreign or abnormal entities (Hafen, Karren, Frandsen, & Smith, 1996, chap. 2). Black (1994) explains that various physiological responses to stress can result in increased levels of corticosteroids, catecholamines, and certain opiates. These substances are known to be generally immune-suppressive. In addition, during the early response to stress, concentrations of growth hormone and prolactin are elevated. These substances are known to be generally immune-enhancing. When functioning normally, all of these responses to stress are later suppressed and the system returns to its normal homeostatic state. However, the delicate balance of the immune system can be upset by emotional distress (Hafen, Karren, Frandsen, & Smith, 1996, chap. 2). When this happens, the immune system becomes deregulated resulting in continued immune-suppression or continued immune-enhancement.

Stein, Keller, and Schleifer (1985) investigated the effects of two emotions, bereavement and depression, on immunity. They found an association between bereavement and a suppressed immune response. They also found an association between depression and certain autoimmune processes.

How can emotions deregulate the immune system? Intense emotions may function to increase the perceived severity of a stressful situation and may also prolong the perception of continued threat resulting in physiological responses that are correspondingly more intense and prolonged. Pelletier (1979) explains that our physiology is ill-suited to cope with stress and anxiety over an extended period of time and from which no physical escape takes place (chap. 2). Since our immunoregulatory system was designed to cope with short-term stressors, intense or prolonged stress may cause the system to adapt and change the way it responds to accommodate long-term stressors.

Thus, instead of expressing short-term immune-suppression or immune-enhancement, the system begins to express long-term immune-suppression or immune-enhancement.

Two studies noted in Stein, Keller, and Schleifer (1985) lend support to the idea that the immune system is adaptive. In one study, a single session crowding of mice induced suppression of antibody responses. However, after three days of repeated crowding antibody responses returned to prestress levels. In a second study, exposure of mice to sound stress for up to 20 days suppressed the immune response, but more extended exposure resulted in an enhanced response.

Distress can also induce hormonal alterations. Cooper (1996) explains that the corticotropin-releasing hormone (CRH) acts as coordinator of behavioral, neuroendocrine, autonomic, and immunologic adaption. Therefore, during chronic stress system activation, there is an increased or prolonged production of CRH which may play a role in the pathogenesis of psychiatric, circulatory, metabolic, and immune manifestations associated with chronic stress. Licinio, Gold, and Wong (1995) explain that living organisms are constantly exposed to stresses that threaten homeostasis and that aspects of the organism's response to stress potentially influence susceptibility to disease.

In addition to its role as an immune system coordinator, CRH also acts as an immune modulator (Licinio, Gold, and Wong, 1995). Licinio, Gold, and Wong explain that CRH binds to surface receptors on target cells leading to activation of certain chemicals and the synthesis of transcription factors that can bind to a gene promoter, causing increased transcription and replication. They explain that the elements of the gene promoter that are receptive to transcription factors, are also contained in human oncogenes. These findings led Licinio, Gold, and Wong to hypothesize that these transcription factors may also bind to oncogenes which have captured gene promoter elements responsive to CRH which could possibly affect the outcome of neoplastic transformation. Further research is required to test their hypothesis. However, confirmation of their hypothesis would provide a direct link between the stress-related peptide CRH, induction of intracellular transcription factors, activation of specific genes, and disease outcome.

Another example of adaptation is provided by Cooper (1996) who explains that the hypothalamic-pituitary-adrenal axis (HPA) provides beneficial protection against short-term stressors by producing catabolic and immune-suppressive effects. If short-term, these effects produce no adverse consequences. However chronic activation is another matter. Under prolonged stress conditions, the generalized stress response becomes deregulated leading to chronic activation of the HPA axis and sympathetic nervous system resulting in relative immune-suppression. As an example, Cooper refers to a study by Gold, Goodwin, and Chrousos (1988) who found elevated HPA activity in individuals during periods of melancholic depression. As the depressive episode waned, HPA activity in these individuals returned to normal. Cooper states theoretically, that an excessive HPA axis response to inflammatory stimuli would lead to increased susceptibility of the individual to a host of infections agents or tumors while a defective HPA axis response to such stimuli would lead to relative resistance to infections and neoplastic disease, but increased susceptibility to autoimmune/inflammatory disease.

Types of Emotional Responses

The literature suggests that emotions can contribute to illness because they are directly linked to the body's immunological system (Lazarus, 1991, chap. 4; Lewis & Michalson, 1983, chap. 1). The degree of impact that emotions can have on immunity has been alluded to by Hafen, Karren, Frandsen, and Smith (1996), who state that mental distress can put the immune system into a state of deregulation as it attempts to adapt (chap.2).

If physiological responses to stress, are activated by emotional responses to perceived stressors, we might expect that different types of emotional responses would produce different physiological responses. Emotions that are mild or infrequent would not be expected to have the same effect on biology as those that are intense or frequent. Similarly, emotions that are enduring are likely to be associated with more biological consequences than short-term emotions. In short, we might expect that emotions that are more intense, prolonged, or frequent would have more profound effects on physiology.

Frequent Emotions.

An interesting study by Schmale and Iker (1966) examined the relationship between antecedent stress and cancer of the cervix. In this study, asymptomatic women with suspicious pap smears were interviewed. The researchers looked for evidence of a high hopelessness potential and/or recent feelings of hopelessness. Criteria for judging high hopelessness potential included the subject's report of reactions to life events in general, particularly long term hyperactivity and devotion to causes with little or no feeling of success or pleasure. These subjects rarely felt they achieved what they desired to achieve and experienced feelings of doom and that there was nothing that could be done to overcome the lost gratification. In addition, they assumed most of the responsibility for what they considered to be evidence of failure so that there was no thought of anyone else providing a solution. Schmale and Iker predicted that women with the criteria for high hopelessness potential or who reported feelings of hopelessness during the previous six months would test positive for cancer. As an added objective measure, subjects also completed three subscales of the Minnesota Multiphasic Personality Inventory; the Ego Strength, Depression, and Masculinity-Femininity scales. Schmale and Iker predicted that women with lower ego strength, higher depression, and lower femininity ratings would develop cancer. All predictions were made before the investigators, subjects or physicians knew whether cancer was present or not. They found that they could predict with almost 75% accuracy, those who would subsequently develop cancer. Out of 40 women studied, there were 31 correct predictions and 9 incorrect predictions. However, it may be that most women who have reason to present for testing experience high hopelessness during the six months prior to testing and it may also be that approximately 75% of all women that present for testing are found to have cancer. However, Schmale and Iker do not report the average percentage of asymptomatic women that are ultimately diagnosed with cancer.

Another study by Briski and Sylvester (1987) examined the effect of repetitive acute stress on pituitary secretion of prolactin (PRL) and luteinizing hormone (LH) during subsequent exposure to the same stressor or to a second, novel stressor. Rats were

subjected to either a single episode or to 10 daily episodes of psychological stress. They found that a single exposure to stress caused a significant but temporary increase in circulating LH and PRL while repetitive daily exposure to these stressors resulted in the habituation of the stress-stimulated release of both hormones by the 10th consecutive day. In addition, rats previously exposed to daily novel stress showed an attenuation of both LH and PRL secretory responses when subjected to a single episode of stress, compared to rats who had been exposed to only one stress episode. The results suggest that repeated daily exposure to a specific acute stress stimuli can result in the eventual habituation of the LH and PRL hormonal responses to stress. In addition, adaptation to one acute stressor may result in altered hormonal responsiveness to a second, unfamiliar stressor. This research suggests that physiology will try to adapt when psychological demands are frequent.

Intense Emotions.

Walter Cannon argued that internal mechanisms are designed to keep the human organism in a state of homeostasis. He said that when this state is upset, internal mechanisms operate to return the organism to a homeostatic state but if strained beyond a certain point, homeostasis can not be maintain (Weiner, 1992, chap. 1). Analogous to this is a spring strained by a force. If not over stressed, the spring returns to its original state. However, if over stressed, the strain goes beyond the level of the spring's tolerance and results in a profound structural change (Samueloff & Yousef, 1987, chap. 1). This view suggests that people who experience their emotions intensely are likely putting a strain on themselves that may exceed physiological tolerance limits which could produce profound changes to their health status. In support of this view is Hans Selye's stage theory of stress (Elliott & Eisdorfer, 1982, chap. 1). Selye's model suggests that hedonic tone is not important. It is the intensity of emotions, positive or negative, that will lead to physiological changes.

Pelletier (1979) states that emotions may prolong a stress response by interfering with the organism's attempts to regain homeostasis (chap. 2). Low intensity emotions may do little to prolong the mobilization of neural response mechanisms, while high intensity

emotions may significantly increase the duration of mobilization. Also, it may be that prolonged mobilization of hormones ultimately produces intolerable strain and structural change, that is, at the cellular level. Structural changes could be so small that they are imperceptible to the individual, or larger and very noticeable to the individual. In any event, it seems likely that high intensity emotions would produce more perceptible changes than low intensity emotions.

More recently, researchers are looking at intensity of emotion as a critical factor associated with wellness and disease. For example, Hafen, Karren, Frandsen, and Smith (1996) point out that endorphins, in moderate amounts, "produce calm, kill pain, and give us the thrill of anticipation over a warm-from-the-oven slice of spicy apple pie". However, they add that when endorphins flood the system, they can bind to NK cells, that normally destroy tumor cells, thereby reducing their efficacy so that the immune system is compromised (chap. 2).

Similarly, Birney (1991) explains that the "good" stress of a controllable physical challenge such as exercise, may slightly increase endorphin levels and be immune-enhancing. However, overwhelming or uncontrollable "bad stress" may raise endorphin levels too high and suppress the immune response. Thus, good and bad stress have different effects on the immune system, but their effects appear to differ because of differences in intensity level.

Larsen and Diener (1987) also believe that it is the intensity of emotions that is related to health. Because of their interest in individual differences in affect responsiveness, they developed an instrument to measure the construct of affect intensity. This construct generalizes across specific emotions because they have found that individuals who experience positive emotions more strongly will, over time, experience negative emotions more strongly as well. Consequently, like Selye, Larsen and Diener define affect intensity as the regular experience of strong emotions regardless of their specific content or hedonic tone.

Using the Affect Intensity Measure ("AIM"), Larsen and Diener (1987) performed two separate studies with a total of 136 subjects, and found that the total number of

symptoms endorsed (e.g. headaches, nervousness, feeling uneasy, nausea, heart pounding, soreness in muscles, shortness of breath) was significantly related to affect intensity, as measured by both the AIM and traditional daily measurement methods. They suggest that if the total number of symptoms endorsed can be understood as a general somatic distress dimension, then affect intensity appears to be related to somatic distress. Thus, subjects high on affect intensity are likely to report having more somatic problems.

In another study, a relationship between affect intensity and being at risk for cyclothymia and bipolar affective disorder was examined in a sample of 242 individuals ranging in age from 16 to 68 years. Again, findings showed a tendency for individuals scoring high on the AIM to exhibit behavioral indicators of being at risk for bipolar forms of affective disorder (Larsen & Diener, 1987).

Stein, Keller, and Schleifer (1985) looked at intensity levels in depression and found decreased mitogen responses in hospitalized patients with major depressive disorder but not in ambulatory depressed patients suggesting that altered or deregulated immunity in depression may be related to severity of depressive symptomology. While severity of symptomology may be due to the fact that depression is an emotional state that can be quite intense, it is also an emotional state that is often prolonged.

Although intense emotions have been studied for some time in cardiac patients (Keltikangas-Jarvinen & Raikkonen, 1990; Powch & Houston, 1996) and more recently in cancer patients (Royak-Schaler, 1991) it may be that emotions act as underlying factors in illness generally. For example, in a study by Pettingale, Greer, & Tee (1977), 160 breast cancer patients were measured for expression of anger and serum immunoglobulin (IgA) at 3, 12, and 24 months after operation. They found higher IgA levels in women who suppressed their anger compared to those who were able to express their anger. However, significantly higher IgA levels were only found in those women who had active breast cancer. Findings suggest that suppressed anger may alter serum IgA levels which correlate with breast cancer metastases and mortality rates.

Prolonged Emotions.

As previously indicated, the degree to which emotions prolong the stress response

may be related to emotional intensity. Nonetheless, prolonged mobilization of hormones may interfere with the organism's attempts to regain homeostasis ultimately producing intolerable strain and structural change at the cellular level (Pelletier, 1979).

Birney (1991) suggests that the duration of intense emotional responses determine the nature of an immune response. She says that chronic exposure to a stressor enhances cell-mediated responses, while short-term high intensity exposure depresses these responses.

Responses to stimuli have been found to vary, depending on whether the stressor is interpreted as negative or positive (Weiner, H., 1992, chap. 1). Elliott and Eisdorfer (1982) point out that stressors that are perceived to be negative, or even anticipated to be negative, have been found to be more likely to impact negatively on health (chap. 1). However, this may be because we tend to hang on to negative emotions longer than positive emotions thereby prolonging their effects. If so, is the effect due to negativity, or due to prolonged duration?

Numerous studies have found a correlation between heart disease and hostility or anger. For example, Powch and Houston (1996) examined the relationship between cardiovascular reactivity and cynical hostility, aggressiveness, antagonism, and anger-in using a sample of white college women in high and low experimental stress conditions. They found a positive relationship between systolic blood pressure reactivity and cynical hostility in high interpersonal stress conditions, and a positive relationship between heart rate reactivity and antagonism across conditions. These findings support the view that negative feelings produce physiological responses. However, it could be argued that positive feelings would produce similar responses if they were as intense and prolonged as negative feelings.

Hafen, Karren, Frandsen, and Smith (1996) found research that indicated the immune system may be affected by any kind of emotion. For example, in one study the immune system was found to be significantly affected by both happiness and sadness. However, with respect to negative emotions, researchers found that during intense short-term sadness there was an enhanced immune response while long-term unpleasant

emotions were found to wreak havoc on the body due to prolonged increases in cortisol levels which cause numerous physiological changes that can harm the body and even shorten life (chap. 3). Therefore, although positive and negative emotions affect the immune system, the nature of those effects may depend more on the duration of the emotional experience.

Pert suggests that any emotion can create peptides which inform cells as to how they should manifest in the body (Horrigan, 1995). Therefore, it seems that all types of emotion, whether they are positive or negative, and whether they are mild or intense, are continually creating changes in the body. However, the research generally suggests that healthy changes occur when emotions are maintained for short-term periods and within an acceptable range of intensity.

Susceptibility to Illness

It has been suggested that emotions contribute to illness and susceptibility to illness because physiological responses to stress, whether short-term or long-term, are activated by emotional responses to perceived stressors. Lazarus (1991) writes that illness has its origins in emotion (chap. 4) and Lewis and Michalson (1983) state that there is a direct link between emotions and the body's immunological system. They explain that emotional states are specific, transient, patterned alterations in ongoing levels of physiological activity, somatic or neuronal, that accompany activation of emotional receptors (chap.1). Hafen, Karren, Frandsen, & Smith (1996) write that emotions produced by the brain are a mixture of feelings and physical responses so that every time the brain manufactures an emotion in the brain structures and nerve pathways referred to as the limbic system, physical responses accompany that emotion. They add that mental distress causes a disturbance in the regulation of the immune response (chap.2). In other words, the power of emotions on health is related to their effect on the immune system.

However, Lazarus (1991) indicates that there are individual differences in terms of emotion expressed, intensity and duration of emotion expressed, nature and intensity of physiological responses to emotion, as well as individual differences in physiological vulnerability (chap.4). Generally, the literature has suggested that certain identifiable,

non-clinical groups of individuals are more emotional than others. For example, females are thought to be more emotional than males (Grossman & Wood, 1993; Nolen-Hoeksema, & Girgus, 1994; Petersen, Sarigiani, & Kennedy, 1991), and gifted individuals are thought to be more sensitive and more emotional than average individuals (Miller, Silverman, & Falk, 1994; Silverman, 1993).

If emotions play a role in determining health status, it may be that groups of individuals that have been identified as more emotional, may be at higher risk for illness than individuals identified as less emotional.

Emotions and Gender

The literature suggests that there are gender differences in the way males and females experience stressful events and differences in the way they experience emotions. A study by Billings and Moos (1982) found, after controlling for: i) the fact that symptoms may precede events; and ii) that there is a consistent individual propensity to experience stressful events, a significant relationship remained between negative events and symptoms of mental and physical distress. Negative events were found to have a greater impact on females than on males. In this regard, Billings and Moos suggest that there may be a possible mastery effect among males but not females. They also suggest that coping and social resources may provide comparatively less stress-buffering value for females. However, results from a study by Fusilier, Ganster, and Mayes (1986) indicate no significant differences between males and females as to the amount of social support received or the effects of social support on health.

Stapley and Haviland (1989) explored gender differences in a normal sample of adolescents, ranging in age from 11 to 17 years, both with respect to reports on intensity, duration, and frequency of emotion as measured by Izard's Differential Emotions Scale, and with respect to conditions for experiencing an emotion as measured by Stapley and Haviland's (1986) Elicitors of Emotion Questionnaire. Based on previous research they expected that girls would experience more sadness and inner-directed negative emotions whereas boys would experience more outer-directed negative emotions. In addition they expected that boys would experience sadness in association with achievement issues

whereas sadness would be associated with bodily concerns and interpersonal issues for girls. After collapsing intensity, duration, and frequency into a single scale score representing a salience of emotion score, boys scored higher on contempt, whereas girls scored higher on shy, surprise, shame, guilt, sad, and self-hostility. No significant gender by grade interaction was found. However, saliency of several negative emotions including shy, shame, fear, contempt, and disgust decreased with grade. Orthogonal factor analyses of emotion saliency revealed three factors for both sexes including: i) inner-passive negative emotions; ii) outer-active negative emotions; and iii) positive emotions. For boys, anger loaded on both of the negative factors while surprise loaded on both positive and negative factors. For girls, surprise loaded only on the positive factor while sad loaded on both negative factors. Girls and boys were almost equally elaborated in the areas of activity, achievement and aggression but girls reported more elaborated emotion in affiliative events. In addition, boys were found to deny many experiences of emotion. Stapley and Haviland's results support the prediction that boys negative emotions are more outer-directed and girls negative emotions are more inner-directed. They conclude that if males and females find different types of situations to be emotionally charged, then it is not possible to conclude that there are gender differences in emotional intensity by simply comparing the intensity of responses to identical situations. Their results also suggest that there are significant gender differences in the reporting of the characteristics of most emotions during the adolescent years.

Sowa and Lustman's (1984) research examined gender differences in rating stressful life events, depression, and depressive cognition. They used an interactive model in which sex predicts depression with stressful life events and cognitive distortion serving as modifiers. Subjects completed the Life Stress Questionnaire, the Beck Depression Inventory, and the Automatic Thoughts Questionnaire. Results from t tests indicated that males and females differed significantly on all dependent measures. A stepdown multiple regression was computed to examine the relationship of cognitive distortion, stress, and gender in predicting depression. Cognitive distortion accounted for the majority of depression variance in each regression. Sowa and Lustman found that males reported

experiencing significantly more stressful life changes but after controlling for the number and type of events, females's positive and negative evaluations of events were significantly higher than males's. Some variation was noted for cognitive distortion. Males report significantly less depression than females while simultaneously expressing higher levels of cognitive distortion. Regression analysis showed that levels of cognitive distortion for females were three times more powerful in predicting depressive mood than for males. Sowa and Lustman propose, contrary to Beck's etiological model that suggests that cognitive distortions contribute causally to the development and maintenance of depression, that cognitive distortion may actually insulate males from depressive moods and that Beck's model is most applicable to female depression and less relevant for male depression. They add that coping mechanisms employed to deal with identical stressors may be gender specific and models of depression may also be gender specific. In this regard, Stapley and Haviland also noted that many depression scales focus on inner-directed affects in their composition and, given that depression with an external focus on performance concerns is more characteristic of boys while an internal focus is more characteristic of girls, it may be that these scales are biased toward measuring deviation from normal female emotional experience. They note that the scales do not contain many items that represent male emotional experience such as feelings associated with disturbances in involvements in activities or items pertaining to dysfunction in avoiding emotion display. In addition they noted no question regarding feelings of contempt and only one regarding anger, feelings which reflect areas that are central to normal male emotional functioning.

Gender stereotyping may also play a role in how males and females develop different emotional styles. MacKinnon and Keating's (1989) review of the literature found that American culture invites females, more than males, to focus on feeling rather than action suggesting that females are more likely to have access to their emotions. It was also noted that females tend to "externalize" their feelings more than males suggesting that males may be less "introspective" than females in regard to emotional experience. Consequently, females may develop greater attunement with their emotions. MacKinnon

and Keating conclude that if females are more closely in touch with their feelings and more affectively expressive, we might expect them to also display greater discrimination and variation in the cognitive labels employed to delineate their feelings.

From a developmental perspective, Nolen-Hoeksema & Girgus (1994) state that no gender differences are found in depression rates in prepubescent children, but, after age 15, girls and women are twice as likely to be depressed as boys and men. They explain that girls appear to develop more risk factors for depression than boys prior to adolescence and apparently face more new challenges than boys during early adolescence. They believe that the combination of these two factors generates gender differences in depression that begin in early adolescence.

The view that females are more emotional than males is not always upheld by the literature. Bartell and Reynolds (1986) explored depression and self-esteem in gifted and non-gifted students in grades 4 and 5 and found gifted boys reported significantly lower levels of self-esteem and more depression than gifted girls.

Emotions and Gifted

Dr. Annemarie Roeper (1981) defined gifted as "...a greater awareness, a greater sensitivity, and a greater ability to understand and transform perceptions into intellectual and emotional experiences." She explains that gifted individuals have a cognitive complexity that gives rise to emotional depth, and a finely tuned psychological structure that experiences all of life more intensely. She believes that there is an inextricable link between emotion, cognition, and their combined impact on individuals of high intelligence, and that high emotional responsiveness may be associated with advanced cognitive organization. Sharon Begley (1996) explains that between 10 and 18 months of age, cells in the rational prefrontal cortex connect with emotion regions creating a circuit which later acts as an anxiety control switch by infusing reason into emotion. Perhaps high emotional responsiveness promotes cognitive development because of the greater demand for infused reasoning.

A study by Sommers (1981) found college students with advanced cognitive organization had a wider emotional range, meaning a wider variety of emotional

responses. Sommers writes, “Cognitive complexity enables the person to take other viewpoints and to recognize injustice, creating a strong value system from which to evaluate life events. These evaluations activate rich emotional responses: individuals with well-developed value systems tend to be more emotionally reactive when they see behavior that violates their values.”

While gifted individuals may have a wider range of emotions and may be more emotionally reactive, it is unclear whether this represents healthy emotional development. Begley (1996) suggests there needs to be healthy limits to emotional reactivity. She states that stress and constant threats can rewire emotion circuits. She explains that visual and auditory impulses reach the amygdala before the rational neocortex. The amygdala scans all incoming sights and sounds for emotional content and if such impulses are associated with a painful experience, the amygdala floods the circuits with neurochemicals before the higher brain knows what’s happening. Begley points out that circuits can stay excited for days so that the brain remains on high alert with more circuits attending to nonverbal cues for warnings of impending danger. She adds that prolonged excitement can interfere with the assimilation of complex information and result in the cortex falling behind in development. In addition, she explains that the more frequently this pathway is used, the easier it is to trigger.

Silverman (1993) talks about gifted development being “uneven” because it incorporates the emotional dimension, emphasizing the interrelationship of cognitive complexity and emotional intensity and because the gifted child’s mental age, physical age, and emotional age are not always well integrated (chap.1). As a result, gifted children can be emotionally advanced one moment and emotionally immature the next. She feels that given the emotional vulnerability of the gifted, a supportive environment for healthy emotional development needs to be provided both at home and at school by counsellors and educators.

Silverman (1993) discusses traits of the gifted. One such trait is excitability which is characterized by a high energy level, emotional intensity and reactivity, and a high arousal of the central nervous system (chap. 2). She explains that some gifted children

with this trait are stimulus seekers for whom the pace of the world seems too slow. When these children combine their high energy level with creativity and imagination they can generate impressive responses to challenge. However, she also notes that other children with this trait are stimulus avoiders. When faced with situations in which there is a high degree of sensory stimulus, they feel irritable, overwhelmed, and often frightened. These children may also be more emotionally reactive, have greater difficulty turning off thoughts and feelings than most people, feel things more intensely, and exhibit prolonged emotional responses such as laughing or crying.

Another trait of the gifted referred to by Silverman (1993) is sensitivity which is comprised of two aspects; passion, and compassion (chap. 2). Passion refers to a depth of feeling that brings intensity and complexity to the emotional life of the gifted individual. Passionate people may react to the feeling tone of a situation and may think with their feelings. Compassion is characterized by caring for others and wanting to decrease the pain they feel in others. Compassionate children are highly empathic. They seem to not only know how others feel, but actually feel their feelings, particularly feelings that are intense and negative. Silverman explains that children who feel the feelings of others can become overwhelmed by too much pain coming from other people.

Silverman (1993) writes that gifted students may suffer from more depression because of over-commitment, too much pressure, loneliness, dependence on extrinsic motivation, extreme competitiveness, and other stressors (chap. 4). In addition to depression, gifted individuals may feel humiliation when imperfections are revealed, and despair when failing to meet their goals. Gifted individuals who are introverted may also experience isolation. Silverman explains that when isolation is experienced with the characteristic intensity of the gifted, it can be fatal; the individuals at greatest risk being those who have been alienated from their families. Silverman notes that experienced professionals perceived gifted students to be at greater risk for suicide than their classmates (chap. 4).

If the gifted experience more depression and are more suicidal, then we might ask if the gifted should be classified as a clinical population. However, a study by Gallucci

(1988) does not support this notion. In his study, participants were male and female students in a summer enrichment program. The criterion for admission was a Stanford-Binet Intelligence Scale score (IQ) greater than 135. Subjects were tested using the Child Behavior Checklist and the Child Behavior Checklist-Teacher's Report Form. Their scores were compared to normative data and no significant difference was found in terms of percentage of scores falling into the clinical range. Similarly, children with IQ scores greater than 150 were compared to children with IQ scores of 136 and 170 and no group differences were found in levels of psychopathology. No children of average intelligence were included in this study but the researchers expect that the scores of gifted children would not be significantly different from the scores of average children. Gallucci's (1988) study measures behaviors, as observed by counsellors and teachers, unlike the current research which focuses specifically on emotions as perceived by the subjects being tested. Based on Lazarus' model, personal perception is the key determinant of whether or not an event is experienced as stressful. Because perception is the factor that triggers the emotional response and the concurrent physiological response, behaviors may or may not be useful measures for comparison when looking for an association with health consequences.

Lewis, Kitano, and Lynch (1992) conducted a study that investigated the affective characteristics of academically gifted adults. Academically gifted adults were operationally defined as those succeeding in the competitive admissions process leading to acceptance as a doctoral student in Education. One of the findings in Lewis et al's study was that gifted adults expressed conflicting needs to hold their emotions in check in order to fit into the world around them. Emotions are generally difficult to observe but we might conclude from Lewis et al's study that emotional responses in the gifted are even less observable than in average individuals. Therefore, gifted children may have different scores from average children on perceived emotional intensity, duration, and frequency even though their behavior shows no observable differences from average children.

The literature is not entirely consistent in its view of the gifted as more emotional. Bartell and Reynolds (1986) compared gifted and non-gifted students in grades 4 and 5

and found that gifted students reported levels of self-esteem and depression that were not significantly different from non-gifted students.

Summary

Extensive literature has been written and considerable research conducted on the topic of emotions and their relationship with physical health, with early observational research providing the theoretical foundation for later experimental studies.

Researchers note that thoughts, emotions and physiology are in a relationship of communication (Horrigan, 1995; Hafen, Karren, Frandsen, & Smith, 1996, chap. 2) wherein cognitive appraisal mechanisms elicit emotional responses which determine the specific patterns of hormonal secretions needed to deal with environmental stimuli as appraised (Lazarus, 1991, chap. 4). A number of medical studies have suggested that emotional distress may produce hormonal alterations (Licinio, Gold, & Wong, 1995; Cooper, 1996). Such alterations can put the immune system into a state of deregulation resulting in vulnerability to various infectious diseases or enhanced immune system functioning so that antibodies begin attacking normal body tissues (Hafen, Karren, Frandsen, & Smith, 1996, chap. 3).

Research findings suggest that emotions that are intense, prolonged, or frequent have a more detrimental effect on health than emotions that are less intense, less prolonged, or less frequent. It has been proposed that intense emotions may increase perceived severity of a stressful situation and prolong the perception of continued threat (Stein, Miller, & Trestman, 1991) and that intense emotional distress, such as the threat of separation or loss, may be an important factor not only in the development of disease but also in the exacerbation of disease (Greene & Miller, 1958, Cooper, 1996). It has also been proposed that prolonged feelings such as anxiety, anger, sadness and/or hopelessness may contribute to disease onset (Greene & Miller, 1958) and that frequent emotional distress may produce intolerable strain that ultimately forces the organism to adapt resulting in structural change at the cellular level (Briski & Sylvester, 1987).

This review of the literature also indicated that certain individuals or groups of individuals may be more emotional than others suggesting greater physiological

vulnerability (Lazarus, 1991, chap. 4). For example, previous research found that while males report experiencing more stressful life experiences, females report being more profoundly affected by both positive and negative events (Sowa & Lustman, 1984; Billings & Moos, 1982) and females also report more depression (Sowa & Lustman, 1984). Previous research with gifted individuals suggests that cognitive complexity gives rise to more emotional depth and intensity of life experience (Roeper, 1981), that advanced cognitive organization may be associated with a wider variety of emotional responses and greater emotional reactivity (Sommers, 1981), and that greater emotional intensity and reactivity may contribute to prolonged emotional responses in the gifted (Silverman, 1993).

Given the evidence supporting a relationship between emotions and health and the implications arising from research findings suggesting that frequent, intense, and prolonged emotional distress may underlie many negative health consequences, this study will specifically explore relationships between intensity, duration, and frequency of emotion, and frequency of illness. Because females and the gifted have been identified in the literature as more emotional than average, this study will also investigate differences between females and males and between gifted and non-gifted groups with respect to intensity, duration, and frequency of emotion, and frequency of illness. Finally, intensity, duration, and frequency of emotion will be examined to see if they contribute to our ability to predict frequency of illness.

CHAPTER THREE

METHODOLOGY

Introduction

This exploratory research was designed to look for evidence of a relationship between intensity, duration, and frequency of emotion and frequency of illness in groups of male and female, and gifted and non-gifted adolescents. To this end, four questionnaire instruments were employed to measure intensity, duration, and frequency of emotions and a single index was compiled to measure health.

Instruments.

Izard's (1982) Differential Emotions Scale, (DES III) was used to measure emotional intensity (DESA) and frequency (DESB). These instruments were chosen because they have been used extensively in previous research and have been previously validated using adolescent populations. Larsen's (1984) AIM was also used to measure affect intensity. This instrument has been previously validated with adult populations. Because the AIM has not been used previously with young adolescent populations, a minor modification to this instrument was made by the researcher and pilot-tested to accommodate its use in this study. Because no instrument could be found to measure duration of emotion, the researcher developed and pilot-tested a questionnaire, the Duration of Affect Scale (DAS), as set forth in Appendix A.

Health Index.

In most research studies involving health as a variable, the methods for measuring health have depended solely on self-reports of the subjects, or have involved invasive techniques such as taking blood samples. Because of the ages of the participants in this study, invasive techniques were not considered appropriate and self-reports alone seemed unreliable due to potential social desirability and memory problems. Therefore, a measure of health was obtained by using the Index of Frequency of Illness (IFI), as set forth in Appendix B, a combination of self-report and school records wherein absenteeism not due to illness was subtracted from total absenteeism. Self-report involved answering the question, "Please indicate, to the best of your ability, the number of half or full days of

school you have missed since the beginning of September for reasons **not** due to illness e.g. a visit to the dentist, a recital, or other special circumstance? Days Missed **Not** Due to Illness ____." Total absenteeism was indicated by school records.

This study was also designed to investigate differences between males and females and between gifted and non-gifted individuals with respect to intensity, duration, and frequency of emotion and frequency of illness.

Group Differences.

With respect to group differences, gender was determined by self-report on one of the questionnaires, and the measure of gifted was defined by the participating schools as having an average score of 120 or greater on the combined verbal, quantitative, and nonverbal batteries of the CCAT.

The methodological structure of this study is characterized by two distinct parts:

Methodological Structure.

Part I ("Pilot") refers to a preliminary study that was conducted on a smaller population (n=30) to test two of the instruments measuring emotion, Larsen's (1984) AIM, and Nottell's (1996) Duration of Affect Scale (DAS). The AIM was developed and validated for use with an adult population. For this reason, there was some concern regarding comprehension in a younger population. The pilot study addresses the issue of vocabulary and instrument comprehension in the adolescent age group represented in this study. Because the DAS was not a previously validated instrument, the pilot study was designed to test its validity prior to administering the instrument to subjects in this study.

Part II ("Main") refers to the main study which was conducted using a larger (n=81) population to explore intensity, duration, and frequency of emotion, and frequency of illness, in gifted and non-gifted, female and male students in grades 7, 8 and 9.

Method - Pilot Study

Subjects

The sample was comprised of students ranging from 11 to 15 years of age volunteering from a junior high school in Calgary as shown in Table 1. The subjects (n=30) included 10 students (5 female and 5 male) from each of grades 7, 8, and 9.

Table 1

Subjects - Pilot Study

GENDER	Grade			Total
	7	8	9	
Female	5	5	5	15
Male	5	5	5	15
Total	10	10	10	30

Dependent Measures

The dependent measures for the pilot study included: i) a measure of reliability of the AIM when used with an adolescent population; and ii) a measure of validity of the DAS.

Reliability of the AIM

No studies examining the AIM have been reported that involve young adolescent subjects. The original AIM was developed and tested using 556 college students (Larsen, 1984). Diener, Sandvik, and Larsen (1985) studied 242 subjects ranging in age from 16 to 68 years with respect to affect intensity over the life span. Larsen and Diener (1987) compared life events and affect intensity using 96 college students. Weinfurt, Bryant, and Yarnold (1994) examined the factor structure of the AIM using 673 college undergraduates, and Williams (1989) explored neuroticism and extroversion in different factors of the AIM using 253 subjects with a mean age of 28.68 years. In a study by Blankstein, Flett, Koledin, and Bortolotto (1989) that looked at affect intensity and

dimensions of affiliation motivation, the subjects' mean age was 23.9 years. One study examined the long-term stability of affect intensity and its antecedents in early childhood. However, the subjects in this study were also college-aged students whose parents were asked to report on specific childhood behavior patterns of the subjects (Larsen & Diener, 1987).

Because the AIM has not been tested on a young adolescent population, its reliability with this population was unknown to the researcher and it was anticipated that certain vocabulary in the AIM may be unfamiliar to individuals in a younger age group such as those represented in this study. To meet the requirements of this research, no changes were made to the AIM content but certain additions were made to the questionnaire. Five demographic questions (date, age, grade, sex, and identity number) were added to the top of the questionnaire, a list of terms and their respective definitions (as set forth in Appendix C) was attached to the AIM for subjects to refer to when or if needed, and to determine whether the subjects had any problems with comprehension or any problems generally regarding the questionnaire, two questions were added to the end of the questionnaire:

1. If you had a problem understanding any part of this questionnaire, please describe.
2. Did you have any other problems regarding this questionnaire?

Because of the small sample size, even a few less mature grade 7 students could have an affect on reliability. Therefore, it was decided that reliability of the AIM would be considered satisfactory if comprehension and other problems did not exceed 80%.

Validity of the DAS.

Independent rater evaluations as to the similarity of participant responses in recorded interviews to their responses on the DAS questionnaire, were used to validate the DAS. For Independent Rater Responses, see Appendix D. Because this instrument has not been previously validated, a higher level of confidence was desired. However, given the small sample size it was decided that our confidence in the validity of the DAS would be considered satisfactory if students generally scored a 1 on over 90% of the DAS items. Again, due to the vulnerability of group findings to individual differences in such a

small sample, it was decided that our confidence in the validity of the DAS would be considered satisfactory if the Male, Female, Grade 7, Grade 8, and Grade 9 groups of students scored a 1 on over 80% of the DAS items.

Procedures

Children volunteering for this study were given duplicate copies of two sets of consent forms; one set to be signed by a parent or guardian, as set forth in Appendix E, and the other set to be signed by the student, as set forth in Appendix F, along with an explanatory cover letter as set forth in Appendix G. One copy of each set was to be retained by the parent or guardian and one copy of each set was retained by the researcher. Those students providing full consent were administered the two questionnaires, the AIM and the DAS, each taking approximately 10 minutes to complete. After completion of the DAS, students were interviewed by the researcher who asked each student the following question about each of their answers on the DAS questionnaire: "You said that when you feel _____, the feeling generally lasts _____. Could you give me an example?" Students completed the questionnaires in the school's counselling office, during regular school hours, as arranged in consultation with teachers, the school counsellor, and the administration who provided their permission to conduct the research as set forth in Appendix H. To minimize disruption to regular school programming, questionnaires were administered during the most appropriate time periods possible. Because the subject matter of this study was relevant to the health curriculum, participating students were taken from a health class if possible. When participating students could not be taken from a health class, they were taken from an option period. A short debriefing session followed the completion of both questionnaires.

Coding and Scoring.

The two questions added to the end of the AIM questionnaire were coded either 1 (Yes) or 2 (No) with respect to comprehension or other problems, and sex was coded either 1 (Female) or 2 (Male).

The DAS responses were coded in terms of scale values, 1 to 5, and scored for duration of affect by taking a mean of scores.

Inter-rater Reliability.

Two independent raters reviewed the recorded interviews and rated the similarity of these responses to the responses provided on the DAS questionnaire. If the rater felt that both responses fell on the same point on the Likert scale, the rating given was 1. However, when the rater felt that the interview response was one Likert point away from the questionnaire response, the rating given was 2 and when the rater felt that the interview response was more than one Likert point away from the questionnaire response, the rating given was 3.

Statistical Analysis Procedures.

All of the analyses were run using SPSS. The level of significance was set at .05. For all cases, there were no missing data. The data obtained from the pilot study were examined from an exploratory and descriptive point of view.

For the AIM, frequencies were run to find the number of subjects with comprehension or other problems regarding the questionnaire. In addition, for each question asking about problems, a contingency table analysis was run. Because students scored either 1 (Yes), or 2 (No) on each question, and because there were three grades (7, 8, and 9) involved, 2 by 3 tables were produced providing results in terms of counts and percentages. For Example Contingency Table, see Table 2. For Score Counts by Grade, see Table 3.

For the DAS, frequencies of 1, 2, and 3 ratings of the similarity between interview and instrument answers were run to assess instrument validity.

To assess inter-rater reliability, two analyses were run:

- i) a contingency analysis, which provided percentage agreement and reliability coefficients. Because raters scored either 1, 2, or 3 on each question, 3 by 3 tables were produced providing results in terms of counts and percentages; and
- ii) reliability coefficients, which provided a standardized Cronbach alpha as a statistical measure of both individual question and overall question concordance among raters.

Table 2

Example Contingency Table

Question 1/Rater 1 by Question 1/Rater 2

		Question 1/Rater 2		
Question 1/Rater 1	Count			
	Row Percent			
	Column Percent		Row	
	Total Percent	1	2	Total
1	13	13	13	
	100.0	86.7		
	92.9			
	86.7			
2	1	1	2	
	50.0	50.0	13.3	
	7.1	100.0		
	6.7	6.7		
Column	14	1	15	
Total	93.3	6.7	100.0	

Table 3

Score Counts by Grade

AIM Question 1 by Grade	GRADE			Row Total
	Count	7	8	9
1	2	1	1	4
				13.3
2	8	9	9	26
				86.7
Total	10	10	10	30
	33.3	33.3	33.3	100.0

AIM Question 2 by Grade	GRADE			Row Total
	Count	7	8	9
1	0	1	2	3
				10.0
2	10	9	8	27
				90.0
Total	10	10	10	30
	33.3	33.3	33.3	100.0

Results - Pilot Study

AIM Comprehension

Frequencies were run to find the number of subjects with comprehension or other problems regarding the questionnaire. Contingency table analyses were also run to determine the percentage of students with comprehension or other problems regarding the questionnaire.

Problem Frequencies.

Four subjects, 2 in the Grade 7 group, 1 in the Grade 8 group, and 1 in the Grade 9 group, indicated a problem with comprehension, and three subjects, 2 in the Grade 8 group and 1 in the Grade 9 group indicated some other problem with the AIM. Responses indicating a problem are set forth in Appendix I.

Contingency Table Analyses.

Over 86% of subjects had no problems with comprehension, and 90% of subjects indicated having no other problems with the questionnaire.

For AIM Problem Frequencies and Percentages, see Table 4.

Table 4

AIM Problem Frequencies and Percentages

	<u>Frequency</u>	<u>Percent</u>
AIM Question 1		
Problem	4	13.3
No Problem	<u>26</u>	<u>86.7</u>
Total	30	100.0
AIM Question 2		
Problem	3	10.0
No Problem	<u>27</u>	<u>90.0</u>
Total	30	100.0

DAS Validity

Frequencies were run to explore the similarity between the subjects' interview and instrument responses on the DAS instrument, as assessed by two independent raters.

To assess inter-rater reliability, a contingency table analysis was run to determine percentage agreement and concordance among the raters.

Frequencies

Frequencies of raters ratings were calculated. Out of a possible 570 ratings, a rating of 1 was assigned 514 times for Females and 517 times for Males. A rating of 2 was assigned 47 times for Females and 41 times for Males, and a rating of 3 was assigned 3 times for Females and 12 times for Males.

Out of a possible 380 ratings, a rating of 1 was assigned 349 times for Grade 7's, 320 times for Grade 8's, and 362 times for Grade 9's. A rating of 2 was assigned 23 times for Grade 7's, 47 times for Grade 8's, and 23 times for Grade 9's and, a rating of 3 was assigned 4 times for Grade 7's, 11 times for Grade 8's, and no ratings of 3 were assigned to Grade 9's. Among Grade 7's, two recorded responses were not discernable, and for Grade 8's, one recorded response was not discernable. See Table 5 for Frequency Percentages for Raters' Ratings, Female and Male. See Table 6 for Frequency

Table 5

Frequency Percentages For Raters' Ratings, Females and Males

Rating	Percentage of Total Rating	
	Females	Males
1	90.18%	90.70%
2	8.25%	7.19%
3	.53%	2.11%
X	1.05%	.00%

Note. X = Responses unaccounted for.

Percentages for Raters' Ratings - Grades 7, 8, and 9.

Table 6

Frequency Percentages for Raters' Ratings - Grades 7, 8, and 9

Rating	Percentage of Total Rating		
	Grade 7	Grade 8	Grade 9
1	91.84%	84.21%	95.26%
2	6.05%	12.37%	4.74%
3	1.05%	2.89%	.00%
X	1.05%	.53%	.00%

Note. X = Responses unaccounted for.

Contingency Table Analyses.

The overall percentage agreement among two independent raters ranged from 79.31 to 100%. The percentage agreement among two independent raters for Females ranged from 78.57 to 100% and for Males, ranged from 73.33 to 100%. Percentage agreement among two independent raters for Grades 7 ranged from 66.67 to 100%, for Grade 8 ranged from 60 to 100%, and for Grade 9 ranged from 80 to 100%. For Percentage Agreement Among Independent Raters, see Appendix J.

Concordance.

The overall concordance between raters' ratings indicate reliability coefficients ranging from -.1320 to 1.0000. Concordance between raters' ratings indicate reliability coefficients ranging from -.1538 to 1.0000 for Females and from .5661 to 1.0000 for Males. Concordance between raters' ratings indicate reliability coefficients ranging from .4167 to 1.0000 for Grade 7's, from .6228 to 1.000 for Grade 8's, and from -.2500 to 1.0000 for Grade 9's. Because similarity in answers resulted in a zero variance for some questions, a reliability coefficient could not be calculated. For Concordance Among Independent Raters, see Appendix K.

Summary

With respect to the AIM, fewer than 20% of the subjects indicated having comprehension problems or any other problems with respect to this questionnaire. With respect to the DAS, the most frequent rating given by both raters across all groups and for all questions was 1, indicating high similarity between questionnaire and interview responses. For all groups, agreement among raters ranged between 80% and 100% for most of the questions, with agreement among raters being lowest for the Grade 8 group. Concordance among raters was above .7000 for all but three questions in the Overall group, two questions in the Grade 7 group, and one question in the Female, Male, and Grade 8 groups.

Discussion - Pilot Study

AIM

With respect to the AIM, the percentage of students having no problems with comprehension or other problems with the questionnaire was over 80%. Therefore, the minimum requirements for use of this questionnaire in the main study were met. Findings suggest that the addition of a list of terms and their meanings was a satisfactory way of assisting those who may have been experiencing problems with comprehension. Findings also suggest that the AIM may be a satisfactory questionnaire for use with populations as young as 11 years of age once problems with vocabulary comprehension have been addressed.

DAS

Frequencies.

Overall, regardless of grade, gender, or question item, students' written responses to the DAS fell on the same Likert scale point as interview responses over 90% of the time, and similarity of responses within groups exceeded 84%. These results suggest that the written and interview formats for measuring duration of emotion are similar.

Inter-rater Reliability.

Similarity between the written and interview versions of the DAS was determined by two independent raters. Generally speaking, the percentage agreement among raters

was high suggesting that the raters evaluations of the students' responses are accurate. However, where there was disagreement, the variability in disagreement was not evenly distributed across groups. Disagreement among raters was most notable in the 8 group. It may be that grade 8 students, more so than grade 7 or grade 9 students, lack confidence in their personal emotional assessments and, as a result, tend to re-evaluate their responses when given a second opportunity to do so. In view of Piaget's theory, we might wonder if younger grade 7 students may be less analytical than grade 8 students, while grade 9 students may be more self-aware and, therefore, more confident in their initial emotional self-assessment (Santrock, 1990, chap.2). Nolen-Hoeksema & Girgus (1994) suggest that the combination of learning and experience account for emotional development. Emotional development may also be molded, in part, by societal expectations (MacKinnon & Keating, 1989; Zigler, Lamb, & Child, 1982, chap.8). Perhaps, grade 7 students have not had as many emotional experiences, including societal pressure, from which to learn and develop their emotions while grade 9 students have experienced more societal pressure both in terms of peer pressure, but also because their physical development makes them appear more adult-like so that adults begin to perceive them differently giving rise to greater expectations and pressures from adults (Zigler, Lamb, & Child, 1982). Grade 8 students may be caught in the middle, lacking the experience and emotional development of grade 9 students, while beginning to experience greater pressures from society, a combination that may affect self-confidence.

Reliability coefficients indicate that concordance among the raters was also strong and variability in lack of concordance was not evenly distributed across DAS questions. This variability was most notable on questions 18 and 12. The emotion dealt with in question 18 was shame. In this regard, several students reported never having experienced this emotion and were only able to give an example of a situation wherein they would feel ashamed if such a situation were to occur. For an example Participant Interview, see Appendix L. The emotion dealt with in question 12 was regret. Again, there were several students who reported never having experienced this emotion. That students lack experience with shame and regret, may reflect a lack of emotional

development. However, a lack of experience with these emotions may also reflect a lack of moral development. Shame and regret occur when individuals feel they have done something bad. Emerson was quoted as saying: “The meaning of good and bad, better and worse, is simply helping or hurting” (Santrock, 1990, chap.2). Santrock suggests that adolescent development involves acquiring a capacity for empathy and altruism. Perhaps , grade 7, 8 and 9 students have yet to fully develop this capacity. It is possible that cognitive, emotional, and moral interactions influence results in studies with this age group.

Overall, high similarity in written and interview responses, as measured by an analysis of frequencies of 1, 2 and 3 ratings by two independent raters, and strong inter-rater reliability as indicated by a high percentage agreement and overall concordance among raters, strengthens our confidence in the validity of the DAS instrument as a measure of duration of affect and as an appropriate instrument for use in the main study.

Summary

With respect to the AIM, the addition of a list of terms and their meanings was found to be a satisfactory way of dealing with comprehension problems, and after dealing with these problems, the questionnaire was found to be appropriate for use with populations as young as 11 years of age. With respect to the DAS, two independent raters rated the students’ responses and found both written and interview formats to be similar. In addition, inter-rater reliability was found to be satisfactory. After testing the reliability of the AIM and the validity of the DAS, both instruments met the minimum requirements for inclusion in the main study.

Method - Main Study

Subjects

The sample was comprised of students ranging in age from 11 to 15 years volunteering from two junior high schools in Calgary whose mandate included a gifted program. The subjects ($n = 81$) included 19 female gifted, 25 female non-gifted, 17 male gifted, and 20 male non-gifted, as shown in Table 7.

Table 7

Subjects - Main Study

Gender	Grade			Total
	7	8	9	
Female	22	8	14	44
- Gifted	6	5	8	19
- Non-Gifted	16	3	6	25
Male	24	8	5	37
- Gifted	11	4	2	17
- Non-Gifted	13	4	3	20
Total	46	16	19	81

Dependent Measures

Because of its popularity with previous researchers, Larsen's (1984) AIM was used to measure affect intensity. For the purposes of this study, the researcher added to the AIM the demographic questions and vocabulary definitions, but not the comprehension questions that were added to the instrument for the purposes of the pilot. In addition, the question about absenteeism not due to illness was also added to the AIM. Izard's (1982) Differential Emotions Scale (as adapted for children and adolescents (referred to herein as DESA), was also used to measure affect intensity because of its previous use with populations in the same age group as the population in this study. After being tested in the pilot study, Nottell's (1997) DAS was used to measure duration of emotion. To measure frequency of emotion, Izard's (1982) Differential Emotions Scale (referred to herein as DESB) was used. To measure frequency of illness, the researcher used the same Index of Frequency of Illness (IFI), as was used in the pilot study. As in the pilot study, gender was determined by self-report as provided in one of the demographic questions on the AIM. Gifted individuals were identified from school records as those having a score of 120 or greater on the combined verbal, quantitative, and nonverbal batteries of the Canadian Cognitive Abilities Test (Thorndike & Hagen, 1989).

AIM

Larsen and Diener (1987) view affect intensity as a construct that generalizes across specific emotions; the regular experience of strong emotions regardless of their specific content or hedonic tone. The AIM is a questionnaire that includes 40-items, both positive and negative, that are based on a construct definition of emotional response intensity that distinguishes between frequency of emotional states and intensity of experienced emotion. AIM items have been written to assess the intensity dimension, unconfounded with the frequency with which particular emotions are experienced. To lessen the effects of response set, approximately half of the items are written in a reversed direction.

Test-retest reliabilities for the AIM over three one-month intervals were .80, .81, and .81 respectively (Larsen, 1984), the correlation between AIM scores taken 2 years

apart was .75 ($p < .01$), and in a 3-month daily study, correlations between three daily affect intensity score totals for months one, two, and three ranged from .70 to .90 (Larsen & Denier, 1987).

The AIM was developed for use in research as a less cumbersome method of measuring affect intensity than daily methods. Thus daily assessment of affect intensity is an important criterion variable against which to validate the AIM. The relation between the AIM and average daily affect intensity has been assessed in three separate studies (Larsen & Denier, 1987). The AIM correlated with average daily emotional intensity .61 ($n = 62$, $p < .01$) in one sample, .52 ($n = 74$, $p < .01$), in a second sample, and .49 ($n = 54$, $p < .01$) in a third sample. In addition, the AIM has been found to covary with other related constructs including specific daily moods, the complexity of life situation, general mood variability, and clinical indicators of mood disturbance (Larsen & Denier, 1987).

DAS.

The DAS (Nottell, 1996) was developed by drawing emotions from the AIM (Larsen & Denier, 1987) and the DES III (Kotsch, Gerbing, & Schwartz, 1982) to produce 19 items. Each of these items are rated on a 5 point Likert Scale ranging from "A Few Minutes" to "Several Days".

DES III.

The DES III, as adapted for children and adolescents from the adult version of the DES, is a brief self-report inventory that assesses 10 fundamental emotions. Each emotion is measured by three items. The mean of these three items is used as a scale score. The DES III, referred to herein as DESA and DESB, is scored by summing scores for the three items that measure each emotion resulting in one score for each of the 10 fundamental emotions. The resulting emotion profile can then be inspected to determine the relative intensity or frequency of individual emotions or emotion patterns. The intensity profile is referred to herein as the DESA and the frequency profile is referred to as the DESB. Unlike the AIM, the DES has been tested on children and therefore, adds validity to the measure of affect intensity provided by the AIM. In addition, the DES provides a frequency measure not provided by the AIM.

Construct validity of the DES III was investigated through three separate analyses conducted by Kotsch, Gerbing, and Schwartz (1982). The first analysis investigated the equivalence of the factors measured by the DES and the DES III for college-age subjects. All correlations between corresponding group factors on the DES and DES III were above .92 except interest and contempt, which were .67 and .66 respectively. DES III Item 3 in the Interest cluster shared common variance with the Joy factor, and therefore was not found to be as strong as the Interest cluster of the DES. However, correlations between the DES and the DES III Contempt clusters were lower because of weakness in the DES items. Therefore, the Contempt items emerge as a strong factor on the DES III. Overall results demonstrated that the DES and DES III are equivalent measures of fundamental emotions for individuals who comprehend the meaning of the DES items. Given this equivalence, the second and third studies addressed the dimensionality of the DES III for children and adolescents and found the emotion profiles were similar across both age and sex. In addition, similarity between the item-factor correlations from Study 2 and Study 3 suggest that the psychological meaning of the items was essentially the same for 8-year-olds as it was for 17-year-olds in their sample. The validity of the 10 emotions measured by the 10 corresponding groups of DES III items was supported for three different data sets represented by college-age adults, adolescents, and children above 8 years of age.

IFI

To acquire an Index of Frequency of Illness, an extra question was added to the AIM questionnaire which asked “Please indicate, to the best of your ability, the number of half or full days of school you have missed since the beginning of September for reasons **not** due to illness e.g. a visit to the dentist, a recital, or other special circumstance.” Actual total absenteeism was obtained from participating student’s school attendance records. Finally, absenteeism due to illness was calculated by subtracting the number of absences not due to illness from the total number of absences for each participant.

Procedure

The method for obtaining consent from the schools to conduct research and from

the children to participate in the main study was identical to the method used in the pilot study. Students providing full consent were administered four questionnaires, the AIM, the DESA and DESB, and the DAS, each taking approximately 10 minutes to complete. After consultation with teachers, counsellors, and administration, appropriate time periods for test administration were set and questionnaires were administered to participants as a group in classrooms during regular school hours. Those students who were not participating remained in the classroom and worked on other projects while the participants were completing the questionnaires. Student records were then reviewed and frequency of illness and CCAT scores were noted for each participant.

Coding and Scoring.

The DAS responses were coded in terms of scale values, 1 to 5, and scored for duration of affect by taking a mean of scores. The same procedure for coding was used for the DESA and the DESB. The AIM responses were coded in terms of scale values, 1 to 6. In addition, certain items on the AIM were reverse coded in accordance with Larsen and Diener (1987) recommendations. A total score for affect intensity was obtained by taking a mean of AIM scores. In addition, an overall intensity measure (INTENOA) was obtained by taking a mean of total scores for the DESA and the AIM.

Statistical Analysis Procedures Addressing the Research Questions.

All of the analyses were run using SPSS and for all cases there were no missing data. The data obtained for the main study were examined from an exploratory and descriptive point of view. Two subjects were found to have extreme scores and were eliminated from the study to prevent problems with skewness and kurtosis.

Research question one asks whether there are relationships between the variables and whether there is a relationship between IFI and the other variables. To answer the first part of this question, Pearson product-moment correlations (r) were run. Although Spearmans correlations are ordinarily used with data that is ranked by way of Likert scales, Pearson correlations were more appropriate for this application because continuous data was built by taking a mean of scores for each of the emotion variables (Engels, 1997). Although IFI is a ranked variable and GENDER and GIFTED are categorical variables,

they were included in the correlation analysis for the sake of consistency with the other analyses. This approach is supported by Tabachnick and Fidell (1996) who indicate that even with dichotomous variables, all correlations can be calculated using the equation for Pearson product-moment correlation.

To assess the relationship between IFI and the other variables, Multiple regression analyses were also run. This type of analysis is useful when the independent variables (IV's) are correlated with one another and with the dependent variable (DV) to varying degrees (Tabachnick & Fidell, 1996). This analysis was appropriate for this application because we expect some correlations among the IV's and with the DV. In addition, scatterplots and normality plots revealed no systematic patterns between predicted values and residuals suggesting no violations of the linearity assumption. For the purposes of this study, a standard multiple regression analysis was chosen to analyse the strength of the relationships between IFI and the other variables. This analysis is appropriate for this application because it can assess the unique contribution of each IV to the DV after all other IV's have been entered into the equation and provides a richer interpretation when compared to the correlation results.

Research question two asks whether there are significant differences between the gender and gifted groups and whether there is a significant gender by gifted interaction. To answer this question, a multivariate analysis of variance (MANOVA) was run. This statistical technique is appropriate to use in assessing mean differences among groups on a combination of DV's because it is possible to test DV's simultaneously thereby avoiding the inflated risk of Type I error associated with separate tests (Tabachnick & Fidell, 1996). Results of an evaluation of the assumptions of normality homogeneity of variance were satisfactory.

The MANOVA included a post-hoc descriptive discriminant analysis. This is an appropriate analysis when the primary goal is to discover and interpret the combinations of predictors, or discriminant functions, that separate groups in various ways (Tabachnick & Fidell, 1996). The standardized discriminant function coefficients, typically ranging from -1.0 to +1.0, provide an index of the relative importance of each variable in discriminating

between groups. Those with the highest absolute value contribute most to the group difference. The structure coefficients, ranging from -1.0 to +1.0, are correlations between the dependent variables and the discriminant function scores. They are more replicable and are less affected by intercorrelations among the variables than are standardized discriminant function coefficients. Variables with higher absolute values ($>.40$) on both indices most clearly contribute to group differences. The contribution to group differences is more ambiguous for variables with a high absolute value on only one of the indices. This analysis is statistically stronger and therefore more appropriate than Univariate F-tests because significance is determined after comparing discriminant function coefficients with the correlations between dependent variables and discriminant function scores (Pyryt, 1997).

Research question three asks whether intensity, duration, and/or frequency of emotion add to our ability to predict absenteeism. To assess predictive ability, two regression analyses were run:

i) a hierarchical regression analysis to see how well frequency of illness could be predicted by the GIFTED and GENDER groups. This is an appropriate analysis when the goal is to see how well we can predict the DV from the major IV's while holding constant other IV's (Tabachnick & Fidell, 1996); and

ii) a stepwise regression analysis to explore which variables contribute most to our ability to predict frequency of illness. This is an appropriate analysis when the goal is to eliminate those IV's that do not provide additional prediction to the IV's already in the equation (Tabachnick & Fidell, 1996).

CHAPTER FOUR

RESULTS

Introduction

For research question one, Pearson product-moment correlations (r_s) were run to assess the relationship between the variables; AIM, DESA, DAS, DESB, IFI, GENDER, and GIFTED. A multiple regression analysis was also run to assess the strength of the relationship between IFI and the other variables.

For research question two, a multivariate analysis of variance (MANOVA) was run to assess main effects for GENDER and GIFTED with respect to each of the variables, as well as interaction effects. A descriptive discriminant analysis was run as a post-hoc analysis to determine the discriminating IV's.

For research question three, a hierarchical regression investigated how well IFI could be predicted by the GIFTED and GENDER groups, while controlling for the other IV's. A stepwise regression analyses was also run to see which variables contribute most to our ability to predict frequency of illness.

Research Question One

- (a) Are there relationships between the variables; AIM, DESA, DAS, DESB, IFI, GENDER and GIFTED?
- (b) Is there a relationship between IFI and the other variables; AIM, DESA, DAS, DESB, GENDER, and GIFTED?

Correlations.

Pearson product-moment correlations were run to investigate the relationships between variables. Findings indicate that the AIM was positively correlated with DESA but the relationship was weak ($r = .24$) suggesting certain dissimilarities between them making it unclear what a mean of these two instruments produces. For this reason, the overall intensity measure (INTENOA) was not used in the remainder of the analyses in this study. The AIM was also positively correlated with DAS, and DESB. GENDER was negatively correlated AIM and IFI. DESA was positively correlated with DAS, DESB, GIFTED, and IFI, and DESB was also positively correlated with DAS, GIFTED, and IFI.

The Correlations Between Variables are shown in Table 8. Results exceeding $p < .05$ are reported.

Table 8

Correlations Between Variables

Variable	AIM	DESA	INTENOA	DAS	DESB	GIFTED	GENDER	IFI
AIM	1.00	.24*	.79*	.41*	.36*	.17	-.23*	.21
DESA		1.00	.79*	.27*	.68*	.35*	.14	.27*
INTENOA			1.00	.43*	.66*	.33*	-.06	.30*
DAS				1.00	.24*	.05	-.12	.10
DESB					1.00	.21*	-.16	.37*
GIFTED						1.00	-.03	-.05
GENDER							1.00	-.24*
IFI								1.00

Note. * $p < .05$, all others not significant.

Note. Subscales are abbreviated so that AIM = Affect Intensity Measure (Intensity of Emotion), DESA = Differential Emotions Scale - Intensity (Intensity of Emotion), DAS = Duration of Affect Scale (Duration of Emotion), INTENOA = Overall Intensity (Mean of AIM + DESA), DESB = Differential Emotions Scale - Frequency (Frequency of Emotion), GENDER = Females (1) and Males (2), and GIFTED = Gifted (1) and Non-Gifted (2).

Multiple Regression Analysis.

A standard regression analysis was run to explore the strength of the relationships between frequency of illness and each of the other variables. With all of the independent variables (IV's) entered into the equation, the model was not significant. For Multiple Regression Means and Standard Deviations for the Variables see Table 9

Table 9

Multiple Regression Means and Standard Deviations for the Variables

Variables	<i>M</i>	<i>SD</i>
AIM	3.80	.46
DESA	2.03	.53
DAS	2.52	.54
DESB	2.34	.46
GIFTED	1.56	.50
GENDER	1.46	.50
IFI	3.40	4.44

Note. Subscales are abbreviated so that AIM = Affect Intensity Measure (Intensity of Emotion), DESA = Differential Emotions Scale - Intensity (Intensity of Emotion), DAS = Duration of Affect Scale (Duration of Emotion), DESB = Differential Emotions Scale - Frequency (Frequency of Emotion), GIFTED = Gifted and Non-Gifted, GENDER = Females and Males, and IFI = Index of Frequency of Illness (Absenteeism)..

Research Question Two

- (a) Are there significant differences between females and males with respect to intensity, duration, and/or frequency of emotions, and frequency of illness?
- (b) Are there significant differences between gifted and non-gifted individuals with respect to intensity, duration, and/or frequency of emotions, and frequency of illness?
- (c) Are there significant interactions between GENDER and GIFTED with respect to intensity, duration, and/or frequency of emotions, and frequency of illness?

To investigate these questions, a 2 X 2 multivariate analysis of variance with post hoc descriptive discriminant analysis was performed with GENDER and GIFTED as dependent variables, and AIM, DESA, DAS, DESB, and IFI as independent variables.

There were no missing cases (N=81) and no missing data.

Multivariate Analysis of Variance.

Boxs M criteria (94.35) indicate that assumptions of normality and homogeneity of variance were not violated. Using Wilks' criteria, significant main effects were found for GENDER, $F(5, 73) = 5.33, p < .05$, and GIFTED, $F(5, 73) = 3.73, p < .05$. No significant interaction was indicated. For MANOVA Means and Standard Deviations for Gender and Gifted, see Appendix M.

Descriptive Discriminant Analysis.

A post hoc descriptive discriminant analysis was carried out for each significant effect to identify the variables that most clearly indicated differences for the GENDER and GIFTED groups. A Summary of the MANOVA and Post Hoc Discriminant Analysis for Main Effects in GENDER and GIFTED Groups is reported in Table 10.

Table 10

Summary of MANOVA and Post Hoc Discriminant Analysis for Main Effects in GENDER and GIFTED Groups

Effect	<u>MANOVA</u>		<u>Post Hoc Discriminant</u>		
	Wilks' <i>lambda</i>	<i>F</i>	Variable	Standardized Discriminant Function	Structure
GENDER	.783	.003*	IFI	-.447	-.403
GIFTED	.834	.019*	DESA	1.027	.801

Note. * $p < .05$

Note. Subscales are abbreviated so that DESA = Differential Emotions Scale - Intensity (Intensity of Emotion), IFI = Index of Frequency of Illness (Absenteeism) GENDER = Females (1) and Males (2), and GIFTED = Gifted (1) and Non-Gifted (2).

Examination of the coefficients identified IFI as most clearly contributing to differences between the GENDER groups and DESA as most clearly contributing to differences between the GIFTED groups. An examination of group means revealed that females scored higher on frequency of illness ($M = 4.27$) than males ($M = 2.35$), and that non-gifted males scored higher on intensity of emotion at the time of questionnaire administration ($M = 2.26$) than non-gifted females ($M = 2.13$), gifted males ($M = 1.96$), or gifted females ($M = 1.73$).

Research Question Three

Do intensity, duration, or frequency of emotion add to our ability to predict absenteeism?

To answer this question two multiple regression analyses were run to determine which variables make a significant contribution to the prediction of illness.

Hierarchical Regression Analysis.

Entering GENDER in step one and GIFTED in step two produced a significant model. With only GENDER in the equation, $R^2 = .05$, $F(1, 79) = 3.90$, $p .05$. A t test revealed that the contribution of GENDER to the prediction of illness was significant at $p .05$. However, only a small percentage, 5%, of the variance ($R^2 = .05$) was contributed by GENDER.

After step two, with GIFTED added into the equation, the change in R for regression was not significant.

Stepwise Regression Analysis.

The computer selected DESB as the first item of entry. A t test revealed that DESB contributed significantly to the prediction of illness, $p < .05$. With only DESB in the equation, $R^2 = .06$, $F(1, 79) = 4.65$, $p < .05$. Although its contribution was significant, DESB only accounted for 6% of the variance ($R^2 = .06$) and no other variables were found to contribute significantly, $p < .05$, to the prediction of illness.

For a Summary of Multiple Regression Analyses of Variables Predicting Frequency of Illness, see Table 11. For a Summary of Multiple Regression Coefficients for Variables

Predicting Frequency of Illness, see Table 12. For the Raw Score and Standardized Score Equations for Variables Predicting Frequency of Illness , see Table 13.

Table 11

Summary of Multiple Regression Analyses of Variables Predicting Frequency of Illness

Model	Variable	Semi-Partial Correlations	Multiple R	R ²	Adjusted R ²	R ² Change
Standard Model				Not Significant		
Hierarchical Model						
Block 1						
	GENDER	-.22	.22	.05	.03	.05
Block 2						
	GIFTED	-.10	.24	.06	.03	.01
Stepwise						
Block 1						
	DESB	.24	.24	.06	.04	.06

Note. Subscales are abbreviated so that DESB = Differential Emotions Scale - Frequency (Frequency of Emotion), GENDER = Females and Males, and GIFTED = Gifted and Non-Gifted.

Table 12

**Summary of Multiple Regression Coefficients for Variables Predicting
Frequency of Illness**

Model	Variable	<u>B</u>	<i>B</i>	Constant
<hr/>				
Standard Model			Not Significant	
Hierarchical Model				
Block 1				
	GENDER	-1.92	- .22	6.19
Block 2				
	GENDER	-1.95	- .22	
	GIFTED	-.94	- .11	7.70
Stepwise Model				
Step 1				
	DESB	2.27	.24	-1.92
<hr/>				

Note. Subscales are abbreviated so that DESB = Differential Emotions Scale - Frequency (Frequency of Emotion), GENDER = Females and Males, and GIFTED = Gifted and Non-Gifted.

Table 13

Raw and Standardized Score Equations for Variables Predicting Frequency of Illness

Model	Variable	Equation
Standard Model		Not Significant
Hierarchical Model		
	Block 1	
	GENDER	<p>Raw Score Equation:</p> $Y' = A + B_1X_1 + B_2X_2 \dots B_kX_k.$ <p>Predicted IFI = Constant + B weight of GENDER.</p> <p>Predicted IFI = 6.19 + (-1.92 GENDER)</p> <p>Standardized Score Equation:</p> $ZY' = {}_1Z_1 + {}_2Z_2 \dots {}_kZ_k$ <p>Predicted IFI = Beta weight of GENDER.</p> <p>Predicted IFI = (-22 ZGENDER)</p>
	Block 2	
	GENDER	<p>Raw Score Equation:</p> $Y' = A + B_1X_1 + B_2X_2 \dots B_kX_k.$ <p>Predicted IFI = Constant + B weight of GENDER.</p> <p>Predicted IFI = 7.70 + (-1.95 GENDER).</p> <p>Standardized Score Equation:</p> $ZY' = {}_1Z_1 + {}_2Z_2 \dots {}_kZ_k$ <p>Predicted IFI = Beta weight of GENDER.</p> <p>Predicted IFI = (-.22 ZGENDER).</p>

(continues)

Raw and Standardized Score Equations for Variables Predicting Frequency of Illness

(continued)

Model	Variable	Equation
	GIFTED	<p>Raw Score Equation:</p> $Y' = A + B_1X_1 + B_2X_2...B_kX_k.$ <p>Predicted IFI = Constant + B weight of GIFTED.</p> <p>Predicted IFI = 7.70 + (-.94 GIFTED).</p> <p>Standardized Score Equation:</p> $ZY' = {}_1Z_1 + {}_2Z_2... {}_kZ_k$ <p>Predicted IFI = Beta weight of GIFTED.</p> <p>Predicted IFI = (-.11 ZGIFTED).</p>
Stepwise		
Step 1	DESB	<p>Raw Score Equation:</p> $Y' = A + B_1X_1 + B_2X_2...B_kX_k.$ <p>Predicted IFI = Constant + B weight of DESB</p> <p>Predicted IFI = -1.92 + (2.27 DESB).</p> <p>Standardized Score Equation:</p> $ZY' = {}_1Z_1 + {}_2Z_2... {}_kZ_k$ <p>Predicted IFI = Beta weight of DESB</p> <p>Predicted IFI = (.24 ZDESB).</p>

Note. Subscales are abbreviated so that IFI = Index of Frequency of Illness (Absenteeism), GENDER = Females and Males, and GIFTED = Gifted and Non-Gifted, and DESB = Differential Emotions Scale - Frequency (Frequency of Emotion).

CHAPTER FIVE

DISCUSSION

Introduction

The results of this study fall into four general areas: findings regarding the relationships between the emotion variables; findings related to frequency of illness; findings that refer to gender differences; and findings concerning differences between gifted and non-gifted individuals. The research questions provide the framework for discussion of these areas. This discussion offers, based on the literature, possible explanations or reservations regarding these findings. Also discussed are limitations to this research as well as implications for future research and implications for counselors and educators.

Research Question One

- (a) Are there relationships between the variables; AIM, DESA, DAS, DESB, IFI, GENDER and GIFTED?
- (b) Is there a relationship between IFI and the other variables; AIM, DESA, DAS, DESB, GENDER, and GIFTED?

Relationships Between Variables.

The Pearson produce-moment correlations revealed a positive correlation between typical affect intensity and affect intensity at the time of questionnaire administration. However this correlation was weak ($r = .24$) suggesting that these two instruments may not be measuring the same constructs. In this regard, Izard's DES III was originally conceived of as a "state" measure of one's emotions and, therefore, the usual DESA instructions ask the individual to rate the extent to which each word describes the way he or she feels "at the present time" (Kotsch, Gerbing, & Schwartz, 1982). Larsen and Diener (1987), on the other hand, see affect intensity as a stable individual difference characteristic defined in terms of the "typical" strength of an individual's responsiveness and consequently, their instructions ask individuals to indicate how they react to "typical life events". Therefore, these instruments appear to be measuring different aspects of the same emotional intensity construct. Because these different aspects may add some

valuable information to the findings of this study, both instruments were retained in all of the analyses. However, because these instruments are, in some ways dissimilar, it is unclear what a mean of these two instruments produces. Therefore, the overall intensity measure (INTENOA) was eliminated from the remainder of the analyses.

The negative correlation between typical affect intensity and gender was not strong ($r = -.23$) but appears to support Billings and Moos (1982) view that females experience emotions more intensely than males. However, Stapley and Haviland's (1989) findings suggest that male adolescent subjects may not accurately report their emotions. If this is the case in this study, inaccurate reporting of emotion experiences by males may have the effect of making females appear to have more intense emotion experiences. Given the possibility of inaccurate reporting by males and the low correlations between typical affect intensity and gender we can only conclude that females in this study reported more intense emotions than males but we cannot conclude that females actually experience more intense emotions than males.

Finding typical affect intensity to be moderately correlated with both frequency and duration of affect was not surprising. Similarly, finding frequency of affect to be moderately correlated with duration of affect and frequency of illness was not surprising in light of extensive literature describing the relationship between intensity, duration, and frequency of emotion. For example, Begley (1996) writes that prolonged, intense emotions can flood neuronal circuits causing the brain to remain excited and on high alert for several days at a time. She adds that the more frequent the emotional reaction, the deeper the pathway that is carved and the easier it is for emotional reactions to trigger physiological responses. Larsen and Diener define typical affect intensity as the frequent experience of strong emotions. Therefore, they might argue that infrequent emotional experiences would not be considered "typical". The correlational findings in this study, however, suggest only moderate relationships between these variables. In light of the literature and previous biological research we might expect stronger correlations. However, as indicated by MacKinnon and Keating (1989) and by Nolen-Hoeksema & Girgus (1994), it may be that emotions and emotional style develop in childhood. If so, it

may be that as more sophisticated emotions develop, relationships between affect intensity, duration, and frequency also develop, becoming more responsive to one another and having more effect on physiology.

The strong correlation between affect intensity at the time of questionnaire administration and frequency of affect was not surprising given that the two questionnaires were identical except for the question stem at the beginning of each questionnaire.

Based on the literature, we might expect typical affect intensity to be significantly related to frequency of illness (Hafen, Karren, Frandsen, & Smith, 1996, chap. 2; Schmale & Iker, 1966). However, no significant correlation was found between these variables. As previously suggested, this may be because immature cognitive development protects young adolescents by limiting emotional responses that might otherwise produce negative health outcomes. However, it is also possible that the cumulative effects of certain emotion experiences produce ill health and therefore, effects can only be seen after many years. If this is the case, the subjects in this study may be too young for the effects of their emotional style to have had a notable impact on their health.

That duration of affect was moderately correlated with typical affect intensity but only weakly correlated with affect intensity at the time of questionnaire administration, lends support to the view that the DESA and the AIM are measuring different aspects of affect intensity.

Contrary to the general view indicated by the literature, that gifted individuals are thought to be more sensitive and more emotional than average individuals (Miller, Silverman, & Falk, 1994; Silverman, 1993), no significant relationship was found between typical affect intensity and gifted. On the other hand, a moderate relationship was found between affect intensity at the time of questionnaire administration and gifted. This finding might be expected in light of Silverman's claims that gifted individuals may feel humiliation when imperfections are revealed, and despair when failing to meet their goals. However, later analyses in this study indicated that it was the non-gifted individuals, in particular males, who experienced more emotional intensity than gifted individuals at the time of questionnaire administration. While gifted individuals may experience more

performance concerns than non-gifted individuals, it may be that they are also better equipped, cognitively, to cope with those concerns and, as a result, experience less intense emotional responses.

Finally, the weak correlation found between females and frequency of illness suggests that females experience more illness than males. Given that frequency of illness was moderately associated with frequency of emotion, it may be that females experience illness more frequently than males because they experience emotion more frequently. However, such causal relationships cannot be identified by correlational analyses. In any event, correlations in this study indicate the correlation between females and frequency of emotion was not significant. As indicated by MacKinnon and Keating (1989), gender differences become more notable after age 15. Because this population ranges in age from 11 to 15 years of age, it may be that the younger female scores tend to nullify the older female scores thereby influencing the significance of the results.

Relationships Between IFI and the Other Variables.

Although frequency of illness significantly correlated with affect intensity at the time of questionnaire administration, frequency of emotion, and gender, a standard regression analysis found that none of the variables contributed significantly to our ability to predict frequency of illness. These findings suggest that the variables included in this study are not as important as other unmeasured variables that may contribute to illness.

Research Question Two

- (a) Are there significant differences between females and males with respect to intensity, duration, and/or frequency of emotions, and frequency of illness?
- (b) Are there significant differences between gifted and non-gifted individuals with respect to intensity, duration, and/or frequency of emotions, and frequency of illness?
- (c) Are there significant interactions between GENDER and GIFTED with respect to intensity, duration, and/or frequency of emotions, and frequency of illness?

Gender.

The difference found between males and females was not surprising given previous

research that generally supports the view that females are more emotional than males (Billings & Moos, 1982), that females are different from males in how they perceive, evaluate, and respond to emotional situations, and even in how they report their emotions (MacKinnon & Keating, 1989; Sowa & Lustman, 1984; Stapley & Haviland, 1989). Given that the literature suggests that emotions can influence health, for example by suppressing the immune response (Stein, Keller, & Schleifer, 1985), altering immune functioning (Cooper, 1996), or by increasing cardiovascular reactivity (Powch & Houston, 1996), it is not surprising that females scored higher on frequency of illness than males, and given the amount of literature suggesting that emotions impact health, it is also not surprising that despite the weak correlation between frequency of illness and gender, frequency of illness contributed most to the differences between females and males. Based on similar correlational findings between gender and typical affect intensity, we might have expected typical affect intensity to also make a significant contribution to the differences between females and males. However, this was not the case. Given that no significant relationship was found between gifted and typical affect intensity, any potential contribution of typical affect intensity to differences between males and females may have been canceled out by the gifted component of gender.

Gifted.

The literature suggests that gifted individuals are emotionally different from non-gifted individuals because, among other things, they are more sensitive, display a wider range of emotional responses, and experience more depression (Roeper, 1981; Sommers, 1981; Silverman, 1993). Only one study of self-esteem and depression by Bartell and Reynolds (1986) found no significant difference between gifted and non-gifted individuals. Therefore, the difference found in this study between gifted and non-gifted supports the predominant view in the literature. The literature also suggests that gifted individuals have stronger emotional experiences than non-gifted individuals because of their greater capacity for emotional depth, and their tendency to be more emotionally reactive (Roeper, 1981; Sommers, 1981). Results from this study indicate that affect intensity at the time of questionnaire administration most clearly contributed to differences between gifted and

non-gifted groups. However, contrary to the predominant view that gifted individuals experience emotions more intensely than non-gifted individuals, non-gifted males scored higher on intensity of emotion than gifted males or females, and higher than non-gifted females. Perhaps non-gifted males experience more intense emotions at the time of questionnaire administration because the questions on the questionnaire ask them about their emotions, something they may not have been encouraged to talk about previously. Unlike females, who have been socialized to be more expressive of their feelings, males may feel uneasy venturing into unfamiliar territory. While gifted individuals may be more sensitive and may possess a wider range of emotional responses, it is possible that they do not experience emotions any more intensely than non-gifted individuals. Roeper (1981) writes that gifted individuals have a greater ability to transform perceptions into intellectual and emotional experiences. This combined with what Roeper refers to as “cognitive complexity” may give gifted individuals a greater ability to identify, label, and articulate their emotions. If so, gifted individuals may appear more emotional than non-gifted individuals who may be less able to identify or describe the emotions they experience, but cognitive skills in the gifted may also help them cope with emotional anxiety.

Gender by Gifted Interaction.

A gender by gifted interaction might be expected given that gender is a component of gifted. However, an interaction could only occur where a common variable contributed significantly to both factors. In this case, the variables contributing to each factor were different and, therefore, finding no interaction was not surprising.

Research Question Three

Do intensity, duration, and/or frequency of emotion add to our ability to predict absenteeism?

Only two significant models for predicting frequency of illness were found. In the first model, gender was found to contribute significantly to the prediction of illness but the variance accounted for by this variable was only 5%. In this case, the regression analysis results coincide with the correlational findings wherein a weak relationship was found

between female gender and frequency of illness. In the second model, frequency of emotions was found to contribute significantly to the prediction of illness. In this case, only 6% of the variance was accounted for by this variable. In the correlational analysis, a moderate relationship was also found between frequency of emotion and frequency of illness.

A problem suggested by these results is that a large percentage of the variance contributing to the prediction of frequency of illness (95% in the first model and 94% in the second model) is accounted for by variables not addressed in this study. This means the assumption of independence of errors may have been violated. Multiple regression assumes that important unmeasured IV's that contribute to error are not correlated with any of the measured IV's. If there are contributing IV's correlated with the measured IVs, estimates of regression coefficients may be over or underestimated. In order to accurately reflect the contribution of each IV to the prediction of the DV, all relevant IVs must be included (Tabachnick & Fidell, 1996). Therefore, further research is needed to investigate other possible contributing variables. For example, a study by Malec (1997) found a significant reduction in stress and an increase in physiological fitness among a sample of 110 adults, ranging in age from 24 to 76, as a result of regular (two times per week) moderate effort aerobic exercise. Perhaps, exercise offsets the effects of emotional stress thereby reducing the impact of emotions on physiology. Adolescents are generally active and this activity may, in part, account for many of the low correlations found in this study between frequency of illness and the other variables. Differences in activity level may also explain differences between adolescents and adults in terms of frequency of illness. Research comparing adults and adolescents may be useful to examine this possibility. Physical activity may also act as a cognitive diversion that intrudes upon negative or ruminative thinking thereby reducing the intensity and duration of emotional experiences so that emotions have less effect on physiology. Another contributing variable may be availability of social support. A study by Spiegel, Bloom, Kraemer, and Gottheil (1989) found that group therapy had a significant survival effect for women with terminal metastatic breast cancer. Does social support help us cope with emotional

distress? If social support enhances health by acting as a buffer against emotional distress, it may be that the young individuals in this study are not significantly affected by their emotions because they have social support by virtue of the large variety of social activities that are part of the fabric of most junior high school programs. For those who report frequent illness, however, lack of social support may be a significant contributing factor to predicting frequency of illness. Other factors that may be accounting for some of the variance contributing to frequency of illness include poor self-care such as lack of sleep or poor diet, or unhealthy behaviors such as alcohol or drug abuse (Collins, 1993).

Limitations of Research

The conclusions of this study are not unequivocal and should be read critically. The following represent some limitations noted by the author.

1. While an extensive review was made of theoretical and empirical literature, it was difficult to give equal weight to all of the topics discussed herein. Previous research in certain topic areas was sparse and, therefore, every article relevant to this study was included whenever possible. However, where the literature available on a topic area was too expansive, the researcher chose only those references that were specifically related to the research questions in this study or those articles that might contribute to the readers' understanding of the origins of those questions.
2. This study is exploratory and therefore is only intended to provoke thought, generate new ideas, and stimulate interest in future research. In addition, because this study has not been tested with other samples, replication is needed.
3. The sample size in this study was small and was taken only from schools with gifted programs located in middle-class neighbourhoods. Therefore, the population is not representative of adolescents generally.
4. The criteria for defining gifted in this study may not adequately distinguish gifted from non-gifted. In some cases, a gifted individual may have a combined score of 120 on Thorndike and Hagen's (1989) Canadian Cognitive Abilities Test (CCAT) while another individual may score 119 and be designated non-gifted. Given numerous alternative and conflicting views regarding the meaning of gifted and the best measurement methods for

identifying the gifted, the CCAT may not be the best criterion for use in this type of research. Therefore, the results of this study should be viewed cautiously and should not be generalized to either the general adolescent population or even specifically to gifted adolescents.

5. Subjects in this study were not given psychological assessments. Nor were subjects tested for developmental differences. Therefore, it should be kept in mind that such factors may contribute to some of the findings in this study.

6. All of the tests in this study were administered to students in the classroom. However, the tests were administered to some of the classrooms by teachers while others were administered by the researcher. While specific protocol was provided for all administrators, inconsistencies in test administration may influence results. In addition, scores could be influenced if students experience demand effects from teacher administrators, or if researcher bias were to influence students in any way.

Implication for Future Research

In the pilot study, disagreement among raters with respect to their evaluation of students' responses on the DAS, was not evenly distributed across grades with disagreement being most notable in the Grade 8 group. Certain questions arise as to why the Grade 8 group is different. Perhaps they are more likely to change their mind about their initial answers because they are less self-confident than the Grade 7 and Grade 9 groups. If so, what is affecting their self-confidence? Perhaps physical changes experienced at this time produce insecurity, or perhaps these students are in a transition period between different stages of cognitive development. In any event, future researchers may want to explore group differences further to determine whether self-confidence is a contributing factor.

Two questions on the DAS involved emotions, shame and regret, that were unfamiliar to some of the students in this study. Therefore, researchers wishing to use this instrument in the future may want to eliminate these questions, particularly if they are administering the DAS to this age group. It may be that unfamiliarity with these emotions can be explained in terms of developmental factors and future researchers may want to

explore emotional and moral development more closely in this age group, or researchers may want to test the instrument on an older age group to see if the same or other questions prove problematic.

Two instruments were used to measure affect intensity in this study. The AIM was chosen because it has been validated (with adult populations) and used extensively in previous research, while the DESA was chosen because it has been previously tested on adolescents. While the DESA provided some interesting information to this study, its contribution was limited to findings regarding affect intensity at the time of questionnaire administration. With the few modifications described herein, the AIM was a better measure of typical affect intensity in adolescents. However, future researches may want to try modifying the DESA by changing the question stem from "Please indicate the level of feeling you are experiencing right now" to "Please indicate the level of feeling you generally experience". The modified DESA could then be compared to the modified AIM to determine differences and similarities between instruments and the implications for their use.

Moderate correlations were found in this study between intensity, duration, and frequency of emotion. However, based on the literature, we might expect stronger correlations. It may be that the sample size affects correlational finding and therefore, it may be advisable for any replication of this study to involve a larger sample. However, it is also possible that these results reflect issues of development in early adolescence. Future research using a longitudinal design might be useful for investigating possible patterns of development.

Results of this study indicate that typical affect intensity did not correlate significantly with frequency of illness. Based on the literature, we would expect a strong correlation between these variables. It may be that cognitive development plays a role in perception of threat and resulting intense emotions. Consequently, differences in development across grades may be affecting the findings. It may be useful for future research to look at larger populations in each grade separately and then compare findings in each grade for similarities and differences in typical affect intensity.

It is possible that the cumulative effects of intense emotional experiences produce ill health so that effects can only be seen after many years. If this is the case, a study comparing group differences in affect intensity might be valuable wherein, for example, a researcher might compare a particular diagnostic group, such as a group of individuals with arthritis, to a similar group of individuals who do not have arthritis, to determine whether there are significant differences with respect to affect intensity.

Findings in this study indicate that affect intensity at the time of questionnaire administration was significantly correlated with frequency of illness. This finding raises a question as to how many student sick days fall on exam days. In particular, typical affect intensity in non-gifted males was not significant but affect intensity at the time of questionnaire administration was significant. Perhaps affect intensity and illness frequency in this group are, in part, related to test performance anxiety. A research project designed to examine these questions more closely, may be useful

Results from this study did not support the view that gifted individuals experience emotions more intensely than non-gifted individuals. While gifted individuals may be more sensitive and may possess a wider range of emotional responses, they may only appear more emotional than non-gifted individuals because they are more able to identify, label, and articulate their emotions. Such cognitive skills in the gifted may also help them cope more effectively with emotional anxiety. Research is needed that will attempt to discriminate between intellectual ability to describe emotions and intensity of emotional experience.

Only two variables in this study were significant predictors of illness, gender and frequency of emotion. Females reported more frequent illness than males but frequency of emotions in females was not significant. However, females reported more intense emotions. If frequent emotions are generally related to frequent illness, why is this not the case for females? Once again, differences between cognitive development in Grade 7's and Grade 9's may serve to neutralize results. However, it may also be that the regular expression of everyday emotions reduces their impact on physiology. If females are experiencing more frequent illness and more intense emotions rather than more frequent

emotions, perhaps emotional intensity is contributing to their illness. It may be that intense emotions have a greater impact on physiology because, for females, expression of these emotions is not socially acceptable. The topic of social expectations regarding emotional expression in males and females has been extensively discussed in the literature (MacKinnon, & Keating, 1989; Zigler, Lamb, & Child, 1982, chap 8; Santrock, 1990, chap.11). However, it might be beneficial to conduct a study that focuses on the differences between males and females in terms of emotional restraint. Such a study might look at how much the need for social acceptance plays a role in emotional restraint, the types of emotions that are restrained in males as compared to females, and the differences in the effects of such restraint, if any, on health.

The percentage of variance contributed to the prediction of illness by gender and frequency of emotion was small. Opportunities for future research may also lie in exploring other variables that might be more important predictors of frequency of illness in young adolescents.

Implications for Counselors and Educators

The similarities and differences between Grade 8 student responses on the written and verbal versions of the DAS were less clear than responses provided by Grade 7 and Grade 9 students. This finding suggests that Grade 8 may be a time when students are feeling less certain about themselves. A number of factors may work either separately or together to undermine self-confidence at this age, such as cognitive and physical development, peer pressure, and increasing scholastic demands. Educators may want to explore ways that program design may contribute to or undermine self-confidence in this group. Similarly, counsellors may want to provide students with skills, including cognitive behavioral skills such as imagery, to help them cope with their insecure feelings and improve their self-confidence.

Results indicate that the gifted in this study report experiencing emotions more frequently but less intensely than non-gifted. Therefore, it may be that gifted individuals are better equipped to deal with their emotions. The literature suggests this may be because their advanced cognitive skills help them to identify, label, and articulate their

feelings. If this is true, educators may be able to help young people by encouraging them to identify, label, and share their feelings with classmates as part of regularly scheduled class activities such as show and tell, or storytime, for young children, or in response to films, in book reports, or as part of a discussion of current affairs among adolescents. In this way, skills can be learned that may support healthier emotional development.

The current research findings suggest that frequent emotions are associated with frequency of illness. However, this finding was not significant for females. This may be because females express regular emotions more often than males and expression of emotions may serve to offset the negative health effects of frequent emotions. The literature suggests that social learning may play a role in the development of gender differences in the expression of emotion (MacKinnon, & Keating, 1989). Educators can help students by teaching children appropriate ways of expressing their emotions and by helping them learn, at an early age, that it is acceptable to share their feelings with others when they do so in an appropriate manner. Counselors working with children and adolescents can help young adolescents accept their own feelings as legitimate, normal, and therefore, appropriate to express. By demonstrating empathy and their own comfort with the feelings expressed by adolescents, counselors can help them feel safe to express themselves openly. Counselors can facilitate adolescents becoming more comfortable with emotions and emotional expression by teaching them communication skills such as appropriate, socially acceptable ways of articulating and describing their feelings. With appropriate communication skills, adolescents may find that their expression of emotion is more readily accepted by others. Counselors can also teach ways of coping with feelings. If the effect of emotions on health is cumulative, coping skills that are learned early may also facilitate a healthier physiology in later years.

Summary.

With respect to research question one, the AIM and DESA instruments appeared to be measuring different aspects of the same emotional intensity construct, making the value of the overall intensity measure questionable. Therefore, INTENOA was eliminated from all other analyses. Generally speaking, the correlational findings in this study do not

contradict previous research with adult populations, but the significant relationships found were weak suggesting that emotions and emotional style may develop during early childhood and adolescence. Contrary to general views in the literature, no significant relationship was found between typical emotional intensity and gifted. With respect to intensity of affect at the time of questionnaire administration, non-gifted report experiencing more emotional intensity than gifted suggesting that gifted individuals may be better able to cope with performance concerns than non-gifted and, consequently, experience less intense emotional responses. The correlations between females and frequency of illness and between frequency of illness and frequency of emotion were not strong. Previous research suggests emotions may not be fully developed in this population so that younger female scores may offset older female scores thereby influencing the strength of these results. Finally, none of the variables contributed significantly to our ability to predict frequency of illness.

With respect to research question two, and in support of views expressed in the literature, females and males were found to be significantly different. That frequency of illness contributed most to the differences between females and males supports the views expressed in the literature, that males and females differ with respect to emotion, and that emotions impact health. Generally, the literature suggests that gifted individuals are emotionally different from non-gifted individuals. In this regard, a significant difference was found between gifted and non-gifted but only with respect to affect intensity at the time of questionnaire administration wherein non-gifted males scored higher than gifted males, gifted females, or non-gifted females. Findings suggest that gifted individuals may not experience emotions more intensely but may be more able to identify, label, and articulate their emotions. No gender by gifted interaction was found.

With respect to research question three, regression analyses found that gender and frequency of emotions contributed significantly to the prediction of illness but the variance accounted for by these variables was small. Therefore, a large percentage of the variance contributing to the prediction of frequency of illness may be accounted for by other unmeasured variables suggesting that the assumption of independence of errors may have

been violated and that estimates of regression coefficients may be over or underestimated. Further research is needed to investigate other possible contributing variables.

Certain implications for counselors and educators arise from the results of this study. Counselors and educators may be able to help students by providing a supportive environment and by providing students with skills to cope with their insecure feelings and to improve their self-confidence. By demonstrating empathy and comfort with emotions expressed, counselors working with children and adolescents may be able to help them accept their feelings and feel more comfortable about expressing them. Counselors may further facilitate adolescents becoming more comfortable with emotions by teaching them appropriate communication of emotions and social skills. In addition, ways of coping with feelings can be taught that may have a positive effect on physiology in later years. Educators may also be able to help young people by encouraging them to identify, label, and share their feelings with classmates as part of regularly scheduled class activities so that children learn at an early age that it is acceptable for anyone, regardless of gender, to share their feelings with others.

Conclusion

A review of the literature revealed numerous studies that indicate an emotion/physiology connection, many of which suggested that emotions may adversely impact the immune system. The types of emotion that were highlighted as having the most profound effects on physiology were those emotions that are intense, prolonged, and/or frequent. The literature also suggested that certain groups of individuals, such as females and the gifted, tend to be more emotional than the general population and potentially more susceptible to illness.

Using the literature as a basis for investigation, this study explored relationships between certain independent variables including typical affect intensity, affect intensity at the time of questionnaire administration, duration of affect, frequency of affect, gender, gifted, and frequency of illness. Findings were generally supportive of previous research with adults but correlations were weak suggesting possible differences between adolescents and adults in terms of either emotionality or physiological vulnerability.

Future research is needed to help broaden our understanding of differences that may exist between adults and adolescents and whether such differences influence health.

This study also looked at these variables as possible predictors of frequency of illness. Only two variables, gender and frequency of illness, were found to be significant predictors of illness. The percentage variance accounted for by these variables was very small suggesting that other variables not explored in this study, may account for most of the variance contributing to our ability to predict illness. Therefore, further exploratory research might extend this research by including other variables that may also contribute to the variance in predicting frequency of illness.

Finally, this study investigated group differences in frequency of illness and emotionality. With respect to frequency of illness, and in support of the literature, gender differences were found, with females scoring higher on frequency of illness than males. No significant differences in frequency of illness were found between gifted and non-gifted individuals in this study. With respect to emotionality, differences were found between males and females with respect to typical affect intensity. Females scored higher on typical affect intensity than males but it is unclear whether differences are due to different ways of experiencing emotions or social learning differences that may contribute to the ability to identify, label, and report emotions. Differences in emotionality were also found between gifted and non-gifted groups with respect to emotional intensity at the time of questionnaire administration. Findings indicate non-gifted males scored highest on intensity of emotion at the time of questionnaire administration. These findings contradict previous research suggesting that gifted are more emotional than non-gifted and also contradict the view that females are more emotional than males. Advanced capabilities of gifted individuals may affect the way emotions are communicated. Similarly, social acceptance of expression of emotion may allow females to become more capable of communicating their emotions. In both cases, more advanced emotional expression and a greater ability to communicate emotion may account for certain groups appearing more emotional. Research is needed that will discriminate between ability to express and communicate emotion and the state of being more emotional.

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Appendix A

NO: _____

DAS Questionnaire

DIRECTIONS:

The following questions refer to the typical duration, or length of time, of emotional reactions. Please indicate the typical duration of YOUR emotional reactions by placing a number from the following scale in the blank space following each item. To do so, use the statement "When I feel _____, the feeling lasts ____". Please base your answers on the typical duration of YOUR emotional reaction, *not* on what you think is the typical duration of others' emotional reactions or on what you think should be the typical duration of a person's emotional reaction.

ANSWER SCALE:

A FEW MINUTES	AN HOUR OR TWO	SEVERAL HOURS	A DAY OR TWO	SEVERAL DAYS
1	2	3	4	5
Example: When I feel <u>upset</u>, the feeling lasts <u>several hours</u>. Upset <u>3</u>				
Delighted	_____		Anxious	_____
Discouraged	_____		Regret	_____
Contented	_____		Embarrassed	_____
Sad	_____		Untroubled	_____
Annoyed	_____		Fearful	_____
Peaceful	_____		Excited	_____
Guilty	_____		Hurt	_____
Overjoyed	_____		Ashamed	_____
Angry	_____		Happy	_____
Disgusted	_____			

Appendix B

Index of Frequency of Illness

Subject	Days Absent Total	Days Absent Not Due to Illness	Days Absent Due to Illness
1	7.5	7.0	0.5
2	7.0	1.5	5.5
3	5.0	6.5	0.0
4	3.0	3.0	0.0
5	8.5	0.0	8.5
6	4.0	0.0	4.0
7	3.5	1.0	2.5
8	3.5	4.0	0.0
9	7.5	5.0	2.5
10	5.0	1.0	4.0
11	8.0	2.0	6.0
12	4.5	0.5	4.0
13	4.0	1.0	3.0
14	5.5	3.0	2.5
15	11.5	10.0	1.5
16	4.5	6.0	0.0
17	6.0	0.0	6.0
18	14.5	3.0	11.5
19	2.0	0.0	2.0
20	27.5	35.0	0.0
21	10.0	12.0	0.0
22	4.0	1.0	3.0

(continues)

Index of Frequency of Illness (continued)

Subject	Days Absent Total	Days Absent Not Due to Illness	Days Absent Due to Illness
23	13.0	14.0	0.0
24	0.0	0.0	0.0
25	6.5	8.0	0.0
26	5.5	3.5	2.0
27	8.0	5.5	2.5
28	26.5	5.0	21.5
29	34.0	10.0	24.0
30	3.5	4.5	0.0
31	1.0	1.0	0.0
32	8.5	6.5	2.0
33	13.5	20.0	0.0
34	10.0	5.0	5.0
35	9.0	5.5	3.5
36	12.5	5.0	7.5
37	3.0	2.0	1.0
38	1.5	5.0	1.0
39	6.0	3.0	3.0
40	6.5	4.5	2.0
41	5.5	2.0	3.5
42	2.0	1.0	1.0
43	4.5	1.5	3.0
44	3.5	1.0	2.5
45	7.0	6.0	1.0

(continues)

Index of Frequency of Illness (continued)

Subject	Days Absent Total	Days Absent Not Due to Illness	Days Absent Due to Illness
46	2.5	6.0	0.0
47	7.0	1.0	6.0
48	4.0	0.0	4.0
49	6.0	0.0	6.0
50	3.0	0.0	3.0
51	1.0	1.0	0.0
52	1.0	0.0	1.0
53	16.0	2.0	14.0
54	9.5	10.0	0.0
55	5.5	1.5	4.0
56	0.5	8.0	0.0
57	11.0	4.0	7.0
58	22.0	10.0	12.0
59	1.0	0.5	0.5
60	4.5	1.0	3.5
61	11.0	15.0	0.0
62	2.0	5.0	0.0
63	2.5	0.0	2.5
64	6.0	10.0	0.0
65	2.5	1.0	1.5
66	9.5	7.0	2.5
67	7.0	5.0	1.0
68	15.0	0.0	15.0

(continues)

Index of Frequency of Illness (continued)

Subject	Days Absent Total	Days Absent Not Due to Illness	Days Absent Due to Illness
69	6.5	2.0	4.5
70	8.5	5.0	3.5
71	1.5	1.0	0.5
72	1.0	10.0	0.0
73	8.0	2.0	6.0
74	7.0	0.5	6.5
75	7.5	0.0	7.5
76	5.0	3.0	2.0
77	27.0	3.5	23.5
78	1.5	0.0	1.5
79	27.5	35.0	0.0
80	8.5	4.0	4.5
81	8.5	1.0	7.5
82	11.5	10.0	1.5
83	8.5	1.0	7.5

Appendix C

<u>WORD</u>	<u>DEFINITION</u>
anticipation	- to expect or foresee.
anxiety	- the state of being worried or concerned.
aroused	- stirred into activity.
calm	- still, quiet, tranquil.
content	- satisfied, adequately happy.
contentment	- satisfied state, tranquil happiness.
cool	- unexcited, calm.
delighted	- pleased greatly, take great pleasure in.
ecstatic	- overwhelming feeling of joy.
elated	- excited, enlivened, lifted up, pleased, gladdened.
enthusiastic	- intense interest or eagerness.
euphoric	- a mood of high spirits, a feeling of exceptional well-being.
exhilaration	- enlivened or gladdened, a feeling of cheerfulness.
exuberance	- being full of joyful enthusiasm.
guilt	- a painful memory of wrongdoing.
high-strung	- an unusually nervous, highly excitable temperament.
jubilant	- feel like shouting for joy.
overjoyed	- great or excessive joy, enthusiastically delighted.
overreact	- respond more strongly than is justified.
rational	- sensible, reasonable.
shame	- feeling of disgrace or dishonour.
tense	- high mental pressure involving a strain on emotions or nerves.
touch	- to affect with some feeling or emotion, as tenderness, or pity.
trying	- hard to endure, annoying.
zestful	- keen enjoyment.

Appendix D

Independent Rater Responses

Emotion	Students														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Delighted															
Rater 1:	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1
Rater 2:	1	2	1	2	1	2	1	1	1	1	1	1	1	1	1
Discouraged															
Rater 1:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rater 2:	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Contented															
Rater 1:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rater 2:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sad															
Rater 1:	1	2	1	1	1	2	1	1	1	1	1	1	1	1	1
Rater 2:	1	3	1	1	1	3	1	1	1	2	1	2	1	1	1
Annoyed															
Rater 1:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rater 2:	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1
Peaceful															
Rater 1:	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1
Rater 2:	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1
Guilty															
Rater 1:	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1
Rater 2:	2	1	1	1	1	1	1	1	1	1	1	1	1	2	1

(continues)

Independent Rater Responses (continued)

Emotion	Students														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Overjoyed															
Rater 1:	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1
Rater 2:	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1
Angry															
Rater 1:	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1
Rater 2:	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1
Disgusted															
Rater 1:	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1
Rater 2:	1	1	1	1	1	X	1	1	1	1	1	1	1	1	1
Anxious															
Rater 1:	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1
Rater 2:	1	1	1	1	1	2	1	1	2	1	2	1	1	1	1
Regret															
Rater 1:	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rater 2:	3	1	1	1	1	2	1	1	1	1	1	1	1	1	1
Embarrassed															
Rater 1:	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1
Rater 2:	1	1	1	1	2	2	1	1	2	1	1	1	1	2	1
Untroubled															
Rater 1:	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1
Rater 2:	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1

(continues)

Independent Rater Responses (continued)

Emotion	Students														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Fearful															
Rater 1:	1	1	1	1	1	1	3	1	1	1	1	1	1	3	1
Rater 2:	1	1	1	1	1	2	1	2	1	1	1	1	1	3	1
Excited															
Rater 1:	1	2	1	1	2	1	2	1	1	1	1	1	1	1	1
Rater 2:	1	3	2	1	3	2	2	1	1	2	1	1	1	1	1
Hurt															
Rater 1:	2	1	2	1	1	2	1	1	1	1	1	1	1	1	1
Rater 2:	2	2	2	1	2	3	1	1	1	1	1	1	1	1	1
Ashamed															
Rater 1:	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1
Rater 2:	2	2	1	2	3	2	1	2	1	1	1	1	1	1	1
Happy															
Rater 1:	1	2	1	1	1	2	1	1	1	1	1	1	1	1	1
Rater 2:	1	3	1	1	1	2	1	1	1	1	1	1	1	2	1
Delighted															
Rater 1:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rater 2:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Discouraged															
Rater 1:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rater 2:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

(continues)

Independent Rater Responses (continued)

Emotion	Students														
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Contented															
Rater 1:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rater 2:	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1
Sad															
Rater 1:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rater 2:	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1
Annoyed															
Rater 1:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rater 2:	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1
Peaceful															
Rater 1:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rater 2:	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1
Guilty															
Rater 1:	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1
Rater 2:	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1
Overjoyed															
Rater 1:	1	1	1	1	1	1	1	1	3	2	1	1	1	1	1
Rater 2:	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1
Angry															
Rater 1:	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1
Rater 2:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

(continues)

Independent Rater Responses (continued)

Emotion	Students														
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Disgusted															
Rater 1:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rater 2:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Anxious															
Rater 1:	1	1	1	1	1	1	1	1	2	1	2	1	1	1	1
Rater 2:	1	1	1	1	1	2	1	1	2	1	2	1	1	1	1
Regret															
Rater 1:	2	2	1	1	1	1	2	1	2	1	1	1	1	1	1
Rater 2:	2	2	1	1	1	1	2	1	1	1	1	2	1	1	1
Embarrassed															
Rater 1:	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1
Rater 2:	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1
Untroubled															
Rater 1:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rater 2:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fearful															
Rater 1:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rater 2:	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1
Excited															
Rater 1:	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1
Rater 2:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

(continues)

Independent Rater Responses (continued)

Emotion	Students														
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Hurt															
Rater 1:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rater 2:	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1
Ashamed															
Rater 1:	1	1	1	1	1	1	1	1	X	1	1	1	1	2	1
Rater 2:	1	1	1	1	1	1	1	1	X	1	1	1	1	2	1
Happy															
Rater 1:	1	1	1	1	1	1	1	1	X	1	1	1	1	1	1
Rater 2:	1	1	1	1	1	1	2	1	X	1	1	1	1	1	1

Appendix E

Parent Consent for Research Participation

I/We, the undersigned, hereby give my/our consent for _____ to participate in a research project which is looking at possible relationships between different kinds of emotions and health.

I/We, understand that such consent means that _____ will be completing four questionnaires that take approximately 10 minutes each, that these questionnaires will be administered in a group, at school and during regular school hours, and that a short debriefing session will follow the completion of the questionnaires.

I/We, also understand that such consent means that the records of attendance for _____ will be examined for the purpose of documenting absences due to illness.

I/We understand that participation in this study may be terminated at any time by my/our my/our request, or of the investigators. Participation in this project and/or withdrawal from this project will not affect my/our request or receipt of other services from the school board or the university.

I/We understand that this study will not involve any greater risks than those ordinarily occurring in daily life.

I/We understand that the responses will be obtained anonymously and kept in strictest confidence with access being provided only to the investigators.

I/We understand that only group data will be reported in any published reports, that group findings may be reported to participating classes, and that a copy of the group results and/or my child's individual results will be made available to me/us upon request.

I/We understand that all raw data will be kept in a locked file cabinets and destroyed two years after publication of study results (completion of the study).

I/We have been given a copy of this consent form for my(our) records. I/We understand that if at any time I/We have questions, I/We can contact the researcher at

220-3675, their supervisor at 220-6277, the Office of the Chair, Faculty of Education Joint Ethics Committee, at 220-5626, or the Office of the Vice-President at 220-3381.

Date

Signature, Parent or Guardian

Appendix F

Student Consent for Research Participation

I, the undersigned, hereby give my consent to participate in a research project which is looking at possible relationships between different kinds of emotions and health.

I understand such consent means that I will take part by completing four questionnaires that will take approximately 10 minutes each, that these questionnaires will be administered in a group, at school and during regular school hours, and that a short debriefing session will follow the completion of the questionnaires.

I also understand that such consent means that my attendance records will be examined for the purpose of documenting absences due to illness.

I understand that participation in this study may be terminated at any time by my request or at the request of the investigator. Participation in this project and/or withdrawal from this project will not adversely affect me in any way.

I understand that this study will not involve any greater risks than those ordinarily occurring in daily life.

I understand that the responses will be obtained anonymously and kept in strictest confidence.

I understand that only group data will be reported in any published reports.

I understand that if I have any questions I can contact the researcher at 220-3675, the researcher's supervisor at 220-6277, the Office of the Chair, Faculty of Education Joint Ethics Committee at 220-5626, or the Office of the Vice-President (Research) at 220-3381.

Date

(Signature)

Participant's Printed Name

Appendix G

Explanatory Letter to Parents Consent for Research Participation

Dear Parent/Guardian:

My name is April Nottell. I am a graduate student in the Department of Educational Psychology at the University of Calgary. As part of the requirements for a Masters of Science degree, I will be conducting a research project, under the supervision of Dr. Sal Mendaglio. I am writing to provide information regarding my research so that you can make an informed decision regarding your child's participation.

The purpose of the study is to examine the relationship between emotional style and health. As part of the study, your child will be asked to complete four questionnaires that will take approximately 10 minutes each. These questionnaires will be administered in a group, at school and during regular school hours. In addition, your child's attendance records will be examined for the purpose of documenting absences due to illness. Data from the questionnaires and attendance records will be analysed by the researcher and group findings may be presented to participating classes. You should be aware that even if you give your permission, your child is free to withdraw at any time for any reason without penalty.

Participation in this study will involve no greater risks than ordinarily experienced in daily life.

Each participant will be given an identity number to ensure anonymity, and all data gathering instruments will be numbered accordingly. Once collected, individual responses will be kept in strictest confidence. Following analysis of the data, group findings may be reported to participating classes, and a copy of the group results and/or your child's individual results will be made available to you on request. Only group results will be reported in any published studies. The raw data will be kept at the University of Calgary in a locked filing cabinet only accessible to the researcher. All files will be destroyed two

years after publication of study results (completion of the study).

If you have any questions, please feel free to contact me at 220-3675, my supervisor at 220-6277, the Office of the Chair, Faculty of Joint Education Ethics Committee at 220-5626, or the Office of the Vice-President (Research) at 220-3381. Two copies of the consent form are provided. Please return one signed copy to your child's school by Month ____, 1996, and retain the other copy for your records.

Thank you for your cooperation.

Sincerely

Appendix H

Permission to Conduct Research

I, the undersigned, hereby give my consent for April Nottell to conduct a research project which is looking at possible relationships between different kinds of emotions and health.

I understand that such consent means that four questionnaires will be administered to a group of consenting students and that these questionnaires will take approximately 10 minutes each.

I understand that these questionnaires will be administered at school and during regular school hours, and that a short debriefing session will follow the completion of the questionnaires.

I understand that such consent means that the records of attendance for participating students will be examined for the purpose of documenting absences due to illness.

I understand that participation in this study may be terminated at any time by the request of a student, parent, or by the investigators and that participation in this project and/or withdrawal from this project will not affect any student's or parent's request or receipt of other services from the school board or the university.

I understand that this study will not involve any greater risks than those ordinarily occurring in daily life.

I understand that the responses will be obtained anonymously and kept in strictest confidence with access being provided only to the investigators.

I understand that only group data will be reported in any published reports, that group findings may be reported to participating classes, and that parents will be provided with a copy of group results and/or a copy of their child's individual results upon request.

I understand that all raw data will be kept in a locked file cabinets and destroyed two years after publication of study results (completion of the study).

I have been given a copy of this consent form for my records. I understand that if at

any time I have questions, I can contact the researcher at 220-3675, their supervisor at 220-6277, the Office of the Chair, Faculty of Education Joint Ethics Committee, at 220-5626, or the Office of the Vice-President at 220-3381.

Signature, Teacher or Administrator

Date

Appendix I

AIM Problem Responses

Question 1

If you had a problem understanding any part of this questionnaire, please describe.

Grade 7.

Subject 7: There were a few words that confused mild in (intensity).

Subject 10: I had problems understanding the vocabulary.

Grade 8.

Subject 17: On some questions I feel both of something, like inner calm one second and excitement another, so I usually go with what I feel first as an instinct reaction, instead of an afterthought.

Grade 9.

Subject 27: Some of the questions may have completely different answers depending on the circumstances. For example, #9, it could be a project I'm doing for fun, or for school.

Question 2

Did you have any other problems regarding this questionnaire?

Grade 8.

Subject 12: I find there are too many questions about when your happy how do you feel because it gets a little confusing after a while.

Subject 17: Yes, on question 11, I usually don't watch movies, so it's like asking me a question I don't know how to answer. Also, on 14, I don't know how I compare to other people, cause my 'standards' are usually higher than other peoples.

Grade 9.

Subject 23: Some of the description words were close to being the same and it was hard to decide how I felt about them.

Appendix J

Percentage Agreement Among Independent Raters

DAS Question	Percent Agreement		
	Overall	Females	Males
1	93.33	93.33	93.33
2	100.00	100.00	93.33
3	100.00	100.00	93.33
4	83.33	80.00	86.67
5	93.33	86.67	100.00
6	86.67	86.67	86.67
7	90.00	86.67	93.00
8	93.33	86.67	100.00
9	93.33	86.67	100.00
10	96.67	100.00	100.00
11	96.67	93.33	100.00
12	90.00	86.67	93.33
13	93.33	100.00	86.67
14	100.00	100.00	100.00
15	83.33	80.00	93.33
16	83.33	93.33	73.33
17	83.33	80.00	86.67
18	79.31	78.57	80.00
19	89.66	92.86	86.67

(continues)

Percentage Agreement Among Independent Raters (continued)

DAS Question	Percent Agreement		
	Grade 7	Grade 8	Grade 9
1	100.00	80.00	100.00
2	90.00	100.00	100.00
3	100.00	100.00	90.00
4	100.00	70.00	80.00
5	100.00	90.00	90.00
6	90.00	90.00	80.00
7	80.00	90.00	100.00
8	90.00	100.00	90.00
9	90.00	90.00	100.00
10	100.00	100.00	100.00
11	100.00	90.00	100.00
12	80.00	90.00	100.00
13	100.00	80.00	100.00
14	100.00	100.00	100.00
15	90.00	60.00	100.00
16	100.00	60.00	90.00
17	90.00	70.00	90.00
18	66.67	70.00	100.00
19	100.00	80.00	90.00

Appendix K

Concordance Among Independent Raters

DAS Question	Concordance		
	Overall	Females	Males
1	.7155	.8105	0 variance
2	0 variance	0 variance	0 variance
3	0 variance	0 variance	0 variance
4	.9160	.8937	.9408
5	0 variance	0 variance	0 variance
6	-.1320	-.1538	0 variance
7	.8072	-.1538	.9699
8	.5880	.3570	1.0000
9	.7155	.6967	0 variance
10	0 variance	0 variance	0 variance
11	.9188	.8105	1.0000
12	.6237	.7368	.5661
13	.8105	1.0000	0 variance
14	1.0000	0 variance	1.0000
15	.6588	0 variance	.8105
16	.8909	.8105	.9105
17	.8196	.8937	.7882
18	.7825	0 variance	.8684
19	.8798	.8091	.9408

(continues)

Concordance Among Independent Raters (continues)

DAS Question	Concordance		
	Grade 7	Grade 8	Grade 9
1	1.0000	0 variance	0 variance
2	0 variance	0 variance	0 variance
3	0 variance	0 variance	0 variance
4	0 variance	.9639	0 variance
5	0 variance	0 variance	0 variance
6	0 variance	0 variance	-.2500
7	.9390	.8000	0 variance
8	0 variance	1.0000	0 variance
9	0 variance	.8000	0 variance
10	0 variance	0 variance	0 variance
11	1.0000	.8000	1.0000
12	.4167	0 variance	1.0000
13	0 variance	.7596	0 variance
14	0 variance	1.0000	0 variance
15	0 variance	.6228	0 variance
16	0 variance	.8952	.8000
17	.8000	.8914	.8000
18	.5666	.8914	0 variance
19	0 variance	.9066	0 variance

Appendix L

Participant Interview

- Researcher: You said that when you feel delighted, the feeling lasts a few minutes. Can you give me an example?
- Participant: When I get tests back and do really well, I'll feel delighted but it only lasts a few minutes until I get to the next class.
- Researcher: You said that when you feel discouraged, the feeling lasts an hour or two. Can you give me an example?
- Participant: If I get a bad test back I'll feel discouraged for an hour or two because I'm used to doing well but I'll probably get over it at lunch time or after school.
- Researcher: You said that when you feel contented, the feeling lasts a few minutes. Can you give me an example?
- Participant: If I find something I have lost, I'll feel contented but only for a few minutes because I'll start to think about something else.
- Researcher: You said that when you feel sad, the feeling lasts several days. Can you give me an example?
- Participant: Like when someone dies. Sad is just one of those things you don't get over that fast.
- Researcher: You said that when you feel annoyed, the feeling lasts a few minutes. Can you give me an example?
- Participant: Like if someone is bothering me in class, it only lasts a few minutes because before you know it, you are in another class.
- Researcher: And do you think about it in the next class?
- Participant: No, not really.
- Researcher: You said that when you feel peaceful, the feeling lasts an hour or two. Can you give me an example?
- Participant: Well, when I feel peaceful, it seems like nothing is happening. After an hour or two, I realize there are things going on and I want to get back into the action.

- Researcher:** You said that when you feel guilty, the feeling lasts several hours. Can you give me an example?
- Participant:** If I take my sister's stuff when I'm not supposed to I'll feel guilty for a few hours cause its kind of like sad but not as strong so it wouldn't last as long.
- Researcher:** You said that when you feel overjoyed, the feeling lasts a few minutes. Can you give me an example?
- Participant:** Well, its like doing well in a competition - actually it lasts longer than a few minutes because I did well in front of a lot of people.
- Researcher:** You said that when you feel angry, the feeling lasts an hour or two. Can you give me an example?
- Participant:** When someone hurts someone I know. If it happened just before class I'd probably be out mentally for the rest of that class.
- Researcher:** Would you still be thinking about it next class?
- Participant:** Maybe, depending on what happened.
- Researcher:** You said that when you feel disgusted, the feeling lasts a day or two. Can you give me an example?
- Participant:** When someone does something that repulses me it will stay with me for a while like if I saw someone killing someone it would probably take a year or two to get over that!
- Researcher:** You said that when you feel anxious, the feeling lasts a few minutes. Can you give me an example?
- Participant:** I do horseback riding and I'm usually anxious to get into the ring but that will only last a few minutes because in a few minutes I'll be in there.
- Researcher:** You said that when you feel regret, the feeling lasts several days. Can you give me an example?
- Participant:** If I get a bad test, I think back "I should have studied harder!" If it happens at the end of the day it will last a couple of hours.
- Researcher:** You said that when you feel embarrassed, the feeling lasts a few minutes.

Can you give me an example?

Participant: Being embarrassed is one of those things that doesn't last very long - people will think of other things so they forget about it and I can forget about it too.

Researcher: You said that when you feel untroubled, the feeling lasts an hour or two. Can you give me an example?

Participant: If I have no troubles, I'm bound to run into some troubles sooner or later - usually within an hour or two.

Researcher: You said that when you feel fearful, the feeling lasts a few minutes. Can you give me an example?

Participant: Something scary happens like watching a car crash then I'm scared to the bone but after a few minutes I'll realize that I'm doing other things and I get on to that.

Researcher: You said that when you feel excited, the feeling lasts an hour or two. Can you give me an example?

Participant: Like when I do really well in a sport like soccer, it will last a few hours because I am happy we won or I scored but just a couple of hours.

Researcher: You said that when you feel hurt, the feeling lasts a few minutes. Can you give me an example?

Participant: If someone puts me down I'll probably feel hurt for a couple of hours.

Researcher: You said that when you feel ashamed, the feeling lasts an hour or two. Can you give me an example?

Participant: No, not really. I guess if I did something bad or hurt someone else, it would last from several hours to a day.

Researcher: You said that when you feel happy, the feeling lasts a few minutes. Can you give me an example?

Participant: If I get happy, I'll get over it pretty soon because I'm always busy doing a lot of things so once something happens, I almost immediately have to do something else and my mind will be on that.

Appendix M

MANOVA Means and Standard Deviations for GENDER and GIFTED

Variable	Group		<i>M</i>	<i>SD</i>	<i>n</i>
<u>AIM</u>					
	GENDER	Entire Population	3.80	.46	81
		Female	3.93	.41	44
		Male	3.65	.46	37
<u>DESA</u>					
	GENDER	Entire Population	2.03	.53	81
		Female	1.96	.51	44
		Male	2.12	.54	37
<u>DAS</u>					
	GENDER	Entire Population	2.52	.54	81
		Female	2.60	.56	44
		Male	2.42	.41	37
<u>DESB</u>					
	GENDER	Entire Population	2.34	.46	81
		Female	2.41	.44	44
		Male	2.26	.48	37
<u>IFI</u>					
	GENDER	Entire Population	3.40	4.44	81
		Female	4.27	5.34	44
		Male	2.35	2.77	37

(continues)

MANOVA Means and Standard Deviations for GENDER and GIFTED (continued)

Variable	Group		<i>M</i>	<i>SD</i>	<i>n</i>
<hr/>					
<u>AIM</u>					
	GIFTED	Entire Population	3.80	.46	81
		Gifted	3.67	.42	36
		Non-Gifted	3.91	.46	45
<u>DESA</u>					
	GIFTED	Entire Population	2.03	.53	81
		Gifted	1.84	.48	36
		Non-Gifted	2.19	.52	45
<u>DAS</u>					
	GIFTED	Entire Population	2.52	.54	.81
		Gifted	2.52	.51	36
		Non-Gifted	2.52	.58	45
<u>DESB</u>					
	GIFTED	Entire Population	2.34	.46	81
		Gifted	2.25	.50	36
		Non-Gifted	2.41	.42	45
<u>IFI</u>					
	GIFTED	Entire Population	3.40	4.44	81
		Gifted	3.89	4.73	36
		Non-Gifted	3.00	4.21	45

(continues)

MANOVA Means and Standard Deviations for GENDER and GIFTED (continued)

Variable	Group	<i>M</i>	<i>SD</i>	<i>n</i>
<u>AIM</u>				
	GIFTED			
	Females	3.86	.34	19
	Males	3.46	.42	17
	NON-GIFTED			
	Females	3.99	.46	25
	Males	3.81	.45	20
<u>DESA</u>				
	GIFTED			
	Females	1.73	.40	19
	Males	1.96	.54	17
	NON-GIFTED			
	Females	2.13	.52	25
	Males	2.26	.52	20
<u>DAS</u>				
	GIFTED			
	Females	2.64	.47	19
	Males	2.38	.52	17
	NON-GIFTED			
	Females	2.57	.63	25
	Males	2.46	.52	20

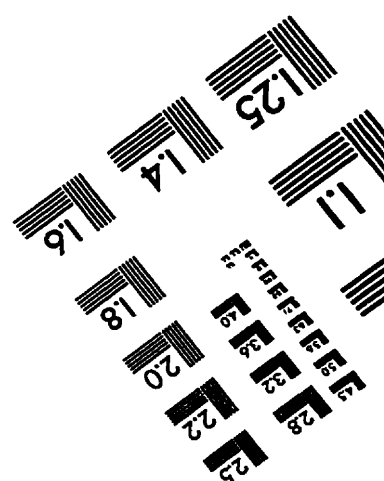
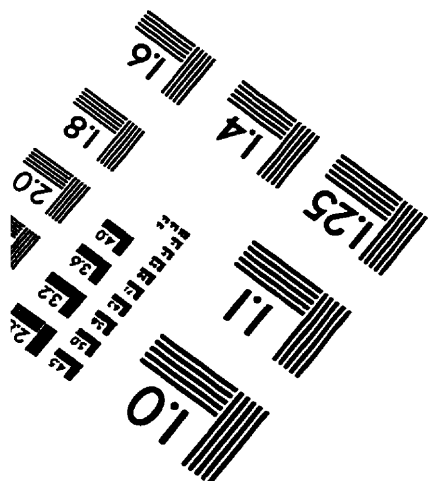
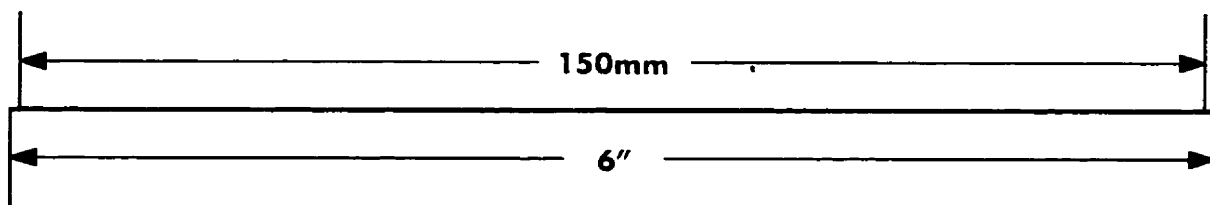
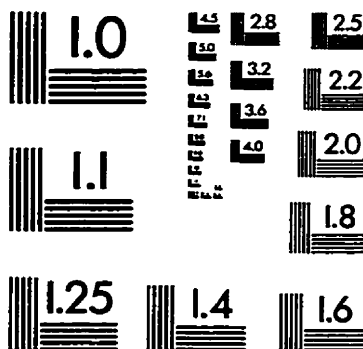
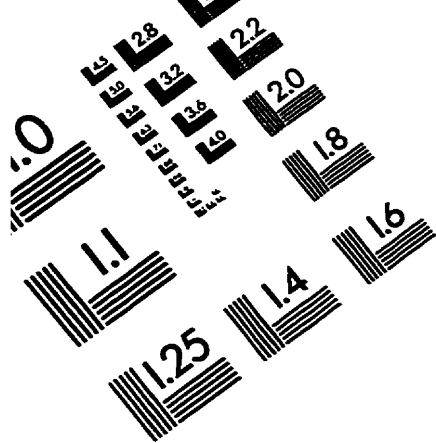
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MANOVA Means and Standard Deviations for GENDER and GIFTED (continued)

Variable	Group	<i>M</i>	<i>SD</i>	<i>n</i>
<u>DESB</u>				
	GIFTED			
	Females	2.34	.43	19
	Males	2.15	.57	17
	NON-GIFTED			
	Females	2.46	.45	25
	Males	2.35	.37	20
<u>IFI</u>				
	GIFTED			
	Females	4.18	5.70	19
	Males	3.55	3.49	17
	NON-GIFTED			
	Females	4.34	5.18	25
	Males	1.33	1.37	20

Note. Subscales are abbreviated so that AIM = Affect Intensity Measure (Intensity of Emotion), DESA = Differential Emotions Scale - Intensity (Intensity of Emotion), DAS = Duration of Affect Scale (Duration of Emotion), INTENOA = Overall Intensity (Mean of AIM + DESA), DESB = Differential Emotions Scale - Frequency (Frequency of Emotion), GENDER = Females (1) and Males (2), and GIFTED = Gifted (1) and Non-Gifted (2).

TEST TARGET (QA-5)



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