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Illness attributions, perceptions of stigma and coping strategies: Adjusting to inflammatory bowel disease

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Illness attributions, perceptions of stigma and coping strategies: Adjusting to inflammatory bowel disease

by

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ABSTRACT

The present study examined the personal and perceived illness attributions made by patients with inflammatory bowel disease (IBD) and then investigated the relationships between illness attributions, coping strategies and psychological adjustment. An archival data set of 290 IBD patients included self-reported measures of personal and perceived illness attributions, coping strategies and psychological adjustment. The results demonstrated clear differences between personal and perceived illness attributions. For example, IBD patients were more likely to indicate that other people attributed the cause of their illness to internal and controllable factors, whereas the patients themselves attributed the cause to internal and uncontrollable factors. Attributions were indirectly related to psychological adjustment when IBD patients used avoidant coping strategies. Furthermore, attributions were both directly and indirectly associated with psychological adjustment when either problem-focused or emotion-focused coping strategies were used. Additionally, trait optimism was positively related to beliefs about responsibility for one's health and negatively related to feelings of self-blame, while trait neuroticism was positively related to self-blame. Disease severity was also found to have a negative impact on psychological adjustment, independent of the coping strategy employed. Interpretations of these results suggest the need for interventions that focus on positively reframing illness attributions and symptom management.

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CHAPTER I

Introduction

Experiencing a threatening or uncertain event motivates people to search for a cause that explains their situation (Janoff-Bulman, 1979; Weiner, 1986). In fact, it has often been described as a human need to find causes for events, especially if the event is negative, unwished for and unanticipated (Faller, Schilling, & Lang, 1995). The reason that people search for causes to explain situations is because they have an inherent need to control, comprehend and predict their environments (Karanci, 1988).

Similar to trauma survivors, individuals suffering from a chronic illness continually experience an event that is negative, unwished for and unanticipated. Most chronic illnesses involve fluctuating symptoms and an uncertain outcome (Bury, 1982). Bury poignantly describes chronic illness as a "biographical disruption", in which the experiences and structures of everyday life can involve pain and suffering; two realities that are normally only a distant possibility for those who are healthy. These disruptions have been found to cause emotional distress for individuals with chronic illness (Rich, Smith, & Christensen, 1999) and therefore, chronically ill patients are motivated to find a cause to explain their negative situation (Chaney et al., 1996). These causal explanations have been found to predict emotional, cognitive and behaviour responses in many different contexts (Taggar & Neubert, 2004, Weiner, 1986).

The purpose of the proposed research is to explore 1) the causes that individuals with a chronic illness, inflammatory bowel disease (IBD), attribute to the origin of their disease and their perceptions of what other people believe to be the cause of their illness and 2) how these attributions relate to their coping strategies and adjustment.

Causal attributions

Attribution theories are based on the premise that people are motivated to explain and interpret their experiences in an effort to control and comprehend their environment (Weiner, 1986). In particular, individuals make what are known as causal attributions, which are defined as social cognitive explanations that provide a subjective framework to guide future behaviour and decisions in order to minimize the reoccurrence of negative outcomes (Roesch & Weiner, 2001). Essentially, attributions help to reinstate a person's fundamental assumptions about the world, such as that the world is good and meaningful (Roesch & Weiner).

Attributing subjective causes to a threatening and negative event has been well documented in a number of diverse populations. Janoff-Bulman (1979) reports that rape victims demonstrate a need to seek a causal explanation for their traumatic experience. Research has generally shown that rape victims blame themselves for their traumatic event (Ullman, 1997; Frazier, 1990; Janoff-Bulman, 1979). There is also evidence to suggest that illness populations will assign causes to their health conditions, or create what are termed *illness attributions* (Butler, Chalder, & Wessely, 2001); for instance, Faller, Schilling and Lang (1995) found that lung cancer patients generally attribute a cause to their illness. Taylor, Lichtman, and Wood (1984) found that out of 78 patients with breast cancer, only five percent *did not* make causal attributions concerning their illness. Similarly, rheumatoid arthritis patients attributed subjective causes to their illness when asked to reflect on their experience (Chaney et al., 1996). Causal attributions allow these patients to make sense of their circumstances, which can influence how they adjust to their illness (Roesch & Weiner, 2001).

Measuring illness attributions

For the most part, no specific framework has been consistently used to measure causal attributions. Weiner (1986) concedes that, in actuality, there are an infinite number of causal explanations that a person can choose to explain the occurrence of a specific outcome. Some investigators have used an inventory of causal attributions and asked participants to rate the likelihood of a specific causal attribution in describing their experience (Rich, Smith, & Christensen, 1999). Others have conducted semi-structured interviews and used qualitative content analysis to code for specific event-related causal attribution categories (Faller, Schilling & Lang, 1995). However, many of these causal explanations can be different across studies, which may be why it has been difficult to get an accurate interpretation of the relationship between causal attributions and psychological adjustment (Hall, French, & Marteau, 2003).

Two of the most common attribution categories found in the literature are characterological and behavioral self-blame. These attributions are often used when examining a victim's psychological adjustment following a traumatic event (Anderson et al., 1994; Frazier, 1990; Janoff-Bulman, 1979). Characterological self-blame is defined as the victim blaming his/her character or disposition for the traumatic event. This type of self-blame attribution is related to poorer adjustment outcomes, such as negative affect, lower self-esteem, feelings of depression, and helplessness (Frazier). Behavioural self-blame refers to the victim blaming his or her behaviour or actions for the occurrence of the traumatic experience. Frazier suggests that these attributions will result in better psychological adjustment because behaviours are generally under the victim's volitional control.

However, Hall, French and Marteau (2003) suggest that it is difficult to distinguish between characterological and behavioural self-blame attributions. Therefore, research attempting to relate these two types of self-blame to psychological adjustment has produced inconsistent findings. Unfortunately, Hall and her colleagues also report that inconsistent findings are pervasive in the literature on causal attributions. These inconsistencies may be partially due to the methods used to elicit causal attributions. To address this problem, recent work has focused on using a consistent framework for measuring causal attributions, such as rating causes along attribution dimensions (Anderson et al., 1994).

One of the common methods for gathering information about causal dimensions has been to ask participants to rate potential causes along key attribution dimensions, such as controllability or stability (Anderson et al., 1994). Anderson et al. suggest that examining attributions in terms of causal dimensions allows a researcher to glean information about the types of causal attributions that a participant will consistently make. These dimensions will then characterize a person's *attributional style*. There is evidence to suggest that attributional style is an important determinant of psychological adjustment for individuals with chronic medical illnesses (Chaney et al., 1996).

The most widely used dimensional approach to causal attributions is based on the cognitive components of Weiner's *attributional theory of motivation* (1986). Because the choice of causal attributions is infinite, Weiner and colleagues narrowed these attributions down to common themes. These common themes or dimensions were then used to predict affect and behaviour. Weiner used factor analysis to study the underlying dimensions of perceived causal attributions and three distinct factors emerged. The first

dimension '*locus of causality*' was interpreted as pertaining to the location of the cause as either internal or external. The second dimension that emerged was *stability* and refers to the temporal duration of the chosen cause. The third dimension is *controllability* and refers to the ease or difficulty associated with changing the cause of the event.

Weiner suggests that each causal attribution is uniquely related to an individual's affective reaction. The emotional reaction will then be the direct motivator of the individual's behaviour. Weiner concludes that affect mediates the relationship between cognition and action. That is, thoughts give rise to feelings, which in turn guide our behaviour. Consistent with this theory, research has shown that attributing the cause of an event to internal factors is associated with feelings of self-blame, depression and low self-esteem (Glinder & Compas, 1999; Stoltz & Galassi, 1989). Similarly, Taylor, Lichtman and Wood (1984) investigated the illness attributions in a sample of patients with breast cancer and found that believing that they had some control of the cancer was associated with better adjustment.

Nevertheless, the dimensional method of rating causal attributions has received criticism for being overly reductionist. Specifically, it is thought that when investigators prefer to reduce causal explanations to dimensions, the causal explanations tend to lose their context or meaning (French, Maissi, & Marteau, 2005). That said, Russell, McAuley and Tarico (1993) have found that when testing predictions with attribution theories it is best to go beyond specific causal attribution categories and assess the underlying causal dimensions or attributional style. Similarly, Roesch and Weiner (2001) suggest that assessing an individual's attributional style may allow for a more accurate

prediction of the consequences of these attributions and the individual's psychological adjustment.

Causal attributions and psychological adjustment

Considerable research has been devoted to the study of causal attributions as important determinants of psychological adjustment. For example, Faller, Schilling and Lang (1995) found that whether or not the attribution is realistic does not seem to matter because even illusions can influence psychological adjustment. In particular, these investigators found that a sample of lung cancer patients tended to overestimate their personal contribution to the origin of their disease (self-blame), which resulted in depression, feeling helpless and greater emotional distress.

In another study, Chaney et al. (1996) investigated the role of perceived control and illness attributions in adjusting to rheumatoid arthritis (RA). These investigators found that RA patients will attribute personal responsibility for their illness and symptoms when they perceive that they have little control over their circumstances. In this case, having little control and attributing personal responsibility for RA was associated with poorer adjustment. Furthermore, the results of this study support using a patient's attributional style rather than specific attribution categories. Chaney et al. demonstrated that attributional style was a better predictor of adjustment following negative events that are both related and unrelated to one's illness. Specifically, it was found that when a RA patient attributed the cause of negative events to internal, stable and global (vs. specific) factors, he or she demonstrated poorer psychological adjustment following that event.

Recently, Roesch and Weiner (2001) conducted an extensive meta-analysis that investigated the role of illness attributions and coping strategies in adjusting to a serious illness. The investigators hypothesized that illness attributions influenced adjustment through two different mechanisms. The first mechanism hypothesized was that illness attributions have a direct effect on psychological adjustment. The second mechanism hypothesized was that illness attributions have an indirect effect on adjustment that is mediated through the use of different coping strategies.

Twenty-seven studies were included in this meta-analysis and most of these studies described causal attributions in terms of specific categories rather than causal dimensions. Roesch and Weiner (2001) found that the combined number of categories for this review was so large that no meaningful effect sizes could be ascertained. To address this problem, they coded each of the 27 studies' attribution categories along Weiner's three dimensions. The results revealed that individuals who attributed the cause of their illness as internal, unstable and controllable reported using more adaptive forms of coping and had better psychological adjustment than individuals who attributed the cause as external, stable and uncontrollable. In addition, it was found that the dimension of controllability was directly related to psychological adjustment. That is, the participants who attributed a greater amount of control over their illness were better adjusted. Although the stability dimension was unrelated to indices of adjustment, the locus of causality dimension was found to be associated with poorer psychological adjustment. Overall, however, Roesch and Weiner conclude that attributions accounted for only a small, but significant, amount of variance in both coping and psychological adjustment variables.

Similarly, Sainsbury and Heatley (2005) conducted a review and also found associations between causal attributions, coping and psychological adjustment. These investigators report that blaming oneself for the cause of an illness led to using avoidant coping methods, which was related to poorer adjustment. Interestingly, there is also evidence that this relationship expands to other contexts unrelated to one's health. For instance, Roesch and Ano (2003) investigated the effects of religious attributions and coping strategies on depression and spiritual growth after stressful life events. These researchers found that coping mediated the relationship between attributions and adjustment.

Most research has demonstrated only weak to moderate relations between causal attributions and indices of psychological adjustment (Anderson et al., 1994; Taylor, Lichtman, & Wood, 1984). This suggests that there are other important factors that need to be identified in order to understand adjusting to a chronic illness.

Perceptions of stigma

An important factor that may affect causal attributions and psychological adjustment is the perception of stigma. That is, the causes that other people in society attribute to a patient's illness may affect the causal explanation generated by the patient and his or her adjustment to the illness.

From the perspective of the stigmatized individual, stigma is described as both real and perceived fear of negative responses from others (Abel, Rew, Gortner, & Delville, 2004). Joachim and Acorn (2000) describe stigmatization as a process by which social meaning is attached to individuals and behaviour. Stigmatization has been reported to occur with respect to a variety of populations including the mentally ill

(Corrigan, Markowitz, Watson, Rowan, & Kubiak, 2003), trauma victims (Muller, Caldwell, & Hunter, 1994) and those suffering from a physical illness, such as HIV/AIDS (Visser, Makin, & Lehobye, 2006). Perceiving that one is the target of stigma has been shown to directly affect psychological adjustment (Looper & Kirmayer, 2004). In particular, perceiving stigma has resulted in feelings of isolation (Fernandez & Arcia, 2004), helplessness and depression (van der Zaag-Loonen, et al., 2004).

Having a strong belief in a just world may be one reason why stigmatization occurs (Murray, Spadafore & McIntosh, 2001). The belief in the just world hypothesis (Lerner & Simmons, 1966) states that people believe that individuals have direct control over their destiny and essentially get what they deserve in life. Research suggests that people who hold strong beliefs in a just world often display little sympathy towards rape victims because they believe that the victim was ultimately responsible for eliciting the rape (Murray, Spadafore & McIntosh). Recently, an experiment performed by Murray, Spadafore and McIntosh found intriguing evidence that beliefs in a just world are activated automatically and used by people without conscious awareness. Furthermore, just world beliefs are thought to be applicable to a tremendous range of settings and targets (i.e., a chronic illness population).

Once just world beliefs are triggered, people who observe individuals with medical illnesses will also search for causal explanations and judgements of personal responsibility (Weiner, 1993). Weiner suggests that even stigma itself can imply a particular cause. For example, being obese is automatically associated with overeating unhealthy foods. According to Weiner's theory of perceived responsibility and social motivation (1993), people will perceive that an individual is personally responsibility for

his or her situation if they believe the cause of that situation is controllable. Perceiving the situation as controllable or uncontrollable will predict an observer's affective and behavioural reactions. In testing this theory, Weiner, Perry and Magnussen (1988) examined student ratings of personal responsibility to ten different stigmatized conditions, including HIV/AIDS, drug addiction, cancer, and obesity. Overall, the findings suggest that individuals were more likely to be found responsible for conditions that were psychological or behavioural in nature. Specifically, these researchers found that four of the ten stigmatized conditions (drug addiction, child abuse, HIV/AIDS and obesity) were attributed as controllable and therefore were rated high on personal responsibility. Reactions to the individuals who were held responsible for their stigmatized condition included anger, little pity and unwillingness to engage in helping behaviours. This finding implies that patients with stigmatizing conditions may suffer without much support from other individuals in society.

To date, little research has examined the attributions of cause made by both the victim of a negative event and other people in society. To this end, Williams and Healy (2001) conducted an exploratory qualitative study in sample of patients with depression. The findings from this study suggest that there are differences between other people's causal attributions for depression and the patient's own causal attributions. Moreover, Meiser, Mitchell, McGirr, Van Herten, and Schofield (2005) found that some individuals with bipolar disorder perceived that others attributed the cause of their disorder to social or personality factors and believed that they were responsible for their illness. These patients themselves did not believe that they were responsible but that their illness was due to genetic factors. However, Meiser et al. found that these bipolar patients were

more likely to experience feelings of self-blame and guilt. This finding illustrates that the perceptions of stigma (perceived attributions) are important factors to take into account when predicting psychological adjustment.

Inflammatory Bowel Disease

Inflammatory bowel disease (IBD) patients have been a highly under researched population, with most of its scientific interest centered around the pathology and treatment of IBD. Thus far, this chronic disease has been characterized as incurable, partly due to the disease's unknown aetiology (Casati, Toner, De rooy, Drossman, & Maunder, 2000). Because there is no known cause for IBD, IBD patients are in a position where they have to generate their own subjective interpretations of the causes of the illness in order to cope with their disease. To date, the illness attributions of an IBD population have not been studied.

In general, IBD refers to two related diseases: Crohn's disease (CD) and ulcerative colitis (UC). These diseases are usually considered together as IBD because both share similar clinical courses and symptoms (Searle & Bennett, 2000). However, these diseases differ primarily in the anatomical location and nature of the inflammation (Mackner, Sisson & Crandall, 2004). CD usually occurs anywhere in the intestinal tract, whereas UC is found only in the large intestine (Mackner, Sisson & Crandall). Symptoms of the disease include pain in the stomach, diarrohoea, weight loss and fatigue (Searle & Bennett, 2000). Additionally, all symptoms of IBD can vary in severity and the disease is associated with stages of remission and relapse (Hall, Ruben, Dougall, Hungin & Neely, 2005).

Because there is no cure for IBD, treatment has generally focused on controlling the inflammation (Mackner, Sisson & Crandall, 2004). IBD patients may take several medications daily, most of which have moderate to severe side effects. Surgery is an option, albeit a last resort, for IBD patients; however, this is usually performed to abate symptoms for a period of time, as symptoms often recur sometime after surgery.

Similar to other stigmatized chronic illnesses, some patients with IBD experience depression and feelings of helplessness, which can leave an IBD patient suffering in silence rather than seeking the social support they need (Casati, Toner, De rooy, Drossman, & Maunder, 2000). Recently, qualitative data gathered from IBD patients suggests that this disease is "painful and embarrassing", restricting freedom, and affecting all aspects of daily life (Hall et al., 2005). Also, Van der Zaag-Loonen, Grootenhuis, Last, and Derkx (2004) report that IBD patients can feel embarrassed by the consequences of their chronic illness because some patients suffer from frequent stools, associated smells, stomach noises and rumbling. These uncontrollable personal characteristics of IBD are associated with the use of avoidant coping strategies and poorer health related quality of life (Van der Zaag-Loonen, Grootenhuis, Last & Derkx).

Taylor (2001) indicates that diseases that attract stigma are those that tend to be associated with uncertain causes, limited treatment options and strong emotional responses on the part of the general public, such as fear or revulsion. Because the causes of this disease are not well understood, IBD is a stigmatized chronic illness that can provide a useful context with which to investigate the associations among a patient's own causal attributions and perceptions of stigma on adjustment.

Causal attributions and coping

Lazarus and Folkman (1985) describe coping as a cognitive process that is meant to change the effects of stress on the person-environment relationship. More specifically, coping is defined as cognitive and behavioural efforts to manage a disrupted relationship between the person and his or her environment (Lazarus & Folkman, 1980). These authors suggest that unless there is a focus on change, one can never comprehend how individuals manage stressful situations. Therefore, coping should be viewed as a process that is constantly changing in order to meet the demands of a stressful situation.

Coping strategies are used in response to an appraisal of a stressful situation. In particular, cognitive appraisals are described as an initial evaluation of a stressful event (Roesch, Weiner & Vaughn, 2002). Then, cognitive appraisals of an illness or any other stressful occurrences influence the initiation of coping strategies (Lazarus & Folkman, 1985). Coping strategies have been found to mediate the relationship between cognitive appraisals and stress (Lazarus & Folkman, 1980).

Similar to appraisals, causal attributions are an evaluation of a life event. Although, rather than an initial assessment, causal attributions are an ad-hoc, retrospective interpretation of why the stressful situation has occurred (Roesch, Weiner & Vaughn, 2002). Roesch and Weiner (2001) investigated the direct relationship between coping and causal attributions in their comprehensive meta-analysis. The locus of causality and controllability dimensions were found to be positively related to both problem-focused and emotion-focused coping strategies. That is, individuals who reported making internal and controllable attributions to their illness were more likely to report seeking social support, dealing directly with the situation, using positive reframing

strategies and venting about their emotions. However, the stability dimension was negatively related to the use of these coping strategies. Specifically, individuals who made stable attributions reported using avoidant coping strategies, such as denial, seeking alternative rewards and resigned acceptance of their current situation.

Indeed, much of the coping literature has focused on specific coping styles. Generally, the two most commonly referred to are: emotion-focused coping and problem-focused coping (Lazarus & Folkman, 1980). Emotion-focused coping is characterized as a function of distressing emotions and is activated when the stressful event is seen as something that needs to be endured. Conversely, problem-focused coping refers to taking action to change for the better and is activated when the individual believes that something constructive can be done (Lazarus & Folkman). Examples of problem-focused coping include taking action, planning and seeking social support for instrumental reasons (Penley, Tomaka, & Wiebe, 2002). Examples of emotion-focused coping include positive reframing, seeking emotional support, denial and mental disengagement (Penley, Tomaka, & Wiebe, 2002). Lazarus and Folkman (1980) suggest that both forms of coping are adaptive and associated with positive adjustment.

However, Carver, Scheier and Weintraub (1989) suggest that there is some debate about the types of coping responses subsumed under the terms emotion-focused and problem-focused coping strategies. For example, both denial and positive reframing are forms of emotion-focused coping. Yet, these coping responses are distinct and may be part of two different coping strategies. As well, problem-focused coping can involve unrelated responses. For instance, taking direct action and seeking assistance are both

part of problem-focused coping. Carver, Scheier and Wientraub suggest that outcomes associated with these two coping strategies seem to depend on how they are defined.

For example, Ben Zur (2005) examined emotion-focused and problem-focused coping strategies in a community sample of Israeli adults and found that emotion-focused coping was a maladaptive coping strategy. Conducting a factor analysis of the COPE scale (Carver, Scheier & Weintraub, 1989), Ben Zur found that acceptance, mental and behavioural disengagement, denial, venting, religion, humor and restraint coping responses loaded high on the emotion-focused coping factor. Conversely, active coping, planning, seeking instrumental and emotional support, positive reframing and suppression of competing activities loaded high on the problem-focused coping factor. Using these two coping strategies, Ben Zur found that using emotion-focused coping in response to a negative life event was positively related to distress. Alternatively, problem-focused coping was negatively associated with feelings of distress (Ben Zur).

Conversely, Roesch and Weiner (2001) found that emotion-focused coping was an adaptive coping strategy. In their meta-analysis, Roesch and Weiner assessed the indirect relationship between attributions and adjustment through the use of coping strategies. However, they defined emotion-focused and problem-focused coping differently than Ben Zur (2005). Three major coping taxonomies were coded according to different coping inventories, including the COPE scale (Carver, Scheier & Wientraub, 1989), and other meta-analyses. Inter-rater reliabilities for this classification method ranged from .61 to .81 (Roesch & Weiner, 2001). The first taxonomy was the approach-avoidant coping strategies, which refers to either attempting to actively eliminate the stressor or avoid it all together. Approach strategies included coping responses such as

efforts to be in control of the stressor, planning, acceptance, problem solving and optimistic comparisons. Avoidant strategies included denial, mental and behavioural disengagement and withdrawal (Roesch & Weiner). The second taxonomy was developed by Holohan and Moss (1987) and involved crossing cognitive-behavioural methods with approach-avoidant methods (as cited by Roesch & Weiner). Cognitive approach coping involved paying attention to one particular aspect of the stressful situation at a time, drawing on past experiences, and positively restructuring the situation (Roesch & Weiner). Behavioural approach coping included seeking guidance, taking action and dealing directly with the situation. The cognitive avoidance strategy included denial and minimization of the stressful event, whereas behavioural avoidance strategies involved venting, acceptance and seeking alternative rewards. The third coping taxonomy was emotion-focused and problem-focused coping strategies. Emotion-focused coping included positive reframing, acceptance, seeking emotional support. Problem-focused coping involved seeking instrumental support, planning and problem solving. Thus, both emotion-focused and problem-focused coping strategies were defined in terms of adaptive coping responses (Roesch & Weiner).

The results of this study demonstrated that participants who attributed the cause of their illness to internal, unstable and controllable causes also reported using cognitive approach and emotion-focused coping (Roesch & Weiner, 2001). In general, it was found that using these coping strategies ultimately lead to better adjustment. However, individuals who attributed the cause of their illness to stable and uncontrollable factors were more likely to use avoidant coping and this lead to poor psychological adjustment. Behaviour coping strategies (problem-focused, behavioural approach and avoidance)

were not found to mediate the relationship between attributions and adjustment. Therefore, Roesch and Weiner suggested that perhaps illness attributions affect emotional coping rather than behavioural coping.

Other factors associated with adjustment

Psychological adjustment can also be influenced by factors other than causal attributions and coping. For example, Sainsbury and Heatley (2005) suggest that an important factor involved in adjusting to IBD is disease severity. In particular, it has been found that poorer adjustment is related to greater disease severity. Additionally, Sainsbury and Heatley report that individual difference variables are related to psychological adjustment. Specifically, it has been suggested that individual difference characteristics such as optimism and neuroticism may play an important role in an IBD patient's psychological adjustment. In general, neuroticism was linked to poorer adjustment, whereas optimism has been related to better adjustment outcomes.

Purpose

The purpose of this study was two-fold. The primary aim was to examine the attributional style of patients with IBD (personal attributional style) and their perceptions of what other people in society believe is the cause of their illness (perceived attributional style). In order to explore the patient's attributional style, open-ended questions regarding the causes of IBD and perceptions of what other people believe are the causes of IBD were analyzed using the content analysis of verbatim explanations (CAVE) technique.

The CAVE technique was developed by Peterson, Luborsky and Seligman (1983) and allows a researcher to assess an individual's attributional style from written or verbal

accounts of causal attributions. The CAVE procedure first involves extracting causal attributions from written or verbal materials and then rating these attributions along specified causal dimensions (Lee & Peterson, 1997). One of the main advantages to using this technique is that it allows the researcher to understand the context of the participant's response (Lee & Peterson, 1997). Furthermore, investigations into the reliability and validity of the CAVE method were conducted and compared to a well-known quantitative measure of causal dimensions, the *Attributional Style Questionnaire* (ASQ; Seligman, Abramson, Semmel, & von Baeyer, 1979). Schulman, Castellon and Seligman (1989) demonstrated that the CAVE technique was comparable in its reliability to that of the ASQ ($\alpha = 0.8$) and was deemed as valid as the ASQ for assessing attributional style (Schulman, Castellon & Seligman, 1989).

Using the CAVE method, both personal and perceived attributional style were rated along the locus of causality, stability and controllability attribution dimensions (Table 1). The rationale for using these particular dimensions is that they had been examined before in chronic illness populations and therefore may be more representative of the attributions made by an IBD illness group.

Consistent with previous attribution research, the second aim of this study was to investigate the potential mediational role of coping strategy in the relationship between attributions and psychological adjustment. Three models were created to examine the associations among illness attributions, three specific coping strategies (problem-focused, emotion-focused and avoidant coping) and indices of psychological adjustment (Figure 1). These models were tested using a structural equation modeling (SEM) technique. This statistical technique was most appropriate for the current study because it can be

used to test causal models or theories with non-experimental data (Reisenzein, 1986). In particular, SEM is a statistical technique where the causal processes are represented by a number of regression equations (structural relations) and then presented in a model to clearly conceptualize the theory under evaluation (Bryne, 2001). Similar to factor analysis, the SEM technique enables a researcher to test concepts that cannot be directly observed, such as psychological adjustment. These abstract concepts are factors that cannot be directly measured and are called latent variables, which are defined in terms of observed variables that represent this underlying construct (Bryne, 2001); that is, using multiple indicators that can be observed represent a latent variable. The operational definitions of each of the proposed latent variables will be presented in the analysis section.

Table 1.

Dimension taxonomy for the attribution categories

Attribution categories	Locus of Causality		Stability		Controllability	
	Internal	External	Stable	Unstable	Controllable	Uncontrollable
Self blame	X					
Self	X					
Effort	X			X	X	
Heredity	X		X			X
Congenital problem	X		X			X
Personality	X		X			X
Stress, distress	X			X	X	
Physiology	X					
Characterological self-blame	X		X			X
Behavioural self-blame	X			X	X	
Others		X				X
Environment		X				X
Chance, luck, fate		X		X		X

Research questions

The current study explored the following research questions:

1) Do attributions about the cause of one's illness affect psychological adjustment in individuals with IBD?

2) Does coping mediate the relationship between illness attributions and psychological adjustment in individuals with IBD?

3) Does trait optimism and trait neuroticism relate to the illness attributions made by an IBD patient?

4) How does disease severity affect an IBD patient's psychological adjustment?

Figure 1.

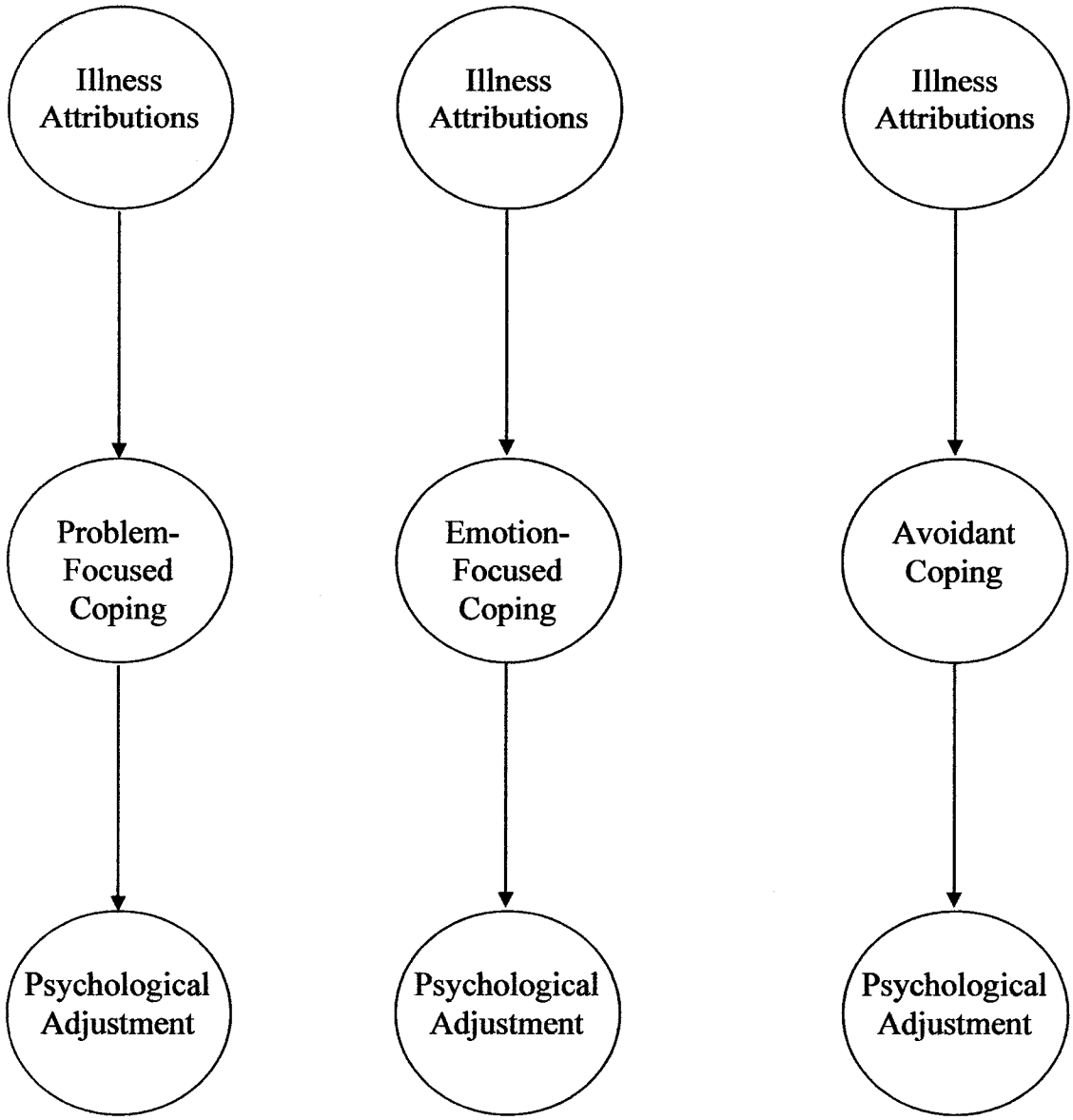


Figure 1. The three hypothesized structural models representing the relationships among illness attributions, coping strategies and psychological adjustment.

CHAPTER II

Method

Participants

An archival data set comprised of 290 adults with inflammatory bowel disease was used. Participants were recruited in offices of several gastroenterologists in the Ottawa, Ontario area, through notices placed in the Ottawa community and through online postings to support groups and message boards specifically for Crohn's disease, Colitis, or IBD in general.

Procedure and measures

The purpose of the original study was to statistically validate a new measure, the Control Beliefs Inventory (Sirois, 2003). This study received initial approval from the Carleton University's Research Ethics Board and all participants gave their consent to use their data in future research. This secondary analysis was approved by the University of Windsor's Research Ethics Board. For online communities, the moderator of the notice board was contacted and permission was given prior to posting the study notice. All but 36 participants completed the survey package on line. Those who were recruited through the community were mailed the survey package. Participants who learned about the study from the online notices could complete the survey online or have the survey mailed to them if they lived in Canada or the United States. Participants completed a survey that included questions about illness attributions, perceptions of stigma, coping and psychological adjustment.

Illness attributions. All illness attributions for IBD were extracted from the responses to two open-ended questions that were: "what do you think initially caused

your IBD?" and "in your opinion, what do other people (friends, family, society) think causes IBD?" Responses were imported into Nvivo, a qualitative data software program designed to aid in coding non-numerical, unstructured data. Two independent raters were used to code the open-ended responses along the three attribution dimensions: locus of causality, stability and controllability. Composite scores for both personal attributional style and perceived attributional style were calculated by aggregating each of the three causal dimensions. This method has demonstrated good interrater reliability, alpha = .80 (Schulman, Catellon & Seligman, 1989).

Self blame. Self-blame and beliefs about responsibility and blame for one's state of health were assessed using the eight-item Health Attribution Scale (HAS; Sirois & Gick, 2002). Sample items are "it's up to me to avoid unhealthy behaviors" and "if I don't take care of myself then I deserve to get sick". Each statement was rated on a six-point Likert scale ranging from one (strongly disagree) to six (strongly agree). An exploratory factor analysis was conducted in order to assess the underlying factor structure of this measure and its psychometric properties. Two distinct factors that characterized self-blame and beliefs about responsibility emerged from this analysis. The self-blame subscale consisted of six items and demonstrated an alpha coefficient of .78. The belief about responsibility subscale was comprised of two items with an alpha coefficient of .78.

Coping strategy. Coping strategy was assessed using the Brief COPE (Carver, 1997). This scale measured responses to items that tested both effective and ineffective coping. Fourteen different coping styles were measured by 28 items that were rated on a four-point Likert scale ranging from one (I usually don't do this at all) to four (I usually

do this a lot). The 14 different coping styles measured were the following: self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioural disengagement, venting, positive reframing, planning, humor, acceptance, religion and self-blame.

Participants were asked to generate a list of the most stressful aspects of their illness at the top of the measure and then think about the type of coping they would perform to deal with this stressor. Scores for each coping style were calculated by taking a mean of the two items in this subscale. A measure of problem-focused coping was calculated by aggregating the scores for the planning, active coping and use of instrumental support. A measure of emotion-focused coping was calculated by aggregating the scores for venting, positive reframing and use of emotional support. A measure of avoidant coping was calculated by aggregating the scores for denial, behavioural disengagement and substance abuse. An investigation of the psychometric properties of the brief COPE with a sample of breast cancer patients (n = 132) reported that six of the 14 coping subscales had alpha coefficients of .70 or greater, which meets the criterion recommended by Nunnally and Bernstein (1994). Five of the 14 subscales had alpha coefficients of .60 or greater, with the other subscales reaching the minimally acceptable value of .50 suggested by Nunnally (Fillion, Kovacs, Gagnon, & Endler, 2002).

Psychological adjustment outcomes. The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) is a well-known measure of global feelings of self-esteem. This scale consisted of 10 items used to assess a participant's sense of self worth. Sample items include "I take a positive view of myself." and "I feel that I have a number of good

qualities". Each item was rated on a four-point Likert scale ranging from zero (strongly disagree) to three (strongly agree). A total self-esteem score was calculated by reverse scoring half of the items and then summing the total across all 10 items. Research has demonstrated that the RSES has good internal consistency (alpha = .88; Rosenberg, 1965).

The Illness Cognition Questionnaire (ICQ; Evers et al., 2001) is an 18 item measure used to assess three distinct illness cognitions (Helplessness, Perceived Benefits and Acceptance). These cognitions have been associated with adjustment to a chronic illness. Each of the subscales is composed of six items. Participants were asked to rate the extent to which they agree with each statement on a 4-point response format ranging from one (not at all) to four (completely). For the purpose of the current study, only the Helplessness subscale will be assessed. Psychometric properties of this measure were investigated and found that the Helplessness subscale had an alpha coefficient of .88, Perceived Benefits had an alpha of .87 and the Acceptance subscale had an alpha coefficient of .90.

The Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) assessed the participant's positive and negative emotions. The PANAS is composed of 20 words describing emotions: 10 positive emotions and 10 negative emotions. Participants rated each word to answer 'to what extent you feel this way in general'. This statement was measured on a five-point rating scale ranging from 'very slightly' or 'not at all' to 'extremely'. Crawford and Henry (2004) report that this scale demonstrated good internal consistency with an alpha coefficient of .89.

Coping efficacy. Coping efficacy was assessed using three response items that measure the participant's confidence in managing or coping with their chronic illness (Gignac, Cott & Badley, 2000). Participants were asked to what extent they are effectively "coping with the emotional aspects of your condition", "coping with the day to day problems that living with your condition creates" and "coping with the symptoms of my condition". Each item was rated on a five-point Likert scale with responses ranging from one (strongly disagree) to five (strongly agree). These items were combined into a measure of coping efficacy, which has demonstrated good internal consistency (alpha = .79, n = 286).

Disease severity. IBD severity was measured using the 10-item bowel symptoms subscale of the Inflammatory Bowel Disease Questionnaire (IBDQ; Guyatt et al., 1989). The IBDQ is a well-validated and widely used measure of disease related dysfunction in IBD populations (McColl, Han, Barton, & Welfare, 2004). Participants are asked to rate the severity and frequency of their bowel symptoms within the past two weeks on a seven-point Likert scale ranging from one (more frequent than before) to seven (no increase or normal). Scores for each item are reversed and then summed, with higher values indicating greater symptom severity. This subscale has demonstrated good internal consistency in a sample of IBD patients (alpha = .81; McColl, Han, Barton, & Welfare, 2004).

Individual difference variables. Optimism and pessimism were assessed using the Life Orientation Test - Revised (LOT-R; Scheier et al., 1994). This scale is a 10-item measure of dispositional optimism and pessimism that has demonstrated good construct validity in several health-relevant studies (Scheier & Carver, 1992). Participants rated

each of the items on a five-point Likert scale ranging from one (I agree a lot) to five (I disagree a lot). Of the ten items, four items were fillers and were not included in the score. Three of the items assessed optimism and three assessed pessimism. The ratings on the six scored items were calculated and higher values are associated with optimism. The LOT-R has demonstrated adequate internal consistency (alpha = .78; Carver, 1997).

The Big Five Factor Inventory (BFFI; John & Srivastava, 1999) is a 44-item inventory that assessed the Big Five personality factors: openness, agreeableness, neuroticism, extroversion, and conscientiousness. A list of 44 characteristics was presented after the statement "I see myself as someone who ..." and participants rated to how much they agree with each of the characteristics on a five point Likert scale, ranging from one (Disagree strongly) to five (Agree strongly). Higher scores were related to greater identification with that particular personality factor. The BFFI has demonstrated good internal consistency for both the total scale (alpha = .83, n = 462) and subscales, with alpha coefficients ranging from .81 for Conscientiousness to .88 for Extraversion, and has shown good construct validity when compared with other Big Five measures (John & Srivastava, 1999).

Demographics. Demographic questions regarding age, gender, ethnicity, presence of psychiatric conditions, and relationship status were also included.

Research design

The current study used mixed methodological approach, which incorporated the collection and interpretation of qualitative and quantitative data. Creswell (1994) suggests that mixed methodology approaches are sometimes referred to as "two-phased" designs, incorporating methods from both positivist and constructivist epistemologies (as

cited by Johnstone, 2004). The initial phase of the research included qualitative data collection and analysis from open-ended response items that asked patients to identify their own causal attributions and their perceptions of other's attributions. This phase was followed by quantitative data analysis using well-established questionnaires. Structural equation models were used to determine the relationships between causal attributions, coping strategies and psychological adjustment.

Statistical analysis

Guided by the meta-analysis conducted by Roesch and Weiner (2001), personal and perceived illness attributions were coded into categories. Using the CAVE technique, these categories were then rated along the seven-point continuum developed by Schulman, Catellon and Seligman (1989) for each dimension of locus of causality, stability and controllability. Attributing the cause of one's illness to someone or something external to oneself was given a rating of one for locus of causality. A rating of seven was assigned to attributing the cause of IBD to one's personality or physiology, effort or heredity. Ratings in the two to six range applied to attributions sharing both internal and external elements, implying an interaction between the self and the environment or the self and another individual. Higher scores denoted internal locus of causality whereas lower scores reflect external locus of causality. Both stability and controllability dimensions were evaluated in a similar way using a seven-point Likert scale. Ratings of stability depended on the length of time the cause will be present and its duration, the degree to which the cause will influence the patient's life and the frequency with which the cause would remain in the patient's life. Ratings of controllability

depended on the extent to which the patient has the ability to change the cause of their illness and the difficulty of making such a change (Sergerstrom et al., 1996).

The primary researcher and another trained graduate student coded 290 IBD patients' personal and perceived attributional styles. Among the 290 participants, 204 participants offered at least one personal illness attribution and 194 participants offered at least one perceived illness attribution. Attribution statements were copied into a separate document and each statement was identified by a participant number. A coding instruction sheet (Appendix C) was created using Roesch and Weiner's (2001) theoretical framework. This instruction sheet was adapted from the original instructions on how to use this content analysis technique that were provided by Schulman, Castellon and Seligman (1989).

Each attribution statement was rated along the three attribution dimensions described above. However, the first dimension assessed *locus of causality*, was then further divided into five different scales (Segerstrom, Taylor, Kemeny, Reed & Visscher, 1996). The first scale was internal-physiological (e.g., the participant's physical or biochemical makeup), the second scale was internal-characterological (e.g., what the participant is or was), the third scale was internal-behavioural (what the participant did or does), the fourth scale was internal-other, which included any attribution that did not readily fit into the other three internal scales. Finally, the fifth scale was external (e.g., something or someone outside of the participant).

Prior to the analysis, each judge practiced using the CAVE technique with 20 cases and then discussed any inconsistencies that they found between their ratings. After

a consensus was reached on these inconsistencies, each judge then evaluated the rest of the open-ended responses independently.

Structural equation modeling (SEM) was tested using AMOS 7.0. The current study was testing the mediational effect of coping on the relationship between attributions and adjustment using on a statistical technique recommended by Holmbeck (1997), which follows similar procedures as the mediation analysis described by Baron and Kenny (1986). All of the variables under study are tested simultaneously, rather than a step-wise process, to determine the extent to which the models were representative of the data (Bryne, 2001).

A latent variable representing psychological adjustment was first created using measures of self-esteem, positive and negative affect and feelings of helplessness. These measures have been used to characterize psychological adjustment in previous literature (Roesch & Weiner, 2001). Each of the three models were created using a different latent variable for coping strategy. The first model used a latent variable for problem-focused coping, which was defined by using active, planning and seeking support for instrumental reasons as indicator variables. The second model included an emotion-focused latent variable, which was measured by the coping responses of venting emotions, positive reframing and seeking emotional support. The final model involved a latent variable for avoidant coping, which was measured by behavioural disengagement, denial and substance use. Lastly, a latent variable for illness attributions was measured by the composite scores for personal and perceived attributional styles and scores for self-blame and beliefs about personal responsibility for one's state of health.

Visually, SEM models are portrayed using four geometric symbols (Byrne, 2001). Ellipses represent latent variables, rectangles represent observed variables and single-headed arrows are used to represent the influence of one variable on another. Associated with each observed variable is an error term, which represents the measurement error of the observed variable and is enclosed in a circle (Byrne).

The distinct advantage of using this technique is that SEM is able to estimate the amount of error variance, thus providing a more accurate interpretation of the true relationships among illness attributions for IBD, coping strategies and psychological adjustment and these models may be have the ability to generalize to other stigmatized populations.

An additional analysis was conducted to elucidate the associations between trait optimism, trait neuroticism and illness attributions. This analysis was performed separately from the SEM analysis because both trait optimism and trait neuroticism are considered exogenous variables (Byrne, 2001), which means that these variables would likely cause fluctuations in the values of the latent variables which would be unexplained by the model because they are considered to be influenced by external factors.

CHAPTER III

Results

Demographics

An archival data set comprised of 218 females (72.8%) and 72 males (24.8%) diagnosed with IBD was used for the current study. The mean age of the participants was 36.2 years (*SD* = 11.93; range = 13 - 77). The vast majority of participants were Caucasian (96%), eight participants were Asian (2.9%), two participants were Hispanic (0.7%) and one participant was Aboriginal (0.4%). The educational level of the participants varied: 5.9% had some high school education, 11.5% were high school graduates, 24.1% had some university credits, 33.6% were university graduates, 9.4% had some graduate school training and 15.4% had graduate degrees. The majority of participants reported being married or living with a partner (58.6%), and the remaining participants reported being either separated or divorced (10.9%), never married (29.8%), or widowed (0.7%). Regarding employment status, 51.1% of the participants were employed full time, 18.3% of participants had part-time jobs, 18.0% were unemployed and 9.5% were on disability, and 3.2% of participants were retired.

Health status

The majority of the participants reported having Crohn's Disease (65.2%), followed by Ulcerative Colitis (27.9%) and "other" (7%). On average, participants reported that they had IBD for 9.58 years (*SD* = 8.76). Participants reported the extent to which IBD affected their daily activities. The results showed that 23.5% of participants reported that their IBD did not affect their daily activities, 16.6% indicated that their IBD had a little effect on daily activities, 32.5% perceived that their IBD had somewhat of an

effect on daily activities and 43.9% of the participants reported that IBD had a large effect on their daily activities.

Illness attributions

Reliability. Crano and Brewer (2002) suggest that the simplest way of evaluating reliability is to assess stability or internal consistency. Specifically, internal consistency refers to the extent to which different judges are able to reach the same conclusions when examining responses to open-ended questions and thus assigning more or less identical scores to their observations (Crano & Brewer, 2002). Measures of internal consistency are most commonly assessed using a Cronbach's alpha coefficients. Despite some differences in the theoretical framework employed, the alpha coefficients found for the present study are generally consistent with those found in previous literature (e.g., Peterson, Luborsky & Seligman, 1983; Peterson, Bettes & Seligman, 1985). The resulting Cronbach's alpha coefficients for the current study are summarized in Table 2. Specifically, for the patient's own attributions, alpha coefficients were .92 for locus of causality, .95 for the stability dimension and .90 for controllability. For perceived illness attribution dimensions, the alpha coefficients were .97 for locus of causality, .98 for stability and .95 for controllability.

However, Crano and Brewer (2002) suggest that a more rigorous approach to assessing reliability should also be used when conducting content analysis. That is, the assessment of "reproducibility" or the extent to which coding can be recreated under different circumstances, locations and judges. Otherwise known as "inter-rater reliability", these authors recommend evaluating reproducibility using a Cohen's Kappa statistic, which is a chance-corrected measure of proportion of agreement among judges.

These values can range from zero (no agreement) to one (perfect agreement). Crano and Brewer suggest that kappa values of 0.75 or greater are acceptable, while values below 0.60 are considered to have high levels of disagreement among coders. Thus far, kappa statistics have not be reported in previous literature using the CAVE technique, however, based on the above ranges, only the kappa values for the perceived controllability and perceived locus of causality ratings fall marginally below 0.75 (Table 2).

Table 2.

Reliability coefficients for personal and perceived illness attribution dimensions

Illness attributions	Cronbach's alpha coefficient	Cohen's Kappa
Personal attributions		
Locus of causality	.92	.82
Stability	.95	.85
Controllability	.90	.81
Perceived attributions		
Locus of causality	.97	.72
Stability	.98	.78
Controllability	.95	.74

Ratings for both the personal attributions and the perceived attributions were averaged separately so that each participant had a score for each of the three dimensions. If more than one illness attribution was generated, the scores for each attribution were averaged. Table 3 presents the correlations between the judges' scores for each dimension. Correlations for the averaged ratings for each of the three attribution dimensions are presented in Table 4. Because the correlations among the ratings for each dimension were quite high, a composite score for each participant's personal attributional style and perceived attributional style was computed using the sum of the three attribution dimensions, locus of causality, stability and controllability (Peterson,

Luborsky & Seligman, 1983). Means and standard deviations for these composite scores and the individual illness attribution dimensions are presented in Table 5.

The average number of personal attributions generated was 1.31 ($SD = 0.64$) and the mean number of perceived attributions was 1.56 ($SD = 0.76$). The specific personal and perceived attributions are presented in Table 6. The most common personal attribution that participants endorsed as the cause of their disease was stress (33.3%), followed by genetics/heredity (32.4%) and diet/eating habits(11.1%). For perceived attributions, the most common cause attributed to the IBD was stress (43.3%) followed by genetics/heredity (17.1%) and mental problems/ "it's all in my head" (10.0%).

Table 3.

Bivarate correlations between the two judges scores for each of the personal and perceived illness attribution dimensions

	1	2	3	4	5	6	7	8	9	10	11	12
1.Personal locus rater 1												
2.Personal locus rater 2	**.97****											
3. Personal stability rater1	.53**	.52**										
4. Personal stability rater2	.52**	.52**	**.97****									
5. Personal control rater 1	-.02	.01	.60**	.60**								
6. Personal control rater 2	-.03	.02	.56**	.59**	**.96****							
7. Perceived locus rater 1	.22*	.22*	.18*	.16	.03	.05						
8. Perceived locus rater 2	.22*	.22*	.22*	.20*	.10	.11	**.95****					
9. Perceived stability rater 1	.18	.13	.26**	.22*	.02	-.03	.44**	.45**				
10. Perceived stability rater 2	.13	.08	.22*	.19*	.03	-.00	.44**	.45**	**.93****			
11.Perceived control rater 1	-.10	-.11	.02	.03	.08	.03	.31**	.29**	.14	.19*		
12.Perceived control rater 2	-.07	-.08	.03	.06	.06	.02	.29**	.28**	.20*	.22*	**.97****	

Note. *p<.05; **p<.01

Table 4.

Bivariate correlations among the averaged ratings for each of the three attribution dimensions

Illness Attribution Dimension	1	2	3	4	5	6
1. Personal Locus of causality	1					
2. Personal Stability	.51**	1				
3. Personal Controllability	-.12	.46**	1			
4. Perceived Locus of Causality	.21*	.17*	.07	1		
5. Perceived Stability	.13	.21*	.00	.45**	1	
6. Perceived Controllability	-.09	.03	.02	-.20**	.28**	1

Note. *$p<.05$; **$p<.01$

Table 5.

Means and standard deviations for personal and perceived attribution dimensions and attributional styles

Illness Attributions	N	*M*	*SD*
Personal Locus of causality	188	5.45	2.12
Personal Stability	188	4.03	2.18
Personal Controllability	188	4.73	2.24
Perceived Locus of Causality	178	6.30	1.26
Perceived Stability	178	4.14	1.95
Perceived Controllability	178	2.87	2.13
Personal Attributional Style	188	14.22	4.74
Perceived Attributional Style	178	13.31	3.66

Table 6.

Summary of specific personal and perceived illness attributions

Attribution Category	Personal %(N)	Perceived %(N)
Internal - Physiological	40.7%(88)	21.9%(46)
Genes/Heredity	79.6% (70)	78.3% (36)
Hyperactive immune system	14.8%(13)	10.9%(5)
Hormones	3.4%(3)	4.3%(2)
Thyroid problems	1.1%(1)	
Inability to digest fat	1.1%(1)	
Nerves		6.5%(3)
Internal Characterological	6.0%(13)	19.0%(40)
Inbred	7.7%(1)	
Inherent	7.7%(1)	
Anxiety/Depression	15.4%(2)	5.0%(2)
Age	15.4%(2)	
Food Allergies	23.1%(3)	2.5%(1)
Being nervous/bad in social situations	15.4%(2)	
Low self-esteem	7.7%(1)	
Personality traits	15.4%(2)	12.5%(5)
Mental/"all in my head		52.5%(21)
Not being strong enough to deal with stress		10.0%(4)
Being a "Drama queen"		2.5%(1)
Irish decent	7.7%(1)	
Being a vegetarian	7.7%(1)	
Internal - Behavioural	24.5%(53)	36.2%(76)
Going off birthcontrol	3.8%(2)	
Diet/eating habits	45.3%(24)	67.1(51)
Quitting smoking	9.4%(5)	1.3%(1)
Not taking care of self	1.9%(1)	13.2%(10)
Unhealthy Lifestyle	5.7%(3)	9.2%(7)
Drug dependency	3.8%(2)	
Medicine taken	13.2%(7)	
Drinking too much	1.9%(1)	2.6%(2)
Working too hard	1.9%(1)	
Getting rundown/lack of sleep	3.8%(2)	
Internal - Other	36.6%(79)	43.3%(91)
Stress	91.1(72)	100%(91)
Pregnancy	8.9%(7)	
External	22.2%(48)	16.2%(34)

Attribution Category	Personal %(N)	Perceived %(N)
Antibiotics/Immunizations	14.6%(7)	
Bacteria/Mold/Toxin Exposure	14.6%(7)	
Flu	6.3%(3)	
Virus	12.5%(6)	11.8%(4)
Environment	4.2%(2)	
Food/Contaminated Food	20.8%(10)	44.1%(15)
Chance/Fate	14.6%(7)	20.6%(7)
Mother's smoking while pregnant	2.1%(1)	
Ancestory/Family history	4.2%(2)	2.9%(1)
Sexual Assault	2.1%(1)	
Surgery	2.1%(1)	
Sensitive child care taker	2.1%(1)	
Medicine/Excess of medicine		5.9%(21)
Interaction	6.5%(14)	
Genes/environmental trigger	100%(14)	
Total N	216	210

Differences among personal and perceived attributions. In order to investigate differences between personal and perceived attributional styles, as well as differences between specific illness attribution dimensions, several t-tests were conducted. The results indicated that there was a significant difference between the patient's own attributional style and their perceptions of what other people thought was their attributional style, t (147) = 3.00, $p < .05$, indicating that the patient themselves were more likely to attribute the cause of their IBD to internal, stable and uncontrollable factors. The illness attribution dimensions yielded significant differences between personal and perceived locus of causality ratings, t (146) = -3.09, $p < .05$), such that patients felt that other people were more likely than the patient themselves to attribute the cause of their IBD to internal factors. Results also indicated that the IBD patients were more likely to perceive that other people attribute the cause of their illness to factors that were under their control, t (146) = 7.51, $p < .001$. There were no significant differences between personal and perceived ratings of stability.

Research Question 1

Do attributions about the cause of one's illness affect psychological adjustment in individuals with IBD?

Correlates among all measured variables. Table 7 presents the bivariate correlations among the personal and perceived illness attribution variables. Bivariate correlations among all the measured variables were assessed to determine if personal and perceived attributional style, coping strategies and the psychological adjustment outcome measures were significantly related (Table 8 & Table 9). Means and standard deviations for all measured variables are displayed in Table 10. Personal attributional style and

perceived attributional style scores were not significantly correlated with any of the other measured variables. However, individual attribution dimensions demonstrated some interesting associations. For example, patients' own ratings of controllability were negatively correlated with disease severity ($r = -.18, p < .05$), suggesting that greater disease severity was related to the patient perceiving that he or she had less control over the initial cause of their disease. Furthermore, personal ratings of controllability were negatively correlated with helplessness ($r = .15, p < .05$), suggesting that IBD patients felt more helpless when they perceived that they had little control over their illness. Additionally, consistent with previous research, self-blame was positively associated with avoidant coping and negative affect and negatively related to self-esteem. Furthermore, beliefs about responsibility for one's state of health was negatively associated with avoidant coping and negative affect and positively associated with problem-focused and emotion-focused coping, positive affect, self-esteem and coping efficacy.

Table 7.

Bivariate correlations among personal and perceived illness attributions

Variable	1	2	3	4	5	6	7	8
1.Personal Locus of causality								
2.Personal Stability	.51**							
3.Personal Controllability	-.12	.46**						
4.Perceived Locus of Causality	.21*	.17*	.07					
5.Perceived Stability	.13	.21*	.00	.45**				
6.Perceived Controllability	-.09	.03	.02	-.20**	.28**			
7.Personal attributional style	.63**	.91**	.63**	.12	.09	.02		
8.Perceived attributional style	.08	.17*	.01	.48**	.85**	.66**	.11	

Table 8.

Bivariate correlations among personal illness attributions, coping strategies and psychological adjustment variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1.Personal Locus of causality																				
2.Personal Stability	.51**																			
3.Personal Controllability	-.12	.46**																		
4. Personal attributional style	.63**	.91**	.63**																	
5. Self-blame	-.05	-.02	-.09	-.07																
6.Responsibility	.02	-.01	.04	.02	.21**															
7.Denial	.06	.03	-.10	-.01	.25**	-.17**														
8.Substance Use	.04	.04	.02	.04	.14*	-.01	.13*													
9.Behavioural Disengagement	-.01	.06	-.05	.00	.12*	-.24**	.44**	.08												
10.Use of emotional support	-.01	-.04	.01	-.02	-.14*	.05	-.01	-.21**	-.03											
11.Venting	.16*	.05	-.04	.08	.08	-.00	.20**	.21**	.16**	.27**										
12.Positive Reframing	-.05	.01	.05	.01	-.03	.21**	-.05	-.01	.15**	26**	.07									
13.Active	-.02	-.07	.07	-.01	-.05	.31**	-.17**	-.05	-.34**	.23**	.02	.25**								
14.Planning	.07	.03	.02	.06	-.07	.18**	-.06	.03	-.18**	.19**	.17**	.26**	.64**							
15.Use of instrumental support	.08	.03	-.00	.05	-14**	.01	.01	-.10	-.01	.67**	.28**	.23**	.25**	.30**						
16.Self-esteem	.01	-.02	.09	.04	-.25**	.16**	-.22**	-.19**	-.45**	.26**	-.11	.20**	.21**	.09	.10					
17.Positive affect	-.04	-.06	-.01	-.05	-.03	.27**	-.10	-.07	-.42**	.22**	.04	.44**	.34**	.39**	.13*	.35**				
18.Negative affect	-.01	-.04	-.11	-.08	.21**	-.17**	.34**	.14**	.44**	-00	.25**	-.12	-.12	.02	.10	-.50**	-.30**			
19.Helplessness	.05	-.07	-.14*	-.08	.09	-.10	.27**	.18*	.43**	-.06	.20**	-.14**	-.12*	-.05	.05	-.56**	-.34**	.57**		
20.Coping Efficacy	-.06	.07	.16*	.08	-.08	.16**	-.21**	-.09	-.33**	.09	.17**	.19**	.17**	.09	-.01	.33**	.27**	-.40**	-.40**	

Note. *$p<.05$; **$p<.01$

Table 9.

Bivariate correlations among perceived illness attributions, coping strategies and psychological adjustment variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1.Perceived Locus of causality																			
2.Perceived Stability	.45**																		
3.Perceived Controllability	-.20**	.28**																	
4. Perceived attributional style	.48**	.85**	.66**																
5. Self-blame	.04	.07	-.04	.03															
6.Responsibility	-.08	-.01	.10	.03	.21**														
7.Denial	.04	.12	.10	.14	.25**	-.17**													
8.Substance Use	.03	.03	.07	.07	.14*	-.01	.13*												
9.Behavioural Disengagement	.13	.09	-.02	.08	.12*	-.24**	.44**	.08											
10.Use of emotional support	-.01	-.12	.06	-.03	-.14*	.05	-.01	-.21**	-.03										
11.Venting	.05	-.04	-.02	-.02	.08	-.00	.20**	.21**	.16**	.27**									
12.Positive Reframing	-.16*	-.06	.22**	.04	-.03	.21**	-.05	-.01	.15**	26**	.07								
13.Active	.06	.06	.11	.11	-.05	.31**	-.17**	-.05	-.34**	.23**	.02	.25**							
14.Planning	.10	.10	.04	.11	-.07	.18**	-.06	.03	-.18**	.19**	.17**	.26**	.64**						
15.Use of instrumental support	-.09	-.03	.02	.03	-14**	.01	.01	-.10	-.01	.67**	.28**	.23**	.25**	.30**					
16.Self-esteem	.00	.04	.01	.03	-.25**	.16**	-.22**	-.19**	-.45**	.26**	-.11	.20**	.21**	.09	.10				
17.Positive affect	-.03	.06	.12	.09	-.03	.27**	-.10	-.07	-.42**	.22**	.04	.44**	.34**	.39**	.13*	.35**			
18.Negative affect	.11	.01	-.03	.02	.21**	-.17**	.34**	.14**	.44**	-00	.25**	-.12	-.12	.02	.10	-.50**	-.30**		
19.Helplessness	.01	-.03	.03	.00	.09	-.10	.27**	.18*	.43**	-.06	.20**	-.14**	-.12*	-.05	.05	-.56**	-.34**	.57**	
20.Coping Efficacy	-.04	.08	.10	.08	-.08	.16**	-.21**	-.09	-.33**	.09	.17**	.19**	.17**	.09	-.01	.33**	.27**	-.40**	-.40**

Note. *$p<.05$; **$p<.01$

Table 10.

Means and standard deviations for all self-reported measured variables

Variable	N	*M*	*SD*
Self-blame	264	3.11	.95
Responsibility	264	5.02	.79
Use of emotional support	264	2.58	.967
Venting	264	2.23	.84
Positive Reframing	264	2.33	.95
Active Coping	264	2.88	.85
Use of instrumental support	264	2.49	.88
Planning	264	2.80	.84
Denial	264	1.36	.68
Substance Use	264	1.33	.67
Behavioural Disengagement	264	1.58	.75
Helplessness	264	12.90	4.60
Self-esteem	264	3.05	.60
Coping Efficacy	264	3.30	1.06
Positive Affect	264	26.94	8.75
Negative Affect	264	19.41	8.37
Disease Severity	247	30.91	13.26
Neuroticism	264	3.27	.85
Optimism	264	3.21	.90

Research Question 2

Does coping mediate the relationship between illness attributions and psychological adjustment in individuals with IBD?

This research question was answered by analyzing the relationships between illness attributions, coping behaviour and psychological adjustment using structural equation modeling (SEM). Prior to conducting SEM, all variables were examined for missing data, and the assumptions of univariate and multivariate outliers, normality and linearity were assessed. Univariate outliers were assessed by generating *z*-scores for each of the variables involved in the present study. Using the recommended cut-off of three standard deviations above the mean (Kline, 2005), two univariate outliers were found on negative affect subscale and four outliers were found on avoidant coping subscale. Using AMOS 7.0, five multivariate outliers were identified using Mahalanobis distance ($p<.001$). These outliers were subsequently deleted from the analyses. Normality was assessed by visually examining histograms of all variables of interest and by examining skewness and kurtosis statistics generated from AMOS. All variables were below the critical values of skewness and kurtosis (Stevens, 2002), therefore the univariate normality assumption was met. However, the data demonstrated a moderate departure from multivariate normality, as the multivariate kurtosis value was 4.06, which exceeds its critical value of 2.13. An examination of bivariate scatterplots indicated that for most pairs of variables met the assumption of linearity. Additionally, scale reliabilities were assessed and all variables except venting ($\alpha=.62$) were found to have an alpha level of above 0.70 (range = .62-.94), ensuring that most variables were at least adequately free from random error.

There were 166 cases with missing data. For the most part, missing data was found on the personal and perceived illness attribution dimensions (N=139). Several steps were taken in order to ensure that this data was not missing systematically and thus producing systematic bias in all subsequent analyses and conclusions. First, a dummy code was created in order to group the cases that had missing data and the cases that did not have missing data. Then, a logistic regression analysis was conducted using the dummy variable as the criterion variable and the demographics variables and other variables of interest in the study as predictors. There were no significant predictors, suggesting that missing data could not be predicted by the other variables in the data set. This indicates that the data is missing at random (MAR) and thus producing less biased parameter estimates.

Furthermore, several *t*-tests were conducted to examine if those who did not respond to the variables and those who did respond significantly differed in terms of the demographic variables and the other variables of interest to the study. Significant differences were found on self-esteem, $t\ (291) = 2.30, p < .05$), suggesting that those participants with missing data were more likely to have lower self-esteem than those without missing data. This indicates that some systematic bias may be introduced into analyses using these illness attribution variables. Bias comes from the fact that the cases with missing data differ from cases without missing data for a particular reason (self-esteem) and therefore the conclusions drawn from these analyses should be interpreted with caution because they may not generalize to the whole population (Kline, 2005).

However, because 139 cases was deemed to be a significant amount of missing data, missing values on the personal and perceived attribution variables were imputed in

order to retain sufficient sample size and statistical power for further analysis. A regression-based imputation was employed. This is a strategy that uses knowledge from other variables in the dataset in order to predict the missing values on a given variable (El-Masri & Fox-Wasylyshyn, 2005). The advantage of using such a technique was that it estimates the missing data methodologically and is therefore believed to be a relatively objective technique (Tabachnick & Fidell, 2005). Although, El-Masri and Fox-Wasylyshyn contend that this imputation technique yields reasonable mean estimates, it tends to underestimate variances and covariances. However, the extent to which this underestimation occurs is much less with a regression imputation technique than merely substituting in the mean for the missing value.

In total, 27 missing values were found on the other 13 variables of interest. Because this was deemed a relatively small amount of missing data, these cases were deleted from the data set rather than imputed. The following analyses were performed using a sample size of 259.

Measurement model. In the first set of analyses, three measurement models were assessed to determine if the hypothesized latent variables of illness attributions, coping strategy and psychological adjustment fit the data (Figure 1). That is, the measurement model evaluates the indicator variables validity in measuring the construct of interest (the latent variable). Once the measurement models are deemed to be a good fit of the data, the researcher can be more confident in the findings related to the assessment of the hypothesized structural model (Byrne, 2001). A brief overview of structural equation modeling can be found in Appendix D.

The first measurement model tested included a latent variable for illness attributions, a latent variable for problem-focused coping and a latent variable for psychological adjustment. The second and third measurement models tested differed from the first only in that latent variables for avoidant coping and emotion-focused coping, respectively, were used in substitution for problem-focused coping. According to the above criteria, the measurement models including problem-focused and avoidant coping demonstrated a good fit of the data, while the measurement model involving emotion-focused coping demonstrated a poor fit of the data (Table 9). However, all three models showed that the illness attribution variables were not significant predictors of their latent variable. Thus, modification indices were examined in order to determine the particular reasons for the lack of fit.

In all three measurement models, the modification indices showed that positive and negative affect influenced scores on the coping indicator variables, such that the chi-square statistic would decrease significantly if the bi-directional relationships among these variables were taken into account. This indicates that affect is likely both a predictor of adjustment as well as being an outcome of adjustment and therefore, due to this dual role, positive and negative affect were then removed as outcome variables and replaced by coping efficacy. This finding is in accordance with Weiner's attributional theory of motivation (1986) and other empirical research based on this theory (Weiner, Perry & Magnusson, 1988; Weiner, 1985). An examination of the three items that comprise coping efficacy and the associations among coping efficacy and all of the other measured variables indicated that coping efficacy was a good outcome measure for both attributions and coping behaviour as this variable measured the participant's belief about

their success in coping with the physical and emotional aspects of their health condition. In addition to this, none of the factor loadings relating the illness attribution indicator variables were significant. However, the modification indices revealed that there were unanalyzed associations between the self-blame and responsibility attributions and the coping and adjustment variables, meaning that self-blame and responsibility may affect coping and adjustment. Therefore, self-blame and responsibility were used as endogenous variables (observed variables) in further analyses. In addition, the squared multiple correlations (R^2) for the personal and perceived attributions, that is, the proportion of variance of illness attributions that is explained by these variables was very low (-.001 and .000, respectively) suggesting that these variables should be dropped from further analyses.

Table 11.

Summary of fit indices from initially hypothesized measurement models

Model	χ^2	*df*	*p*	CFI	TLI	IFI	RMSEA (90% CI)
Measurement model 1	93.21	41	.000	.90	.87	.90	.07 (.05-.09)
Measurement model 2	90.10	41	.000	.90	.87	.91	.07 (.05-.09)
Measurement model 3	143.44	41	.000	.77	.70	.78	.10 (.08-.12)

Note. CFI = Comparative Fit index; TLI = Tucker Lewis index, IFI = Incremental Fit index; RMSEA = Root mean square error of approximation.

Taking these modifications into account, the three measurement models were assessed again, this time with only two latent variables, coping strategy and psychological adjustment. The measurement model testing problem-focused coping

demonstrated good fit, $\chi^2(8, N=259) = 17.34, p<.05$; CFI=.97, TLI=.94, IFI=.97, RMSEA=.07(90%CI:.02-.111).

The measurement model testing avoidant coping demonstrated good fit of the data, ($\chi^2(8, N=259) = 16.78, p<.05$; CFI=.97, TLI=.94, IFI=.97, RMSEA=.07(90%CI:.02-.10); however, substance abuse was not a significant predictor of avoidant coping. Further examination of the modification indices revealed that there was an unanalyzed association between behavioural disengagement and substance abuse, suggesting that these two variables covary and perhaps often occur together. Thus, the measurement model was assessed again, allowing the error terms from each of these two coping variables to correlate and this model provided even better fit of the data, $\chi^2(7, N=259) = 7.27$, *n.s.*; CFI=.99, TLI=.99, IFI=.99, RMSEA=.01(90%CI:.00-.08), along with the finding that substance abuse was a significant predictor of avoidant coping (β=.28, $p<.01$).

The third measurement model testing the significance of emotion-focused coping and psychological adjustment yielded poor fit of the data, $\chi^2(8, N=259) = 46.57, p=.000$; CFI=.84, TLI=.69, IFI=.84, RMSEA=.14(90%CI:.10-.18). The modification indices revealed there were unanalyzed association between the error terms of positive reframing and the psychological adjustment variables of self-esteem and coping efficacy. Additionally, there were unanalyzed associations between the error terms of venting and all three psychological adjustment variables. This finding is not surprising as it would make sense that in order to engage in positive reframing, one would also have to think that he or she is effectively coping, which in turn would likely maintain self-esteem. Similarly, engaging in venting one's frustrations would likely decrease one's feelings of

helpless, maintain one's self-esteem and increase one's belief that he or she is coping effectively with his or her disease. In order to ensure that the explanation for these suggested modifications was not because of the presence of measurement error for these variables, the means and standard deviations as well as reliabilities were compared to normative data found in the literature (Carver, 1997). In fact, all reliabilities, means and standard deviations were consistent with published norms. Thus, allowing the error terms of these variables to correlate improved the fit of this model, $\chi^2(3, N=259) = 14.13$, $p<.01$; CFI=.95, TLI=.76, IFI=.96, RMSEA=.12(90%CI:.06-.19).

Structural model. In the second set of analyses, maximum likelihood estimation was employed to estimate the structural models testing the mediation relationship between attributions (self-blame and responsibility), coping and adjustment was assessed using the steps recommended by Holmbeck (1997). The results of the structural models are presented below according to the three different coping strategies.

Problem-focused coping. The first step outlined by Holmbeck is to test the direct relationship between illness attributions and psychological adjustment. This model was found to be a good fit of the data, $\chi^2(4, N=259) = 15.29$, $p=.000$; CFI=.94, TLI=.86, IFI=.95, RMSEA=.11(90%CI: .05-.16). Both self-blame ($\beta=0.33$, $p=.000$) and responsibility ($\beta=0.28$, $p=.000$) were found to be significant predictors of adjustment. The second step to testing mediation using SEM is to assess the mediational model; that is the direct relationships between illness attributions and problem-focused coping and between problem-focused coping and psychological adjustment and the indirect relationship between illness attributions and psychological adjustment. This model demonstrated good model fit, $\chi^2(18, N=259) = 52.43$, $p=.000$; CFI=.91, TLI=.86, IFI=.91,

RMSEA=.09(90%CI: .06-.11) and direct paths between attributions, coping and adjustment were all significant in the predicted directions (Model 1, Figure 2). The final step to testing mediation, according to Holmbeck, is to assess the mediational effect under two conditions: 1) when the direct path between illness attributions and psychological adjustment is constrained or forced to equal 0 (Kline, 2005) and 2) when the path between these two variables is not fixed to 0 (Model 2, Figure 2). Assessing the improvement in overall fit of the data is based on the significance of the difference between these two chi-square values (Holmbeck). If there is a mediational effect, then the additional path between illness attributions and psychological adjustment should not improve the fit. In this case, however, this additional path did improve the overall the model's overall fit of the data, $\chi^2_D(2, N=259) = 19.96, p=.000$, indicating that problem-focused coping did not mediate the relationship between the illness attribution variables and psychological adjustment. Further evidence of this conclusion was demonstrated by there being little difference between the path coefficients between the illness attribution variables and psychological adjustment when problem-focused coping was added to the model (self-blame $\beta=0.30$ and responsibility $\beta=0.21$).

Avoidant coping. The above steps were repeated in testing the mediational effect of avoidant coping. Given that self-blame and responsibility were previously found to be significant predictors of psychological adjustment, this first step was skipped for this analysis and the following analysis using emotion-focused coping. The mediational model between illness attributions, avoidant coping and psychological adjustment indicated a good fit of the data, $\chi^2(17, N=259) = 37.66, p=.000$; CFI=.94, TLI=.91, IFI=.94, RMSEA=.07(90%CI: .04-.10). All path coefficients between variables were

significant in the predicted direction (Model 1, Figure 2). The final step testing the mediational effect (Model 2, Figure 2) indicated that the additional paths between self-blame and adjustment and responsibility and adjustment did not improve the fit of the model, $\chi^2_D(2, N=259) = 1.39$, *n.s.*, demonstrating that avoidant coping does in fact mediate the relationship between the illness attribution variables and psychological adjustment.

Emotion-focused coping. The mediational model between illness attributions, emotion-focused coping and psychological adjustment indicated relatively poor fit of the data, $\chi^2(13, N=259) = 48.74, p=.000$; CFI=.88, TLI=.73, IFI=.88, RMSEA=.10(90%CI: .07-.13). However, the path coefficient between emotion-focused coping and psychological adjustment ($\beta=0.71, p=.000$) was significant in the predicted direction such that using an emotion-focused coping strategy increased the participants' psychological adjustment. Additonally, self-blame ($\beta=-.29, p<.01.$), and responsibility ($\beta=.33, p=.000$) were significant predictors of emotion-focused coping. Modification indices revealed that there were unanalyzed associations between the illness attribution variables and psychological adjustment. Thus, the final step assessed the improvement of model fit for the additional paths between the illness attribution variables and psychological adjustment. It was found that the additional paths between self-blame and adjustment and responsibility and adjustment did improve the fit of the model to the data, $\chi^2_D(2, N=259) = 9.91, p<0.01$. However, it is interesting to note that adding the direct paths from the illness attribution variables to psychological adjustment resulted in the paths between responsibility and emotion-focused coping and self-blame and emotion-focused coping to become non-significant.

Research Question 3

How does trait optimism and trait neuroticism relate to illness attributions?

Bivariate correlations among all illness attribution variables, trait optimism and trait neuroticism were assessed to determine how optimism and neuroticism relate to illness attributions (Table 7). Neither personal nor perceived attributional style nor any of the individual attribution dimensions were significantly correlated with optimism or neuroticism. However, self-blame and responsibility demonstrated some interesting associations with optimism and neuroticism. For example, being more optimistic was negatively related to self-blame (r = -.15, p < .05) and positively related to believing that one is responsible for their state of health (r =.13, p < .05). Whereas higher scores on neuroticism were positively related to self-blame (r =.19, p < .05), no relationship was found between neuroticism and responsibility for one's state of health.

Research Question 4

Does disease severity affect the relationships between illness attributions, coping behaviours and psychological adjustment?

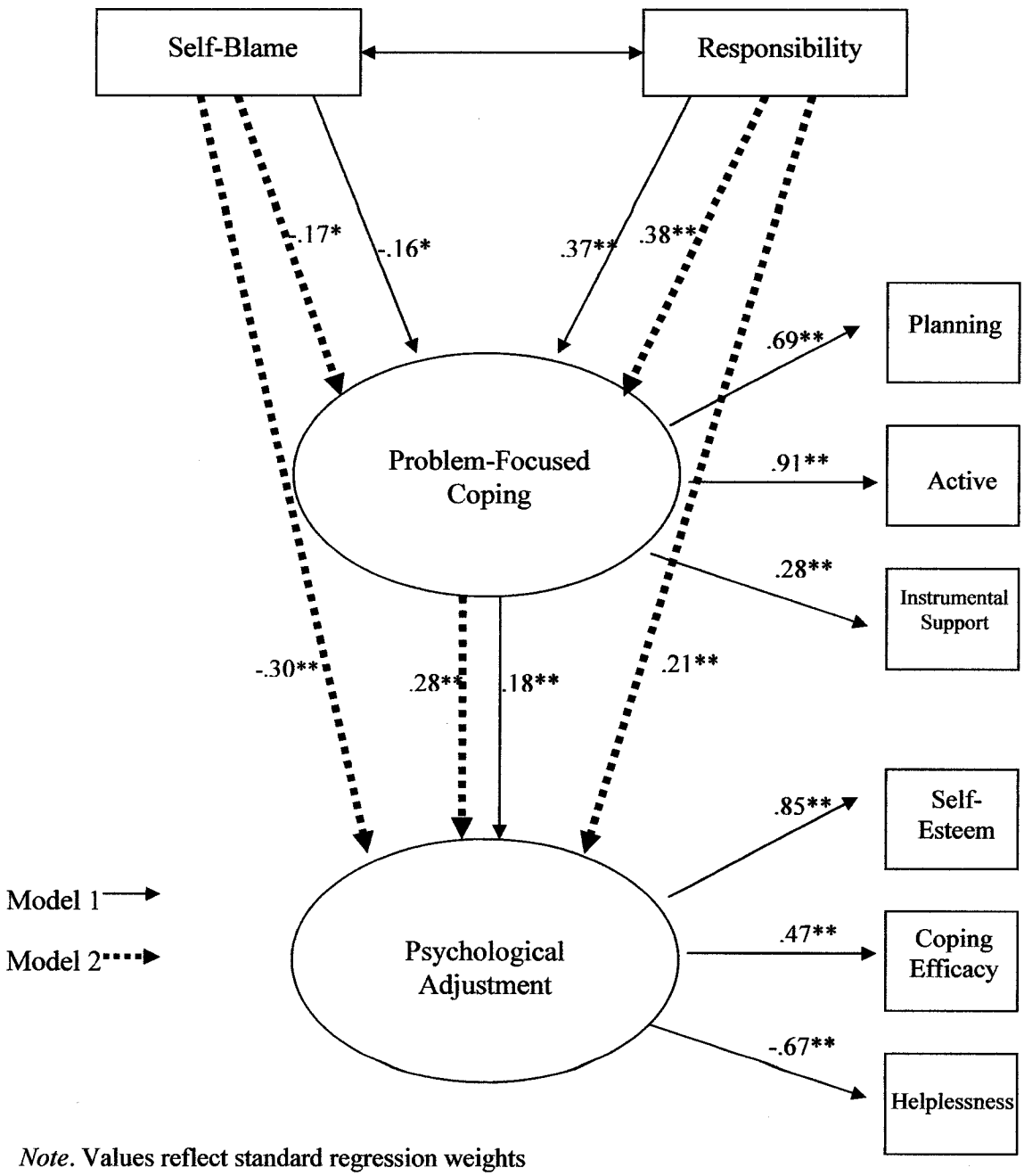
To elucidate the effect of disease severity on coping with and adjusting to IBD, a direct path between disease severity and psychological adjustment as well as correlations between disease severity and both self-blame and responsibility attributions were added to each of the three structural equation models and the overall fit of the model was assessed. Adding disease severity to the model involving problem-focused coping (Figure 4) demonstrated a good fit of the data, (χ^2(21, N=259) = 47.10, p=.000; CFI=.94, TLI=.87, IFI=.94, RMSEA=.07(90%CI: .04-.10), such that increases in disease severity resulted in significantly poorer psychological adjustment. However, with the addition of

disease severity, problem-focused coping only marginally predicted psychological adjustment (p=.052). Neither self-blame nor responsibility were significantly correlated with disease severity.

In terms of the structural model involving avoidant coping, adding disease severity to the model resulted in poor model fit, $\chi^2(22, N=259) = 71.07, p=.000$; CFI=.88, TLI=.76, IFI=.87, RMSEA=.09(90%CI: .07-.12). Further examination of the model's modification indices revealed that fit would significantly increase if the unanalyzed association between disease severity and avoidant coping was taken into account. Thus, an additional path from disease severity to avoidant coping was added and this model improved the model's overall fit, $\chi^2_D(2, N=259) = 19.96, p=.000$, suggesting that increases in disease severity influenced more avoidant coping strategies and poorer psychological adjustment (Figure 5).

With regard to the model involving emotion-focused coping, adding a direct path between disease severity and psychological adjustment revealed a poor fit to the data, $\chi^2(16, N=259) = 64.76, p=.000$; CFI=.86, TLI=.70, IFI=.87, RMSEA=.11(90%CI: .08-.14). Interestingly, this model's modification indices indicated that adding a correlation between responsibility and positive reframing (and indicator of emotion-focused coping) would provide a better overall model fit. This in fact was the case, $\chi^2(16, N=259) = 50.61, p=.000$; CFI=.90, TLI=.78, IFI=.90, RMSEA=.10(90%CI: .07-.13), with self-blame, responsibility and disease severity significantly predicting psychological adjustment (Figure 6).

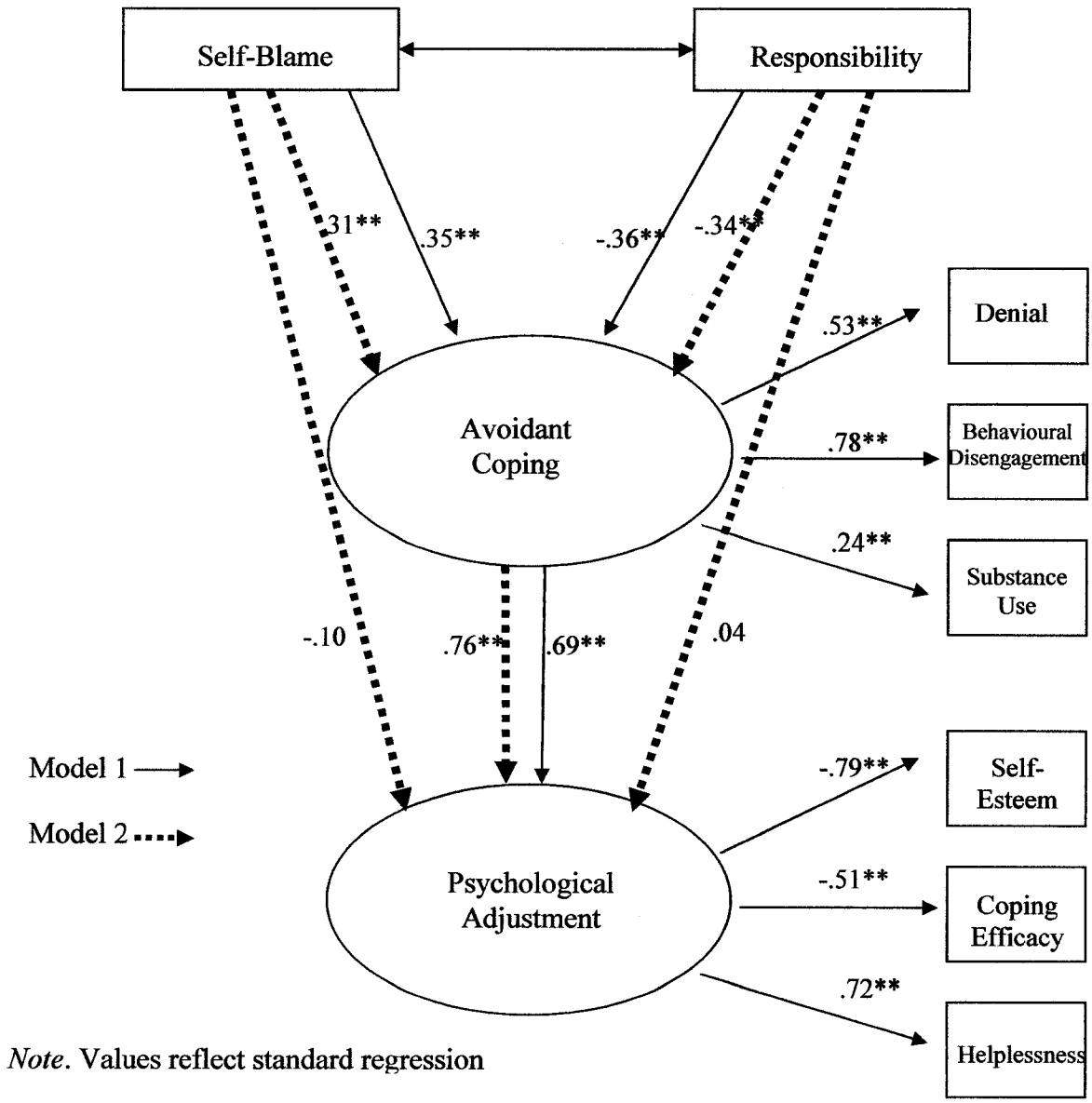
Figure 2.



Note. Values reflect standard regression weights

Figure 2. *Testing for direct and indirect effects between attributions and psychological adjustment when IBD patients use a problem-focused coping strategy.*

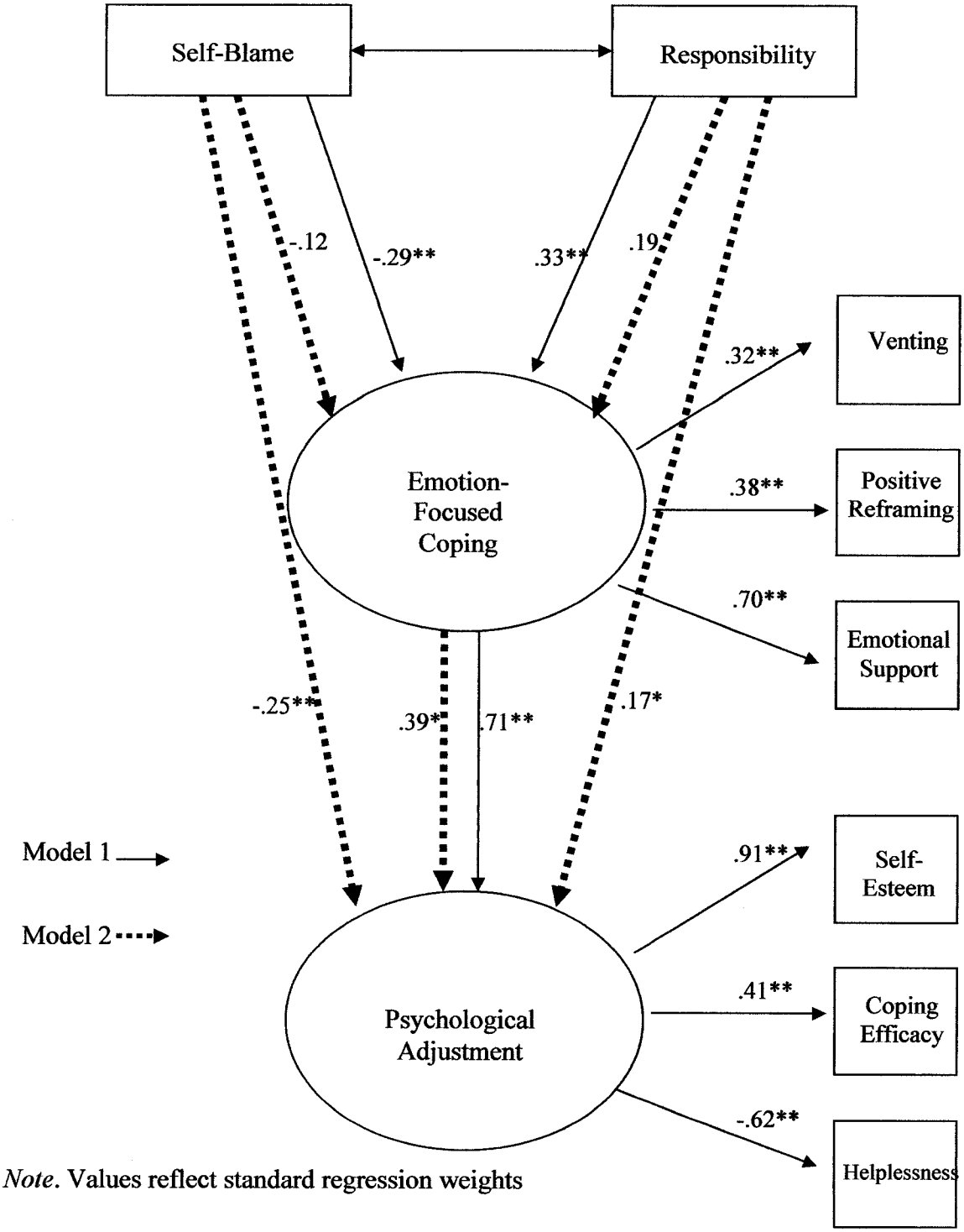
Figure 3.



Note. Values reflect standard regression

Figure 3. *Testing for direct and indirect effects between attributions and psychological adjustment when IBD patients use an avoidant coping strategy.*

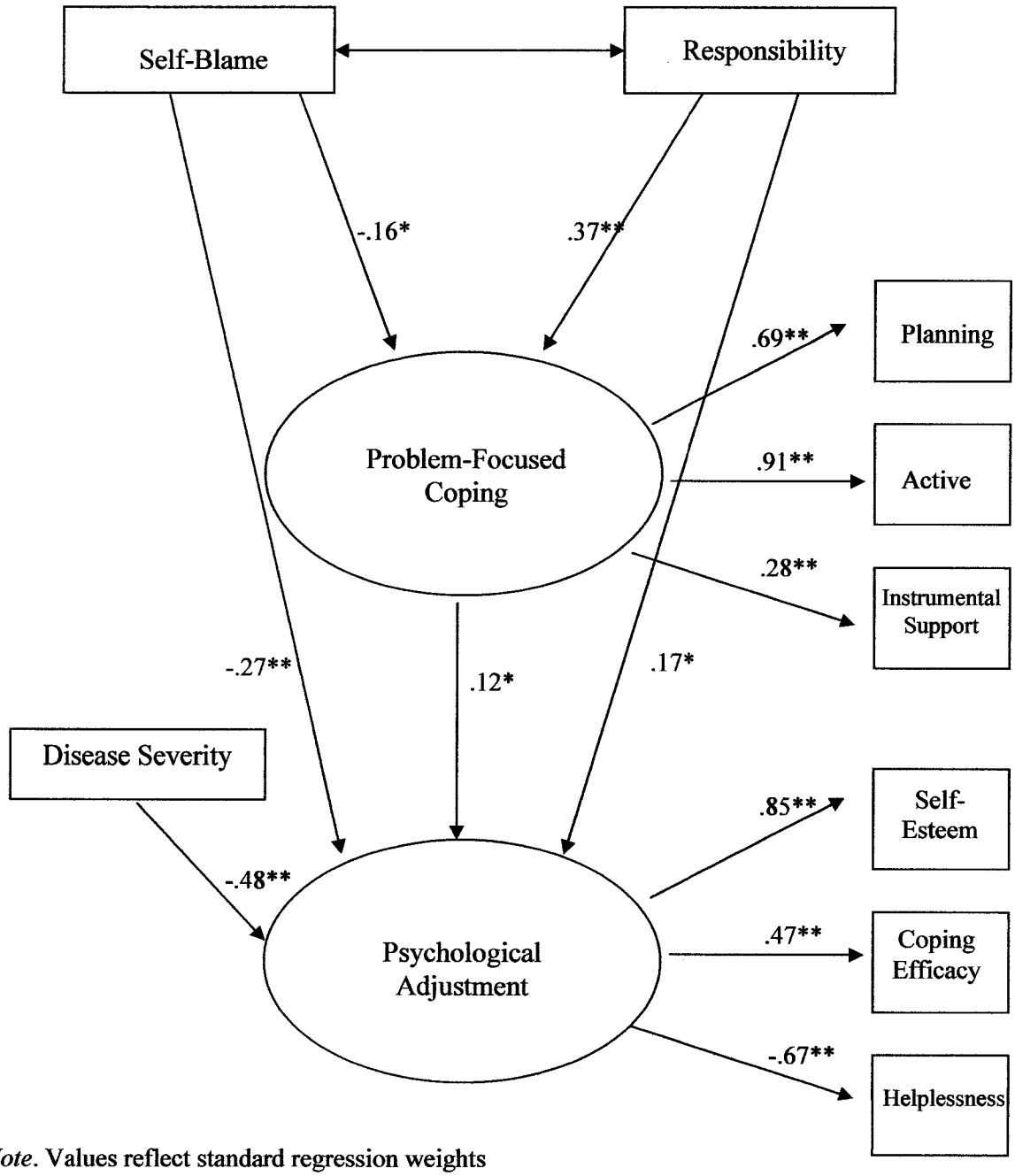
Figure 4.



Note. Values reflect standard regression weights

Figure 4. *Testing for direct and indirect effects between attributions and psychological adjustment when IBD patients use an emotion-focused coping strategy.*

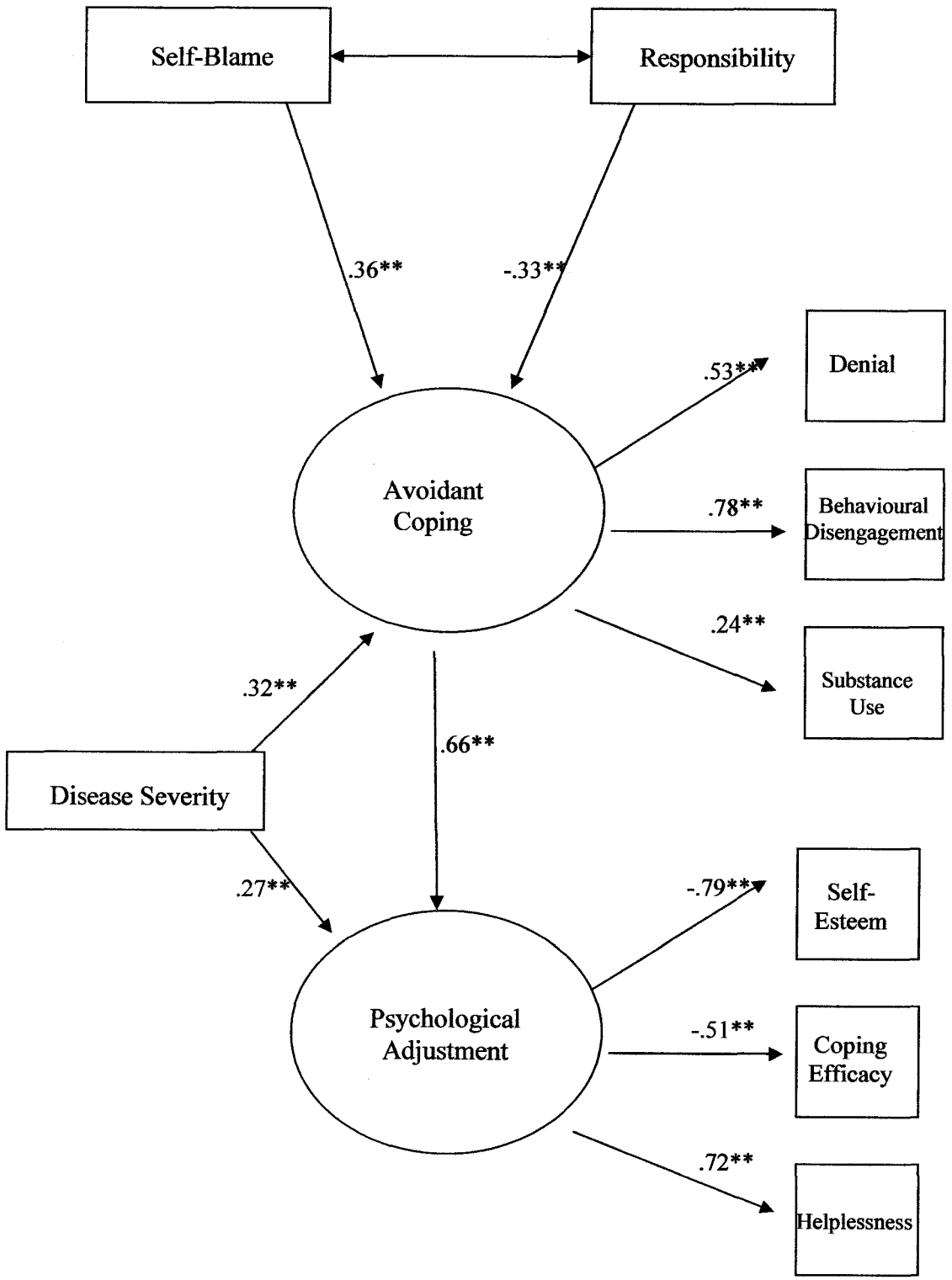
Figure 5.



Note. Values reflect standard regression weights

Figure 5. *Testing the direct relationship between disease severity and psychological adjustment for IBD patients using problem-focused coping strategies.*

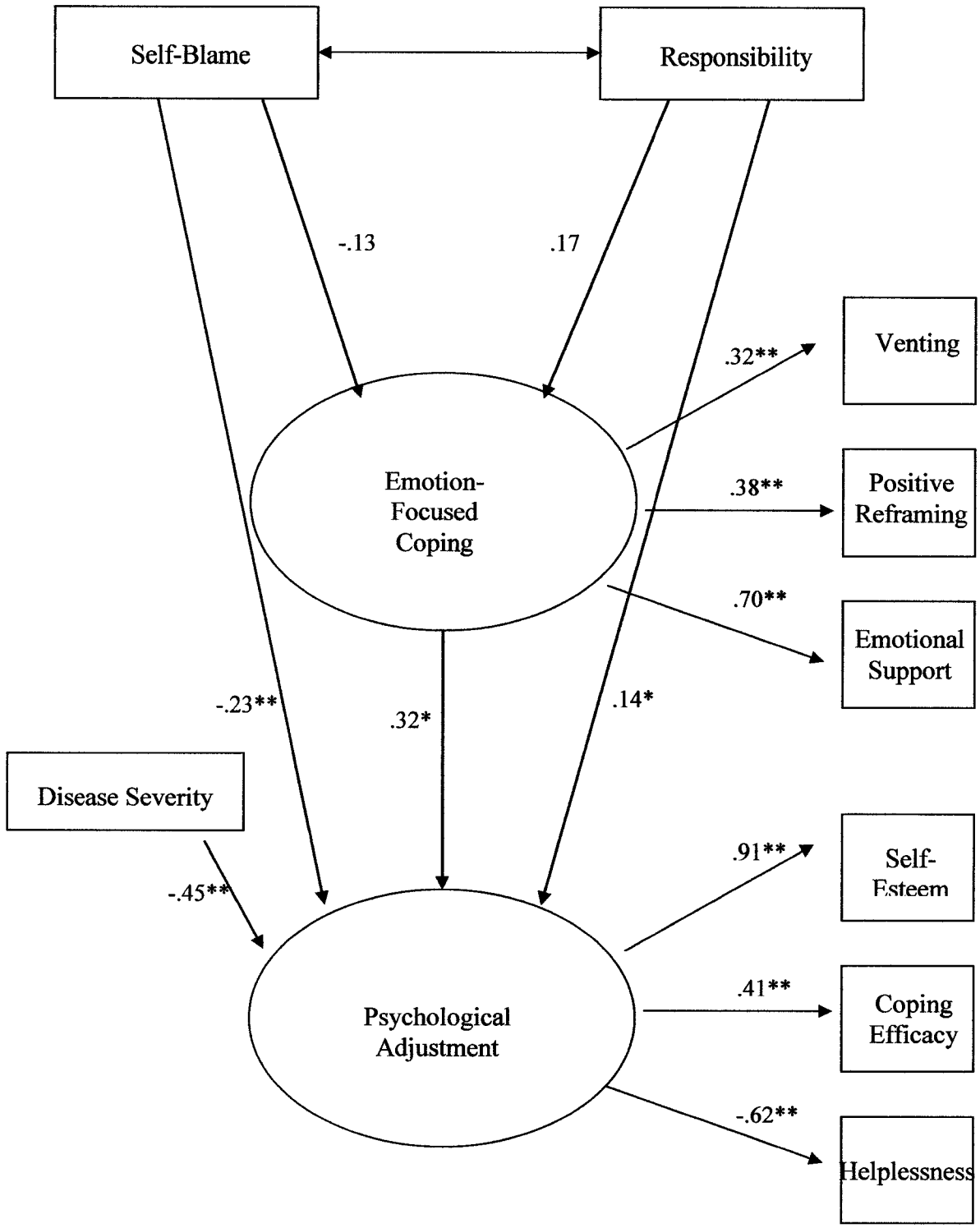
Figure 6.



Note. Values reflect standard regression weights

Figure 6. *Testing the direct relationships between disease severity and coping and disease severity and psychological adjustment for IBD patients using avoidant coping strategies.*

Figure 7.



Note. Values reflect standard regression weights

Figure 7. *Testing the direct relationship between disease severity psychological adjustment for IBD patients using emotion-focused coping strategies.*

CHAPTER IV

Discussion

The purpose of this study was two-fold. The first aim was to explore the illness attributions that IBD patients make with regards to the initial cause of their chronic illness and their perceptions of what other people believe to be the cause of their illness. The second aim of this study was to explore the relationship among illness attributions, coping strategies and psychological adjustment.

Personal and perceived illness attributions

Despite a growing body of knowledge and the recent medical advances for controlling symptoms, there is still no cure for inflammatory bowel disease. Patients with IBD are therefore forced to adapt and integrate their illness experience into their daily lives. As many researchers have suggested, it is these circumstances that lead people to search for a cause that will explain the occurrence of the illness, potentially making it easier to assimilate to the changes happening in the patient's body and the environment that surrounds them (Roesch & Weiner, 2001; Taylor, Lichtman, & Wood, 1984).

Although medical research has not been able to isolate a cause for IBD, this does not seem to preclude these patients from generating their own personal theories to account for the origin of their disease. The findings of this study confirmed that like many other chronic illness populations, IBD patients engage in a causal search when faced with living with their chronic illness. In this study, IBD patients were asked what they believed initially caused their IBD and over 70% of participants provided an explanation for this question.

The specific nature of these explanations ranged from genetic or heredity factors to stress to ingesting contaminated food. The findings of this study showed that it was more likely that participants believed that they, themselves, were responsible for their IBD. However, this conclusion needs to be interpreted with some caution because clearly attributing the cause of IBD to genetic factors is different from attributing the cause to a psychological problem, although both of these causes would by definition be subsumed under the dimension "internal" locus of causality. The present study divided the locus of causality dimension into five distinct subscales (physiological, characterological, behavioural, other and external) in an effort to better describe the attributions that these IBD patients made for their illness; however, there was not enough data and therefore not enough statistical power to conduct any analyses using these subscales. Further research is needed to understand the impact that endorsing a cause subsumed under one of these locus of causality subscales over a cause that is associated with the other subscales can have on the IBD patient's ability to cope and adjust to their disease.

In general, participants were less clear as to whether the initial cause of their disease was due to stable or controllable factors, as the averages for these two attribution dimensions fell along the midpoint of their seven-point scale. This seems to make sense, however, given the breakdown of the specific causes offered by these patients. That is, stress and genetics/heredity tended to top the list of illness attributions generated by participants and although both causes are internal or related to the participant themselves, put together their scores on the stability and controllability dimensions tend to average to about the midpoint of the scale. In sum, the causes that these IBD patients qualitatively attributed to the initiation of their disease ranged considerably. Overall, averaging the

three attribution dimensions: locus of causality, stability and controllability, demonstrated that participants were more likely to assign causes that were internal, stable and uncontrollable.

When asked what they believed other people (family, friends and others in society) thought caused their illness, over 60% of participants provided a causal explanation. Interestingly, participants who reported having lower self-esteem were less likely to respond to this question. One reason for this finding may be that individuals with lower self-esteem did not respond to this question because their responses may have been too self-damaging. Thus, this question may have been skipped in an effort to preserve or protect their current level self worth. However, further research is needed in order to confirm this hypothesis.

For those who did provide an explanation to this question, they were more likely to perceive that other people were blaming them for their disease, specifically suggesting that the illness was characterological or "all in their head". Furthermore, participants believed that others were more likely to think that the cause was somehow under the participants' control. This finding was unsurprising, given that this belief has often been reported in previous research conducted with a variety of medical and mental illness populations (Meiser et al., 2005; Corrigan et al., 2003; Weiner, Perry, & Mangussen, 1988).

Although statistically the patients' perceived attributional style did not reveal any significant findings, I believe that the hypothesis that perceived stigma is an important determinant of an IBD patient's psychological adjustment still holds merit for several reasons. First, having a chronic illness makes one different from the general population

and being different makes one a target for stigmatization. Recently, research has shown that being stigmatized affects a patient's psychological adjustment (Looper & Kirmayer, 2004; Joachim & Acorn, 2000). However, for IBD patients, the relationship between stigma and psychological adjustment may be more nuanced. That is, like many psychological disorders, IBD is an invisible chronic illness and therefore other people in society would not necessarily know that these patients are in fact suffering from a disease that can greatly affect their daily functioning (Hall et al., 2005). But the people who would know that a person is suffering from an invisible chronic illness are the patient's family and their physician. In her clinical practice, Gerson (2002) notes the interesting dynamic created by these two distinct relationships and the influence that it can have on the IBD patient. Specifically, Gerson recounts that it is likely that often physicians are frustrated with their efforts to abate an IBD patient's symptoms and relieve their suffering that they, at least according to the patient, give the impression that their disease is psychosomatic or "all in their head". Unfortunately, she also suggests that this same presumption extends to family members as well and perhaps comes from the fact that chronically ill patients are naturally more dependent on family members and therefore particularly vulnerable to the beliefs and attitudes of significant others. These findings suggest that the perceived causal explanations that are the most hurtful to the IBD patient come directly from family members and physicians.

The causal explanations made by other people may come from the fact that there is something threatening about the appearance of an illness that lacks a physiological cause. The discomfort that ensues from not being able to explain what is happening to the patient, probably makes everyone in contact with this person quick to provide an

explanation and, unfortunately, it may be that the specifics of this explanation matter very little. I believe that these unfounded causal explanations provide a greater context in which power imbalances are produced between those who are "sick" and those who are deemed "healthy" or "normal" and by extension fosters an environment that breeds such ideas as the just world hypothesis and that people generally get what they deserve in life. At least to some extent, the results of the current study demonstrate that this power imbalance, or indeed the *perception* of this imbalance, does seem to occur in that participants perceived other people believing that the cause of their illness was a mental problem or "all in their head" ten percent of the time. Additionally, there were clear differences between the illness attributions generated by the participant and the illness attributions they perceived other people having with regards to their IBD, such that participants felt that other people were more likely to attribute the cause of their illness as being due to internal and controllable factors.

Another explanation that may account for the perception that other people are likely to attribute the cause of their IBD to internal and controllable factors is the presence of the *fundamental attribution error* (FAE). The FAE, originally coined by Lee Ross in 1977, is one of the oldest and most celebrated attribution theories (Sabini, Siepmann & Stein, 2001). Sabini, Siepmann, and Stein describe the FAE as an observer's tendency to overestimate the degree to which behaviour is internally caused. That is, more often than not, causal explanations that are used to explain others people's behaviour usually place an importance on the other person's disposition, rather than considering the situation. According to Myers and Spencer (2006), not only does everyone commit the FAE, but they do so quite regularly.

Although IBD is not a behaviour, the idea underlying the FAE theory could be inferred to extend to explanations concerning the origin of a chronic illness. Certainly, the situational context surrounding an IBD patient's diagnosis would likely be unknown to other people. For example, most people in society would not be privy to information about the IBD patient's family background or whether they were exposed to a toxin at young age. Given this, it would make sense that IBD patients perceive that other people are committing the FAE against them and therefore perceiving the cause of their IBD to be something both internal(dispositional) to the patient and under their control.

That being said, the lack of statistically significant findings may have more to do with how this question was asked in the study. Specifically, IBD patients were asked one question about what they perceived other people thought caused their disease. Their responses to this question may have been confounded by the fact that they were asked to generalize across three groups of people: family, friends and other people in society rather than discussing these groups separately. Perhaps focusing on these groups independently would have been a better way to explore the impact of perceived illness attributions. Furthermore, examining the perceived illness attributions made by family physicians or the medical community at large may have been useful. Overall, I think this study does demonstrate that there is a need for further (and more rigorous) exploration of the influence of perceived stigma among IBD patients.

Illness attributions and psychological adjustment

The associations among the coded attribution responses and the psychological adjustment variables were relatively non-existent. That is, neither personal attributional style nor perceived attributional style directly influenced the IBD patient's levels of self-

esteem, negative affect, helplessness or coping efficacy. In fact, the only association revealed among the coded attribution responses and psychological adjustment involved the personal controllability dimension, which suggests that patients who feel that they have more control over the initial cause of their illness felt less helpless. From this finding, it may be inferred that feeling more control over the cause of the illness also means that these patients felt more in control of living with their illness everyday; however, further exploration would be needed to support this interpretation. Overall, the results involving personal and perceived attributions and psychological adjustment were inconsistent with previous research that has reported direct relationships between causal attributions and psychological adjustment.

There may be several reasons for these null findings. Firstly, based on previous research using qualitative data to measure attributions, personal and perceived attributional style may have been improperly defined in an effort to adapt to the already existing data available for this study. As previously mentioned, the CAVE technique was designed for the purpose of measuring attributional style and according to Peterson, Bettes and Seligman (1985), attributional style reflects how people will consistently make causal attributions across many different situations and contexts. In their studies, Peterson and colleagues averaged scores across 12 different situations (six "bad events" and six "good events") in order to gain information that would reliably reflect a participant's attributional style. Conversely, the current study used information from only one particularly "bad" event, that of being diagnosed with a chronic illness, to measure what would be deemed a stable method or "style" in which IBD patients would consistently use to make causal explanations for challenging situations in their lives. It

seems unlikely that one bad event would give insight into a participant's attributional style and this may have contributed to the lack of associations found between the participant's personal and perceived attributional style and psychological adjustment.

Additionally, because the current study used already existing data, the original instructions for employing the CAVE technique needed to be adapted to suit the available data. In particular, most studies that have used this technique (i.e., Segerstrom et al., Peterson, Bettes & Seligman, 1985; Peterson, Luborsky & Seligman, 1983) have extracted "spontaneous" or unprompted causal attributions from either interview transcripts or materials written by participants. The participants, themselves, were essentially unaware that they were in fact making causal explanations for good and bad events that had occurred in their lives. The nature of the gaining unprompted causal explanations for events gave these researchers confidence that their findings parsed with both the Learned Helplessness model developed by Seligman and, by association, Weiner's *attributional theory of motivation*, both of which rely on the belief that people are unconsciously motivated to generate explanations for situations that happen in their lives. However, the current study did not gather causal attributions as they naturally emerged, but rather asked participants to consciously recount what they believed to be the cause of their IBD diagnosis. This is a relatively subtle methodological difference but may have had a negative impact on the present findings.

Given that IBD patients are susceptible to being stigmatized, having participants aware of the fact that causal explanations were being gathered may have also triggered the patients' need to appear more in control of their illness or more "normal"(Hall et al., 2005). Understanding the impact of stigma, Hall and colleagues question whether the

IBD patients that they interviewed were, either consciously or unconsciously, projecting an image of adaptively coping or of being "normal" in an attempt not to be judged or labelled. To some extent, this same concern could be relevant to the current study given that participants were not blind to the purpose of the question. The causes elicited from participants may have been affected because they were acutely aware of the fact that these explanations were going to be judged. That being said, perhaps a better method of measuring attributions may have been asking participants to take a few minutes to recall the events that lead to their diagnosis and then write a short paragraph about these events. These short stories could then be used to code for unprompted illness attributions.

It should also be noted that in previous studies using the CAVE method, the judges who have been trained to code the data were blind to the study's research objectives. However, this was not the case for the current study, as both coders were aware of the research goals. Subjective interpretations are always a general concern with coding qualitative data and the current study is no different; the judges may have been unintentionally projected their own interpretations on to the data that were in line with the goals of this research. In future, perhaps a better way to gain less biased ratings of illness attributions would be have a self-report measure that asked participants to rate their own causal explanations along the three attribution dimensions.

Lastly, as indicated by several researchers (Roesch & Weiner, 2001; Faller, Schilling & Lang, 1995; Anderson et al., 1994; Taylor, Lichtman & Wood, 1984), the literature linking attributions with psychological adjustment has produced inconsistent findings. Though their meta-analysis finds that attributions are important determinants of psychological adjustment, Roesch and Weiner also report that attributions account for a

small (albeit significant) proportion of variance in psychological adjustment and coping strategies, which suggests that there are other factors that need to be considered with respect to adjustment. Therefore, coupling the above mentioned methodological concerns and the fact that attributions have been shown to only account for a small proportion of variance in adjusting to an illness, it may be that the CAVE technique was not a sensitive enough data collection procedure to accurately measure illness attributions. It is likely for these reasons that neither personal nor perceived attributional style performed well in this study's statistical analyses.

Attributions of self-blame and responsibility

Self-blame and the belief that one is responsible for their health status were measured separately from both personal and perceived illness attributions. Although the self-blame and responsibility scales were not directly measuring attributions specifically related to the initial cause of the IBD, they were assessing attributions about the personal role the IBD patient plays in their illness.

The current findings related to self-blame and responsibility beliefs demonstrate the similarities and distinctions between these two attributions. Specifically, this study showed that self-blame and responsibility were related to each other, that is, those who blamed themselves felt responsible for their illness and vice versa. However, the connotations associated with these two attributions, which is manifested by their relationship to psychological adjustment, demonstrates the disparity between self-blame and responsibility attributions. That is, blaming oneself for an illness was negatively related to the use of avoidant coping strategies and to poorer psychological adjustment. In addition, participants who believed that they were responsible for their health triggered

more adaptive forms of coping (problem-focused and emotion-focused) and better psychological adjustment. In the past, research has often found that self-blame leads to negative outcomes (Sainsbury & Heatley, 2005), however, according to these results, there seems to be something quite positive about taking responsibility for one's health. The distinction between self-blame and responsibility attributions may be explained similarly to the original interpretation used to describe the differences between characterological self-blame and behavioural self-blame (Janoff-Bulman, 1979). That is, believing that one is responsible for their health gives a person a feeling of control over the ways in which he or she chooses to deal with their health, which in turn would likely lead to better psychological adjustment. On the other hand, not being able to control and change the parts of the self that are being blamed for causing an illness leaves a person feeling helpless, unworthy and unable to cope effectively.

Attributions, coping strategies and psychological adjustment

Exploring the relationships among illness attributions, coping strategies and psychological adjustment revealed several interesting findings. These results are presented below according to the three different coping strategies that were examined.

Before these findings are discussed, however, the reasons for several changes in the statistical analyses conducted in this study need to be considered. As previously discussed, both the attributional style variables were not significantly predicting psychological adjustment and were therefore removed from the analyses. However, both correlations and SEM modification indices had revealed that self-blame and beliefs about responsibility were associated with coping strategies and psychological adjustment. Despite these findings, self-blame and responsibility were not combined and added into

the analyses as a latent variable for statistical reasons. According to Kline (2005), there should be no less than three indicator variables per latent variables as this decreases the reliability and validity of the statistical analyses.

Positive and negative affect were replaced by coping efficacy in order to have a better operational definition of psychological adjustment. The choice to replace positive and negative affect was not only for statistical reasons, but was also based on previous research and Weiner's *attributional theory of motivation.* This theory surmises that causal attributions affect people's emotional states, which in turn motivate the way that people behave. If this is indeed true, then it can be inferred that not only are emotional reactions an outcome of causal explanations but they are also a predictor of coping behaviour, and by extension, how a person adjusts to events in their life. Further evidence of the reciprocal relationship between affect and behaviour is demonstrated by Cane and Martin (2004), who note that coping behaviour can increase a person's feelings of distress, while feelings of distress can also impact a person's tendency to use a particular style of coping when faced with challenging situations. Given this, it makes sense that using positive and negative affect ratings solely as an outcome measure of psychological adjustment may misrepresent the relationships that exist among attributions, coping strategies and psychological adjustment. Moreover, coping efficacy reflects a person's belief in their success in coping with the physical and emotional aspects of their disease and has been previously used as an outcome of adjustment. For example, Gignac (2001) reported increases in the coping efficacy of patients with muscle skeletal disorders following their participation in a short-term psychotherapy. Therefore,

coping efficacy was used in the current study to characterize psychological adjustment rather than using positive and negative affect.

Problem-focused coping. Attributions of self-blame and responsibility directly influenced the use of problem-focused coping strategies and indirectly affected psychological adjustment. More specifically, when an IBD patient blames themselves for their condition, he or she is less likely to engage in problem-focused coping strategies and this leads to poorer psychological adjustment. Conversely, feeling responsible for one's health was found to elevate problem-focused coping, which lead to better psychological adjustment. However, the results of the current study revealed that attributions of self-blame and responsibility have further impact on adjusting to IBD. That is, self-blame and responsibility have an indirect effect through the use of problem-focused coping but also have a direct effect on adjustment that is independent of how the patient copes.

This finding was not supported by previous research conducted by Roesch and Weiner (2001). In contrast, these authors suggested that there were no significant relationships among attributions, problem-focused coping and psychological adjustment. These differences may be explained by the methodology used by Roesch and Weiner, as these researchers were limited by the studies that they included in their meta-analysis. Firstly, many of their studies defined problem-focused coping differently than the current study. Specifically, often behavioural approach and approach avoidance strategies were coupled with problem-focused coping to create one category of coping behaviour. Also, the studies included in the meta-analysis represented findings from many different illness

populations. Therefore it may be the case that IBD patients are more likely to use problem-focused coping than other chronically ill patients.

Avoidant coping. The influence of self-blame and beliefs about responsibility on psychological adjustment appears to be exclusively mediated by the use of avoidant coping strategies. This finding confirms the results that were previously reported by Roesch and Weiner (2001) and also lends strong support for the theoretical model stating that attributions affect coping, which consequently affects adjustment. More specifically, the results of this study suggest that self-blame can lead to denial, behavioural disengagement and substance abuse and that these avoidance strategies produced overall poorer psychological adjustment. On the other hand, taking responsibility for one's health leads to rejecting avoidant coping strategies, which in turn results in adjusting better to IBD.

Emotion-focused coping. Although attributions of self-blame and responsibility were found to indirectly affect psychological adjustment through the use of emotion-focused coping strategies, the results of the present analyses indicated that in fact the model fit better when self-blame and responsibility were allowed to both directly and indirectly affect adjustment. However, when the additional path was added that directly linked self-blame and responsibility to adjustment, the direct relationship between these attribution variables and emotion-focused coping failed to remain significant. This model contradicted the finding that self-blame and responsibility directly predicted emotion-focused coping and only indirectly influenced adjustment through the use of emotion-focused coping. Given that the model fit indices demonstrated that both of these models represented the data fairly well, these results are difficult to interpret. As with all

structural models, it is possible to conceive of alternative formations that *statistically* account for the data equally well and therefore it becomes impossible to "prove" a mediational theory (Reisenzein, 1986). The best that can be hoped is that replicating the findings in future research provides more consistent evidence for the mediation model.

However, one explanation for these conflicting findings is that there could be the presence of a suppression effect. Kline (2005) defines classical suppression as when one predictor variable is uncorrelated with a criterion variable but yields a nonzero regression weight when controlling for another variable. Furthermore, Tabachnik and Fidell (2005) suggest that there is evidence of a suppressor variable when the absolute value of the simple correlation is substantially smaller than the regression weight. This does seem to be the case, given that prior to the SEM analyses, the only significant correlation between emotion-focused coping and the self-blame and responsibility variables was a negative relationship between responsibility and seeking emotional support. However, when testing for a mediational effect, both self-blame and responsibility significantly predicted the use of emotion-focused coping strategies and the regression weight between responsibility and emotion-focused coping was substantially larger than the simple correlation mentioned above.

When suppression variables have been identified, Tabachnik and Fidell suggest that it should not be necessarily interpreted as a confounding influence but rather as variables that enhances the prediction the criterion variable. In this case, the presence of both the attribution variables and emotion-focused coping strategies enhances the prediction of the patient's psychological adjustment. However, attempting to replicate this finding in future research should be considered.

In sum, the results of this study were generally consistent with previous research suggesting that attributions affect coping strategies and psychological adjustment. Particularly, these findings suggest that how attributions affect psychological adjustment seems to be unique to the specific coping strategy that the IBD patient employs. As well, these findings provide support for the interpretation that particular attributions will provide more resiliency to IBD patients with respect to adjusting to their chronic illness. That is, it seems that the well-adjusted IBD patients were more likely to believe that they are responsible for their health, which could suggest that they felt more in control of their condition and took more control over their condition in terms of how they decided to cope. Alternatively, when the IBD patient engaged in self-blame, he or she had a tendency to use more maladaptive forms of coping with their illness, which did not appear to help their overall psychological adjustment.

Other factors associated with illness attributions and psychological adjustment

Trait optimism and trait neuroticism. The relationship between optimism and neuroticism personality traits and illness attributions was explored in the current study. The findings suggest that IBD patients who are more optimistic were more likely to take responsibility for their state of health rather than engage in self-blame. On the other hand, IBD patients who are more neurotic are also more likely to blame themselves. These relationships between the two personality traits and the illness attributions may be at least partially explained by the IBD patient's emotional reaction to their illness.

Disease severity. Despite using more adaptive forms of coping, that is, problem-focused and emotion-focused coping methods, to deal with their IBD, those patients who perceived their condition as being more severe were more poorly adjusted then those who

perceived their illness as less severe. The finding that increased disease severity lead to poorer psychological adjustment was supported by previous research conducted by Sainsbury and Heatley (2005).

However, a more complex relationship involving disease severity was found when an avoidant coping strategy was present, such that disease severity was found to not only lead to poor psychological adjustment but also to trigger the use of avoidant coping. In a review of the literature, an interesting piece of evidence surfaced that may lend some support in interpreting these findings. Warren, Warren and Cockerill (1991) conducted a study investigating multiple sclerosis (MS) patients who had recently experienced an exacerbation of their illness symptoms and compared them to a group of MS patients who had not recently experienced an exacerbation. These authors found that MS patients who had recently experienced an exacerbation were more likely to use emotion-focused coping strategies to deal with these inflamed symptoms rather than problem-focused coping strategies and that the use of emotion-focused coping ultimately lead to poorer psychological adjustment. Interestingly, in this case emotion-focused coping was operationally defined by combining the indicators of avoidant coping and the indicators of emotion-focused coping that were used in the present study. These results suggest that a recent "flare-up" in symptoms, as so often described by IBD patients, may moderate the relationship between coping and adjustment.

In the current study, it is likely that ratings of disease severity would increase when an IBD patient is experiencing a "flare-up" or a relapse in their symptoms. Given this interpretation, then Warren and colleagues (1991) finding suggesting that emotion-focused coping strategies (and by their definition, avoidant coping strategies) are

triggered by periods of exacerbated symptoms may also extend to a patient who reports higher disease severity. More specifically, self-reported disease severity probably increases when the IBD patient's symptoms are flaring up, which may be the reason why increases in disease severity were found to not only decrease psychological adjustment but also to increase the use of avoidant coping strategies. Therefore, in general, disease severity may be more likely to trigger the use of maladaptive coping rather adaptive coping strategy. Given the previous research presented, the effect of disease severity on the use of emotion-focused coping depends on whether it is defined as an adaptive or maladaptive coping strategy.

Future research

Conducting a longitudinal study investigating the types of illness attributions that IBD patients make for their disease would give a better understanding of how these explanations could affect the patient's coping and psychological adjustment. This type of design would beneficial in determining whether illness attributions are stable explanations or more fluid and part of the ongoing process of adjusting to IBD over time.

Additionally, the findings of the current study demonstrate that perceiving stigma from family members and physicians should be considered in future research and how these perceptions affect the explanations that IBD patient make for their chronic illness and their subsequent psychological adjustment.

Lastly, although it is difficult to make conclusions about the generalizability of the current study's findings, future research should also focus on replicating or testing the invariance of the structural models found in the current study with other chronic illness populations, such as rheumatoid arthritis patients.

Conclusions

To my knowledge, the current study is the first to investigate and describe the causal explanations made by IBD patients and to explore the perceived explanations made by other people with regards to the cause of IBD. Despite some methodological errors, the current study provides some compelling evidence that personal and perceived illness attributions may play an important role in an IBD patient's psychological adjustment and that further research in this area is warranted.

Also, the results of this study provide at least partial support for Roesch and Weiner's (2001) theoretical model demonstrating the indirect influence of causal attributions on psychological adjustment through the use of coping behaviour in illness populations. Interestingly, support for this mediational theory depended on the particular coping style used by the IBD patient, which was for the most part influenced by attributions of self-blame and responsibility over current state of health. These conclusions demonstrate that it would be profitable to focus on interventions to reframe attributions to causes in which the IBD patient takes responsibility for their health, but in a way that is positive and makes them feel more in control of the disease.

Finally, the current findings demonstrating the negative impact that disease severity has on an IBD patient's coping and psychological adjustment implies that interventions that focus on symptom management are extremely important for reducing the psychological distress that accompanies IBD.

REFERENCES

Anderson, C.A., Miller, R.S, Riger, A.L., Dill, J.C., & Sedikides, C. (1994). Behavioral and characterological attributional styles as predictors of depression and loneliness: Review, refinement, and test. *Journal of Personality and Social Psychology, 66*, 549-558.

Abel, E., Rew, L., Gortner, E-M., & Deville, C. L. (2004). Cognitive reorganization and stigmatization among persons with HIV. *Journal of Advanced Nursing, 47*, 510-525.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology, 51*(6), 1173-1182.

Ben-Zur, H. (2005). Coping, distress, and life events in a community sample. *International Journal of Stress Management, 12*(2), 188-196.

Bury, M. (1982). Chronic illness as biographical disruption. *Sociology of Health & Illness, 4*(2), 167-182.

Butler, J. A., Chalder, T., & Wessely, S. (2001). Causal attributions for somatic sensations in patients with chronic fatigue syndrome and their partners. *Psychological Medicine, 31*(1), 97-105.

Byrne, B. M. (2002). *Structural equation modeling with AMOS: Basic concepts, applications, and programming.* New Jersey: Lawrence Erlbaum Associates, Publishers.

Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the Brief COPE. *International Journal of Behavioral Medicine, 4*(1), 92-100.

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56*(2), 267-283.

Casati, J., Toner, B., De rooy, E., Drossman, D. A., & Maunder, R. G. (2000). Concerns of patients with inflammatory bowel disease: A review of emerging themes. *Digestive Diseases and Sciences, 45*, 26-31.

Chaney, J. M. et al. (1996). Attributional style and depression in rheumatoid arthritis: The moderating role of perceived illness control. *Rehabilitation Psychology, 41*, 205-224.

Corrigan, P., Markowitz, F.E., Watson, A., Rowan, D., & Kubiak, M. (2003). An attribution model of public discrimination towards persons with mental illness. *Journal of Health and Social Behaviour, 44,* 162-179.

Crane, C, & Martin, M. (2004). Social learning, affective states and passive coping in irritable bowel syndrome and inflammatory bowel disease. *General Hospital Psychiatry, 26*, 50-58.

Crawford, J. R., & Henry, J. D. (2004). The positive and negative affect schedule (PANAS): Construct validity, measurement properties and normative data in a large non-clinical sample. *British Journal of Clinical Psychology, 43*(3), 245-265.

El-Masri, M. M., & Fox-Wasylyshyn, S. M. (2005). Missing data: An introductory conceptual overview for the novice researcher. *CJNR: Canadian Journal of Nursing Research, 37*(4), 156-171.

Evers, A. W. M., Kraaimaat, F. W., van Lankveld, W., Jongen, P. J. H., Jacobs, J. W. G., & Bijlsma, J. W. J. (2001). Beyond unfavorable thinking: The illness cogntion questionnaire for chronic disease. *Journal of Consulting and Clinical Psychology, 69*(6), 1026-1036.

Faller, H., Schilling, S., & Lang, H. (1995). Causal attribution and adaptation among lung cancer patients. *Journal of Psychosomatic Research, 39*, 619-627.

Fernandez, M. C., & Arcia, E. (2004). Disruptive behaviors and maternal responsibility: A complex portrait of stigma, self-blame, and other reactions. *Hispanic Journal of Behavioural Sciences, 26*, 356-372.

Fillion, L., Kovacs, A. H., Gagnon, P., & Endler, N. S. (2002). Validation of the shortened COPE for use with breast cancer patients undergoing radiation therapy. *Current Psychology: Developmental, Learning, Personality, Social, 21*(1), 17-34.

Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology, 48*(1), 150-170.

Folkman, S., & Lazarus, R. S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior, 21*(3), 219-239.

Frazier, P. A. (1990). Victim attributions and post-rape trauma. *Journal of Personality and Social Psychology, 59*(2), 298-304.

Gignac, M. A. M. (2000). An evaluation of a psychotherapeutic group intervention for persons having difficulty coping musculoskeletal disorders. *Social Work in Health Care, 32*, 57-75.

Gignac, M. A., Cott, C., & Badley, E. M. (2000). Adaptation to chronic illness and disability and its relation to perceptions of independence and dependence. *Journal of Gerontology, 55B*, 362-372.

Glinder, J. G., & Compas, B. E. (1999). Self-blame attributions in women with newly diagnosed breast cancer: A prospective study of psychological adjustment. *Health Psychology, 18*(5), 475-481.

Guyatt, G., Mitchell, A., Irvine, E. J., Singer, J., Williams, N., Goodcare, R., & Tompkins, C. (1989). A new measure of health status for clinical trials in inflammatory bowel disease. *Gatroenterology, 96*, 804-810.

Hall, N. J., Rubin, G. P., Dougall, A., Hungin, A. P. S., & Neeley, J. (2005). The fight for 'health-related normality': A qualitative study of the experiences of individuals living with established inflammatory bowel disease (IBD). *Journal of Health Psychology, 10*, 443-455.

Holmbeck, G. N. (1997). Toward terminological, conceptual, and statistical clarity in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literatures. *Journal of Consulting and Clinical Psychology, 65*(4), 599-610.

Janoff-Bulman, R. (1979). Characterological versus behavioral self-blame: Inquires into depression and rape. *Journal of Personality and Social Psychology, 37*, 1798-1809.

Joachim, G., & Acron, S. (2000). Stigma of visible and invisible chronic conditions. *Journal of Advanced Nursing, 32*, 243-248.

Johnstone, P. L. (2004). Mixed methods, mixed methodology health services research in practice. *Qualitative Health Research, 14*(2), 259-271.

Karanci, N.A. (1988). Patterns of depression in medical patients and their relationship with causal attributions for illness. *Psychotherapy & Psychosomatics, 50*, 207-215.

Kline, R. (2005). *Principles and practice of structural equation modeling* (2nd Ed.). New York, NY: The Guilford Press.

Lee, F., & Peterson, C. (1997). Content analysis of archival data. *Journal of Consulting and Clinical Psychology, 65*(6), 959-969.

Looper, K. J., & Kirmayer, L. J. (2004). Perceived stigma in functional somatic syndromes and comparable medical conditions. *Journal of Psychosomatic Research, 57*, 373-378.

Mackner, L.M., Sisson, D. P., & Crandall, W. V. (2004). Review: Psychosocial issues in pediatric inflammatory bowel disease. *Journal of Pediatric Psychology, 29*, 243-257.

McColl, E., Han, S. W., Barton, J. R., & Welfare, M. R. (2004). A comparison of the discriminatory power of the inflammatory bowel disease questionnaire and the SF-36 in people with ulcerative colitis. *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care & Rehabilitation, 13*(4), 805-811.

Meiser, B., Mitchell, P.B., McGirr, H., Van Herten, M., & Schofield, P.R. (2005). Implications of genetic risk information in families with a high density of bipolar disorder: An exploratory study. *Social Science and Medicine, 60*, 109-118.

Muller, R. T., Caldwell, R. A., & Hunter, J. E. (1994). Factors predicting the blame of victims of physical child abuse or rape. *Canadian Journal of Behavioural Science, 26*, 259-279.

Myers, D. G, & Spencer, S. J. (2006). *Social psychology (3rd Ed.)*. Toronto, CA: McGraw-Hill.

Nunnally, J. C., & Bernstein, I. H. (1994). Psychometric theory (3rd Ed.). New York: McGraw-Hill.

Penley, J. (2002). *The Association of Coping to Physical and Psychological Health Outcomes: A Meta-Analytic Review. Journal of Behavioural Medicine, 25*, 551-603.

Peterson, C., Bettes, B. A., & Seligman, M. E. P. (1985). Depressive symptoms and unprompted causal attributions: Content analysis. *Behavioral Research Therapy, 23*, 379-382.

Peterson, C., Luborsky, L., & Seligman, M. E. (1983). Attributions and depressive mood shifts: A case study using the symptom-context model. *Journal of Abnormal Psychology, 92*(1), 96-103.

Reisenzein, R. (1986). A structural equation analysis of Weiner's attribution-affect model of helping behavior. *Journal of Personality and Social Psychology, 50*(6), 1123-1133.

Rich, M. R., Smith, T. W., & Christensen, A. J. (1999). Attributions and adjustment in end-stage renal disease. *Cognitive Therapy and Research.Special Issue: Cognitive Factors in Chronic Illness: Empirical Approaches, 23*(2), 143-158.

Roesch, S. C., & Ano, G. (2003). Testing an attribution and coping model of stress: Religion as an orienting system. *Journal of Psychology and Christianity, 22*(3), 197-209.

Roesch, S. C., & Weiner, B. (2001). A meta-analytic review of coping with illness: Do causal attributions matter? *Journal of Psychosomatic Research, 50*, 205-219.

Roesch, S. C., Weiner, B., & Vaughn, A. A. (2002). Cognitive approaches to stress and coping. *Current Opinion in Psychiatry, 15*(6), 627-632.

Rosenberg, M. (1965). *Society and the adolescent self-image* . Princeton, NJ: Princeton University Press.

Russell, D. W., McAuley, E., & Tarico, V. (1987). Measuring causal attributions for success and failure: A comparison of methodologies for assessing causal dimensions. *Journal of Personality and Social Psychology, 52*(6), 1248-1257.

Sabini, J., Siepmann, M., & Stein, J. (2001). The really fundamental attribution error in social psychological research. *Psychological Inquiry, 12*, 1-15.

Sainsbury, A., & Heatley, R.V. (2005). Review article: psychosocial factors in the quality of life of patients with inflammatory bowel disease. *Aliment & Pharmacological Therapy, 2*1, 499-508.

Schulman, P., Castellon, C., & Seligman, M. E. (1989). Assessing explanatory style: The content analysis of verbatim explanations and the attributional style questionnaire. *Behaviour Research and Therapy, 27*(5), 505-512.

Searle, A., & Bennett, P. (2001). Psychological factors and inflammatory bowel disease: A review of a decade of literature. *Psychology, Health & Medicine, 6.*

Seligman, M. E., Abramson, L. Y., Semmel, A., & von Baeyer, C. (1979). Depressive attributional style. *Journal of Abnormal Psychology, 88*(3), 242-247.

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods, 7*(4), 422-445.

Simpson, J. A., Rholes, W. S., & Nelligan, J. S. (1992). Support seeking and support giving within couples in an anxiety-provoking situation: The role of attachment styles. *Journal of Personality and Social Psychology, 62*(3), 434-446.

Sirois, F. M. (2003). *Control beliefs inventory.* Unpublished manuscript.

Sirois, F. M., & Gick, M. L. (2002). An investigation of the health beliefs and motivations of complementary medicine clients. *Social Science and Medicine, 55* (6), 1025-1037.

Stevens, J. P. (2002). Applied multivariate statistics for the social sciences. (4th Edition). Mahwah, NJ: Lawrence Erlbaum Associates.

Stoltz, R. F., & Galassi, J. P. (1989). Internal attributions and types of depression in college students: The learned helplessness model revisited. *Journal of Counseling Psychology, 36*(3), 316-321.

Tabachnick, B.G., & Fidell, L.S. (2007). Principal components and factor analysis. In S. Hartman (Ed.), *Using multivariate statistics* (pp. 607-675). Boston, MA: Pearson Education Inc.

Taggar, S., & Neubert, M. (2004). The impact of poor performers on team outcomes: An empirical examination of attribution theory. *Personnel Psychology, 57*(4), 935-968.

Taylor, B. (2001). HIV, stigma and health: Integration of theoretical concepts and the lived experiences of individuals. *Journal of Advanced Nursing, 35*, 792-798.

Taylor, S. E., Lichtman, R. R., & Wood, J. V. (1984). Attributions, beliefs about control, and adjustment to breast cancer. *Journal of Personality and Social Psychology, 46*(3), 489-502.

Ullman, S. E. (1997). Attributions, world assumptions, and recovery from sexual assault. *Journal of Child Sexual Abuse, 6*, 1-19.

Van der Zaag-Loonen, H. J., Grootenhuis, M.A., Last, B. F., & Derkx, H. H. F. (2004). Coping strategies and quality of life of adolescents with inflammatory bowel disease. *Quality of Life Research, 13*, 1011-1019.

Visser, M.J., Makin, J.D., & Lehobye, K. (2006). Stigmatizing attitudes of the community towards people living with HIV/AIDS. *Journal of Community & Applied Social Psychology, 16*, 42-58.

Wallston, K. A., Wallston, B. S., & DeVellis, R. (1978). Development of the multidimensional health locus of control (MHLC) scales. *Health Education Monographs, 6*(2), 160-170.

Warren, S., Warren, R. G., Cockerill, R. (1991). Emotional stress and coping in multiple sclerosis (MS) exacerbations. *Journal of Psychosomatic Research, 35*, 37-47.

Watson, D., Clark, L., Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS Scales. *Journal of Personality and Social Psychology*, 54, 1063-1070.

Williams, B., & Healy, D. (2001). Perceptions of illness causation among new referrals to a community mental health team: "Explanatory model" or "exploratory map"? *Social Science and Medicine, 53,* 465-476.

Weiner, B. (1986). An attributional theory of motivation and emotion. New York, NY: Springer.

Weiner, B. (1993). On sin versus sickness: A theory of perceived responsibility and social motivation. *American Psychologist, 48*(9), 957-965.

Weiner, B., Perry, R. P., & Magnusson, J. (1988). An attributional analysis of reactions to stigmas. *Journal of Personality and Social Psychology, 55*(5), 738-748.

Appendix A

Self-reported Questionnaires

Illness attribution open-ended questions

1) In general, what do you think causes inflammatory bowel disease (IBD)?

2) In your opinion, what do other people (friends, family, society) think causes IBD?

Health Attribution Scale

People often have different ideas and beliefs about their state of health. The following are statements about some of these beliefs. Please read each statement carefully and indicate how much you agree or disagree with each one by checking the appropriate box.

	Strongly Disagree	**Disagree**	**Mildly Disagree**	**Mildly Agree**	**Agree**	**Strongly Agree**
1. I am responsible for my state of health.						
2. If I get sick, I am to blame.						
3. It's up to me to avoid unhealthy behaviors.						
4. When I haven't been taking care of myself as well as I know I should, and I get sick, I think to myself " I should have known better".						
5. It is my responsibility to do things to be as healthy as I can be.						
6. If I get sick it is usually because I did something I shouldn't have.						
7. When I get sick I often think about things that I could have done differently to stay healthy.						
8. If I don't take care of myself then I deserve to get sick.						

Brief COPE

The following statements are about the different ways that people cope with the stress related to living with an ongoing or long-term illness. Different people will deal with their stress in different ways. We are interested in how you deal with the more bothersome or stressful aspects of your health condition.
Please select one of the stressful areas of your life that you indicated in the previous question was causing you the most trouble and list it here: _____ (e.g., problems with symptoms, etc.).

Now, thinking just about the problems related to this area of your life, please read each of the following statements about a particular way of coping and indicate how much you do this to cope with the particular stress that you listed above. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Please use the following 4-point scale to respond to each statement.

1	2	3	4
I usually <u>don't</u> do this at all	**I usually do this a <u>little bit</u>**	**I usually do this a <u>medium amount</u>**	**I usually do this a <u>lot</u>**

I turn to work or other activities to take my mind off things.	1 2 3 4
I concentrate my efforts on doing something about the situation I'm in.	1 2 3 4
I say to myself "this isn't real.".	1 2 3 4
I use alcohol or other drugs to make myself feel better.	1 2 3 4
I get emotional support from others.	1 2 3 4
I give up trying to deal with it.	1 2 3 4
I take action to try to make the situation better.	1 2 3 4
I refuse to believe that it has happened.	1 2 3 4
I say things to let my unpleasant feelings escape.	1 2 3 4
I get help and advice from other people.	1 2 3 4
I use alcohol or other drugs to help me get through it.	1 2 3 4
I try to see it in a different light, to make it seem more positive.	1 2 3 4
I criticize myself.	1 2 3 4
I try to come up with a strategy about what to do.	1 2 3 4
I get comfort and understanding from someone.	1 2 3 4
I give up the attempt to cope.	1 2 3 4
I look for something good in what is happening.	1 2 3 4
I make jokes about it.	1 2 3 4
I do something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.	1 2 3 4
I accept the reality of the fact that it has happened.	1 2 3 4
I express my negative feelings.	1 2 3 4
I try to find comfort in my religion or spiritual beliefs.	1 2 3 4
I try to get advice or help from other people about what to do.	1 2 3 4
I learn to live with it.	1 2 3 4
I think hard about what steps to take.	1 2 3 4
I blame myself for things that happened.	1 2 3 4
I pray or meditate.	1 2 3 4
I laugh about the situation.	1 2 3 4

Coping Efficacy Questionnaire

Please indicate how well you feel you have been dealing with the different aspects of your condition in general by checking a box for each question.

	Strongly Disagree	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
a) I am successfully coping with the symptoms of my condition					
b) I am successfully coping with the day to day problems that living with my condition creates					
c) I am successfully coping with the emotional aspects of my condition					

Self-esteem scale

The statements below reflect thoughts which people often have about themselves. Some of these statements may be characteristic of your own thoughts, while others may not be. Please check the box to the right of each statement that indicates the extent to which that particular statement is characteristic of you. Please respond honestly to all of the statements. There are no right or wrong ratings. Your responses will remain confidential.

	Strongly agree	**Agree**	**Disagree**	**Strongly disagree**
1. I feel that I'm a person of worth, at least on an equal basis with others				
2. I feel that I have a number of good qualities.				
3. All in all, I am inclined to feel I am a failure				
4. I am able to do things as well as most other people.				
5. I feel I do not have much to be proud of.				
6. I take a positive attitude towards myself.				
7. On the whole, I am satisfied with myself.				
8. I wish I could have more respect for myself.				
9. I certainly feel useless at times.				
10. At times I think I am no good at all.				

Positive and Negative Affect Scale

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale to record your answers.

1	2	3	4	5
very slightly or not at all	**a little**	**moderately**	**quite a bit**	**extremely**

	interested		hostile		nervous
	distressed		enthusiastic		determined
	excited		proud		attentive
	upset		irritable		jittery
	strong		alert		active
	guilty		ashamed		afraid
	scared		inspired		

Illness Cognition Questionnaire

Below is a list of statements of people with a long-term illness. Please indicate **the extent to which you agree** with these statements by circling one of the numbers following the statement that corresponds to your answer. Use the following scale to answer:

1	2	3	4
not at all	**somewhat**	**to a large extent**	**completely**

Do not spend too much time considering your answer. Your first impression is usually the best.

1. Because of my illness I miss the things I like to do the most.	1	2	3	4
2. I can handle the problems related to my illness.	1	2	3	4
3. I have learned to live with my illness.	1	2	3	4
4. Dealing with my illness has made me stronger.	1	2	3	4
5. My illness controls my life.	1	2	3	4
6. I have learned a great deal from my illness.	1	2	3	4
7. My illness makes me feel useless at times.	1	2	3	4
8. My illness has made life more precious to me.	1	2	3	4
9. My illness prevents me from doing what I would really like to do.	1	2	3	4
10. I have learned to accept the limitations imposed by my illness.	1	2	3	4
11. Looking back, I can see that my illness has also brought about some positive changes in my life.	1	2	3	4
12. My illness limits me in everything I do.	1	2	3	4
13. I can accept my illness well.	1	2	3	4
14. I think I can handle the problems related to my illness, even if the illness gets worse.	1	2	3	4
15. My illness frequently makes me feel helpless.	1	2	3	4
16. My illness has helped me realize what's important in life.	1	2	3	4
17. I can cope effectively with my illness.	1	2	3	4
18. My illness has taught me to enjoy the moment more.	1	2	3	4

Life Orientation Test - Revised

Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no "correct" or "incorrect" answers. Answer according to your own feelings, rather than how you think "most people" would answer. For each statement circle that letter next to each statement that corresponds to how much you agree or disagree with each statement.

	I agree a lot	**I agree a little**	**I neither agree nor disagree**	**I DISagree a little**	**I DISagree a lot**
1.In uncertain times, I usually expect the best.					
2. It's easy for me to relax.					
3.If something can go wrong for me, it will.					
4.I'm always optimistic about my future.					
5.I enjoy my friends a lot.					
6.It's important for me to keep busy.					
7.I hardly ever expect things to go my way.					
8.I don't get upset too easily.					
9.I rarely count on good things happening to me.					
10.Overall, I expect more good things to happen to me than bad.					

Instructions: For each of the 44 characteristics listed below, rate how descriptive each characteristic is of you using the scale from 1 to 5 as shown below.

1	2	3	4	5
Disagree strongly	**Disagree a little**	**Neither Agree or disagree**	**Agree a little**	**Agree strongly**

I see myself as someone who . . .

1. Is talkative
2. Tends to find fault with others
3. Does a thorough job
4. Is depressed, blue
5. Is original, comes up with new ideas
6. Is reserved
7. Is helpful and unselfish with others
8. Can be somewhat careless
9. Is relaxed, handles stress well
10. Is curious about many different things
11. Is full of energy
12. Starts quarrels with others
13. Is a reliable worker
14. Can be tense
15. Is ingenious, a deep thinker
16. Generates a lot of enthusiasm
17. Has a forgiving nature
18. Tends to be disorganized
19. Worries a lot
20. Has an active imagination
21. Tends to be quiet
22. Is generally trusting
23. Tends to be lazy
24. Is emotionally stable, not easily upset
25. Is inventive
26. Has an assertive personality
27. Can be cold and aloof
28. Perseveres until the task is finished
29. Can be moody
30. Values artistic, aesthetic experiences
31. Is sometimes shy, inhibited
32. Is considerate and kind to almost everyone
33. Does things efficiently
34. Remains calm in tense situations
35. Prefers work that is routine
36. Is outgoing, sociable
37. Is sometimes rude to others
38. Makes plans and follows through with them
39. Gets nervous easily
40. Likes to reflect, play with ideas
41. Has few artistic interests
42. Likes to cooperate with others
43. Is easily distracted
44. Is sophisticated in art, music, or literature

Inflammatory Bowel Disease Questionnaire

Please indicate how your illness has affected you **during the past 2 weeks**. Circle your answer for each question according to the following scale:

1	2	3	4	5	6	7
more frequent than ever before	**extremely frequent**	**very frequent**	**moderately frequent**	**somewhat frequent**	**slight increase in frequency**	**no increase or normal**

1. How frequent have your bowel movements been?	1	2	3	4	5	6	7
2. How much of the time have your bowel movements been loose?	1	2	3	4	5	6	7
3. How often have you been troubled by cramps in your abdomen?	1	2	3	4	5	6	7
4. How often have you been troubled by pain in the abdomen?	1	2	3	4	5	6	7
5. Overall, how much of the time have you had a problem with passing large amounts of gas?	1	2	3	4	5	6	7
6. How much of the time have you been troubled by a feeling of abdominal bloating?	1	2	3	4	5	6	7
7. How much of the time have you had a problem with rectal bleeding with your bowel movements?	1	2	3	4	5	6	7
8. How much of the time have you been troubled by a feeling of having to got to the bathroom even though your bowels are empty?	1	2	3	4	5	6	7
9. How much of the time have you been troubled by accidental soiling in your underpants?	1	2	3	4	5	6	7
10. How much of the time have you been troubled by feeling sick at your stomach?	1	2	3	4	5	6	7

Appendix B

List of measures in the archival data set that are not included in this study

1. Control Beliefs Inventory (Sirois, 2003)
2. Multidimensional Health Locus of Control (Wallston et al., 1978)
3. Attachment Styles Survey (Simpson et al., 1992)
4. Self-report questions about health specifically related to IBD

Appendix C

Instructions for using the CAVE technique

Extracting and Coding Causal Attributions

1. Code the content of the participant's response into the categories outlined by Roesch & Weiner (2001), which define each category. If content does not fit into one of these categories then specify it as "other"
2. For each response, rate the **INTERNAL-EXTERNAL, STABLE-UNSTABLE, CONTROLLABLE-UNCONTROLLABLE** aspects of the response by circling a number on a seven-point Likert scale. Scores of four are seen as entirely neutral and assigned when the cause is perfectly between the two extremes or if an accurate rating cannot be determined from the information given.

INTERNAL-EXTERNAL refers to the "who" or "what" is responsible for the initial cause of the IBD. This category is defined as either "self-caused or other-caused".

1. Internal-Physiology : refers to causes such as genetics, heredity, auto-immune disorder
2. Internal - Characterological: refers to what the person is or was
3. Internal - Behavioural: refers to what the person does or did

4. External: someone or something other than the participant

(7= internal, cause seen as entirely due to the participant, some sort of behavioural, mental or physical characteristic; 2-6 = if the participant attributes the cause of the IBD to some combination of self and other; 4=complete balance between internal and external causes or if response cannot be determined; 1= external, cause is seen as unrelated to the participant, something or someone totally external to the participant)

STABLE-UNSTABLE refers to

- the length of time the cause is present and the cause's duration,
- the degree to which the cause will influence the participant's life and
- the frequency with which the cause would remain in the participant's life.
- "This is never going to be going away" vs. "one time only".

Important to note that we are assessing stability of the cause, not stability of the disease. The question is "given the IBD, how longlasting is the cause". (7 = stable, cause is seen as chronic/longlasting/unrelenting; 4= balance between stable and unstable causes; 1 = unstable; cause is seen as momentary/highly transient/one time only)

There are four interacting criteria that help determine the rating of the stability dimension.

1. ***The tense of the cause.*** **If the cause of the IBD is in the past tense, then the rating would tend to be less stable than if the cause is in the present tense.**

2. *The probability of future re-occurance of the cause.* A cause that is unlikely to occur again would be less stable than a cause that is likely to occur again.

3. *An intermittent vs. continuous cause.* A cause that is intermittent, such as the weather, would be less stable than a continuous cause, such as a physical trait.

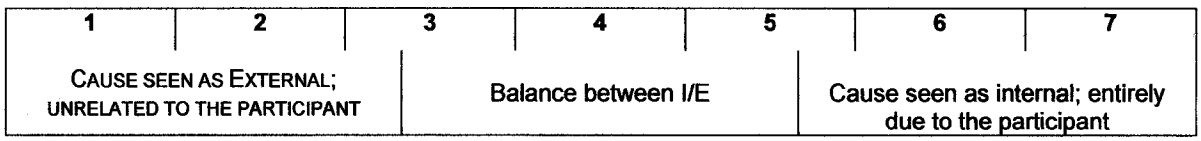
4. *A characterological vs. behavioural cause.* Explaining the IBD by a character trait (I am lazy) is more stable than attributing the IBD to a behaviour (I made a bad decision).

CONTOLLABLE-UNCONTROLLABLE refers to the extent to which the participant

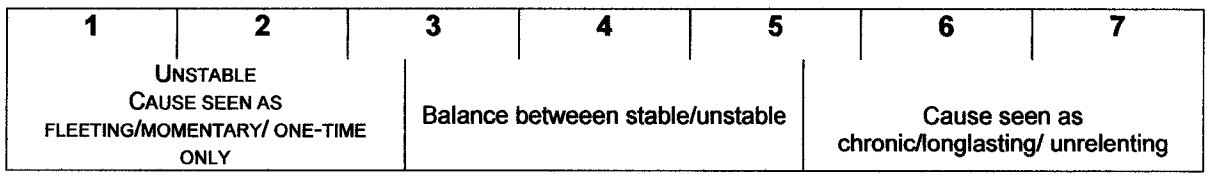
- has the ability to change the cause of their illness
- the difficulty of making such a change.

(1 = controllable; 4 = balance between controllable and uncontrollable; 7= cause is seen as uncontrollable).

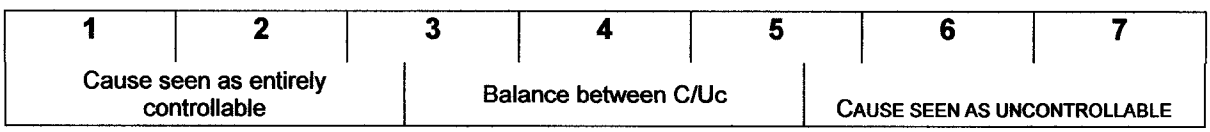
a) Internal-External



b) Stable-Unstable



c) Controllable-Uncontrollable



Appendix D

Brief Overview of Structural Equation Modeling

To begin, Kline (2005) recommends conducting structural equation modeling using a two-step process. That is, by first testing the relationships between the latent variables and their indicator variables using a confirmatory factor analysis measurement model and then, should this model fit the data, assessing the structural model or the direct relationships between latent variables. The idea here is that if the measurement model does not fit the data, then the likelihood of the structural model fitting the data is poor.

The parameter value obtained using AMOS 7.0 (i.e., the direct path leading from the latent variables to its indicator variable) is analogous to a factor loading. In order for this model to be identified, that is, what Kenny (1979) instructs as having enough information in the sample's covariance matrix to solve for the unknown parameter values, one direct path (factor loading) from each latent variable to one of its indicator variables was fixed to 1 and the latent variables were allowed to correlate.

A chi-square statistic is used to assess whether this model fits the data in which a non-significant chi-square indicates very good fit. However, the chi-square statistic generated by AMOS increases as a function of the sample size and is also quite sensitive to departures from the multivariate normality assumption. Therefore, several other "goodness of fit" indices are used to assess model fit. The indices that will be assessed by the current study are: 1) the comparative fit index (CFI), which according to Kline (2005) is among the most widely used fit indices. The values of CFI range from zero to one and the rule of thumb for CFI and many of the other fit indices is that values over 0.90 indicate reasonably good fit and values above 0.95 suggest very good fit. 2) Tucker

Lewis index (TLI), which is a commonly used fit index that follows the same criteria as that of the CFI. However, it should be noted that TLI values are usually much lower than the other fit indices, particularly with smaller sample sizes (Kline). 3) Bollen's incremental fit index (IFI) is another index that is commonly used in the literature and generally follows the same rule of thumb as CFI (Byrne, 2001) and 4) Root mean square of approximation (RMSEA), which is a "badness of fit" index has values that also range from zero to one, however, with this index, higher RMSEA values indicate poor model fit (Kline). Values between 0.05 and 0.08 indicate reasonably good fit and most computer programs usually give 90% confidence intervals for RMSEA in order to glean an accurate impression of model fit (Kline).

VITA AUCTORIS

Jennifer Voth was born in Grimsby, Ontario in 1981. She obtained a B.A. (Hons.) in Psychology at the University of Western Ontario in 2004.