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A gift wrapped in barbed wire: Personal growth among individuals with arthritis or inflammatory bowel disease

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A GIFT WRAPPED IN BARBED WIRE: PERSONAL GROWTH AMONG INDIVIDUALS WITH ARTHRITIS OR INFLAMMATORY BOWEL DISEASE

by

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Abstract

Despite the growing interest in the development of personal growth following a health-related adversity such as the diagnosis of a chronic illness, there has been little research investigating the factors that may give rise to personal growth. The objective of the present study was to explore the experience of posttraumatic growth and to identify the factors associated with posttraumatic growth among individuals with arthritis or inflammatory bowel disease (IBD) at two time points spaced six months apart. Using Schaefer and Moos' (1992) model as a theoretical framework, the association of positive outlook, spirituality, social support, stressors, cognitive appraisal variables, and coping strategies was examined among 214 individuals diagnosed with arthritis and 377 individuals diagnosed with IBD. Two structural equation models were estimated for each illness group. For the IBD group, the results showed that positive outlook, stressors, and social support each had an indirect effect on posttraumatic growth, mediated through symptom control beliefs, benefit-finding, and adaptive coping strategies. For the arthritis group, the results showed that positive outlook and stressors had an indirect effect on posttraumatic growth, mediated though benefit-finding and adaptive coping strategies, whereas social support had an indirect effect on posttraumatic growth, mediated through symptom control beliefs and adaptive coping. Importantly, this study highlights the relative roles of positive outlook, stressors, social support, cognitive appraisal variables and coping strategies that may facilitate the experience of posttraumatic growth among individuals facing a non-life threatening chronic illness.

Dedication

To my beloved Tarik. As much as you think I helped you this year, I think you helped me more. You taught me to believe in myself and you gave me hope when I thought there was none. And… I'll never look at Macs or blue jays the same way again.

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CHAPTER I

Introduction

Research on stress and coping has largely followed the idea that stressful events, or adversity, lead to negative psychological, emotional, and physical outcomes (Updegraff, Taylor, Kemeny, & Wyatt, 2002). The negative impact of adversity is indisputable and can lead to such psychological distress as depression, anxiety, confusion, anger, disrupted personal relationships, and vocational difficulties (Bifulco & Brown, 1996; Finlay-Jones & Brown, 1981; Holland & Rollan, 1989; Nolen-Hoeksema & Morrow, 1991). However, the focus on the negative impact of adversity has resulted in the relative neglect of potentially positive outcomes. That is, the response to adversity is not universally devastating nor is severe psychological distress a normative response. There are reports that in the aftermath of a trauma or adversity, individuals often show persevering resilience and eventually experience enhanced personal growth.

In this context, "personal growth" describes the experience of individuals whose development in some areas has exceeded what was present before the struggle with the trauma occurred. According to a growing body of literature, individuals exposed to even the most traumatic events report at least some personal growth emerging from their struggle (see Linley & Joseph, 2004 for a review). Research investigating reports of personal growth among individuals who have experienced a health-related adversity is growing. Whereas the majority of research on the relation between personal growth and health-related adversity has been conducted on individuals with life threatening diseases, such as cancer and HIV/AIDS, there is an increasing amount of research that suggests

individuals with other forms of chronic diseases, albeit not necessarily life threatening, also experience personal growth.

Chronic illness involves an ongoing, persistent health issue that cannot be cured, and is akin to a chronic stressor or traumatic event. Like many other stressful events, chronic illness effects people differently depending on how the illness is perceived. When the illness is perceived as tragic and uncontrollable, it can undermine an individual's ability to cope, give rise to depression, and negatively impact psychological well-being (Taylor, 1983). However, when the illness is viewed as an opportunity for growth and positive experiences, it can strengthen an individual's ability to find benefits and can improve overall well-being. Although research in this area is growing, our understanding of the incidence and development of personal growth among individuals with a chronic illness is largely unknown. Therefore, the purpose of this study is to examine the experience of personal growth and the factors associated with the experience of personal growth between two chronic illness populations: individuals with arthritis or inflammatory bowel disease (IBD). Using these two illness populations, this study will: (a) explore the experience of personal growth, (b) identify the types of personal growth reported, and (c) test a model of personal growth to reveal the factors potentially relevant to the development of personal growth, and (d) explore how posttraumatic growth is related to later psychosocial well-being. The following sections describe the nature of a traumatic experience, provide a background of personal growth, discuss current conceptualizations of personal growth, and highlight the theories that try to make sense of the phenomenon.

What is a Trauma?

We all use the word "trauma" in every day language to mean a highly stressful event. According to the Diagnostic and Statistical Manual IV (DSM), a trauma refers to experiencing, witnessing, or confronting an event that involves actual or threatened death or serious injury or threat to physical integrity to self or others. Accordingly, traumatic events may include but are not limited to, personal assault (sexual assault, physical attack, robbery, mugging), natural or manmade disasters, military combat, severe automobile accidents, or being diagnosed with a life-threatening illness. Witnessed events include observing the serious injury or unnatural death of another person due to violent assault, accident, war, or disaster. Events experienced by others that are learned about include violent personal assault, serious accident, or serious injury experienced by a family member or a close friend; learning about the sudden, unexpected death of a family member or a close friend, or learning that one's child has a life-threatening disease. This suggests that a trauma includes responses to powerful acute or one-time incidents (e.g., accidents, natural disasters, crimes, surgeries, deaths) as well as chronic or repetitive experiences (e.g., abuse, combat, illness, and enduring deprivation). The response associated with experiencing such can involve emotional (e.g., shock, panic/fear, denial), physiological (elevated blood pressure, fatigue, headache), cognitive (poor concentration, intrusive thoughts), and behavioral (pacing, exaggerated startle) effects.

The key to understanding traumatic events is that it refers to extreme stress that may overwhelm a person's ability to cope. Although different experts define trauma in

different ways, what is emphasized is that it is an individual's *subjective experience* that determines whether an event is or is not traumatic (Pearlman & Saakvitne, 1995). This definition intentionally does not allow *experts* to determine whether a particular event is traumatic - that is up to each survivor.

According to Allen (1995), there are two components to a traumatic experience: the objective and the subjective. Specifically, Allen writes that "It is the subjective experience of the objective events that constitutes the trauma...The more you believe you are endangered, the more traumatized you will be... (Allen, 1995, p.14). In other words, trauma is defined by the *experience of the survivor*. For example, two people could undergo the same harmful event and one person might be traumatized while the other person remained relatively unscathed. As noted by several researchers (e.g., Allen, 1995; Pearlman & Saakvitne, 1995), it is not possible to assume that the particulars or meaning of an event, such as a assault or diagnosis of a life-threatening illness, that are most distressing for one person will be same for another person.

As traumatic as acute or one-time incidents are, the traumatic experiences that tend to result in the most serious mental health problems are prolonged and repeated, sometimes extending over years of a person's life (Pearlman & Saakvitne, 1995). One of the best-documented research findings in the field of trauma is the *dose-response* relationship - the higher the dose of trauma, the more potentially damaging the effects (Powell, Rosen, Butollo, Tedechi & Calhoun, 2003). According to Giller (1999), the effects are likely to be most severe if the trauma is (presented in descending order):

human caused, repeated, unpredictable, multifaceted, aggressive, undergone earlier in life.

Health-related Trauma and Adversity

As noted above, the diagnosis of a life-threatening illness, such as cancer or HIV/AIDS, can be considered a traumatic event. But what about other types of illnesses and diseases? While the term "trauma" may be more appropriately reserved for such life-threatening illnesses, the diagnosis of a chronic illness can be intense, extremely distressing, and involve serious life disruptions that change the trajectory of one's life. According to Bury (1982), chronic illness which has no well-defined recovery point is a profoundly disruptive experience, because everyday life and the assumptions underlying one's life are altered and reexamined. Similar to the idea of the *subjective experience* of a trauma discussed above, a biomedical focus on symptoms and processes reveals only one aspect of the full range of what it means to have a chronic illness. In order to distinguish between life-threatening illnesses and other serious chronic illnesses, the term "health-related adversity" will be used henceforth to describe the diagnosis and experience of a chronic disease.

According to the Ministry of Ontario Health and Long Term Care (MOHLTC, 2005), chronic diseases can develop slowly, last long periods of time, and in most cases, there is no cure. The long-term effects of a chronic illness may be difficult to predict. Some illnesses involve few problems and symptoms that can be controlled with medication. In some cases, a chronic disease may severely limit a person's ability to work, go to school or take care of routine needs. Examples of such chronic diseases

include diabetes, congestive heart failure, asthma, hypertension, chronic kidney disease, inflammatory bowel disease, arthritis, emphysema, and multiple sclerosis. Despite the wide variety of chronic diseases, there are many similar concerns for those who live with them. Common concerns may include knowing how to recognize and respond to changes in a chronic disease, using medicines and treatments effectively, coping with fatigue, pain and sleep problems, maintaining good nutrition, making decisions about when to seek medical help, talking about your illness with family and friends, and managing work, family and social activities.

Arthritis and Inflammatory Bowel Disease

The present study examines the experience of personal growth across two chronic illnesses: arthritis and inflammatory bowel disease (IBD). There two specific illness groups were not chosen arbitrarily. While both of these diseases affect men and women, persons of all ages, and can be profoundly disruptive experiences (Bury, 1982; Lee & Poole, 2005), the psychological, social, and physical implications of these diseases are vastly different. That is, the ways in which these two diseases are experienced - not only by way of symptoms - vary tremendously. IBD is a less widespread condition and associated with more stigma than arthritis (Casati et al., 2000; Hall et al., 2005). Moreover, IBD could be considered an "invisible" disease in that, other than weight loss, weight gain, and fatigue, most IBD-related symptoms generally occur internally (e.g., abdominal pain and cramps). This is in contrast with arthritis in that the physical effects may be readily apparent (e.g., disfigured joints, use of a cane or crutches). Therefore, examining individuals with arthritis and IBD will provide additional information about

how personal growth is experienced and if it is experienced differently as a result of illness context. The following sections discuss each disease in more detail, and highlight the similarities and differences.

Arthritis. Arthritis is one of the most prevalent chronic health conditions in Canada and a major cause of morbidity, disability and health care utilization (Wolfe et al. 1991, Doeglas et al., 1995; Krol et al., 1993). According to the 2000 Canadian Community Health Survey (CCHS; Health Canada 2003), arthritis and other rheumatic conditions affected nearly four million Canadians aged 15 years and older – approximately 1 in 6 people. Two-thirds of those with arthritis are women, and nearly three in every five people with arthritis were younger than 65 years of age.

Arthritis refers to inflammation of the joints and consists of more than 100 different conditions, and there is no known etiology, course or radical treatment. These can range from relatively mild forms of tendonitis (i.e., tennis elbow) to crippling forms, such as rheumatoid arthritis. Further, there are pain syndromes like fibromyalgia and arthritis-related disorders, such as systemic lupus, that involve every part of the body. Often that pain is a result of inflammation of the joint lining. This can prevent the normal use of the joint and therefore it can cause the loss of function of that joint (Health Canada, 2003). The disease is typically accompanied by pain, fatigue, unpredictability and inevitable disability (Wolfe et al., 1991). For example, compared with people with other chronic conditions, those with arthritis experienced more pain, activity restrictions

and long-term disability, were more likely to need help with daily activities, and reported worse self-rated health (Bartlett et al., 2003; Health Canada, 2003).

Suffering from this chronic disease does not only mean potential deterioration of physical functioning but also deterioration of social and psychological functioning. In severe cases of arthritis, the individual's social roles, capacity to work, independence, self-concept, mood and psychological well-being are usually affected as well (Doeglas et al., 1995; Krol et al., 1993). For example, compared to healthy controls and patients with other chronic diseases, individuals with rheumatoid arthritis demonstrated poorer psychological well-being (Smedstad et al., 1996). Moreover, the perceived amount of stress experienced on a daily basis can be a consequence of illness or disease. As noted by Health Canada's (2003) report, the only significant differences in the level of perceived stress between people with arthritis and individuals with other chronic conditions were in the youngest age groups (15 to 44 years) and in those aged 65-74. The proportion in each of these age groups who reported finding extremely stressful was nearly twice as high for people with arthritis as it was among those living with other chronic conditions. Moreover, in a study comparing women with rheumatoid arthritis to healthy women (all aged 50-75 years), the women with rheumatoid arthritis showed a less-active pattern of social engagement than the healthy women (Zautra et al., 2000).

Inflammatory bowel disease. IBD refers to two chronic diseases that cause inflammation of the intestines: ulcerative colitis and Crohn's Disease. The onset of these diseases occur most frequently in individuals aged 15 to 30, but disease onset can also occur in younger children and older people. In Canada, Bernstein, Wajda, Svenson,

MacKenzie, Koehoorn, Jackson, Fedorak, Israel, & Blanchard (2006) found that significantly more women than men (controlling for age) reported having Crohn's disease but there was no gender difference for Ulcerative Colitis. The authors further noted that Canada has the highest incidence and prevalence of Crohn's disease yet reported. Approximately 0.5% of Canadians have inflammatory bowel disease, which means ulcerative colitis and Crohn's disease together strike about one in 350 persons.

IBD is a chronic disorder of uncertain and likely complex pathogenesis and is characterized by remissions and relapses. In addition to inflammation of the intestines and development of ulcers, symptoms include abdominal cramps, weight loss, systemic signs of inflammation, rectal bleeding, diarrhea, urgency, nausea and fatigue. Extra-intestinal complaints involving eyes, joints, skin and the hepatobiliary system can also be present (CCFC, 2006). Individuals are at increased risk of surgery and other complications. More than one-third of those with childhood-onset IBD will eventually require surgery (Langholz, Munkholm, Krasilnikoff, & Binder, 1997). There is no cure, so patients may take many medications to control the inflammation and symptoms.

IBD is a potentially disabling chronic disease that can have a severe impact on physical, social and psychological well-being (Casati, Toner, DeRooy, Drossman & Maunder, 2000; Jones, Bratten, & Keefer, 2007; Searle & Bennett, 2001). As disease onset often occurs during adolescence, the symptoms can be embarrassing, socially limiting, and lead to changes in physical appearance. Symptoms include frequent diarrhea, abdominal pain, weight loss or growth delay, and possibly fever, fatigue, and

delayed puberty. Because of the unpredictable nature of the disease, IBD is seen as responsible for restriction in activity or freedom and affected all aspects of everyday life. This included social and family relationships, fulfilling roles such as caring for the family as well as social activities, work, travel, shopping and even in some cases simply leaving the house.

In a recent study comparing individuals with IBD to healthy adolescents, Mackner et al. (2006) found that adolescents with IBD reported to have worse anxious and/or depressed and social problems than healthy adolescents. In a qualitative study of individuals with IBD, Hall et al. (2005) reported that participants saw their disease in terms of their bodies being "under attack" by an inconvenient, smelly, painful and embarrassing disease. Graff et al. (2006) examined a total of 388 individuals diagnosed within 7 years were recruited from a population-based registry of IBD patients for the Manitoba IBD Cohort Study. Seventy-four percent of Crohn's disease and 66% of ulcerative colitis participants had active disease during the previous six months. Results showed that those with active disease had higher levels of distress, health anxiety, and perceived stress, lower social support, well-being and mastery, and poorer disease-specific QOL, relative to those with inactive disease.

The Experience of Personal Growth Following Trauma or Adversity

Despite the potentially devastating effects a trauma or adversity, many individuals consistently demonstrate resilience and report experiencing enhanced personal growth. Life crises and traumas that have produced reports of personal growth include bereavement (Davis, Nolen-Hoeksema & Larson, 1998; Polantinsky & Esprey, 2000),

natural disasters such as earthquakes (Vázquez, Cervellón, Pérez-Sales, Vidales, & Gaborit, 2005), ship sinking (Joseph, Williams, & Yule, 1993), and minor life stressors among college students (Park, 1996), human-inflicted traumas such as bombing (Pargament, Smith, Koeing, & Perez, 1998), assault (Frazier, Conlon, & Glaser, 2001; McMillen, Smith & Fisher, 1997; McMillen, Zuravin & Rideout, 1995; Snape, 1997; Thompson, 1985), and military combat (Fontana & Rosenheck, 1998; Schnurr, Rosenberg, & Friedman, 1993; Waysman, Schwarzwald, & Solomon, 2001).

There is also a substantial amount of research showing that exposure to a health-related trauma is associated with personal growth. Such heath-related traumas include cancer (Best, Streisand, Catania, & Kazak, 2001; Cordova, Cunningham, Carlson, & Andrykowski, 2001; Fromm, Andrykowski, & Hunt, 1996; Weiss, 2004), spinal cord injury (McMillen & Cook, 2003), HIV/AIDS (Massey, Cameron, Ouellette, & Fine, 1998; Siegel & Schrimshaw, 2000; Updegraff et al., 2002), and various types of chronic illness (Abraido-Lanza, Guier, & Colon, 1998; Affleck, Tennen, Croog, & Levine, 1987; Evers, Kraaimaat, van Lankveld, Jongen, Jacobs, & Bijlsma, 2001; King, Scollon, Ramsey, & Williams, 2000; Tennen, Affleck, Urrows, Higgins, & Mendola, 1992).

To date, only three studies have investigated personal growth among individuals with arthritis (Danoff-Burg et al., 2005; Katz et al., 2001; Tennen et al., 1992). Specifically, the results from two longitudinal studies suggest that individuals with rheumatoid arthritis were able to identify benefits resulting from their illness experience and grow in areas of interpersonal relationships, spirituality, and personal values. Similarly, Katz et al. reported that individuals with lupus also reported personal growth.

There has been no study to investigate whether individuals with IBD also report personal growth, and there have been few studies that have examined the coping of individuals with IBD (Jones et al., 2007). However, in a study of parents with IBD, Mukherjee et al. (2002) reported the main positive effect for parents was developing a closer relationship with their children.

Background of Personal Growth Following Adversity

Although researchers have tended to focus on the negative effects of trauma and adversity, research and interest in perceived positive outcomes following adversity is not entirely new (e.g., Caplan, 1964; Frankl, 1963). For example, drawing upon his experiences in the Auschwitz concentration camp, Frankl wrote that negative events or circumstances could have a positive impact on personal development, such that they can provide opportunities for finding meaning and restore the notion that one's own life has purpose, value, and worth. Frankl further wrote that the perception that one's life has purpose and worth is critical to self-esteem and well-being. Likewise, Caplan (1964) saw life crises as a period of intense disequilibrium, and proposed that most individuals manage life crises in four to six weeks during which time changes are formed that may remain stable for years afterwards. Specifically, Caplan suggested that individuals dealing with a trauma might be helped to cope effectively and, as a result, to experience personal growth. A decade later, Finkel (1974) introduced the concept of "strens," or life events that promote psychological well-being. In his research that examined the impact of life events on psychological well-being, Finkel found that strens were usually associated with positive life events; however, he found that strens were also associated

with *negative* life events such as traumas. In fact, 36% of participants reported life events that involved elements of both strens and trauma, prompting Finkel to look more closely at the process by which traumas were "converted" into strens. Finkel suggested that these conversions were essentially cognitive in nature and typically occurred between two weeks and four months. Besides these early examples of research and theorizing, few other researchers focused on personal growth. Most of the studies that did acknowledge growth tended to focus on coping with trauma whereby growth was mentioned as a coping strategy or was described in passing (Calhoun & Tedeschi, 1998).

A Renewed Interest in Positive Outcomes

It was not until the 1980s, and then more often in the 1990s, that researchers began to focus on personal growth. One of the reasons for the renewed interest was the overwhelming evidence that individuals, facing a wide variety of very difficult circumstances, experience significant positive changes in their lives. Moreover, the renewed interest in growth may be a reflection of the increasing emergence of the positive psychology movement. Positive psychology is a relatively new and rapidly expanding field focused on the empirical study of optimal human functioning and aims to discover and promote the factors that allow individuals to thrive (Seligman & Csikszentmihalyi, 2000). As discussed in their paper, Seligman and Csikszentmihalyi note that the field of psychology has three distinct missions: (a) making the lives of people more productive and satisfying, (b) identifying and nurturing talent, and (c) curing mental illness. However, ever since World War II researchers have devoted a great deal of time to understanding and curing mental illness and have generally neglected the other

two missions. Until recently, theorists and researchers alike have started to devote a great deal of energy to the study of human strengths. Thus, positive psychology may represent a catalyst for a renewed interest in the remaining two missions and reinforce the notion that psychology is not only the study of mental pathology but it is also the study of human strength and virtue.

As noted above, previous research investigating outcomes following adversity has generally focused on the negative implications which has led to a biased understanding of posttraumatic reactions (Linley & Joseph, 2004). More recently, and in accordance with the positive psychology movement, a greater amount of research has devoted more attention to the negative *as well as the positive* outcomes following adversity. This trend has afforded for a more comprehensive understanding of personal growth.

Definition of Personal Growth

The area of personal growth research is conceptually limited. One of the most observable problems is that there is currently no clear consensus as to what personal growth derived from adversity should be termed. For example, researchers apply various terms to describe personal growth. The three most common terms include *benefit-finding* (Tennen & Affleck, 2002), *positive reappraisal coping* (Scheier, Weintraub, & Carver, 1986), and *posttraumatic growth* (Tedeschi & Calhoun, 1996). Less frequently used terms include *stress-related growth* (Park, Cohen, & Murch, 1996), *adversarial growth* (Joseph & Linley, 2004), *flourishing* (Ryff & Singer, 1996), *positive-by-products* (McMillen, Howard, Nower, & Chung, 2001), *thriving* (O'Leary & Ickovics, 1995), *stren conversion* (Finkel, 1974), *positive psychological changes* (Yalom & Lieberman, 1991),

and *perceived benefits or construing benefits* (McMillen et al., 1995; Tedeschi & Calhoun, 1996; Tennen et al., 1992). Indeed, Rothbaum, Weisz, and Snyder (1982) speculate that the imprecision of the construct may in part derive from how it was developed with respect to Frankl's (1963) work and has limited researchers' ability to study it scientifically. However, recent theorizing (e.g., Davis et al., 1998; Pakenham, Sofronoff, & Samios, 2004; Tennen & Affleck, 1996) has sharpened the distinctions between the three most commonly used terms: benefit-finding, positive reappraisal coping, and posttraumatic growth. A more detailed discussion that attempts to make these conceptual distinctions clear is provided below.

Benefit-finding, Positive Reinterpretation, and Posttraumatic Growth

Both benefit-finding and positive reinterpretation coping are frequently used incorrectly to describe growth or changes following adversity. According to Tennen and Affleck (2002), *benefit-finding* is defined as the identification of benefits from adversity. Benefit-finding can manifest itself several ways, including the awareness of deepened interpersonal relationships, an enhanced sense of spirituality and life purpose, and an increased appreciation of life (Affleck et al., 1987; Davis et al., 1998). However, *positive reinterpretation* (Scheier et al., 1986) refers to ways of coping with a trauma by reframing events related to the crisis in a more positive light, thus signifying a process rather than an outcome of adversity. In contrast to both these terms, *posttraumatic growth* specifically refers to the experience of significant positive change arising from the struggle with adversity (Calhoun & Tedeschi, 2001).

Although researchers continue to use these terms interchangeably (e.g., Stanton, Bower, & Low, 2006), substantial evidence is accumulating that suggests that benefit-finding, positive reinterpretation, and post-traumatic growth are in fact different constructs (e.g., Sears, Stanton, & Danoff-Burg, 2003; Tennen & Affleck, 1996). For example, Sears et al. reported that the identification of benefits, positive reappraisal coping and posttraumatic growth were only moderately correlated and each had different predictors. Furthermore, they demonstrated that the identification of benefits and the intentional and repeated use of benefit-related information as a coping strategy may over time lead to perceptions of positive change among women with breast cancer. These findings are consistent with Affleck and Tennen's (1996) distinction between beliefs about benefits from adversity (*benefit-finding*) and the use of such knowledge as a deliberate strategy of coping with the problem (*benefit-reminding*).

Posttraumatic Growth

The term used throughout this study to conceptualize personal growth following adversity is Tedeschi and Calhoun's (1996) label *posttraumatic growth.* According to Tedeschi and Calhoun, posttraumatic growth emphasizes that the individual has not only survived but has experienced changes that exceed their previous level of functioning. That is, posttraumatic growth is not simply a return to baseline, but describes the experience of individuals whose development in some areas has transcended what was present before their struggle with the trauma.

The term posttraumatic growth is favoured in this study because it appears to capture the essence of personal growth better than other terms in several ways. First,

compared to stress-related growth, adversarial growth and thriving, posttraumatic growth tends to focus on major life disruptions, particularly those involving a considerable amount of stress. This distinction is important because according to several researchers (e.g., Janoff-Bulman, 1992; Taylor, 1983), posttraumatic growth may require a significant threat or the shattering of fundamental schemas and may at times coexist with significant psychological distress - something these other terms do not connote. Second, research to date suggests that posttraumatic growth seems to have a great impact on people's lives and involve fundamental changes or insights about living. This suggests that personal change is not merely another coping mechanism but rather an outcome or an ongoing process. Finally, terms such as perceived benefits imply that the benefits identified may not be real or valid (e.g., Taylor, 1983), whereas posttraumatic growth emphasizes real changes (e.g., changes in diet and lifestyle). To some, these terms represent semantic choices. Regardless of the choice of term, the last 15 years has seen considerable interest in the reports of growth resulting from a major life crisis.

Domains of Posttraumatic Growth

Posttraumatic growth can manifest itself in many ways. According to Tedeschi and Calhoun (1996), the growth outcomes reported vary from person to person, but tend to fall within certain categories. That is, posttraumatic growth is conceptualized as a multidimensional construct, suggesting that persons may report experiencing growth in one area while not in other areas. There are at least three broad categories of growth that

have been identified: *changes in self, changes in interpersonal relationships, and changes philosophy of life.* Each of these domains are described in more detail below.

Perceived changes in self. One class of benefits cited by individuals who have faced trauma involves positive change in how they perceive themselves. Persons coping with a traumatic event often draw the conclusion that they are stronger (Thomas et al., 1991), possessing a confidence which may generalize to all kinds of situations including future traumas. The perception of personal strength reported by survivors of trauma is often interpreted as a sense of increased self-reliance or self-efficacy. Much of the evidence for the link between trauma and self-efficacy comes from the literature on spousal bereavement (Calhoun & Tedeschi, 1990; Thomas et al., 1991). For example, Thomas et al. found that older women who lost their husbands reported that out of necessity they learned to do things that they never did before.

Moreover, survivors of trauma frequently report that "if I survived this I can handle anything" (Aldwin, Levenson & Spiro, 1994). There is not much literature available to make a case that persons experiencing a subsequent trauma would be less vulnerable to it. Phifer and Norris (1989) found that a subsequent flood did not affect individuals who survived a previous flood, whereas persons who experienced a flood for the first time developed more psychological symptoms. This line of reasoning is consistent with literature on stress inoculation (e.g., Meichenbaum & Novaco, 1985) and leads to the conclusion that experiencing a stressful event can enhance one's ability to face future stressors.

Paradoxically, even among those individuals who recognize their strengths, survivors of trauma frequently describe a heightened awareness of their vulnerability, mortality, and the preciousness of life. As noted by Calhoun and Tedeschi (2006), a sense of vulnerability does not immediately seem compatible alongside positive changes, but it can motivate positive changes in terms of interpersonal relationships, appreciation of life, and priorities for spending one's time.

Changes in interpersonal relationships. The recognition of one's vulnerability can lead to more emotional expressiveness and a willingness to accept help - a use of social supports that had previously been overlooked. For example, people confronted with a traumatic event may feel a need to discuss the consequences of the event. In turn, this can lead to individuals becoming more self-disclosing than they were before. Self-disclosure may provide an opportunity for the individual to reflect on the events, which in turn may aid in identifying meaning and possible benefits that have resulted (Calhoun & Tedeschi, 2006). Indeed, the ability to express feelings and disclose personal information is related to various indices of mental and physical health (Henderson, Davison, Pennebaker, Gatchel, & Baum, 2002). However, there are some instances whereby openness and expressiveness may not always be seen as a more positive way of relating to others. For example, researchers focusing on sexual assault victims have described positive changes in interpersonal relationships that instead involve increased caution (Frazier & Burnett, 1994; McMillen et al., 1995).

Moreover, experiencing strong emotions during and in the aftermath of trauma may be a kind of empathy training that allows a survivor to develop more compassion

towards others. According to Wills (1987), survivors of trauma often are motivated to share their experiences with others, and to help others in similar circumstances. That is, survivors of trauma have a strong motivation to share this "gift" of knowledge with others who are experiencing similar circumstances. In this way, interpersonal relationships may be strengthened by the need for support among those who are also hurting and through a reciprocal process of giving and receiving support.

A changed philosophy of life. According Tedeschi and Calhoun (1995), trauma often prompts consideration of fundamental questions about life and spirituality. Individuals who have experienced a trauma, or *survived* a traumatic event, frequently refer to the event as a second chance or a "wake up call" (Janoff-Bulman, 1992). Changes in life priorities often involve a recognition that it is important to spend more time on their intimate relationships, to appreciate the "little things" in life, and to take life a bit more slowly (Taylor, Lichtman & Wood, 1984; Tedeschi & Calhoun, 1996). Moreover, many traumatic events question the most fundamental assumptions about life and the nature of existence, that survivors of trauma previously may have not seriously considered. Although these existential changes can be regarded as growth, they are not necessarily pleasant because they involve the meaning and purpose of life and the inevitability of death (Yalom & Lieberman, 1991). Recognizing meaning in the trauma may allow a person to experience emotional relief and lead to a new philosophy of life that alters basic assumptions people hold about life (Janoff-Bulman, 1992; Taylor & Brown, 1988).

Experiencing trauma or adversity may eventually lead some individuals to develop spiritual beliefs or to use their existing spiritual or religious beliefs to understand and cope with a trauma (Pargament, 1997; Pargament, Ensing, Falgout, Olsen, & Reilly, et al., 1990). Spirituality in this context refers to a greater sense of being connected to something transcendent, in ways that were not possible before the trauma (Calhoun & Tedeschi, 1991). This may involve a greater sense of a presence of God or a connection to something greater than oneself, an increased sense of commitment to one's chosen religion, or a clearer understanding of one's religious beliefs. Pargament (1997) notes that a strengthening of religious beliefs may lead to an increased sense of control, intimacy, and finding meaning.

In addition to spirituality, a change in philosophy of life may be a route to wisdom, involving an increased understanding about basic issues of living learned in a powerful manner through suffering. Although few studies have examined the relation between wisdom and posttraumatic growth, several studies of trauma yield some evidence that wisdom may grow as a result of trauma (Collins, Taylor and Skogan, 1990; Lehman, Davis, DeLongis, Wortman, Bluck, et al., 1993). For example, Neugarten (1976) described how people who have lived through physical and psychological pain reported that they recognized that they were enriched by these events. Furthermore, there is evidence that wisdom is not reserved for the elderly, and that some younger persons can operate from a similar perspective on life (Baltes, Staudinger, Maercker, & Smith, 1995). Hence, the development of wisdom appears to have more to do with life experiences and the ways people cope with adversity than age per se.

Posttraumatic Growth: Conceptual Issues

Just as different terms are used to describe positive growth following adversity, there are also a variety of scales used to measure it. Although this study focuses on posttraumatic growth, which will be measured by the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996), it may be helpful to discuss this scale as well as the other frequently used growth scales. Besides the PTGI, there are at least five scales designed to assess growth following adversity. These scales include the Changes in Outlook Questionnaire (CiOQ; Joseph et al., 1993), the Stress-related Growth Scale (SRGS; Park et al., 1996), the Perceived Benefit Scale (PBS; McMillen & Fisher, 1998), the Thriving Scale (TS; Abraido-Lanza et al., 1998), and the Illness Cognition Questionnaire (ICQ; Evers et al., 2001).

Besides the number of scales that purportedly measure personal growth, several major methodological issues hinder measurement and interpretation of the growth scales mentioned above. First, there is no standard definition of what constitutes growth from the perspectives of those who have experienced adversity that may guide item selection for measurement development. Second, there is little consensus as to the number of growth domains. Both the CiOQ and the SRGS conceptualize growth as a unidimensional construct, but the remaining four scales conceptualize growth as a multidimensional construct. Thus, it is unclear whether positive change following adversity is most appropriately understood as a unitary construct or as a collection of distinct components grouped hierarchically. Third, a variety of samples have been used to

develop and test these scales. For example, both the PTGI and the SRGS were developed using a college undergraduate population (Park et al., 1996; Tedeschi & Calhoun, 1996), the PBS was developed using adults involved in church activities (McMillen & Fisher, 1998), and the TS was developed using Latinas with chronic illness (Abraido-Lanza et al., 1998). Few researchers have tested the psychometric properties of these scales using different illness populations; hence, it is unclear whether the scales adequately assess, or fail to assess, dimensions of growth similarly across various trauma or illness populations.

Posttraumatic Growth: Psychometric Issues

Of the growth scales developed, the PTGI (Tedeschi & Calhoun, 1996) is the most frequently used. The PTGI comprises 21 items measured on a 6-point scale, with response options ranging from 0 (*I did not experience this change as a result of my crisis)* to 5 (*I experienced this change to a very great degree as a result of my crisis*). The PTGI items were developed based on a literature review, and were then administered and evaluated using college undergraduates who experienced minor less stresses (e.g., illness or injury, bereavement, parents divorce). Principal components analysis with orthogonal rotation revealed five factors that accounted for about 60% of the variance: (a) Relating to Others (seven items; e.g., "Knowing that I can count on people in times of trouble"); (b) New Possibilities (five items; e.g., "I'm able to do better things in my life"); (c) Personal Strengths (four items; e.g., "Knowing I can handle difficulties"); (d) Spiritual Change (two items; e.g. "I have a stronger religious faith"); and (e) Appreciation of Life

(three items; e.g. "My priorities about what is important in life"). According to the initial psychometric testing, both the full scale (coefficient alpha of .90) and the separate subscales (coefficient alphas ranged from .67 to .85), the PTGI demonstrated acceptable internal reliability.

Besides the initial psychometric testing by Tedeschi and Calhoun (1996), only a few researchers have investigated the psychometric properties and dimensionality of the PTGI (Joseph, Linley, & Harris, 2005; Polantinsky & Esprey, 2000; Powell, et al., 2003; Taku, Cann, Calhoun, & Tedeschi, 2008; Updegraff & Marshall, 2005). Using a large sample of physically injured survivors of community violence, Updegraff and Marshall conducted a confirmatory factor analysis of the PTGI and found support for the proposed five-factor model. However, other studies have not found such support. For example, Polantinsky and Esprey tested the PTGI using a small sample of South African parents (N = 67) who had lost a child and found that the PTGI factors were highly intercorrelated and had low subscale reliabilities (e.g., coefficient alphas ranged from .26 to .67). Powell et al. tested the PTGI using a sample of former refugees and displaced people in Sarajevo, and although they reported acceptable reliability for the five factors, a principal components analysis with varimax rotation yielded only three interpretable factors. Similarly, Ho, Chan, and Ho (2004) conducted a confirmatory factor analysis on data from the PTGI using Chinese cancer patients (N = 188). The results showed a different factor structure whereby the factors were interpreted as four factors: changes in the self, spiritual changes, changes in life orientation, and interpersonal changes. However, both

Powell et al. and Ho et al. used translated versions of the PTGI which may limit their applicability.

More recently, Taku et al., (2008) tested five possible models underlying the structure of the PTGI to see whether the PTGI comprises three domains (Changed Perception of Self, Changed Interpersonal Relationships, and Changed Philosophy of Life), five factors (Relating to Others, New Possibilities, Personal Strength, Spiritual Change, and Appreciation of Life), or a unitary dimension. Using confirmatory factor analysis on data from 926 participants who had experienced a variety of traumatic events completed the PTGI, the results showed an oblique five-factor model best fit the data, therefore revealing the PTGI was multidimensional. Although their study represents one of the first attempts to rigorously test the PTGI, their samples typically consist of university undergraduates. The extent to which the same or similar findings would be observed in an illness population, for example, is unknown. Therefore, additional rigorous psychometric testing of the PTGI is necessary.

Further adding to the debate regarding the validity of the PTGI, data from qualitative studies suggests that the PTGI, as well as the other scales mentioned, may not cover all relevant dimensions of growth. The debate regarding the pros and cons of using qualitative versus quantitative data are beyond the scope of this paper, but certainly one of the primary advantages of a qualitative approach is that it may be able to capture a wider variety of growth domains, and therefore augment the depth and scope of existing instruments (McMillen, 2004). That is, participants provide their information without being prompted by specific items on growth scales, and researchers can be relatively

certain that the growth responses given are relevant to the participant. Such information is particularly useful in the early phases of research on a given topic because it allows researchers to identify the content of items that can then be used in later quantitative research.

Qualitative research and anecdotal evidence shows that, following adversity, positive change may occur in domains that are unassessed by current scales. For example, many people view cancer as a "wake up call" and make positive changes in their health habits such as dietary changes, increasing regular exercise and reducing the use of cigarettes or alcohol (American Cancer Society, 2006). Similarly, qualitative studies suggest that one of the more prevalent positive changes among individuals with HIV/AIDS is the adoption of positive health behaviors (Siegel & Schrimshaw, 2000; Updegraff et al., 2002). In addition to decreasing their use of cigarettes and alcohol and improving their diet, Siegel and Schrimshaw reported that women with HIV/AIDS adjusted their life goals. That is, they developed a new set of life goals that included helping others by becoming involved in AIDS advocacy, education and care provision. Likewise, King and Patterson (2000) found that parents of children with Down Syndrome developed a new set of life goals.

Another domain that is not assessed by current growth scales relates to one of Janoff-Bulman's (2004) proposed aspects of growth. In addition to gaining strength through suffering and learning fortitude, and existential reevaluation – both of which are adequately represented on current growth scales - there is a third aspect that is not measured: psychological preparedness. According to Janoff-Bulman, psychological

preparedness involves changes in one's assumptive world, whereby people are better prepared for subsequent adversities, and therefore, less traumatized by them. That is, Janoff-Bulman theorizes that rebuilding one's assumptive world should lead to greater psychological protection. Further research is needed to uncover and test the various domains of growth.

Theoretical Underpinnings of Posttraumatic Growth

Many of the theories that help explain the development and experience of posttraumatic growth involve elements of perceived control. Perceived control, or *control beliefs*, refers to an individual's beliefs about how much control they have over a given situation. Theorists from a wide variety of perspectives have been emphatic about the importance of control beliefs, and it has helped to shape our thinking about the role of beliefs in the context of health behaviors, health outcomes and health care. Control beliefs are important because they are part of the self-concept and contribute to the planning, initiation and regulation of goal-oriented behaviour. In fact, Rothbaum et al. (1982) note that low levels of control beliefs are associated with passivity, submissiveness, and withdrawal behaviours. There is substantial evidence that control beliefs are associated with positive health outcomes and more specifically adjustment to health challenges (Frazier, Steward, & Mortensen, 2004). For example, in a recent study on adjustment of people with tinnitus, a chronic condition that is both distressing and potentially disabling, Sirois, Davis and Morgan (2006) found that general health and symptom control beliefs were related to better psychological adjustment.

In the aftermath of a stressful event, control beliefs are challenged and individuals are motivated to restore them (Janoff-Bulman, 1992). One of the ways in which they can achieve this is through cognitive adaptation. There are at least three theories that underlie the idea of posttraumatic growth: Rothbaum et al.'s (1982) Two-process Model of Perceived Control, Taylor's (1983) Cognitive Adaptation Theory, and Janoff-Bulman's Theory of Restoration of Assumptive World (1992). The three theories are discussed below.

Two-Process Model of Perceived Control (Rothbaum et al., 1982)

Rothbaum et al. (1982) view the discovery of positive outcomes following adversity as a "secondary control" appraisal, one that provides a comforting alternative to feelings of helplessness from the loss of primary or personal control over an uncontrollable event. To illustrate this, Rothbaum et al. broaden our understanding of control beliefs by distinguishing two process models: the one-process model and the two-process model. The one-process model refers to the individual's ability to change the environment to fit the self's needs; this model is consistent with learned helplessness and control theorists' conceptualization of perceived control. In contrast, Rothbaum et al. propose that the pursuit for control involves a two-process model whereby people attempt to regain control beliefs by aligning the environment with their own views (*primary control*) and by aligning their own views with the environment (*secondary control*). In other words, primary control attempts to change the world so that it fits the existing cognitive structure whereas the secondary control attempts to fit in with the world and to "flow with the current," and hence, individuals accommodate and change their cognitive

structure. This distinction highlights the relevance of secondary control for adjusting to health-related adversity. That is, health-related adversities cannot be adjusted through primary control because the individual may go into complete denial of their health problem. For example, believing you do not have cancer when you do is not reasonable, which highlights why secondary control or adapting to the illness is a much more adaptive response.

Within Rothbaum et al.'s (1982) two-process model of control, four types of control beliefs are distinguished: predictive, illusory, vicarious, and interpretive. The type of control belief that is most applicable to this review and which will therefore be the focus is *interpretive control*. Interpretive control refers to the search for meaning or understanding following loss or trauma and finding positive implications. It also relates to each of the previous three kinds of control beliefs because these attributions help individuals find meaning in events and thus accept them. As suggested by the model, coming up with an explanation and finding benefits gives some understanding to the "bizarreness" of the event and may help restore some degree of control beliefs to the individual. Accordingly, the two-process model suggests that diminished stress reflects the successful attainment of finding meaning and positive implications and thereby the ability to accept potentially stressful events, or live with one's reality.

Cognitive Adaptation Theory (Taylor, 1983)

According to Cognitive Adaptation Theory, successful adjustment following adversity is achieved through a series of positive cognitive adaptations (Taylor, 1983).

Specifically, the adjustment process focuses on three themes: (a) searching for meaning, (b) gaining a sense of mastery, and (c) restoring self-esteem. *Searching for meaning* involves trying to understand why a crisis occurred and its impact in order to achieve or maintain an optimistic attitude towards the event or life in general. This may include a causal analysis and/or a rethinking of one's attitudes and priorities in attempts to restructure one's life along more pleasing lines. *Gaining a sense of mastery* involves trying to regain control over the event or over one's life in general. Taylor suggests that sense of mastery can be preserved by focusing on areas of one's life where one continues to experience control. For example, an individual who suffered a heart attack may turn to psychological effects (e.g., meditation) or behavioral effects (e.g., diet) in order to gain a feeling of control over the threatening event so as to manage it or keep it from occurring again. *Restoring self esteem* involves efforts to enhance a positive sense of self. For example, adversity may impact one's sense of self in a negative way (e.g., I am weak). Construing personal benefits from the experience by comparing oneself to others who are less fortunate (i.e., downward comparison) or by focusing on aspects of one's own situation that make one appear to be well off aid in restoring a positive sense of self.

Janoff-Bulman's Theory of Restoration of Assumptive World (1992)

To understand the adaptive value of appraisals of personal growth under threat requires an appreciation of the ways in which major adversities can threaten our most treasured assumptions about ourselves and our world. The final theory, which can be seen as compatible within Rothbaum et al.'s (1982) formulation of secondary control, is

Janoff-Bulman's (1992) Theory of Restoration of Assumptive World. According to her theory, all individuals function on a daily basis using a set of assumptions and personal theories that allow them to set goals, plan activities, and order behaviour. An individual's view of reality constitute their "assumptive world" (Parkes, 1971), which refers to strongly held assumptions about how the world generally functions. There appear to be three highly related types of assumptions that most people share: (a) a belief in personal invulnerability, (b) a belief of the world as meaningful and comprehensible, and (c) a belief of positive self-perceptions. *Personal vulnerability* refers to the belief that people overestimate the likelihood that they will experience positive events and underestimate the likelihood that they will experience negative events (e.g., traumas do happen but they can't happen to me). The *world as meaningful* refers to the belief that the world is comprehensible and orderly - we believe that we are protected from misfortune by being good and worthy people. The thinking underlying this reasoning is consistent with Lerner's (1980) Just World Theory, in that individuals generally believe that people deserve what they get and get what they deserve. Upon victimization, finding meaning or purpose in the victimization is one way of coping with a world that makes little sense. For example, during a group therapy session, a paraplegic noted that he coped with his loss by reasoning that God needed legs for someone else (Janoff-Bulman, 1992). *Positive self-perceptions* refers to the belief that we are worthy, decent people and we generally try to maintain a relatively high level of self-esteem. However, victimization can activate negative self images (e.g., I am worthless).

According to Janoff-Bulman (1992), much of the psychological trauma produced by adversity comes from the shattering of these basic assumptions. Thus, dealing with adversity involves coming to terms with these shattered assumptions and re-establishing an assumptive world that incorporates one's experiences as a victim with all prior illusions. In fact, it is suggested that this re-examination of basic assumptions is what sets the stage for personal change (Janoff-Bulman & Schwartberg, 1991). Strategies to restore assumptive worlds involve downward comparison, self blame, and perceiving benefits for oneself and others. By engaging in interpretations that focus on benefits and lessons learned, "individuals emphasize benevolence over malevolence, meaningfulness over randomness, and self-worth over self-abasement" (Janoff-Bulman, 1992, page 133).

Summary of Theories

The theoretical models described above highlight the role that cognitive restructuring can have in mitigating the negative implications of adversity. Interestingly, there appears to be considerable overlap among the theories. For example, both Janoff-Bulman's (1992) and Taylor's (1983) model include aspects of cognitive adaptation or restructuring in order to regain "lost" control, and thus encompass Rothbaum et al.'s (1982) notion of secondary control. Furthermore, Janoff-Bulman's theory and Taylor's model share comparable elements (e.g., the importance of self-worth). According to these theories, individuals are rarely aware of the fundamental elements of their assumptive world until they are confronted with a trauma or personal catastrophe - the minor disappointments and daily hassles seldom bring them to light. As noted by both Janoff-Bulman and Taylor, much of the shock individuals' experience immediately

following a loss or traumatic event appears to stem from threats to esteemed assumptions of mastery, meaning and self-worth. This very questioning of basic assumptions is what sets the stage for deep-seated personal change through the task of rebuilding an assumptive world accommodated to new realities (Janoff-Bulman & Schwartzberg, 1991).

Variables Related to Posttraumatic Growth

What kinds of psychosocial variables are most closely related to reports of growth following adversity? The following section briefly outlines the personal characteristics, health-related variables, social resources, and appraisal and coping processes significantly associated with posttraumatic growth.

Personal characteristics. There is growing evidence that younger age is associated with posttraumatic growth (Bellizzi & Blank 2006; Fortune, Richards, Griffiths & Main, 2005; Manne, Ostroff, Winkel, Goldstein, Fox, & Grana, 2004; Milam, Ritt-Olson, & Unger, 2004; Polantinsky & Esprey, 2000; Powell et al., 2003; Widows, Jacobsen, Booth-Jones, & Fields, 2005). For example, Widows et al. found that younger cancer patients who were undergoing a bone marrow transplant reported more posttraumatic growth than did older patients. However, a small proportion of studies (e.g., Bellizzi & Blank 2006; Lechner, Zakowski, Antoni, Greenhawt, Block, et al., 2003) has shown that older individuals report higher levels of posttraumatic growth. For example, in a small sample of women diagnosed with breast cancer, Lechner et al. reported that older age was linked to higher levels of posttraumatic growth; however, in each of these studies, older participants also reported high levels of disease severity,

which has been consistently linked to higher levels of posttraumatic growth (e.g., Fortune et al., 2005; Updegraff & Marshall 2005).

Women tend to report more posttraumatic growth compared to men (Park et al., 1996; Tedeschi & Calhoun 1996). However, these results are based primarily on reports from white, college undergraduates so their generalizability is limited. One study by Bellizzi and Blank (2006) reported that female cancer patients scored higher than their male counterparts did on four out of the five growth domains of the PTGI. Besides gender differences, studies have consistently shown that less education is associated with higher levels of posttraumatic growth (Bellizzi & Blank 2006; Weiss, 2004, Widows et al., 2005). However, these findings are based on cancer patients so their generalizability to other illness populations has yet to be determined.

Although there is a large body of research suggesting a positive relation between hope, optimism and quality of life (Carver, Pozo, Harris, Noriega, Scheier et al., 1993; Scheier & Carver, 1987; Taylor et al., 1984), it is less clear whether optimism and hope are associated with posttraumatic growth. From a theoretical perspective, some researchers have suggested that optimism and hope are part of the pathway to growth (Schafer & Moos, 1992; Tedeschi & Calhoun, 1996). For example, optimism might promote growth because of its relationship to adaptive coping strategies such as problem-focused coping and seeking social support (Aspinwall & Taylor, 1992; Scheier, Matthews, Owens, Magovern, Lefebvre, et al., 1989). However, the research on optimism is somewhat mixed. In a health-related context, optimism was associated with

posttraumatic growth among individuals with arthritis and heart disease (Tennen et al., 1992), and among women with HIV/AIDS (Milam, 2004; Updegraff et al., 2002; Updegraff & Marshall, 2005). But in three recent studies of early-stage breast cancer survivors (Bellizzi & Blank, 2006; Henderson et al., 2002; Sears et al., 2003) and two studies using students with various types of adversity (Park & Fenster, 2005; Park et al., 1996), optimism was not significantly related to reports of posttraumatic growth. With regards to hope, two studies involving early-stage breast cancer survivors have found that hope was not significantly related to posttraumatic growth (Bellizzi & Blank, 2006; Sears et al., 2003).

Disease context. Numerous studies have demonstrated a positive association between severity of the trauma and posttraumatic growth (Fortune et al., 2005; Kesimic, Goral, & Gencoz, 2005; Lev-Wiesel, Amir, & Besser, 2005; Lechner et al., 2003; Updegraff & Marshall 2005). However, it appears that at exceedingly high levels of trauma, less posttraumatic growth is experienced (Salo, Punamäki, & Qouta, 2005). For example, Lechner et al. reported that women diagnosed with Stage II breast cancer reported higher levels of posttraumatic growth than did those at Stage I or Stage IV. This curvilinear relationship suggests that lower levels of adversity are not strong enough to shatter existing assumptions and elicit posttraumatic growth; however, higher levels of disease severity may hinder one's ability to construe benefits and grow from the experience. For example, in Lechner et al.'s study, women diagnosed at Stage IV cancer

may not have survived long enough to achieve personal growth or were perhaps more focused on death and dying.

Time elapsed since the occurrence of trauma may play a role in the development of posttraumatic growth. Although posttraumatic growth can certainly occur very soon after a trauma (e.g., Frazier et al., 2004), several theoretical models suggest that time may provide a chance for the individual to ruminate the important issues inherent to posttraumatic growth (Schafer & Moos, 1992; Tedeschi & Calhoun, 1996). Whereas some studies have found a positive relation between time elapsed and posttraumatic growth (Cordova et al., 2001; Milam, 2004; Park et al., 1996; Polantinsky & Esprey, 2000; Sears et al., 2003), others have not found this association (Siegel, Schrimshaw, & Pretter, 2005; Tedeschi & Calhoun, 1996; Weiss, 2004). Moreover, there is some evidence to suggest that posttraumatic growth increases over time. For example, in a longitudinal study of women who experienced sexual assault, Frazier et al. reported that positive changes reported tended to increase over time whereas negative changes tended to decrease over time.

Religion and spirituality. Religion frequently serves as an individual's core schema informing beliefs about the self, the world, and their interaction (McIntosh, Silver, & Wortman, 1993), and therefore, may make reality and suffering more understandable (Pargament, 1997). It is thought that intrinsic religiousness promotes posttraumatic growth because it helps the individual find meaning in the crisis (Park & Cohen 1993). Not surprisingly, there is some research that shows intrinsic religiousness

is related to perceptions of growth (Koenig, Pargament, & Neilsen, 1998; Park & Cohen, 1993; Park, Cohen & Herb, 1990). Religious participation, such as attending church and praying, has also been shown to be related to posttraumatic growth (Milam et al., 2004; Pargament, 1997; Tedeschi & Calhoun, 1996), suggesting that individuals experiencing posttraumatic growth seek out religious experiences or that their religious participation primes them for spiritual growth. Compared to religion, there has been little research examining the relation between spirituality and posttraumatic growth. However, one study by Cadell, Regeher, and Hemsworth (2003) found that spirituality (i.e., spiritual involvement and beliefs) was related to posttraumatic growth among bereaved HIV/AIDS caregivers. Moreover, in a more recent qualitative study of 15 bereaved HIV/AIDS caregivers, Cadell (2007) identified that themes of growth were related to issues of spirituality.

Social resources. Perceived social support plays an important role as a buffer against life stress (Cohen & Wills, 1985). It is possible that individuals who suffer from devastating life crises will experience outcomes that are more positive because these crises trigger an outpouring of support from others. In contrast, some traumas are so severe or present such prolonged burdens that they exhaust or erode individual and family resources, which may lead to continuing distress and depression (Schaefer & Moos, 1992). Not surprisingly, the research on the role of social support on posttraumatic growth is mixed. For example, several correlational studies have shown that social support in general is related to posttraumatic growth (Lev-Wiesel & Amir, 2003; Mohr,

Dick, Russo, Pinn, Boudewyn, et al., 1999; Park et al., 1996; Seigel et al., 2005), but other studies show a non-significant relationship (Sears et al., 2003; Updegraff et al., 2002; Widows et al., 2005). Moreover, social support satisfaction and quality of relationships (Cadell et al., 2003; Cordova et al., 2001; Park et al., 1996, 2005; Sheikh, 2004; Weiss, 2004) and greater disease disclosure (Henderson et al., 2003) were positively associated with growth.

Cognitive processing and coping. Although cognitive adaptation and issues of control are emphasized in the three broad theories reviewed earlier, few studies have examined their role in contributing to the development of posttraumatic growth. Of the few studies that have examined the role of control and mastery in posttraumatic growth, there is some evidence to suggest that perceived control over the adversity may be beneficial (Frazier et al., 2004; Sears et al., 2003; Siegel et al., 2005). For example, Sears et al. found that women with breast cancer who perceived more control over the course of their illness and recovery reported more posttraumatic growth. Moreover, in a large longitudinal study of college undergraduates who had experienced a variety of minor life disruptions, Park and Fenster (2004) reported that higher levels of mastery and control appraisal (i.e., threat and challenge) were positively related to growth.

According to several researchers, cognitive appraisals and restructuring are a critical aspect of recovery and growth following stressful experiences (Park et al., 1996; Taylor, 1983). In fact, several researchers (Davis et al., 1998; Davis & Nolen-Hoeksema, 2001; Janoff-Bulman, 1992) argue that individuals who experience a trauma need to first

make sense of the event and identify benefits from the experience before they can experience posttraumatic growth. However, few researchers have examined this assumption. In a longitudinal study of women with breast cancer, Manne et al. (2004) found that contemplating the reasons for developing the illness was related to higher levels of posttraumatic growth. In another, albeit cross-sectional study, Sears et al. (2003) found that benefit-finding was related to posttraumatic growth among women with breast cancer. Although research examining this possibility is sparse, it is possible that sense-making and benefit-finding may serve as a catalyst for posttraumatic growth.

Empirical research examining the role of coping and posttraumatic growth is lacking. Among the studies that have examined it, it appears that several coping strategies, such as positive coping (Ho et al., 2004), problem-oriented coping (Kesimic et al., 2005; Sheikh, 2004), acceptance coping (Bellizzi & Blank, 2006; Park et al., 1996), and positive reinterpretation coping (Sears et al., 2003) are positively related to posttraumatic growth. In fact, several researchers suggest that coping strategies actually mediate the relationship between personal resources (e.g., sociodemographics, positive outlook) and cognitive variables (e.g., benefit-finding) with posttraumatic growth (Park & Fenster, 2004; Sears et al., 2003). For example, in a small longitudinal study involving college undergraduates, Park and Fenster's structural equation model found that intrinsic religiousness was indirectly related to higher levels of personal growth; however, this relationship was mediated by cognitive appraisal (i.e., the event was appraised as threatening), and then further mediated by positive reinterpretation coping. This linear

pattern of results is consistent with Sears et al. who suggest that positive reinterpretation coping mediates the relationship between cognitive appraisal (i.e., benefit-finding) and posttraumatic growth.

Well-being and positive outcomes. Few studies have investigated the ramifications, or outcomes, of posttraumatic growth. Among the studies that have, the findings are somewhat mixed. For example, Park (2005) found that quality of life was related to posttraumatic growth in a sample of bereaved college undergraduates. In another cross-sectional study, Cordova et al. (2001) found that breast cancer survivors who reported higher levels of posttraumatic growth also reported more personal well-being. However, several others studies examining posttraumatic growth among breast cancer patients have found no significant improvement in psychological well-being (Leiberman & Goldstein, 2005; Sears et al., 2003). In a qualitative longitudinal study, King and Patterson (2000) reported that parents of children with Down Syndrome reported posttraumatic growth was associated with higher levels of life satisfaction two years later.

Depressive symptomatology. Particularly for individuals with a chronic illness, the initial trauma is generally associated with the beginning of difficult times. Thus, the presence or absence of depression is not necessarily an indicator of posttraumatic growth. Not surprisingly, the research examining depression and posttraumatic growth is inconclusive. Among studies involving assault and bereavement (Frazier et al., 2001, 2004; Snape, 1997) and studies involving illness (Cadell et al., 2003; Fortune et al., 2005;

Leiberman & Goldstein, 2005; Updegraff et al., 2002; Widows et al., 2005), no significant relationship existed between depression and posttraumatic growth. However, several longitudinal studies have found that depression is negatively related to growth over time (Milam, 2004; Milam et al., 2004). Milam found that individuals dealing with HIV/AIDS who experienced depressive symptoms were significantly less likely to perceive positive changes since diagnosis. In fact, it is likely that a relationship between posttraumatic growth and depression exists. According to Fredrickson's (1998) *broaden and build model*, positive emotions (and finding positive meaning) "undo" negative emotions and, over time, create an "upward spiral" in adjustment.

Explanatory Models of Posttraumatic Growth

In efforts to better understand posttraumatic growth, a number of models have been developed which integrate the variables associated with posttraumatic growth (Calhoun & Tedeschi, 1992; Dohrenwend, 1978; Hobfoll, 1989; O'Leary & Ickovics, 1995; Park & Fenster, 2004; Schaefer & Moos, 1992). Although each model differs in the specific variables they posit are associated with posttraumatic growth, all propose factors that can be conceptually grouped into categories resembling those proposed by Schaefer and Moos (1992). In fact, Schaefer and Moos were among the first researchers to integrate anecdotal evidence and research findings of growth and propose a framework of positive adaptation (Moos & Schaefer, 1993). Specifically, they developed a conceptual model that encompasses sets of variables that purportedly reflect the process and development of positive change following adversity. These sets of variables include: (a) personal resources, (b) social resources, (c) event and health-related factors, and (d)

appraisal and coping responses. Each set of variables are briefly described in more detail below.

The *personal resources* involve demographic characteristics such as age, gender, and marital and socioeconomic status, as well as other factors such as optimism, hope and resilience. For example, Schaefer and Moos (1992) propose that demographic variables associated with more personal and social resources, such as being married, are related to higher levels of posttraumatic growth. Moreover, personal resources such as optimism may help individuals to rely on coping strategies that are more apt to promote outcomes; in turn, these outcomes may facilitate posttraumatic growth. They also propose that prior experience with life crises can enhance individual's self-efficacy and improve their coping resources.

The *social resources* primarily involve the individuals' relationship with family and friends, as well as aspects of their financial, home, and living situations. According to Schaefer and Moos (1992), individuals confronted with a trauma may benefit from the resources that their social networks provide. For example, social networks may influence coping behaviours and enable individuals to redefine an event in a more positive light.

The development of posttraumatic growth is also dependent on several important *event and health-related factors.* The development of posttraumatic growth may reflect event severity, the individual's proximity to and amount of exposure to the stressor, and the extent of the loss, and prior crises. Furthermore, traumas may also vary in their duration, predictability and suddenness of onset. For example, terminal illnesses

involving a longer duration allow spouses the chance to prepare for their partners' death, and thus, tend to report better post-bereavement outcomes (Schaefer & Moos, 1992). In addition, the sudden onset of a life-threatening illness may induce individuals to seek meaning in their illness, and therefore, value life more. This type of crisis may also elicit support from family and friends, consequently strengthening emotional ties between family members.

According to Schaefer and Moos (1992), a*ppraisal and coping responses* are closely related processes that are linked to posttraumatic growth. For example, individuals who appraise a life crisis as a challenge that they can control are more likely to cope actively with the problem, and thus, will be more apt to grow from the experience. Moreover, the unpredictability of a physical illness may lead individuals to try to make sense of their situation in order to gain some sense of control over it.

In addition to these antecedents of posttraumatic growth, Schaefer and Moos (1992) outline three major types of positive outcomes, which closely resemble the five factors of posttraumatic growth described by Tedeschi and Calhoun's (1996) PTGI: (a) enhanced social resources (e.g., better relationships with family and friends); (b) enhanced personal resources (e.g., more assertiveness, self-understanding, empathy, and maturity); and (c) the development of improved coping skills (e.g., the ability to think through a problem logically, and to seek support when needed).

Studies Applying Explanatory Models

Schaefer and Moos' (1992) conceptual model of positive outcomes from life crises provides an intuitively appealing model for describing the development of

posttraumatic growth. However, this model is rarely applied as a theoretical framework in research investigating posttraumatic growth following adversity. In fact, there are few instances whereby *any* type of theoretical framework is applied, which is surprising, considering the rapid growth of research in this area. Based on a thorough literature review, only three studies that applied parts of Schaefer and Moos' model were identified. Each of these studies are described briefly below.

Siegel et al. (2005) examined posttraumatic growth in a sample of 138 women living with HIV/AIDS, and found some support for Schaefer and Moos' (1992) model. Certain *personal resources* (e.g., sociodemographics such as being African American, and *personal resources* such as having higher self-esteem and less depressive affect), social resources (e.g., perceiving more social and practical support), event and health-related factors (e.g., having more symptoms, stress), and appraisal and coping responses (e.g., perceiving more control over health, using positive reappraisal coping) were positively related to posttraumatic growth. Although Siegel et al. found support for the various factors related to posttraumatic growth, the study employed a cross-sectional design that limits conclusions regarding the longitudinal process and development of posttraumatic growth. In another cross-sectional study conducted in England, Sheikh (2004) examined the role of positive outlook (i.e., personal resources), social support (i.e., social resources), and coping strategies (i.e., coping responses) in predicting posttraumatic growth among 110 individuals coping with heart disease. Sheikh found that problem-focused coping mediated the relationship between extraversion and

posttraumatic growth, but that social support satisfaction was not related to posttraumatic growth; thus, there was only partial support for Schaefer and Moos' (1992) model.

In a longitudinal study, Park and Fenster (2004) tested several aspects of Schaefer and Moos' (1992) model using a sample of 94 college undergraduates who had experienced a variety of minor adversities. They examined the role of religion and mastery (i.e., personal resources) and coping (i.e., appraisal and coping responses) on posttraumatic growth. Unlike previous research in this area, Park and Fenster employed structural equation modeling techniques to examine the variables associated with the longitudinal course of posttraumatic growth. They found that intrinsic religiousness was directly related to posttraumatic growth six months later whereas mastery was indirectly related to higher levels of posttraumatic growth six months later. Consistent with Schaefer and Moos' model, the relationship between intrinsic religiousness and mastery was mediated by the perceived threat and challenge of the stressor (i.e., cognitive appraisals) and use of positive reinterpretation coping (i.e., coping responses).

Current Gaps in the Posttraumatic Growth Literature

Although Schaefer and Moos' (1992) model represents a useful model for understanding posttraumatic growth, few researchers have applied the model to their research. Furthermore, the studies that have applied the model have only considered a unidimensional construct of posttraumatic growth. That is, no study has examined the association between the various factors and the PTGI domains. This issue, as well as those presented below, represents many of the current gaps in knowledge that exist in the posttraumatic growth literature.

Testing a comprehensive model of posttraumatic growth. There is yet to be a study that tests Schaefer and Moos' (1992) entire model. Instead, research thus far has only examined parts of their model (e.g., Seigel et al., 2005). Moreover, recent research has uncovered additional variables associated with posttraumatic growth that are not represented in the model. For example, cognitive processing variables such as sense-making and benefit-finding have been found to be strongly related to posttraumatic growth (Manne et al., 2004; Sears et al., 2003) but are not well represented by the model. Sears et al. suggest that posttraumatic growth is a result of benefit-finding mediated through positive reinterpretation coping. Although several researchers (e.g., Janoff-Bulman, 1992; Tedeschi & Calhoun, 1996) have alluded to this linear process, it has yet to be empirically tested. Clearly, more research on posttraumatic growth using a comprehensive model is needed. There is reason to believe that future research based on such models will offer a richer, fuller view of the mechanisms through which growth occurs than current research based on simpler models has provided (Saakvitne, Tennen, & Affleck, 1998).

How does posttraumatic growth change over time? Because the majority of the studies examining posttraumatic growth typically employ cross-sectional designs, the development or longitudinal course of posttraumatic growth, as theorized by Schaefer and Moos, is largely unknown. According to Schaefer and Moos' model, as well as similar models of growth (e.g., Tedeschi & Calhoun, 1996), posttraumatic growth is assumed to be the result of a long recovery process. Consistent with this notion, most of

the data on the occurrence and domains of posttraumatic growth is collected years after the trauma occurred (Tedeschi & Calhoun, 1996). However, several studies that have assessed positive growth soon after the occurrence of a traumatic event find that individuals are able to report positive changes (20% to 80%) shortly after the experience, even as soon as one week after the trauma (Affleck, et al., 1987; Affleck, Tennen & Gershman, 1985; Frazier et al., 2001; McMillen et al., 1997; Thompson, 1985). Therefore, one of the most intriguing questions in this area is how prevalent posttraumatic growth is at the onset of the traumatic event, and how does it change over time? According to Tedeschi and Calhoun (1996), posttraumatic growth is more likely for those who find it relatively soon after the event. Thus, a more complete understanding of the development of or change in posttraumatic growth over time is necessary to provide information to both researchers and clinicians about the natural trajectory of adaptation to a health-related adversity and its individual variability.

Negative changes following adversity. It is important to note that many studies on posttraumatic growth focus exclusively on positive growth without also assessing negative changes that may occur in these same domains (e.g., negative changes in self worth, problems in relationships). According to several cross-sectional studies that have assessed the relations between both positive and negative changes and distress, negative changes are much more strongly related to distress than are positive changes (Fromm et al., 1996; Joseph et al., 1993). Several longitudinal studies also show that negative changes are related to distress (Davis et al., 1998; Frazier et al., 2001; Milam, 2004; Updegraff et al., 2002). It is important for researchers to allow trauma survivors or those

suffering a health-related adversity to describe both the negative and positive changes that have occurred in their lives to obtain a more comprehensive picture of the aftermath of adverse events (Calhoun & Tedeschi, 1998; McMillen & Fisher, 1998).

The experience of posttraumatic growth across illness populations. Information about how illness-type and the illness trajectory influence reports of posttraumatic growth is not well understood. That is, information about how posttraumatic growth is experienced across various illness populations is largely unknown. The majority of research on posttraumatic growth in a health-related context tends to involve persons living with cancer or HIV/AIDS, both life threatening illnesses. The research conducted thus far in a health-related context has demonstrated that posttraumatic growth can be experienced differently across illness populations. For example, Evers et al. (2001) found that positive outcomes were related to disease duration for individuals with rheumatoid arthritis patients but not for individuals with multiple sclerosis (MS). Moreover, Pakenham (2005) found that the course of the disease was related to positive outcomes among individuals with MS, in that those individuals with a relapse-remitting course had higher personal growth scores than did those with chronic progressive course. This research is consistent with the observations put forth by Linley and Joseph (2004) in their review of adversarial growth. Specifically, they suggest that the differences in reported growth are probably due to the characteristics of the subjective experience of the event (i.e., life threat, helplessness, controllability) rather than the event itself (i.e., the diagnosis of the illness).

Posttraumatic growth, arthritis, and IBD. Individuals suffering from arthritis or IBD can generally manage their symptoms with medication and health behaviours (e.g., food choices for individuals with IBD). However, relapse and deterioration of health over time is likely. Individuals with a chronic illness are likely to have a negative psychological response due to the implication that there is no cure for the illness, and his or her health is in a long-term state of compromise (Pakenham, 2005). That is, there is a high potential for his or her health to deteriorate overtime. Living with this knowledge of one's vulnerability to relapse may involve an investment in the hope and search of a cure; thus, creating a preoccupation with the condition. On the other hand, such knowledge of one's vulnerability may evoke recognition to the self that the condition will always be part of the individual's life. The former approach may lead to disappointment and a greater likelihood of re-traumatization by an unavoidable relapse. The latter approach, however, suggests that accepting, or acknowledging, vulnerabilities, the individual must find other goals, meaning, or identities that take into account their own particular vulnerabilities in order to rebuild an assumptive world that has meaning (Janoff-Bulman, 1992; Taylor, 1983).

Notwithstanding the benefits of gaining information about the experience and progression of posttraumatic growth among individuals with arthritis or IBD, there are other reasons why these two illness populations provide a useful context for examining the experience of posttraumatic growth. First, few studies have examined posttraumatic growth among individuals with arthritis and no studies have examined it among individuals with IBD. Among the three studies that examined individuals with arthritis

(Abraido-Lanza et al., 1998; Evers et al., 2001; Tennen et al., 1992), none of these studies used the PTGI but rather single items to assess positive change.

Furthermore, examining individuals with arthritis and IBD will provide additional information about how posttraumatic growth is experienced and if it is experienced differently as a result of illness context. For example, arthritis and IBD affect both genders, persons of all ages, and involve chronic pain; however, the way in which the diseases are experiences may be very different. IBD is a relatively less widespread condition and associated with more stigma than arthritis (Casati et al., 2000; Hall et al., 2005). Moreover, the "invisibleness" of the diseases differ. It may be easier to recognize if someone has arthritis, in that the physical effects may be more apparent (e.g., disfigured joints). However, it is more difficult to recognize if an individual has IBD. Other than weight loss or weight gain, in that most of their symptoms generally occur internally (e.g., abdominal pain and cramps). It is possible that because of the debilitating effects and stigma associated with IBD, individuals with this condition are reluctant to reach out to available social resources, or they have depleted their existing social resources, and thus, their posttraumatic growth especially in areas of interpersonal relationships is stifled. Examining these two illness populations will provide insight into how disease context influences the experience of posttraumatic growth.

Rationale for the Present Study

One of the objectives of the present study was to explore the experience and the factors associated with posttraumatic growth among two chronic illness populations using Schaefer and Moos' (1992) model as a theoretical framework. Given that most of our

current understanding of posttraumatic growth in a health-related context derives from research on life-threatening illnesses such as cancer and HIV/AIDS, the present study investigated posttraumatic growth as it is experienced among individuals with a generally non-life-threatening chronic illness. In particular, this study examined two illness populations – individuals with arthritis or IBD. Based on the literature reviewed, it appears that individuals who experience prolonged exposure to illness symptoms can experience posttraumatic growth; however, there is very little information on posttraumatic growth among individuals with arthritis and no published research involving individuals with IBD. Furthermore, comparing the experience of posttraumatic growth across these two illness populations will allow for an increased understanding of the potential role that illness context plays. For example, given the stigmatization of IBD, individuals with this disease may perceive fewer social resources compared to their arthritis counterparts. It is therefore possible that the role of social support in predicting posttraumatic growth may be different for individuals with IBD compared to individuals with arthritis.

In addition to examining the experience and factors associated with posttraumatic growth across these two illness populations, this study examined how posttraumatic growth changes over time. According to current theories about posttraumatic growth, it is assumed that growth involves a considerable amount of time and is the result of a long process. However, several studies have found that survivors of trauma tend to report some growth soon after the event occurred. Moreover, there is some evidence to suggest that individuals who report posttraumatic growth soon after the event are more likely to

report increases in posttraumatic growth in the future, which is consistent with Fredrickson's (1998) idea of an "upward spiral" in adjustment. Although there was only six months between Time 1 and Time 2, individuals living with these chronic diseases often face an unpredictable onset of symptoms. Therefore, this interval should provide an opportunity to examine how disease-symptoms and other psychosocial factors related to the experience of posttraumatic growth.

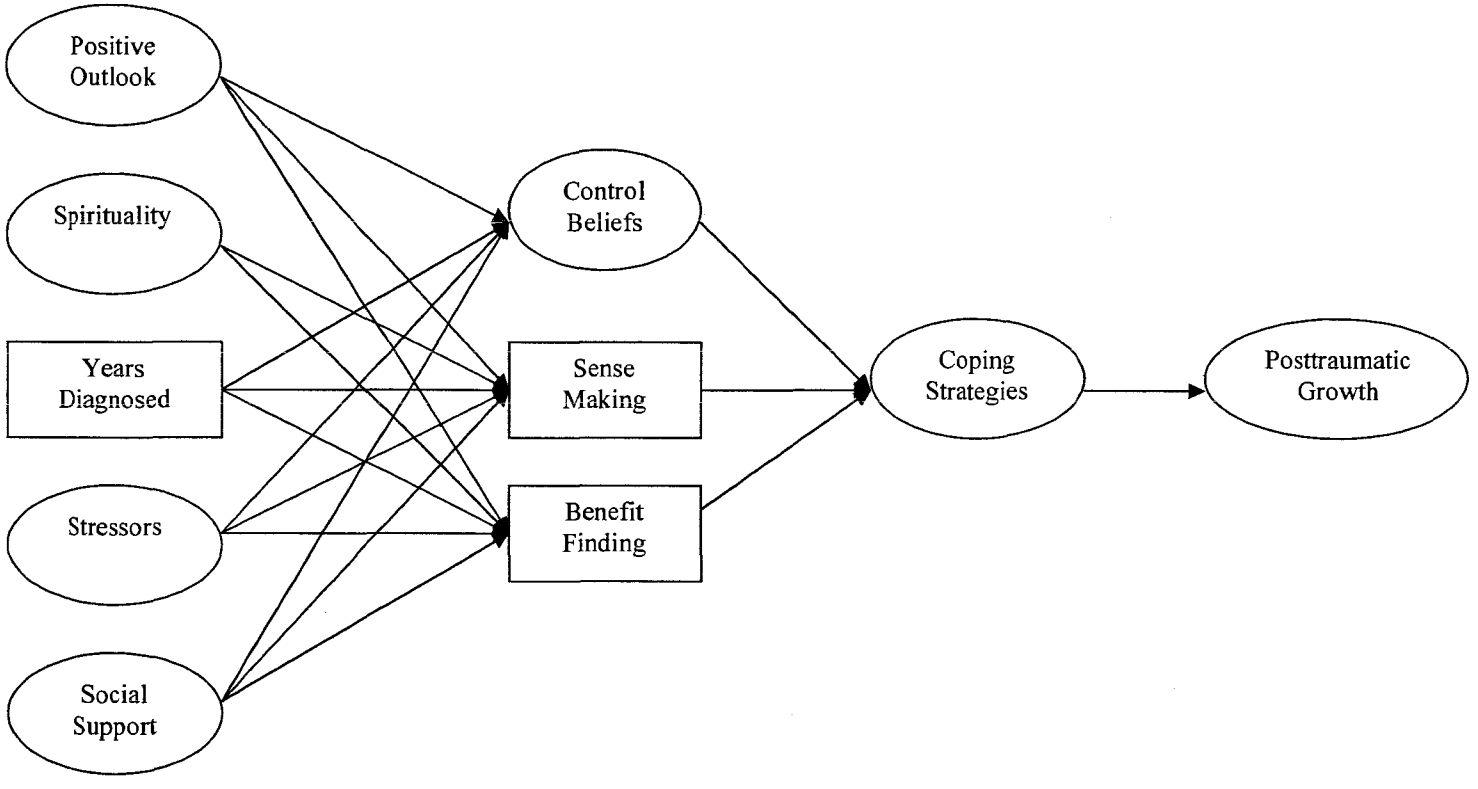
In order to understand the variables associated with posttraumatic growth, the present study applied Schaefer and Moos' (1992) model. The model has been modified in the present study based on recent research findings and theorizing. First, according to the original model, Schaefer and Moos conceptualize cognitive appraisal and coping responses as a single element that is influenced by personal and environmental factors and event-related factors, and exerts influence on posttraumatic growth. Recent research findings suggest that cognitive appraisal and coping responses represent two related yet distinct elements. That is, the identification of benefits and the intentional and repeated use of benefit-related information as a coping strategy may over time lead to perceptions of positive change. Therefore, this study considers cognitive appraisal (e.g., benefit-finding, sense-making) and coping responses (e.g., adaptive coping) as separate elements (Figure 1).

Last, this study examined the possible outcomes associated with the experience of posttraumatic growth. Based on the results from longitudinal research, reports of posttraumatic growth were associated with less depression over time, suggesting that posttraumatic growth is both an outcome and a process. In order to examine the

possibility that posttraumatic growth predicts psychosocial well-being, the present study examined whether posttraumatic growth predicts improved psychological well-being six months later.

Figure 1

Hypothesized Model for Predicting Posttraumatic Growth



Hypotheses

To review, the major goals of this study were to: (a) explore the experience of personal growth, (b) identify the types of personal growth reported, and (c) test a model of personal growth to reveal the factors relevant to the development of personal growth, and (d) explore how posttraumatic growth is related to psychosocial well-being. To this end, a series of hypotheses were developed.

The experience of personal growth. Because previous research has shown that individuals who have endured a health-related adversity report personal growth, it was expected that individuals with arthritis or IBD would report personal growth and positive outcomes as a result from their struggle with the illness. Specifically, it was hypothesized that:

1) individuals with arthritis or IBD who report posttraumatic growth at Time 1 will report higher levels of posttraumatic growth at Time 2.

Testing a model of posttraumatic growth. Based on existing literature exploring personal growth experienced across a wide range of traumatic and/or adverse situations and guided by Schaefer & Moos' (1992) theoretical framework, it was hypothesized that:

2) personal resources (e.g., higher levels of optimism and hope, and having a higher degree of intrinsic religiousness and spirituality) will be indirectly associated with reports of posttraumatic growth through cognitive appraisals and coping strategies.

3) social resources (e.g., reporting higher levels of social support) will be indirectly associated with reports of posttraumatic growth through cognitive appraisals and coping strategies.

4) event and health-related factors (e.g., experiencing previous trauma/adversity, reporting higher levels of disease severity at diagnosis, reporting poorer health status, experiencing higher levels of disease-related symptoms, perceiving more stress and depressive symptomatology) will be indirectly associated with reports of posttraumatic growth through cognitive appraisals and coping strategies.

5) cognitive appraisal (e.g., finding meaning in the illness experience, identifying benefits from the illness experience, and perceiving higher levels control) will be indirectly associated with reports of posttraumatic growth through coping strategies.

6) coping strategies, particularly higher levels of adaptive coping, will be directly related to reports of posttraumatic growth.

Outcomes of posttraumatic growth. One of the objectives of this study is to explore the possibility that posttraumatic growth influences reports of psychosocial well-being. Based on research that suggests posttraumatic growth is associated with lower levels of depression and higher levels of positive affect, the following hypothesis was made:

7) higher levels of posttraumatic growth at Time 1 will be related to higher levels of psychosocial well-being (e.g., lower levels of negative affect, higher levels of satisfaction with life, and higher levels of positive affect) at Time 2.

In addition to the above hypotheses, the present study also explored the relationship between personal resources and environmental factors, event-related factors, cognitive appraisals, and coping responses. Furthermore, previous research demonstrates that posttraumatic growth can be experienced differently across individuals who have experienced a health-related adversity. Therefore, this study explores the experience and change in posttraumatic growth among individuals with arthritis relative to individuals with IBD. As this portion of the study was exploratory, no directional hypotheses were made.

CHAPTER II

Method

In order to examine the experience and potential change in posttraumatic growth among a larger, more diverse sample of individuals with arthritis and IBD, participants were primarily recruited through the internet and then completed an online survey at two points in time. Internet research can provide access to subpopulations within illness groups who may not have easy access to the community and will provide the required sample size to test the proposed model. A recent comparison of traditional- and internet-based questionnaires found that data provided through internet methods were as good in quality and the samples gathered were at least as diverse as those provided by traditional psychological research (Gosling, Vazire, Srivastava, & John, 2004).

Sample

Participants for this study were individuals who had been diagnosed with any kind of arthritis or any kind of IBD. A total of 602 participants completed the Time 1 survey, of which 382 (63.5%) were diagnosed with IBD and 219 were diagnosed with arthritis (36.4%). For the six-month follow-up survey, 323 participants completed the survey for an overall response rate of 53.7%. The response rate across the two illness populations was similar, with 206 (54.5%) of IBD participants and 116 (54.2%) of arthritis participants completing the Time 2 survey. The data were screened for errors and missing data, and nine cases (five cases from the IBD group and four cases from the arthritis group) were removed due to excessive missing data. Therefore, the final sample consisted of 592 participants, of which 378 (63.9%) were diagnosed with IBD and 214

(36.1%) were diagnosed with arthritis. The following paragraphs outline the sociodemographic characteristics of each illness group across each time point, and explore any differences between the participants who completed the study (i.e., Time 1 and Time 2 surveys) and those who completed the Time 1 survey only.

Sample characteristics: Arthritis participants. The most common form of arthritis participants reported having was rheumatoid arthritis (n = 81, 37.9%) and osteoarthritis/degenerative arthritis (n = 46, 21.5%). A tenth of the participants reported having either fibromyalgia (n = 25, 11.7%) or psoriatic arthritis (n = 21, 9.8%), and the remaining participants reported having ankylosing spondylitis (n = 9, 4.2%), systemic lupus erthematosis (n = 6, 2.8%), Reiter's syndrome (n = 4, 1.9%), scleroderma (n = 1, 0.5%) or gout (n = 1, 0.5%).

The mean age of participants at Time 1 was 37.77 years (SD = 12.59); they ranged in age from 18 to 72 years. The majority of the participants were female, Caucasian, living in either Canada or the United States, had some university/college education or have a university/college degree, married or living with an intimate partner. Almost half of the participants reported having an income between $15,000 and $59,999 although 39 (18.6%) of participants did not report their level of income. At Time 2, the mean age of the participants was 41.84 (SD = 13.34), ranging in age from 18 to 58 years. A full description of the sample characteristics for individuals with arthritis is presented in Table 1.

Table 1

Demographics for the Arthritis Participants at Time 1 and Time 2

Variable	Arthritis	
	Time 1	Time 2
Age (M, SD)	37.77 (12.59)	41.84 (13.34)
Sex (% female)	194 (90.7)	94 (91.3)
Country		
Canada	90 (42.1)	49 (22.9)
USA	104 (48.6)	43 (20.1)
Australia	2 (0.9)	1 (0.5)
South America	1 (0.5)	1 (0.5)
United Kingdom	9 (4.2)	5 (2.3)
Europe	2 (0.9)	1 (0.5)
Other (please list)	6 (2.8)	3 (1.4)
Education		
Some high school	9 (4.2)	3 (1.4)
High school graduate	22 (10.3)	5 (2.3)
Some college/university	65 (30.4)	28 (13.1)
College/university graduate	75 (35.5)	37 (17.3)
Some graduate school	12 (5.7)	8 (3.7)
Graduate degree	28 (13.1)	22 (10.3)
Income		
Under $14,999	32 (15.3)	15 (7.0)
$15,000 - $29,999	33 (15.8)	9 (4.2)
$30,000 - $44,999	32 (15.3)	17 (7.9)
$45,000 - $59,999	26 (12.4)	22 (10.3)
$60,000 - $74,999	10 (4.8)	4 (1.9)
$75,000 - $89,999	11 (5.3)	7 (3.3)
$90,000 - $104,999	11 (5.3)	3 (1.4)
$105,000 - $119,999	5 (2.4)	3 (1.4)

$120,000 - $134,999	4 (1.9)	2 (0.9)
Over $135,000	11 (5.3)	3 (1.4)
I prefer not to provide this information	34 (16.3)	18 (8.0)
Relationship status		
Married/living with intimate partner	113 (53.3)	60 (28.0)
Separated/divorced	35 (16.5)	11 (5.1)
Never married	57 (26.9)	27 (12.6)
Widowed	7 (3.3)	5 (2.3)
Ethnicity		
Caucasian	198 (92.5)	99 (46.3)
African American	3 (1.4)	--
Hispanic	4 (1.9)	3 (1.4)
Asian/Pacific Islander	7 (3.3)	1 (0.5)
Aboriginal	2 (.9)	--
Employment status		
Full-time	76 (35.8)	41 (19.2)
Part-time	36 (17.0)	15 (7.0)
Not at all	44 (20.8)	15 (7.0)
Retired	13 (6.1)	7 (3.3)
Disabled	43 (20.8)	25 (11.7)

Potential demographic differences for participants completing the Time 1 survey with those who completed the Time 2 survey were explored. Independent samples *t*-tests revealed that arthritis participants who completed the study were significantly older (M = 41.83, SD = 13.33) compared to participants who completed only the Time 1 survey (M = 33.71, SD = 10.38), t (204) = -.489, $p < .001$. Furthermore, chi square tests revealed that a greater proportion of arthritis participants who completed only Time 1 survey reported being unemployed (27%) compared to those who completed the study (14%), χ^2 (4) = 10.04, $p < .05$.

Sample characteristics: IBD participants. The majority of the participants with IBD reported having Crohns disease (n = 251, 67.3%); a third reported having ulcerative colitis (n = 109, 29.2%). The remaining 13 participants reported having lymphatic colitis (n = 2, .5%), collagenous colitis (n = 2, .5%), microscopic colitis (n = 1, 0.3%), whereas the remaining eight participants (2.1%) were still unsure or still in the process of determining a diagnosis or Crohns or ulcerative colitis.

The age of the IBD participants at Time 1 was slightly younger than the arthritis participants (M = 30.80, SD = 9.90), with ages ranging from 15 to 62 years. The majority of the IBD participants at Time 1 were female, Caucasian, living in Canada or the United States. Most of these participants had some university/college education or have a university/college degree and were employed either full- or part-time. Half of the participants were married or living with an intimate partner and reported having an income below $59,999, although 69 did not report their income level. At Time 2, the

mean age of participants was similar to those at Time 1 ($M = 31.70$, $SD = 10.53$), with ages ranging from 16 to 62 years. A full description of the sample characteristics for individuals with IBD is presented in Table 2.

There were no significant differences in any of the sociodemographic characteristics between those who completed the study and those who completed only the Time 1 survey, except for education whereby a greater proportion of participants those who completed the Time 1 survey only had some university or college education (41.7%) compared to those who completed the study (24.1%), χ^2 (5) = 16.38, $p < .01$. Differences in illness-specific symptomatology was examined to ensure that participants who completed the Time 1 survey were not experiencing significantly more or less symptoms compared to those who completed the Time 2 survey. For the arthritis group, there were no significant differences of daily functioning with regards to mobility or dexterity across participants who completed the Time 1 or Time 2 survey. These results suggest that the range in symptomatology did not differ for the arthritis group across time. However, for the IBD group, individuals who completed the Time 2 survey reported higher levels of IBD-specific symptoms ($M = 4.90$, $SD = 1.32$) than did individuals who completed only the Time 1 survey ($M = 4.56$, $SD = 1.52$), $F(1, 375) = 5.19$, $p < .05$. These results suggest that the range in symptomatology for the IBD group was actually broader at Time 2.

Table 2

Demographics for the Inflammatory Bowel Disease Participants at Time 1 and Time 2

Variable	IBD	
	Time 1	Time 2
Age (M, SD)	30.80 (9.90)	31.70 (10.53)
Sex (% female)	312 (82.5)	141 (80.1)
Country		
Canada	140 (37.0)	68 (18.0)
USA	187 (49.5)	86 (22.8)
Australia	14 (3.7)	5 (1.3)
South America	24 (6.3)	9 (2.4)
United Kingdom	8 (2.1)	4 (1.1)
Europe	5 (1.3)	4 (1.1)
Other (please list)		
Education		
Some high school	15 (4.0)	5 (1.4)
High school graduate	41 (10.9)	14 (3.7)
Some college/university	127 (33.9)	51 (13.5)
College/university graduate	136 (36.3)	69 (18.3)
Some graduate school	20 (5.3)	10 (2.6)
Graduate degree	36 (9.6)	27 (7.1)
Income		
Under $14,999	55 (14.8)	17 (4.5)
$15,000 - $29,999	40 (10.8)	19 (5.0)
$30,000 - $44,999	51 (13.7)	22 (5.8)
$45,000 - $59,999	43 (11.4)	21 (5.6)
$60,000 - $74,999	31 (8.4)	13 (3.4)
$75,000 - $89,999	30 (8.1)	11 (2.9)
$90,000 - $104,999	23 (6.2)	13 (3.4)
$105,000 - $119,999	13 (3.5)	4 (1.1)

$120,000 - $134,999	9 (2.4)	7 (1.9)
Over $135,000	14 (3.8)	10 (2.6)
I prefer not to provide this information	62 (16.7)	39 (10.3)
Relationship status		
Married/living with intimate partner	193 (51.3)	87 (23.0)
Separated/divorced	21 (5.6)	9 (2.4)
Never married	159 (42.3)	79 (20.9)
Widowed	3 (.8)	1 (0.3)
Ethnicity		
Caucasian	367 (97.1)	173 (45.8)
African American	4 (1.1)	1 (0.3)
Hispanic	1 (.3)	--
Asian/Pacific Islander	4 (1.1)	1 (0.3)
Aboriginal	2 (.5)	--
Employment status		
Full-time	188 (50.9)	92 (24.3)
Part-time	70 (19.0)	31 (8.2)
Not at all	68 (18.4)	32 (8.5)
Retired	6 (1.6)	4 (1.1)
Disabled	37 (10.0)	17 (4.5)

Procedure

Participants were recruited through notices placed in the community, postings to general psychological survey websites, Dr. Sirois' research website, and postings to online support groups and message boards specifically targeting individuals with arthritis and IBD. Postings to general psychological survey websites and Dr. Sirois' research website advertised the survey to only individuals with either arthritis or IBD. Postings to online support groups and message boards only advertised versions of the survey appropriate for the group being targeted (i.e., IBD survey on IBD-specific websites). In addition to these websites, the survey was posted on illness-specific websites (e.g., Arthritis Society) as well as free classified ad websites. Participants were given the choice to have the survey mailed to them. In total, seven individuals with IBD and five individuals with arthritis requested to have a survey package mailed to them. As an incentive, participants who completed either survey were offered the opportunity to place their name in a draw to win one of several $50 gift certificates.

After providing informed consent, individuals completed the online survey (Time 1) and were contacted approximately six months later to complete a follow-up survey (Time 2), also completed online. The consent forms used for the survey at Time 1 and Time 2 are presented in Appendix A and B. In order to link the two surveys while ensuring the anonymity of the participant, each participant developed a personal code. All identifying information (e.g., email address) was removed from the data file and stored in a separate location. The Research Ethics Board at the University of Windsor

approved this study. Upon completing the survey, each participant was provided with a letter of explanation that generally outlined the purpose and implications of the study (Appendix C).

Materials

With the exception of disease-specific health questions, participants in each illness group completed identical measures of demographic characteristics, personal resources and spirituality, health characteristics, cognitive processes, coping responses, posttraumatic growth, and perceptions of well-being. All of the measures included were selected to reflect the major dimensions discussed in Schaefer and Moos' (1992) model. The survey used at Time 1 and Time 2 were essentially the same with exception to three variables. Only dispositional optimism, dispositional hope, and previous crises or traumas were collected at Time 1. The following paragraphs outline the measures used.

Sociodemographics

Self-reported demographics include age, sex, education, ethnicity, country, relationship status, and income. Income was be determined by the total household income before taxes for the previous year (see Appendix D).

Personal resources

Personal resources (see Appendix E) include sociodemographic characteristics, and personal resources such as previous crisis or trauma experience, optimism, hope, and intrinsic religiousness and spirituality. How each of these constructs are measured is described below.

Optimism. The revised Life Orientation Test (LOT-R; Scheier, Carver, & Bridges, 1994) was used to measure individual differences in generalized optimism. The LOT-R is a 10-item self-report survey that asks participants to indicate the extent of agreement with each statement on the scale. Sample items include "Overall, I expect more good things to happen to me than bad" and "In uncertain times, I usually expect the best." Participants respond to each item using a 5-point scale, with response options ranging from 1 (*I agree a lot*) to 5 (*I disagree a lot*). Data from the LOT–R has demonstrated good validity and reliability in several studies that predict coping with cancer (Allison, Guichard, & Gilain, 2000; Carver et al., 1993; Curbow, Somerfield, Baker, Wingard, & Legro, 1993) and other life stressors (Fontaine, Mastead, & Wagner, 1993). In a recent studies examining posttraumatic growth among women with breast cancer (Bellizzi & Blank, 2006), and college students with minor life disruptions (Park & Fenster, 2004), the reported internal consistency reliabilities were .83 and .91, respectively. The internal consistency reliabilities in this study were .83 for the arthritis group and .84 for the IBD group. The LOT-R was included on the Time 1 survey only.

Dispositional hope. Dispositional hope was measured using Snyder, Harris, Anderson, Holleran, Irving, et al.'s (1991) Hope scale. The Hope scale is a 12-item self-report scale that is divided into hope-agency (i.e., the confidence in one's ability to initiate and maintain actions) and hope-pathways (i.e., the belief in one's ability to generate routes). Participants responded to each item using a 4-point scale, with response options ranging from 1 (*definitely false*) to 4 (*definitely true*). Sample questions include

"There are lots of ways out of a problem" and "Past experience has prepared me well for my future." This measure was developed to assess trait hope versus state hope by wording the items in a way that forces the participants to think across time and situational contexts rather than focus on the present or a specific situation, such as recovery from their illness. Snyder et al. documented the scale's good reliability as well as its convergent, discriminant, and predictive validity. For the two subscales, internal consistency reliability ranged from .63 to .80 (Synder et al., 1991). The internal consistency reliabilities for the hope agency and hope pathways subscales in this study were .78 and .72 for the arthritis group and .71 and .73 for the IBD group, respectively. The Hope scale was included on the Time 1 survey only.

Religion and spirituality. Two measures were used to assess religiousness and spirituality. The *Intrinsic/Extrinsic-Revised Scale* (I/E-R; Gorsuch & McPherson, 1989) is a 14-item measure of religious orientation that measures intrinsic and extrinsic orientation to religion. Only the eight-item intrinsic scale assesses the extent to which one's religion is viewed as a valuable end in its own right was used. A sample item from this subscale is "My whole approach to life is based on my religion." The items were assessed using a 5-point scale, with response options ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). The authors demonstrated good convergent and discriminant validity of the subscales, and documented the internal consistency reliabilities, with the intrinsic subscale having an alpha of .83 (Gorsuch & McPherson, 1989). The internal consistency reliabilities in this study were .86 for the arthritis group and .80 for the IBD group.

Spirituality will be measured with a revised version of the *Spiritual Involvement and Beliefs Scale* (SIBS; Hatch, Burg, Naberhaus, & Hellmich, 1998). This survey was designed to be widely applicable across religious traditions, and to assess actions as well as beliefs. The survey consists of four subscales: External/Ritual, Internal/Fluid, Existential/Meditative, and Humility/Personal Application. In this study, a six-item version of the External/Ritual subscale was used to measure spiritual activities and rituals and a belief in an external power. A sample item includes "I believe there is a power greater than myself." This subscale was originally 13 items with high internal consistency reliability of .98 (Hatch et al., 1998); however, the authors reported that exploratory factor analysis of the data revealed that seven of the items cross-loaded onto other factors; therefore, these seven items were removed from the present study. Participants responded to the first eight items using a 5-point scale with response options ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The internal consistency reliabilities in this study were .89 for the arthritis group and .90 for the IBD group.

Social Resources

The environmental factor (see Appendix F) includes individuals' relationships with and social support from family and friends, as well as their social network. How each of these constructs were measured is described below.

Social support. Perceived social support was assessed with The Duke –UNC Functional Social Support questionnaire (Broadhead, Gehlbach, DeGruy, & Kaplan, 1988). Participants rated each of the eight items on a 5-point scale with responses options

ranging from 1 (*much less than I would like*) to 5 (*as much as I would like*). Scores were summed with higher scores reflecting a greater perceived need for social support. However, to be consistent with the scaling of the social network scale (described below) in order to facilitate interpretation of scores across these two measure, the items on this measure were reverse scored. This scale has demonstrated good internal consistency in illness populations, with internal consistency reliabilities ranging from .90 to .91 (Cordova et al., 2001). The internal consistency reliabilities in this study were .91 for the arthritis group and .91 for the IBD group.

Participants will also complete a three-item scale created by Stanton et al., (2000) to assess perceived receptivity of the social network to their illness-related emotional expression. The items have been adapted for this study to reflect arthritis/IBD rather than cancer. The three items include "I have people to talk to about my worries concerning arthritis/IBD", "I feel free to express all my feelings about arthritis/IBD to those close to me," and "There are people I can count on whenever I want to talk about my experience with arthritis/IBD"). Participants respond to each item using a 5-point scale with response options ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The internal consistency reliabilities in this study were .91 for the arthritis group and .90 for the IBD group.

Event and Health-Related Factors

The event and health-related factors (see Appendix G) include current health status, initial disease severity, years diagnosed, perceived stress, and previous crises/trauma history. How these constructs were measured is described below.

Health status. Participants completed the 25-item Brief Health History questionnaire (Sirois & Gick, 2002), a self-report checklist that assesses the experience of 13 acute and 16 chronic health problems within the past six months. The degree to which participants are bothered by each chronic condition experienced was rated on a 5-point scale with response options ranging from 0 (*not bothered at all*) to 4 (*extremely bothered*). The total number of acute and chronic problems experienced was summed for each individual. A mean subjective severity score for the chronic health problems was also calculated by summing the severity ratings and dividing by the number of chronic health problems.

Participants with IBD completed the Inflammatory Bowel Disease Questionnaire (IBD-Q; Irvine, Zhou, & Thompson, 1996) which is a 10-item survey that measures how IBD has affected them during the past two weeks. Sample items include "How often have you been troubled by pain in the abdomen?" and "How much of the time have you been troubled by a feeling of having to go to the bathroom even though your bowels are empty?" Participants responded to each item using a 7-point scale, with response options ranging from 1 (*more frequent than ever before*) to 7 (*no increase or normal*). The internal consistency reliability in this study was .91 for the IBD group.

Participants with arthritis completed the Arthritis Impact Measurement Scales (AIMS, Meenan, Gertman, Mason, & Dunaif, 1982) which is a 20-item survey that measures how arthritis effects their ability to function in daily life over the past week. Sample items include "Open jars which have previously been opened?" and "Bend down and pick up clothing from the floor?" Participants respond to each item using a 4-point scale, with response options ranging from 1 (*without any difficulty*) to 4 (*unable to do*). A principal axis exploratory factor analysis with promax rotation was used to explore the dimension of the scale because inspection of the items appeared to relate to different types of functioning. Using the scree plot and eigenvalue >1 rule, two factors were extracted. The first factor contained 12 items, accounted for 44.8% of the variance, and was labeled "mobility issues." The second factor contained the remaining eight items, accounted for 8.4% of the variance, and was labeled "dexterity issues." Together, the factors accounted for 53.25% of the variance. The internal consistency reliabilities in this study were .93 for the mobility subscale and .86 for the dexterity subscale for the arthritis group.

Disease severity. Disease severity was assessed by determining time since diagnosis, perceptions of initial illness severity, and intensity or impact of the illness. In order to assess time since diagnosis, participants were asked to indicate the month and year that they were diagnosed, if they had had any surgeries for arthritis/IBD, list any medications that they are currently taking, and indicate if these medications have been successful in relieving their symptoms. As the time since diagnosis may be different from

the time participants began experiencing symptoms, participants were also asked to indicate when they first started experiencing symptoms of arthritis/IBD (e.g., month, year). Three questions were developed for this study that asked the participant to think back to when they were first diagnosed with their condition and consider their health condition. A sample item includes "How would you describe your symptoms in general?" Participants respond to each item using a 4-point scale with response options ranging from 0 (*none*) to 3 (*severe*). Only the items that asked about surgery and medication were included in the Time 2 survey. The internal consistency reliabilities for the disease severity subscale in this study were .81 for the arthritis group and .78 for the IBD group.

Previous crisis or trauma experience. The Trauma Questionnaire (TQ; Wild & Paivio, 2003) was used to assess previous crisis or trauma experience at Time 1. The TQ requires the participant to have either experienced or witnessed the event. Nineteen items assess the occurrence of potentially traumatic negative life events. For each event, participants indicate the degree of distress they experienced at the time of the trauma using a five-point scale, with response options ranging from 0 (*not distressing at all*) to 4 (*extremely distressing*). Two of the items (e.g., "Immediate family member's life-threatening illness" and "Immediate family member's serious illness") were combined as one item. Furthermore, unlike the original measure that asks participants to indicate only those events they had experienced within the past five years and specify when the event occurred, participants in this study will be permitted to indicate life events that occurred

at any point in their life. The reasoning underlying this change is based on the theorizing (e.g., Janoff-Bulman, 1992; Tedeschi & Calhoun, 1996) that suggests previous adversities encountered, even as a child, may aid in the adjustment of subsequent life crises. The TQ will be included on the Time 1 survey only. The authors did not provide data on the internal consistency reliability of the TQ, but the TQ, specifically, the level of distress associated with various trauma(s) experienced demonstrated construct validity as it was negatively correlated with subjective well-being and positively correlated to of posttraumatic symptoms.

Perceived stress. Participants completed the 10-item Perceived Stress Survey (Cohen, Kamarck, & Mermelstein, 1983) that assessed perceived stress within the past month. A sample item is "In the last month, how often have you felt nervous or 'stressed'?" Participants respond to each item using a 5-point scale, with response options ranging from 0 (*never*) to 4 (*very often*). The internal consistency reliabilities in this study were .91 for the arthritis group and .90 for the IBD group.

Depression. Depressive symptomatology was measured with the Center for Epidemiological Studies Depression scale (CES-D; Radloff, 1977). The CES-D is a 20-item measure of current (i.e., past week) depressive symptoms. Sample items include "I was bothered by things that usually don't bother me," and "I felt lonely". Reponses are made on a 4-point scale with response options ranging from 1 (*rarely or none of the time, less than 1 day*) to 4 (*most or all of the time, 5-7 days*). This scale demonstrates good reliability, with internal consistency reliability ranging from .73 to .79 (Cordova et al.,

2001). The internal consistency reliabilities in this study were .89 for the arthritis group and .90 for the IBD group.

Cognitive Appraisals

Cognitive appraisals (see Appendix H) include trying to make sense or find meaning in the illness, identifying benefits in the illness experience, and perceiving control over their illness. How each of these constructs are measured is described below.

Sense-making. Three items evaluated the degree to which the participants tried to find some meaning in the illness experience ("How often have you tried to find some meaning in the illness experience?": search for meaning), tried to understand why they were diagnosed with their illness ("How often have you tried to understand why you were diagnosed with illness?": search for cause), and how often they found themselves thinking about the reason for their illness? ("How often have you found yourself thinking about the reason for your illness?": contemplative reason). Items were rated on a 5-point scale with response options ranging from 1 (*not at all*) to 5 (*a great deal*) and rated for processing in the past month. These questions are based on items used by Manne et al. (2004) and are very similar to the questions that others have used to assess the construal of meaning (e.g., Davis et al., 1998; Lehman, Wortman, & Williams, 1987). The internal consistency reliabilities in this study were .87 for the arthritis group and .81 for the IBD group. Participants were also asked to complete the question: Do you have an answer to the question of "why me?" Among participants who answered that they sometimes ask "why me", they were asked to explain how they answer this.

Benefit-finding. Participants were asked about their feelings on the positive implications of the illness. This question asked: "Sometimes people who experience a hardship like being diagnosed with a chronic illness find some positive aspect in the experience. For example, some people feel they learn something about themselves or others. Have you found anything positive in this experience?" Among the individuals who responded that they were able to identify benefits from their illness experience, they were asked to specify what the benefits include. This question is comparable to what others have used when assessing benefit-finding in illness populations (e.g., Affleck et al., 1987; Davis et al., 1998; Sears et al., 2003; Thompson, 1985).

Participants also completed the *Illness Cognition Questionnaire* (ICQ; Evers et al., 2001) that assessed illness thoughts and beliefs. It is a three-factor, 18-item instrument measured on a 4-point scale with response options ranging from 1 (*not at all*) to 4 (*completely*). The three subscales, six items each, include Helplessness, Acceptance, and Perceived Benefits. For this study, only the Perceived Benefits subscale was analyzed. The internal consistency reliabilities in this study were .91 for the arthritis group and .86 for the IBD group.

Control beliefs. Two subscales from the Control Belief Inventory (CBI; Sirois, 2003) were used to assess perceived control over health. The two subscales include Chance (five items, "If I am lucky I will stay healthy"), and Adaptive Control (six items, "I can take control of my health by managing my day-to-day symptoms"). Participants responded to each item using a 6-point scale with response options ranging from 1

(*strongly disagree*) to 6 (*strongly agree*). The CBI has been used in previous research involving chronic illness populations and has demonstrated good internal consistency reliability (e.g., Sirois, et al., 2006). The internal consistency reliabilities for the Chance Control and Adaptive Control subscales in this study were .70 and .89 for the arthritis group and .77 and .84 for the IBD group, respectively.

Coping Responses

Coping responses (see Appendix I) include the various ways individuals chose to deal, or cope, with their illness. How coping responses are assessed is described below.

Coping strategies. This study measured coping strategies using Carver's (1997) Brief COPE scale, which consists of 28 items grouped into 14 conceptually distinct subscales. The subscales include active coping, planning, suppression of competing activities, restraint coping, seeking instrumental social support, seeking emotional social support, positive reinterpretation, acceptance, turning to religion, focus on venting of emotions, denial, behavioral disengagement, mental disengagement, and alcohol and drug use. Sample questions are "I've been concentrating my efforts on doing something about the situation I am in" or "I have been using alcohol or drugs to make myself feel better." Participants were asked to rate how they are currently coping with the stress in their life associated with their illness using a 4-point scale with responses options ranging from 1 (*I usually don't do this at all*) to 4 (*I usually do this a lot*). These subscales have shown fairly good internal consistency reliability, with 11 of the 14 scales having alphas exceeding .60 and three remaining three (venting, denial, and acceptance) more than .50

(Carver, 1997). One of the reasons attributed to the low reliability scores is that each subscale of the Brief Cope includes only two items (Carver, 1997).

In an attempt to assess adaptive versus maladaptive coping strategies, a principal axis exploratory factor analysis with promax rotation was used on the COPE items. Based on the eigenvalue > 1 rule and inspection of the scree plot suggested that there were two distinguishable factors. The first factor explained 29.4% of the variance and was labeled "Adaptive Coping". This factor included the subscales self-distraction, active coping, seeking emotional and instrumental support, positive reframing, venting, planning, acceptance and religion. The second factor explained an additional 10.2% of the variance and was labeled "Maladaptive Coping". This factor included the subscales denial, substance use, mental and behavioural disengagement, suppression of competing activities, and restraint coping. The internal consistency reliabilities for the Adaptive Coping and Maladaptive Coping subscales in this study were .84 and .77 for the arthritis group and .86 and .70 for the IBD group, respectively.

Positive Outcomes of Life Crises and Transitions

Because researchers have indicated that it is important to assess both positive and negative aspects of adjustment (Folkman & Moskowski, 2003) and both general and even-specific aspects of adjustment (Pargament, Keonig, & Perez, 2000), both positive and negative dimensions of posttraumatic growth were assessed (see Appendix J).

Positive and negative changes. Two items developed by Davis et al., (2006) were used to assess positive and negative changes since diagnosis of the participants' illness.

Participants were asked: "Nowadays, to what extent do you feel that IBD/arthritis has (positively/negatively) affected your life" Participants responded to each question using a 5-point scale ranging from 1 (*not at all*) to 5 (*a great deal*). Among the participants who indicated that there have been either positive and/or negative changes, they were asked the following open-ended question: "Could you please describe the (positive/negative) effect it has had on your life?"

The *Posttraumatic Growth Inventory* (PTGI; Tedeschi & Calhoun, 1996) was used to assess personal growth. It is a 21-item scale that measures positive outcomes reported by people who have experienced a negative event. Participants indicated "changes that may have occurred in your life since you were diagnosed with arthritis/IBD" for each item. The PTGI is comprised of five separate subscales: relationship with others, new possibilities–purpose, appreciation of life, spiritual change, and personal strength. Sample items are "I established a new path for my life" and "Putting more effort into my family relationships." Participants respond to each item using a 6-point scale with response options ranging from 0 (*did not experience this change*) to 5 (*experienced this change to a very great degree*). Based on normative data, the PTGI provides an overall score, with an alpha equal to .90, and scores on five conceptually distinct factors, including relating to others (alpha = .85), appreciation of life (alpha = .77), new possibilities–purpose (alpha = .84), spiritual change (alpha = .85), and personal strength (alpha = .72; Tedeschi & Calhoun, 1996). For the present study, the overall PTGI internal consistency reliability for the arthritis and IBD group was .93 and

.92, respectively. For the individual subscales, the internal consistency reliabilities for the arthritis and IBD group were as follows: relating to others (alpha = .92, .89), new possibilities–purpose (alpha = .87, .85), personal strength (alpha = .84, .85), spiritual change (alpha = .85, .83), and appreciation of life (alpha = .85, .83).

Perceptions of Well-being

Three indicators of perceived well-being (see Appendix K) served as outcome variables of posttraumatic growth. A description of how these constructs are assessed is described below.

Positive and negative affect. The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) was used to assess positive and negative affect. The survey consists of 10 positive affects (interested, excited, strong, enthusiastic, proud, alert, inspired, determined, attentive, and active) and 10 negative affects (distressed, upset, guilty, scared, hostile, irritable, ashamed, nervous, jittery, and afraid). For clarity, "jittery" was replaced with "stressed." Participants are asked to rate items on a 5-point scale with response options ranging from 1 (*very slightly or not at all*) to 5 (*extremely*). According to Watson et al. (1998), the reliability scores of the PANAS are very good. They range from 0.86 to 0.90 for Positive Affect and from 0.84 to 0.87 for Negative Affect. (See appendix for entire instrument.). The internal consistency reliabilities for the Positive and Negative Affect subscales in this study were .85 and .85 for the arthritis group and .84 and .90 for the IBD group, respectively.

Satisfaction with life. Subjective well-being was measured with the Satisfaction With Life Scale (Pavot & Diener, 1993). This five-item survey measures reports of life satisfaction. Sample items include "I am satisfied with my life" and "If I could live my life over, I would change almost nothing." Participants respond to each item using a 7-point scale, with response options ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). The internal consistency reliabilities in this study were .92 for the arthritis group and .90 for the IBD group.

Data Analysis

Confirmatory factor analysis of the PTGI. In order to establish the suitability of the five-factor model to measure posttraumatic growth among individuals with arthritis or IBD, a confirmatory analysis (CFA) was conducted on the pooled sample of participants. The CFA was based on the covariance matrix of the items using maximum-likelihood (ML) estimation and conducted using AMOS 6.0. Latent variables were scaled by fixing one loading to one. Using a similar approach to that used by Taku et al., (2005), five alternative hypothesized models were tested and compared. The five models included: (a) a one-factor model, (b) an oblique three-factor model, (c) an oblique five-factor model based on the PTGI subscales, (d) a three factor with a single higher-order factor model, and (e) a five factor model with a single higher-order factor. Prior to analysis, the data were screened univariate and multivariate normality and outliers. Multivariate outliers were screened using Mahalanobis distance ($p < .001$). Although several items showed slight skewness and kurtosis, there were no serious violations of univariate or multivariate normality and all other assumptions were met.

In comparing the fit of the five hypothesized models, the chi-square statistic was used to assess the overall fit of the model. In addition to this, Kline (2004) recommends using a minimal set of indices which should include (a) an index that describes the proportion of explained variance such as the Comparative Fit Index (CFI; Bentler, 1990) or the Incremental Fit Index (IFI; Bollen, 1989), (b) an index that adjusts the proportion of explained variance for model complexity such as the Non-Normed Fit Index (NNFI; Bentler, 1990), and (c) an index based on the standardized residuals such as the root

mean square error of fit index (RMSEA; Steiger & Lind, 1980). As for the baseline fit index, the RMSEA values of .06 or less are generally taken to indicate reasonable model fit (Hu & Bentler, 1999; Thompson, 2004). The incremental fit indices (CFI, NNFI, and IFI) with .95 or greater indicate acceptable fit (Hu & Bentler, 1999; Schreiber, Stage, King, Nora, & Barlow, 2006). The resulting "best-fitting" model was then subjected to a multi-group invariance test to ensure measurement invariance across the two groups.

The experience of positive and negative changes. The extent to which participants in each illness group experienced positive changes (i.e., growth) and negative changes was first explored by examining the following item: "Nowadays, to what extent do you feel that IBD/arthritis has (positively/negatively) affected your life." Within- and between-group differences across Time 1 and Time 2 were explored through correlations, paired-sample *t* tests, and one-way analysis of variance (ANOVA). To explore the types of positive and negative effects experienced across the two illness groups, participants' responses to the following item were qualitatively analyzed: "Could you please describe the (positive/negative) effect it has had on your life?" For the qualitative analysis of the positive effects, a thematic content analysis approach was used as Tedeschi and Calhoun's (1998) model of posttraumatic growth was available as a theoretical framework. Additional positive changes not captured by Tedeschi and Calhoun's model were examined and highlighted. For the negative effects, no theoretical framework was available, thus, data were analyzed using a grounded-theory approach (Glaser, 1992). Using this approach, data analysis was iterative and proceeded in several closely linked

stages as follows: (a) becoming familiar with the data by rereading transcripts; (b) identifying recurrent topics or comments; (c) developing a topic index; (d) using an index to code the data; (e) combining related topics into themes; and (f) further collapse or refinement of categories. Analysis of the negative effects focused more on identifying the non-physical illness experiences. Data management was conducted using NVivo software (version 2.0, Qualitative Solutions and Research, Victoria, Aus.). The first author and one graduate student research assistant reviewed the open-ended responses from the Time 1 dataset. To ensure the accuracy of the findings, the first author and the research assistant met frequently to discuss the ongoing review of the data and the findings from the data analysis.

Descriptive results for the study variables in relation to posttraumatic growth. Having established the appropriateness of the PTGI model to assess posttraumatic growth for both illness groups, the descriptive results (means, standard deviations, and correlations) for the study variables and their relation to posttraumatic growth at Time 1 and Time 2 are presented.

Testing a model of posttraumatic growth. The next section tests and presents the findings for a hypothesized model of posttraumatic growth using structural equation modeling (SEM). Two SEM models are presented: one for the arthritis group and one for the IBD group. Specifically, in order to examine the factors related to posttraumatic growth, a SEM model was proposed that considered the roles of six latent variables and three measured variables. The latent variables included positive outlook, spirituality, stressors, social support, control beliefs, and coping strategies. The measured variables

included years diagnosed, sense-making, and benefit-finding. The hypothesized model is present in Figure 1. Ovals represent the latent variables and rectangles represent measured variables. Absence of a line connecting variables implies lack of a hypothesized direct effect. The model was evaluated using the same estimation procedures and fit indices as was used for the CFA.

Prior to conducting the SEM, the data were examined in both illness groups. The data showed no violations of the assumptions of linearity, homoscedaticity, and multivariate normality or multicollinearity, and there was no missing data. In addition, the presence of univariate and multivariate outliers were examined. Two cases from the IBD group were identified as having multivariate outliers using Mahalanobis distance and these cases were removed ($p < .001$). Therefore the SEM was tested on 214 respondents with arthritis and 376 respondents with IBD.

It is recommended that each latent variable be measured by at least three indicators (Kline, 2004). Because the latent variables Spirituality, Social Support, Control Beliefs, and Coping Strategies only had two indicators each, these indicators (i.e., intrinsic religiousness, social support, symptom control beliefs, and adaptive coping) were subdivided to create at least three indicators. Following a domain sampling rationale, one method for generating parcels is to assign each item randomly to one of the parcel groupings. Depending on the number of items to be assigned, two or three, or groupings of items, could be constructed. According to Little, Cunningham, Shahar, and

Widaman (2002), this method of random assignment of items to parcels should lead to parcels that contain similar common factor variance.

Change in posttraumatic growth over time. To examine how posttraumatic growth changes across the two time points for each illness group, a series of one-way within-subjects ANOVAs was conducted. To explore how posttraumatic growth differed across the illness groups, a profile analysis was conducted.

Predictors of posttraumatic growth at Time 2. In order to determine which variables collected at Time 1 predict posttraumatic growth at Time 2, two hierarchical multiple regression analyses were conducted, one for each illness group. The order of variables entered into each model was determined using Schaefer and Moos' (1992) theoretical framework as a guide. Specifically, the set of predictor variables entered was as follows: personal resources (e.g., optimism, spirituality), social resources (e.g., social support), health burden and stressors (e.g., illness-specific stressors, perceived stress), cognitive appraisal and coping variables (e.g., benefit-finding, sense-making, symptom control, and adaptive coping), and finally, the five PTGI subscales.

Outcomes of posttraumatic growth. Finally, the relationships between posttraumatic growth at Time 1 and three psychosocial well-being variables (positive and negative affect, and satisfaction with life) at Time 2 were examined using correlations and stepwise hierarchical regressions.

CHAPTER III

Results

In order to help the reader navigate through the results, the results of this study have been divided into six broad sections. First, the results for the confirmatory factor analysis of the PTGI are presented in order to establish the suitability of the five-factor model to measure posttraumatic growth among individuals with arthritis or IBD. The second section examines the experience of positive and negative growth for each illness group. This section also includes the qualitative analysis of the non-physical positive and negative effects each group experienced as a result of their disease. The third section presents the descriptive results for the study variables and their relations to posttraumatic growth at Time 1 and Time 2. The fourth section tests and presents the findings for a hypothesized model of posttraumatic growth using structural equation modeling (SEM). Two SEM models are presented, one for the arthritis group and one for the IBD group. The fifth section explores the experience and change in posttraumatic growth across time for each illness group. The final section explores whether posttraumatic growth at Time 1 was related to three psychosocial well-being variables (i.e., positive and negative affect, and satisfaction with life) at Time 2.

Confirmatory Factor Analysis of the Posttraumatic Growth Inventory (PTGI)

To evaluate the factor structure of the PTGI, five models were tested using CFA on the pooled sample of participants. The models tested were as follows: (a) a one-factor model, (b) an oblique three-factor model, (c) an oblique five-factor model based on the PTGI subscales, (d) a three factor model with a single higher-order factor, and (e) a five-factor model with a single higher-order factor.

Table 3 reports the fit indices for the five models. The results using the chi-square statistic (χ^2) showed that all of the hypothesized models should be rejected. Inspection of the goodness-of-fit indices revealed that Model 1, the one-factor model, was a poor fit to the data. The analyses showed a fairly better fit for Model 2 and Model 4. As seen in Table 3, Model 3 and Model 5 provided a somewhat better fit than the other three models, with Model 3 showing a slightly better fit to the data compared to Model 5. Therefore, Model 3 (oblique five-factor model) was chosen as the preferred model as it provided a slightly better fit to the data relative to the other four models tested, $\chi^2(189, N = 582) = 1008.58$, CFI = .900, NNFI = .883, IFI = .900 and RMSEA = .080 (.079-.090).

Although Model 3 was considered the preferred model, the associated goodness-of-fit indices were still below the recommended cut-off criteria. In an effort to improve model fit, modification indices were reviewed. The modification indices suggested correlating several error terms would improve model fit. However, correlating error terms should be used sparingly and be theoretically or methodologically justified (Kline, 2004), therefore,

Table 3

Fit Indices for the Five Hypothesized Models

Model	Description	χ^2	*df*	CFI	NNFI	IFI	RMSEA	CI
1	1 factor	2332.58***	189	.743	.714	.743	.140	.135-.145
2	3 factors	1735.79***	186	.814	.790	.815	.120	.115-.125
3	5 factors	1008.58***	179	.900	.883	.901	.080	.079-.090
4	3 factors with 1 higher-order factor	1735.79***	186	.814	.790	.815	.120	.115-.125
5	5 factors with 1 higher-order factor	1030.56***	184	.898	.884	.899	.089	.084-.094
6	5 factors, modified	686.48***	173	.938	.925	.939	.071	.060-.077

Note. CFI = Comparative fit index; NNFI = Non-Normed fit index; IFI = incremental fit index; RMSEA = root mean square error of approximation; CI = 90% confidence interval.

*** $p < .001$.

suggested modifications were carefully considered. In total, six pairs of error terms were allowed to correlate because inspection of these items revealed considerable overlap in item content. As seen in Table 3, overall model fit for the revised model (Model 6) improved considerably, $\chi^2(173, N = 582) = 686.48$, CFI = .938, NNFI = .925, IFI = .939, and RMSEA = .071 (.066 -.077).

Table 4 presents the standardized regression weights and correlations among five factors, as well as the descriptive statistics for each of the 21 items of the PTGI. As seen in the table, Model 6 showed that the standardized regression weights from each latent construct to the 21 observed variables ranged from .58 to .96. The correlations between the five factors were all significant at $p < .05$ (*r*s ranged from .42 to .74). The alpha coefficient of the overall PTGI score was .93, and each of the five factors showed moderate to high internal consistency (αs ranging from .82 to .93). The mean of the total PTGI score was 51.33 ($SD = 24.42$), with a range from 0 to 104. These mean values are similar to those reported by Taku et al., (2008) who observed a total PTGI score was 53.04 ($SD = 24.17$), with a range from 0 to 105 among adults who had experienced a variety of traumatic events. The descriptive statistics of each factor across the two illness groups and associated alpha values are presented in Table 5.

Testing for multigroup invariance. The invariance of the five-factor oblique PTGI (Model 6) was tested across the two illness populations. Specifically, I tested for equivalency of the 21-item adaptation of the PTGI across the arthritis group ($N = 209$) and the IBD group ($N = 373$) to ensure that the PTGI measure is applicable across the

Table 4

Standardized Parameter Estimates, Means, Standard Deviations and Factor Correlations for Confirmatory Factor Analysis of the Posttraumatic Growth Inventory (N = 582)

		Standardized regression weights						
	PTGI Item	RO	NP	PS	SC	AL	*M*	*SD*
15	I have more compassion for others	.58					4.29	1.62
20	I learned a great deal about how wonderful people are	.84					3.45	1.70
9	I am more willing to express my emotions	.77					3.18	1.55
21	I better accept needing others	.75					3.52	1.63
8	I have a greater sense of closeness with others	.85					3.21	1.69
16	I put more effort into my relationships	.75					3.65	1.67
6	I more clearly see that I can count on people in times of trouble	.79					3.80	1.64
11	I am able to do better things with my life		.83				3.04	1.66
7	I established a new path for my life		.69				3.21	1.74
3	I developed new interests		.70				3.34	1.62
17	I am more likely to try to change things which need changing		.75				3.53	1.62
14	New opportunities are available which wouldn't have been		.70				2.62	1.68

	otherwise						
10	I know better that I can handle difficulties		.82			4.05	1.53
19	I discovered that I'm stronger than I thought I was		.74			4.21	1.72
4	I have a greater feeling of self-reliance		.70			3.37	1.68
12	I am better able to accept the way things work out		.81			3.55	1.58
5	I have a better understanding of spiritual matters			.96		2.63	1.77
18	I have a stronger religious faith			.83		2.44	1.80
13	I can better appreciate each day				.81	3.54	1.70
2	I have a greater appreciation for the value of my own life				.87	3.78	1.64
1	I changed my priorities about what is important in life				.70	3.90	1.59

	PTGI factors	Correlations among factors			
	New possibilities	.72			
	Personal strength	.69	.74		
	Spiritual change	.42	.53	.43	
	Appreciation of life	.68	.70	.65	.42

Note. RO = Relating to Others; NP = New Possibilities; PS = Personal Strength; SC = Spiritual Change; AL = Appreciation of Life; PTGI = Posttraumatic Growth Inventory.

Table 5

Means, Standard Deviations and Internal Consistency Values for the Posttraumatic Growth Inventory (PTGI)

		Total		Arthritis		IBD	
Subscale	α	*M*	*SD*	*M*	*SD*	*M*	*SD*
RO	0.92	18.11	9.17	16.77	9.16	18.86	9.10
NP	0.87	10.73	6.64	10.52	6.76	10.86	6.57
PS	0.85	11.18	5.38	10.10	5.48	11.79	5.24
SC	0.93	3.07	3.44	3.42	3.62	2.88	3.32
AL	0.82	8.23	4.30	7.83	4.30	8.45	4.29
PTGI (total)	0.93	51.33	24.42	48.63	25.41	52.84	23.75

Note. RO = Relating to Others; NP = New Possibilities; PS = Personal Strength; SC = Spiritual Change; AL = Appreciation of Life; PTGI = Posttraumatic Growth Inventory; IBD = inflammatory bowel disease.

illness groups. The general procedure for testing multigroup invariance involves testing for measurement invariance between the unconstrained model for all groups combined (i.e., baseline model) then for a model where certain parameters are constrained to be equal between the groups. If the chi-square difference statistic does not reveal a significant difference between the baseline and the constrained-equal models, then it can be concluded that the model has measurement invariance across the groups (Byrne, 2004). For this study, invariance on the number of factors and factor loadings was tested. Although one can also test for equality of error variances and covariances across groups, Byrne (2001) considers this to be a rather stringent step.

A baseline χ^2 value was derived by computing model fit for the pooled sample of participants, χ^2 (346, N = 582) = 899.93, with goodness-of fit values CFI = .933, NNFI = .920, IFI = .935, and RMSEA = .052 (.048 - .057). A second model was specified in which all factor loadings, and factor variances, and factor covariances and the six error covariances were constrained equal across the two groups. The fully constrained model showed a similar fit, χ^2 (362, N = 582) = 925.19), with goodness-of fit values CFI = .933, NNFI = .922, IFI = .933, and RMSEA = .053 (.048 - .057). In testing for the invariance of this constrained model, the χ^2 value of the constrained model was compared to the baseline model in which no equality constraints were imposed. As with single-group applications, when models are nested, this difference in chi-square values is distributed as χ^2, with degrees of freedom equal to the difference of the difference in the degrees of freedom. Given that the constrained model is nested within the baseline model, the chi-

square difference test was applied. This comparison produced a chi-square difference ($\Delta\chi^2$) value of 26.07 with 16 *df*, which was not statistically significant at $p < .05$. Therefore, the results suggest that the model is applicable to both illness groups. Two separate CFAs were then computed for each illness group. The results a slightly better fit for the IBD group, χ^2 (173, $N = 373$) = 490.57, with goodness-of fit values CFI = .938, NNFI = .924, IFI = .938, and RMSEA = .070 (.063-.078), compared to the arthritis group, χ^2 (173, $N = 209$) = 409.36, with goodness-of fit values CFI = .929, NNFI = .913, IFI = .929, and RMSEA = .081 (.071-.091).

The Experience of Positive and Negative Growth

The results from this study indicate that the experience of positive changes since diagnosis was common for individuals with arthritis or IBD. At both Time 1 and Time 2, 65% of individuals with arthritis reported that their disease had positively affected their life in some way. A somewhat larger proportion of respondents from the IBD group reported that their disease had positively affected their life in some way at Time 1 (73%) and at Time 2 (78%). When considering the mean differences at Time 1, the IBD group reported experiencing more positive effects ($M = 2.50$, $SD = 1.25$) than the arthritis group ($M = 2.30$, $SD = 1.22$), $F(1, 588) = 3.67$, $p < .05$. Similarly, at Time 2, the IBD group reported experiencing more positive effects ($M = 2.59$, $SD = 1.19$) than the arthritis group ($M = 2.27$, $SD = 1.20$), $F(1, 275) = 4.62$, $p < .05$. There were, however, no significant increases in reports of positive effects across Time 1 and Time 2 for either illness group.

Instead, it appeared that reports of the positive effects of their respective illnesses remained relatively stable across the six months.

Interestingly, participants in both illness groups reported that their illness had negatively affected their lives. For example, among the respondents with arthritis, 85.1% reported at Time 1 and 77.7% at Time 2 that their disease had negatively affected their life somewhat to a great deal. Likewise, among the respondents with IBD, 78.6% reported at Time 1 and 66.2% at Time 2 that their disease had negatively affected their life somewhat to a great deal. The mean differences across the groups at each time point were examined, and at Time 1, the IBD reported experiencing marginally less negative effects ($M = 3.47$, $SD = 1.13$) than the arthritis group ($M = 3.64$, $SD = 1.03$), $F(1, 588) = 3.16$, $p = .08$. However, the difference at Time 2 was significant, whereby the IBD reported experiencing less negative effects ($M = 3.10$, $SD = 1.13$) than the arthritis group ($M = 3.51$, $SD = 1.18$), $F(1, 275) = 8.32$, $p < .01$. Paired-sample t tests revealed that there was a significant *decrease* in reports of negative effects across the six months. Specifically, reports of negative effects significantly decreased for the IBD groups, $t(175) = 2.39$, $p < .05$, and for the arthritis group, $t(102) = 2.02$, $p < .05$.

Qualitative Analysis of Positive and Negative Effects

Participants who responded that their disease had either positively and/or negatively affected their life were then asked to specify how. A thematic content analysis approach was used to analyze the positive effects, keeping Tedeschi & Calhouns' (1996) five domains of posttraumatic growth in mind. In fact, many of the positive effects

indicated fell under at least one of their growth categories. Therefore, presentation of the positive effects or changes experienced below is described for both illness groups. For the negative effects, no existing theoretical framework was available to guide the qualitative analyses, therefore, these open-ended responses were analyzed using a grounded theory approach. The presentation of the negative non-physical effects is presented separately for each illness group because there were substantial differences. Appendix L presents the themes and sub-themes with quotes for the positive effects for each illness group and Appendix M presents the themes and sub-themes with quotes for the negative effects for each illness group separately.

Positive effects. As mentioned, most of the responses regarding positive changes mirrored the posttraumatic growth domains theorized by Tedeschi & Calhoun's (1996). To be consistent with their model, the themes were given the same labels. Specifically, individuals with arthritis or IBD reported positive effects in Relationships, New Possibilities, Personal Strength, Appreciation for Life, and Spirituality. A sixth theme was identified which was labeled Psychological Preparedness.

For the first theme, changes in *Relationships* involved respondents with arthritis accepting help from others, becoming more compassionate, and becoming closer with others. Two sub-themes were identified, with the first involving wanting to help others who have the disease. For example, respondents indicated that they felt a stronger need to be benevolent to others who were also suffering and felt compelled to show more compassion for these individuals. A second sub-theme involved forming stronger and

more intimate relationships. For example, one female respondent who had been living with arthritis for three years indicated that she had formed "new and amazing friendships because of [her] disease."

For the IBD group, a similar pattern of sub-themes emerged whereby they also wanted to help others who are affected by the disease, particularly in the form of informational and emotional support. However, one additional sub-theme emerged that involved appraising friendships. For example, as noted by one man who had been living with Crohns disease for about four years: "Crohns helped me be able to see who my real friends are." In fact, one of the key group differences in this Relationship theme was that the IBD group seemed to rally around each other and enthusiastic about providing support to others affected by the same disease. Moreover, these individuals tended to seek out people who had their disease. Indeed, a number of respondents indicated that they felt they could only *get* support from others with IBD and that they were the only ones who could *give* that same level of support and empathy to others with the disease.

The second theme was *New Possibilities* and involved developing new interests and exploring life paths that they had never considered before. A number of respondents with arthritis indicated that their disease helped them find their "creative side" – a side that many of them did not consider prior to their disease onset. Some of the activities or interests included painting or drawing. For the respondents with IBD, many of them indicated that they developed new hobbies or interests as well, but also that their disease seemed to change the course of their path in life to one in which they had not previously

considered. In addition, a number of individuals from the IBD group indicated that they were open to trying or testing different kinds of treatments to manage their symptoms.

The third theme was *Personal Strength* and generally involved developing a greater sense of self-reliance. While this theme is similar to Tedeschi and Calhoun's (1998) concept of Personal Strength, one notable difference that emerged was that this type of Personal Strength seemed to be particularly health specific, and largely related to beliefs that one could make healthy lifestyle changes. For example, according to one woman who had been living with arthritis for about 6 years: "I completely changed my lifestyle to a more healthier one, ... never thought I had it in me to do that." A number of respondents also reported that they developed more patience, and when inspecting the items on the Personal Strength subscale of the PTGI, this sub-theme seems consistent with the idea that they were more capable of accepting the way things work out. Like the respondents with arthritis, the IBD group also reported becoming more self reliant and realizing that they were stronger than they thought they were. For example, one man who had been living with ulcerative colitis for about six years indicated: "I prepare myself for the future because I know what to expect."

The fourth theme was *Appreciation of Life*, and broadly involved changing priorities in their life and appreciating the "little things" in life to a greater extent. A large proportion of respondents indicated that they no longer cared about material things as they once did. Rather, a sizeable proportion of respondents indicated that they appreciated their "pain free" days and valued their own life more. There were very few notable differences between the two illness groups on this theme.

The fifth theme was *Spiritual Change*, and involved changes or strengthening in one's beliefs of God and/or a higher being, as well as general changes in spirituality. Although this was not the most dominant of changes that participants reported, common changes regarding this theme included changes in spiritual practice or becoming more involved in organized religion. For example, one women who had been living with arthritis for about 11 years noted "Getting off of the treadmill of modern life has given me time for the spiritual practice that I never had time for before." Other participants noted that they contemplated about spiritual matters to a greater extent now than before their diagnosis, and in doing so, it gave them a sense of hope or meaning to their illness. For example, as one man with IBD noted, "I have developed a strong spiritual life outside of any organized religion. This practice has given me strength to not give up entirely. Otherwise, I have contemplated suicide sometimes."

The last theme identified was labeled *Psychological Preparedness*. Although this theme seems somewhat related to Personal Strength, it is more specific and lends support to the role of immunization of past traumatic or disease-related stress. For example, a large proportion of participants in both illness groups explained that having dealt with previous flare-ups and health-related emergencies prepared them, both mentally and to some extent physically, for the possibility of experiencing future health-related emergencies. According to one participant who had been living with Crohns for about eight years: "I know that there isn't much life can throw at me that I can't get through, based on what I've gone through already with each episode." Having experienced previous crises provides insights about the stress experienced during these crisis

situations, and being psychologically prepared appears critical for coping with the reality of their disease. That it, rather than becoming psychologically passive and believing that they have no control over their situation or whatever they do is futile, participants appeared to have to come to grips with the fact that the unpredictability of their disease implies that they will likely experience flare-ups or health-related emergencies in the future and have thus taken steps to mentally prepare for such experiences. For example, one participant who had been living with arthritis for about four years explained: "I know what to expect for my next flare-up. Even though I don't know when that might happen, and I try to get enough rest and exercise more now then I used to…I'm ready for it! I know I can deal with it better next time."

Negative effects – Arthritis group. A number of themes related to the negative effects of their disease emerged for the arthritis group, with the first dealing with *Social Issues*. This theme consisted of two relatively distinct sub-themes: social isolation and feeling that others view them in a negative light. For example, a large proportion of respondents indicated that they felt socially, and to some extent emotionally, isolated from others since being diagnosed with their disease. In addition, many respondents indicated that they felt they were perceived negatively by friends and family, such that others thought they were exaggerating their symptoms. According to one woman who has been living with fibromyalgia for about eight years, she feels her friends and family members think "why doesn't she just get over it?"

The second theme involved negative *Psychological Changes*, and consisted of several sub-themes. The first sub-theme involved negative mood changes, such as

experiencing increased negative affect, and feeling depressed and sad more often. A number of respondents also noted that they experienced mood swings and could become irritable. Several respondents, particularly those with children or partners, noted that they felt ashamed or guilty because they could not do the things they used to do. The second sub-theme involved a sense of identity-loss or loss of their "desired" self. In particular, these respondents seemed to mourn the loss of who they could have been if they did not have the disease. Several respondents indicated that arthritis limited things they wanted to do such as dancing, participating in leisure activities, as well as sexual functioning. A related sub-theme dealt with *negative self-perceptions*. A number of respondents indicated that they could no longer do simple forms of physical activity such as household chores or perform parental or caregivers duties. In fact, it appeared that respondents commonly reflect on not being able to perform their "roles" up to their expectations or standards because they have arthritis. Furthermore, their diseases limited their ability to work, with some respondents indicating that they had to quit their job, reduce their hours, or make strategic changes in career choice due to the limitations imposed by their disease. Moreover, negative self-perceptions was related to body image. Particularly for the younger respondents, many indicated that they had gained weight, either through the side effects of the medication or because of being less physically active. A number of respondents also indicated that changes in body image resulted from the appearance of disfigured joints.

The final theme related to negative changes involved *Financial Constraints*. While this theme appeared to be heavily related to the themes mentioned above (e.g., inability to work full-time), a number of respondents indicated that they experienced substantial financial hardships due to expensive medications and having to see various health-care providers not covered by their health insurance.

Negative effects – IBD group. The IBD group experienced a somewhat different set of negative effects of there disease, although some overlap with the arthritis group is evident. The first and most predominant theme involves *Freedom Restrictions* which was experienced on several levels. A sub-theme that emerged involved food or diet restrictions. For example, a number of respondents indicated that they had diet restrictions, which were generally self-imposed, and spent a considerable amount of time choosing and testing the right types of food that would not cause a flare up. As a result, many indicated that they could no longer eat many of the foods they used to enjoy. A second sub-theme involved being unable to participate in social activities. In particular, many respondents indicated that they could no longer do many of the things they wanted to do, such as play sports, engage in sexual activities, or hold a full-time job, because they felt limited by their IBD symptoms or feared having to run to the bathroom. In fact, many respondents indicated that the felt they always had to pre-plan social outings and take careful note of where the bathrooms are located.

The second theme, which seemed somewhat related to the first theme, involved *Future Uncertainty.* For example, several respondents indicated that due to the

unpredictable nature of their disease, they feared or worried about when they were going to experience their next flare up. A sizable proportion also indicated that they were uncertain about their health in the future, and worried that their IBD symptoms would worsen.

The third theme involved *Psychological Issues*, and was somewhat similar to the theme of the same name for the arthritis group, with a few exceptions. Like the arthritis group, the respondents with IBD indicated that they experienced depressed mood and negative affect, would become frustrated or irritable more easily now, and experienced mood swings. Another sub-theme involved personality changes. For example, a number of respondents indicated that the disease changes who the person used to be. These changes arise from dealing with the disease, in that they find themselves to be more shy or reclusive than before, perceive themselves to have lower self esteem and lacking in self-confidence, and less "upbeat" than they used to be. A related sub-theme involved negative self-perceptions. For example, a number of participants reported that their disease at times made them view themselves in a negative. According to one participant who had been living with ulcerative colitis for about nine years noted "My self esteem is non existent. I have gained weight, and have lots of acne now thanks to the medications. I hate the way I look sometimes."

The fourth theme related to *Social Issues,* and involved the same sub-themes of social isolation and feeling negative perceptions from friends and family as noted in the arthritis group. However, concerning the negative perceptions sub-theme, a somewhat large proportion of respondents indicated that because of such negative perceptions, they

had lost friends who "simply did not understand the disease." A sub-theme that was distinct from the arthritis group involved feeling embarrassed and awkward in social situations. For example, several respondents noted that they were embarrassed about having the disease and the associated symptoms, and found that they had to make excuses to friends for their behaviour.

The final theme dealt with *Financial Constraints*, and closely mirrored the same issues faced by the arthritis group. In particular, many respondents indicated that because of their illness, they could not work full-time and generally did not have insurance to cover the expensive medications necessary to suppress their symptoms. In addition, several respondents indicated that they use alternative forms of treatment, such as acupuncture and Chinese medicine, which could be very costly.

Change in Posttraumatic Growth Over Time

The experience of posttraumatic growth was also examined using the PTGI (Tedeschi & Calhoun, 1996). Participants in both illness groups reported moderate levels of posttraumatic growth at Time 1 and Time 2. To test Hypothesis 1, which stated that individuals with arthritis or IBD who report posttraumatic growth at Time 1 will report higher levels of posttraumatic growth at Time 2, a one-way within-subjects ANOVA was conducted with the factor being time and the dependent variable being the *overall PTGI* scores. The means and standard deviations for both illness groups are presented in Table 6. The results for the ANOVA did not indicate a significant effect of time on overall levels of posttraumatic growth for the arthritis group, Wilks's $\Lambda = .98$, $F(1, 102) = 2.15$,

$p > .05$, or for the IBD group, Wilks's $\Lambda = 1.0$, $F(1, 175) = 1.94$, $p > .05$. Therefore, Hypothesis 1 was not supported when the overall posttraumatic growth scores were used.

To test whether the levels of posttraumatic growth on each of the five PTGI subscales had increased over time, a series of one-way within-subjects ANOVAs were conducted with the factor being time and the dependent variable being *each of the five PTGI subscales* (Relating to Others, New Possibilities, Personal Strength, Spiritual Change, and Appreciation of Life). The means and standard deviations for both illness populations are presented in Table 6. The only significant increases in posttraumatic growth was observed for Personal Strength for the arthritis group, Wilks's $\Lambda = .95$, $F(1, 102) = 4.89$, $p < .05$. There was also a marginal increase in Relating to Others for the arthritis group, Wilks's $\Lambda = .97$, $F(1, 102) = 2.97$, $p = .08$. Table 7 presents the repeated measures ANOVA values and the correlation between the PTGI total score and individual subscales for each illness group. These findings provide partial support for Hypothesis 1. Specifically, when considering individual subscales, there was evidence that posttraumatic growth increased over time.

Differences in Posttraumatic Growth among Illness Groups

In order to examine potential differences between the illness groups and each of the five PTGI subscales at Time 1 and Time 2, two profile analyses were conducted with illness group as the between-groups factors and subscale (Relating to Others, New Possibilities, Personal Strength, Spiritual Change, and Appreciation of Life) as the within-subjects factor. Because the dependent variables must be subjected to the same scaling techniques (Tabachnick & Fidell, 2001), subscale values were converted to means

based on a five point scale. The following section describes the between- and within-group differences observed on the five PTGI subscales, separately for Time 1 and Time 2.

Posttraumatic growth at Time 1. The means for the two groups on each of the five subscales appear in Figure 2. Using Wilks's Λ, the results showed that the groups deviated significantly from parallelism, Wilks's $\Lambda = .95$, $F(4, 587) = 8.02$, $p < .0001$, partial $\eta^2 = .06$, signaling an Group x Subscale interaction. Therefore, patterns of differences between the subscales differed among the two illness groups. the test of levels and the test of flatness did not

Table 6

The Posttraumatic Growth Inventory (PTGI) Overall Scaled Scores and Subscales Scores across Time 1 and Time 2

	Time 1				Time 2			
	Arthritis		IBD		Arthritis		IBD	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Relating to others	3.37	1.32	3.66	1.30	3.21	1.37	3.54	1.23
New possibilities	3.12	1.37	3.14	1.33	3.05	1.40	3.16	1.26
Personal strength	3.51	1.37	3.90	1.33	3.33	1.56	3.94	1.28
Spiritual Change	2.67	1.82	2.42	1.66	2.70	1.83	2.36	1.67
Appreciation of life	3.63	1.44	3.78	1.45	3.58	1.59	3.79	1.33
PTGI (total)	3.26	1.22	3.17	1.33	3.38	1.14	3.36	1.09

Note. IBD = inflammatory bowel disease.

Table 7

Changes in Posttraumatic Growth at Time 1 and Time 2 for each Illness Group

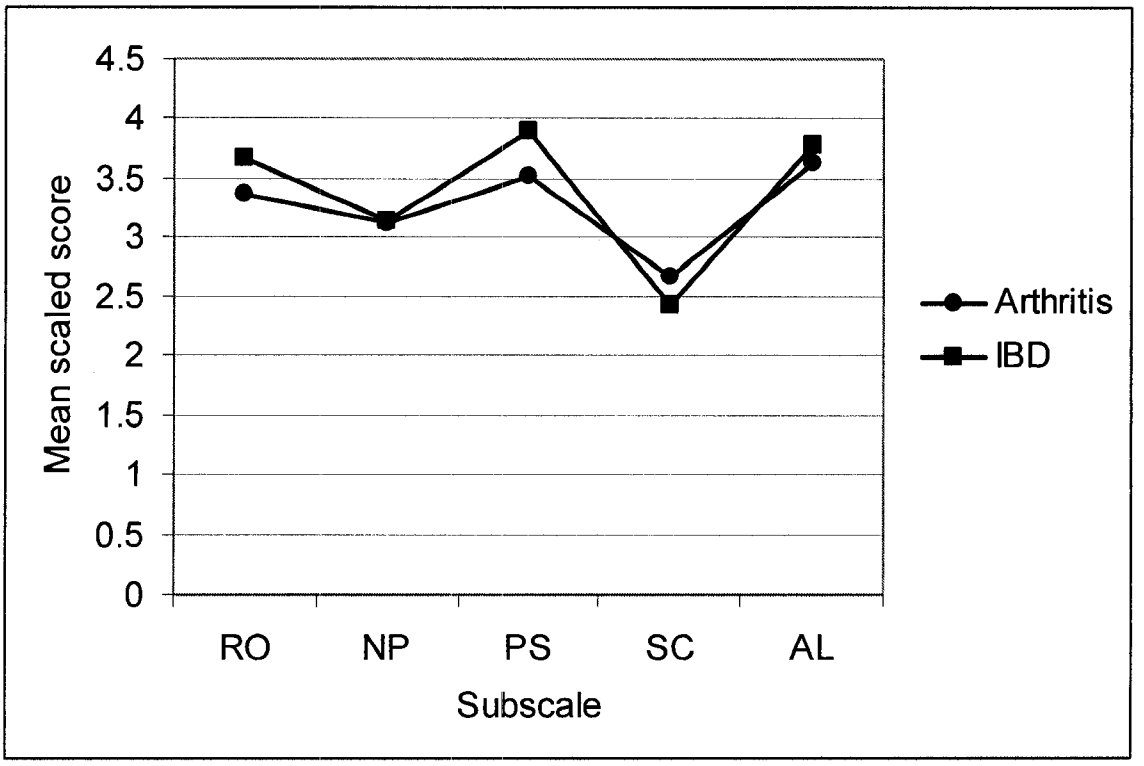
Subscale	Illness group	Wilks's Λ	*F*(*df*)	Pearson's *r*
PTGI total	Arthritis	.98	F (1, 102) = 2.15	.75**
	IBD	1.0	F (1, 175) = .19	.73**
Relating to others	Arthritis	.97	F (1, 102) = 2.97^{+}	.71**
	IBD	.99	F (1, 175) = .68	.67**
New possibilities	Arthritis	1.0	F (1, 102) = .01	.70**
	IBD	1.0	F (1, 175) = .17	.70**
Personal strength	Arthritis	.95	F (1, 102) = 4.89*	.60**
	IBD	.99	F (1, 175) = .149	.64**
Spiritual change	Arthritis	.99	F (1, 102) = .08	.78**
	IBD	.99	F (1, 175) = .62	.79**
Appreciation of life	Arthritis	.98	F (1, 102) = 1.19	.76**
	IBD	.99	F (1, 175) = .10	.64**

Note. IBD = inflammatory bowel disease.

$^{+}p < .08$; * $p < .05$; *** $p < .001$.

Figure 2

Means for Subscales of the Posttraumatic Growth Inventory (PTGI) across Individuals with Arthritis or Inflammatory Bowel Disease at Time 1 (N = 592)



Note. RO = Relating to others; NP = New possibilities; PS = Personal strength; SC = Spiritual Change; AL = Appreciation of life; IBD = Inflammatory bowel disease.

produce reliable differences among the groups. The flatness test was also significant, Wilks's $\Lambda = .58$, $F(4, 587) = 106.50$, $p < .0001$, partial $\eta^2 = .42$, signaling differences within groups.

To investigate the Group x Subscale interaction, a set of between-subjects simple effects analyses was conducted to determine whether there were differences across the two illness groups with regards to the five PTGI subscales at Time 1. The results showed differences for Relating to Others, $F(1, 590) = 7.13$, $p < .01$, Personal Strength, $F(1, 590) = 11.34$, $p < .001$, and marginally for Spiritual Change, $F(1, 590) = 2.88$, $p = .09$. Specifically, the IBD group reported higher levels of changes in Relating to Others and Personal Strength compared to the arthritis group, whereas the arthritis group reported marginally more changes in Spirituality compared to the IBD group.

Next, a within-subjects simple effects analysis was conducted and focused on whether the means for each of the five subscales differed for the two illness groups. For respondents with arthritis, the results showed higher levels of changes regarding Personal Strength than Relating to others ($p < .05$) or New Possibilities ($p < .05$). There were higher levels of changes regarding Relating to Others than New Possibilities ($p < .01$) or Spiritual Change ($p < .001$). Similarly, respondents with arthritis reported more changes regarding Appreciation of Life than New Possibilities or Spiritual Change. And finally, there were higher levels of changes regarding New Possibilities than Spiritual Change ($p < .05$). For individuals with IBD, a similar pattern was observed whereby participants reported greater changes with regards to Personal Strength compared to Relating to

Others, Appreciation of Life, New Possibilities and Spirituality (all *ps* < .001). There were more changes in Relating to Others then New Possibilities or Spiritual Change (p < .05), and more changes relating to New Possibilities and Appreciation of Life than for Spiritual Change (all *ps* < .05).

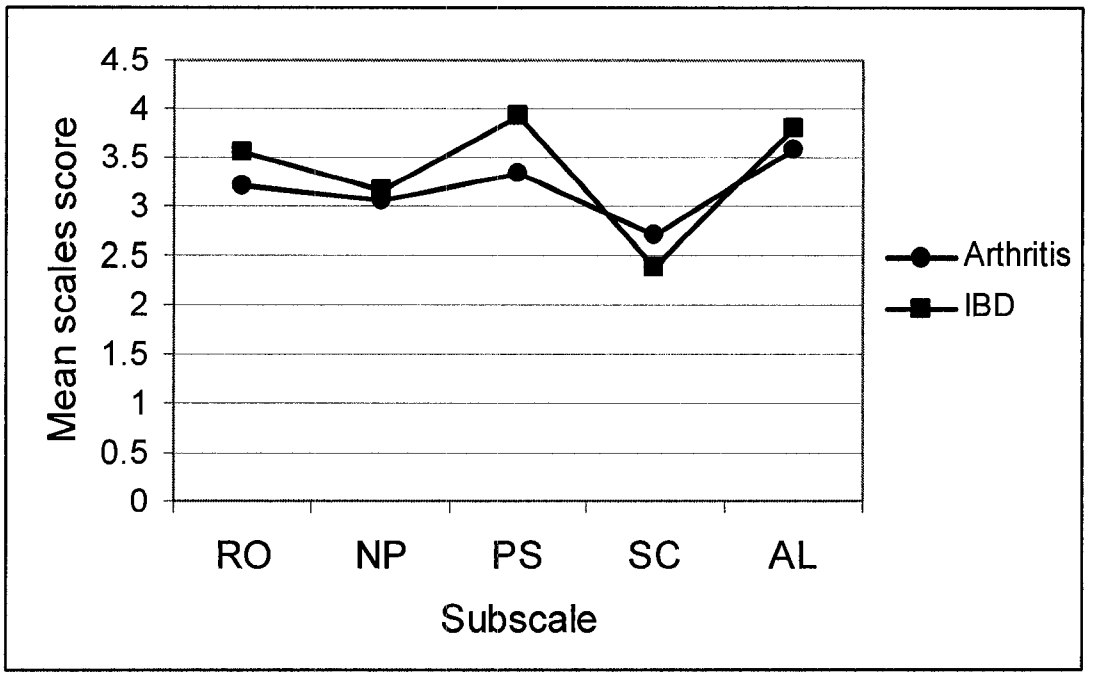
Posttraumatic growth at Time 2. The means for the two groups on each of the five subscales appear in Figure 3. Using Wilks's Λ, the results showed that the groups deviated significantly from parallelism, Wilks's $\Lambda = .90$, $F(4, 274) = 7.45$, $p < .0001$, partial $\eta^2 = .10$, signaling a Group x Subscale interaction. Therefore, patterns of differences between the subscales differed among the two illness groups. the test of levels and the test of flatness sis not produce reliable differences among the groups. The test for flatness was also significant, Wilks's $\Lambda = .90$, $F(4, 274) = 49.39$, $p < .0001$, partial $\eta^2 = .42$, signaling differences within groups.

To investigate the Group x Subscale interaction, a set of between-subjects simple effects analyses was conducted to determine whether there were differences across the two illness groups with regards to the five PTGI subscales at Time 2. The results showed differences for Relating to Others, $F(1, 277) = 4.49$, $p < .05$ and Personal Strength, $F(1, 277) = 12.49$, $p < .001$. Similar to the results observed for Time 1, the IBD group reported higher levels of changes in Relating to Others and Personal Strength compared to the arthritis group.

A within-subjects simple effects analysis was conducted next and focused on whether the means for each of the five subscales differed for the two illness groups at

Figure 3

Means for Subscales of the Posttraumatic Growth Inventory (PTGI) across Individuals with Arthritis or Inflammatory Bowel Disease at Time 2 (N = 279)



Note. RO = Relating to others; NP = New possibilities; PS = Personal strength; SC = Spiritual Change; AL = Appreciation of life; IBD = Inflammatory bowel disease.

Time 2. For respondents with arthritis, the results showed higher levels of changes regarding Relating to Others, New Possibilities, Personal Strength, and Appreciation of Life than Spiritual Change (all *ps* < .01). Furthermore, the respondents with arthritis reported the greatest amounts of change relating to Appreciation of Life than the remaining four subscales (all *ps* < .05). A similar pattern of results was observed for respondents with IBD. In particular, the participants reported higher levels of changes with regards Personal Strength and Appreciation of Life than Relating to Others and New Possibilities (all *ps* < .05) and Spiritual Change ($p < .001$). There were higher levels of changes regarding Relating to Others than New Possibilities ($p < .01$) or Spiritual Change ($p < .001$). Appreciation of life was higher on New Possibilities and Spirit. Finally, there were more changes relating to New Possibilities than for Spiritual Change ($p < .05$).

Descriptive Results

Having established the suitability of the five-factor PTGI model to measure posttraumatic growth for the two illness groups, the following section describes the descriptive results of the study. The means and standard deviations for all the study variables at Time 1 and Time 2 are presented in Table 8 for the arthritis group and the IBD group. Correlations between all of the study variables and the five PGTI subscale values are presented in Table 9 for the arthritis group and Table 10 for the IBD group. In addition, Table 11 presents the correlations of all the study variables collected at Time 1 with the five PTGI subscale values collected at Time 2, separately for each illness group. The following paragraphs describe the sociodemographic characteristics, personal factors (i.e., optimism, hope, religion, spirituality), environmental factors (i.e., social support, perceived stress, health distress, and past crisis/trauma experience), event-related factors (i.e., disease-onset severity and years diagnosed), cognitive appraisals (i.e., sense-making, Benefit-Finding, and control beliefs), and coping strategies, and outline how they are related to overall posttraumatic growth at Time 1 and Time 2.

Sociodemographic characteristics. The only demographic characteristics that showed a marginally significant relationship to overall posttraumatic growth was age in the IBD group at Time 2. Specifically, younger individuals with IBD tended to report more overall posttraumatic growth at Time 2 (r = -.13, p = .08). However, when examining the relations between sociodemographics and the five PTGI subscales, significant differences related to age and employment status were observed. For the arthritis group, age was significantly and negatively correlated with Relating to Others at

Time 1 (r = -.16, p = .05). There were more age differences across the PTGI subscales observed for the IBD group. In particular, individuals with IBD who were younger reported significantly more changes in Relating to Others (r =-.11, p = .03), and Spirituality (r = -.17, p < .001) at Time 1, and Relating to Others (r = -.15, p < .05), New Possibilities (r = -.22, p < .01), and Spirituality (r = -.19, p < .01) at Time 2.

One-way analysis of variance (ANOVA) was use to examine possible categorical sociodemographic characteristic differences on each of the PTGI subscales at Time 1 and Time 2. For the arthritis group at Time 1, the results showed that females reported significantly more changes in Relating to Others (M = 11.07, SD = 4.39) compared to men (M = 9.05, SD = 3.10), F (1, 212) = 3.99, p < .05. For the IBD group, females experienced more positive changes as assessed by the five PTGI subscales compared to men. Specifically, females reported more changes in Relating to Others (M = 26.18, SD = 9.05 versus M = 23.55, SD = 8.71), F (1, 377) = 4.68, p < .05, Personal Strength (M = 15.87, SD = 5.34 versus M = 14.48, SD = 5.33), F (1, 377) 3.81, p < .05, Spirituality (M = 5.03, SD = 3.33 versus M = 4.06, SD = 3.09), F (1, 377) = 4.72, p < .05, compared to men.

There were also differences with regards to employment status. For only the arthritis group at Time 1, employment status was significant for Spiritual Change, F (4, 207) = 3.63, p < .01. Tukey's HSD method was used to control for familywise error rate (used in all subsequent pairwise comparisons) and follow-up analyses revealed that respondents with arthritis who were not at all working reported experiencing more

Table 8

Means and Standard Deviations for Arthritis and IBD for Time 1 and Time 2

Variable	Arthritis				IBD			
	Time 1		Time 2		Time 1		Time 2	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Disease severity	3.28	0.67	--	--	3.40	0.62	--	--
Trauma total	5.17	3.18	--	--	3.95	2.55	--	--
Trauma distress	2.77	0.77	--	--	2.65	0.73	--	--
Years diagnosed	11.79	10.37	--	--	9.87	8.75	--	--
Optimism	3.34	0.94	--	--	3.22	0.88	--	--
Hope agency	11.93	2.16	--	--	11.97	2.13	--	--
Hope pathways	12.26	1.86	--	--	12.10	1.98	--	--
Intrinsic religion	3.20	1.01	3.10	0.97	2.87	0.84	2.89	0.91
Spirituality	3.43	1.06	3.36	1.08	3.10	1.05	3.05	1.16
Social support	30.11	8.01	31.14	8.07	31.50	7.63	32.90	6.77
Social network	3.37	1.20	3.52	1.06	3.57	1.17	3.87	0.96
Perceived stress	2.99	0.78	2.88	0.75	3.02	0.73	2.83	0.73
Acute health problems	5.07	2.71	4.85	2.71	4.46	2.30	4.20	2.27
Chronic health problems	3.33	1.91	3.78	1.98	2.79	1.58	2.64	1.63
Chronic health severity	1.88	0.89	1.89	0.90	2.23	0.92	1.85	0.88
Arthritis mobility	1.83	0.61	1.80	0.62	--	--	--	--
Arthritis dexterity	1.44	0.44	1.41	0.43	--	--	--	--
IBDQ	--	--	--	--	4.72	1.44	5.27	1.37
Control chance	3.41	0.90	3.27	1.05	3.54	0.99	3.44	1.03
Control symptom	4.55	0.83	4.44	0.73	4.39	0.83	4.53	0.73
Sense making	2.55	1.04	2.35	1.04	2.57	0.98	2.22	0.97
Benefit finding	4.21	1.16	4.12	1.22	4.47	1.05	4.53	1.01
Adaptive coping	2.75	0.49	2.76	0.46	2.75	0.53	2.80	0.54
Maladaptive coping	1.64	0.46	1.58	0.43	1.67	0.42	1.58	0.42

Table 9

Correlations between all of the Study Variables and the Five PGTI Subscale Values for the Arthritis Group at Time 1 and Time 2

Variable	PTGI subscales at Time 1 ($N = 214$)					PTGI subscales at Time 2 ($N = 103$)				
	RO	PL	NP	SC	PS	RO	PL	NP	SC	PS
Disease severity	.13	.07	.11	.11	.16*	.20*	.08	.11	.11	.13
Trauma total	.03	.11	.02	.14*	.09	.04	.05	.06	.18	.08
Trauma distress	.08	-.01	-.07	-.07	.03	.02	-.08	-.16	.06	-.14
Years diagnosed	-.07	.18*	.16*	.12	.05	-.13	.12	.03	.14	.01
Optimism	.16*	.21**	.25**	.07	.25**	.13	.29**	.20**	.07	.23*
Hope agency	.09	.08	.19**	-.08	.10	.03	.15	.13	.01	.03
Hope pathways	.09	.19	.14*	-.03	.08	-.03	.11	.02	-.06	-.05
Intrinsic religion	.131	.25**	.14*	.66**	.11	.19	.29**	.19	.69**	.24*
Spirituality	.14*	.27**	.17	.67**	.13	.24*	.35**	.24*	.70**	.30**
Social support	.32**	.16*	26**	.02	.16*	.33**	.12	.14	.03	.13
Social network	.26**	.03	.11	.02	.09	.24*	.07	.06	.16	-.02
Perceived stress	-.07	.03	-.18**	-01	-08	-.08	-.23*	-.18	-.05	-.17
Acute health problems	.09*	.14	-.03	.16*	.05	.080	-.03	-.03	.16	-.01
Chronic health problems	.04	.15*	.01	.28**	.07	.06	.01	.02	.27**	.01
Chronic health severity	-.03	-.02	-.06	-.02	.09	-.07	-.12	-.11	-.05	-.04
Arthritis mobility	.04	.15*	.01	.16*	.19**	.01	-.02	-.06	.04	.01
Arthritis dexterity	.07	.20**	.08	.13	.23**	-.10	-.03	-.07	.03	.04
Control chance	-.04	-.17*	-.13	-.19**	-.09	-.15	-.29**	-.12	-.24*	-.17
Control symptom	.18**	.36**	37**	.15*	.28**	.18	.41**	.26*	.18	.28**
Sense making	.21**	.21**	.14*	.26**	.25**	.22*	.18	.10	.30**	.22*
Benefit finding	.62**	.68**	.68**	.45**	.73**	.58**	.66**	.60**	.46**	.69**
Adaptive coping	.50**	.49**	.49**	.34**	.42**	.45**	.53**	.40**	.36**	.44**
Maladaptive coping	-.13	-.16*	-.25**	-.12	-.20**	-.13	-.13	-.16	-.02	-.16

Note. RO = Relating to others; NP = New possibilities; PS = Personal strength; SC = Spiritual Change; AL = Appreciation of life; * $p < .05$; ** $p < .01$.

Table 10

Correlations between all of the Study Variables and the Five PGTI Subscale Values for the IBD Group at Time 1 and Time 2

Variable	PTGI subscales at Time 1 ($N = 378$)					PTGI subscales at Time 2 ($N = 206$)				
	RO	PL	NP	SC	PS	RO	PL	NP	SC	PS
Disease severity	.05	.02	.06	-.08	.04	-.03	-.01	.05	-.03	-.01
Trauma total	-.03	.09	.06	.12*	.08	.09	.10	.17*	.16*	.10
Trauma distress	.04	-.03	.07	.01	.06	.10	.06	.16*	.21*	.18*
Years diagnosed	-.03	.03	.09	.21**	.06	-.05	-.80	.07	.26**	.02
Optimism	.23**	.19	.22**	.16**	.22**	-.20**	.16*	.12	.09	.12
Hope agency	.18**	.26**	.26**	.12*	.17**	.16*	.24**	.25**	.07	.11
Hope pathways	.14**	.23**	.21**	.07	.19**	.10	.25**	.27**	.09	.09
Intrinsic religion	.12*	.12*	.13*	.63**	.11*	.11	.05	.13	.64**	.10
Spirituality	.22**	.20**	.17**	.64**	.18**	.17*	.12	.14	.65**	.15*
Social support	.42**	.23**	.21**	.03	.19**	.20**	.02	.03	-.02	.01
Social network	.35**	.17**	.15**	-.01	.10*	.19**	.06	.10	-.09	.05
Perceived stress	-.10	-.15**	-.22**	-.09	-.06	-.13	-.17*	-.18	.01	-.12
Acute health problems	-.03	.04	-.02	-.09	.01	-.01	.04	.01	-.03	.01
Chronic health problems	-.11*	-.05	-.09	.07	-.02	-.02	.09	.01	.15	.02
Chronic health severity	.07	-.04	-.11*	-.05	-.03	.07	-.07	-.05	-.08	-.02
IBDQ	.07	.11*	.14**	.09	.05	.03	.09	.12	.02	.05
Control chance	.07	-.04	-.01	.01	.05	.01	-.08	-.01	.04	.03
Control symptom	.24**	.39**	.33**	.13*	.24**	.21**	.35**	.25**	.10	.16*
Sense-making	.23**	.20**	.11*	.18**	.24**	.22**	.23**	.14	.22**	.22**
Benefit finding	.59**	.69**	.65**	.38**	.74**	.45**	.52**	.59**	.37**	.58**
Adaptive coping	.47**	.48**	.44**	.33**	.38**	.37**	.35**	.39**	.31**	.32**
Maladaptive coping	.02	.01	-.14**	.01	-.02	.05	-.03	-.03	.03	.01

Note. RO = Relating to others; NP = New possibilities; PS = Personal strength; SC = Spiritual Change; AL = Appreciation of life; * $p < .05$; ** $p < .01$.

Table 11
Correlations of all the Study Variables Collected at Time 1 with the Five PTGI Subscale Values Collected at Time 2

Time 1 variable	Arthritis PTGI subscales at Time 2 ($N = 103$)					IBD PTGI subscales at Time 2 ($N = 176$)				
	RO	PL	NP	SC	PS	RO	PL	NP	SC	PS
Years diagnosed	-.13	.12	.03	.14	.01	-.05	-.08	.07	.26**	.02
Disease severity	.20*	.08	.11	.11	.13	-.03	-.01	.05	-.03	-.01
Trauma total	.04	.05	.06	.12	.08	.09	.10	.17*	.16*	.10
Trauma distress	.02	-.08	-.16	.06	-.14	.10	.06	.16*	.21**	.18*
Optimism	.13	.29**	.20*	.07	.23**	.20**	.16*	.12	.09	.12
Hope – agency	.03	.15	.13	.01	.03	.16*	.24**	.25**	.07	.11
Hope - pathways	-.03	.11	.02	-.06	-.05	.10	.25**	.27**	.09	.09
Intrinsic religion	.11	.20*	.10	.68**	.16	.12	.09	.13	.69**	.14
Spirituality	.25*	.34**	.25*	.70**	.29**	.18*	.10	.15*	.65**	.17*
Social support	.31**	.18	.15	.07	.09	.29**	.12	.08	.01	.13
Social network	.30**	.12	.09	.18	.16	.25**	.14	.06	.02	.15*
Perceived stress	-.19*	-.31**	-.30**	-.17	-.25**	-.11	-.16*	-.20**	.05	-.10
Acute health problems	.04	-.10	-.13	.12	-.04	.02	.02	.03	.06	.10
Chronic health problems	.10	-.02	-.02	.24*	-.04	-.04	-.02	-.01	.14	-.06
Chronic health severity	.02	-.08	-.05	-.10	.01	-.04	-.06	-.04	.05	.01
Arthritis mobility	.02	-.03	.12	.09	.06	--	--	--	--	--
Arthritis dexterity	.02	.05	-.01	.08	.15	--	--	--	--	--
IBDQ	--	--	--	--	--	.03	.09	.12	.02	.05
Control chance	-.01	-.09	.07	-.09	.08	.01	-.08	-.07	-.01	.02
Control symptom	.25**	.43**	.34**	.21*	.29**	.23**	.32**	.24**	.15*	.12
Sense-making	.25**	.23*	.09	.34**	.33**	.241**	.28**	.22**	.24**	.31**
Benefit finding	.67**	.77**	.72**	.56**	.81**	.59**	.59**	.65**	.34**	.71**
Adaptive coping	.48**	.56**	.49**	.40**	.51**	.42**	.35**	.45**	.34**	.35**
Maladaptive coping	-.11	-.13	-.19*	.04	-.17	.03	-.02	-.05	-.08	.02

Note. RO = Relating to others; NP = New possibilities; PS = Personal strength; SC = Spiritual Change; AL = Appreciation of life; *$p < .05$; ** $p < .01$.

Spiritual Change ($M = 6.35$, $SD = 4.02$) than those who were working full-time ($M = 4.46$, $SD = 3.07$), $p < .05$.

There were also significant differences with regards to employment status at Time 2, $F(4, 96) = 3.88$, $p < .01$. In particular, respondents with arthritis who were working part-time ($M = 11.12$, $SD = 5.96$) reported significantly less changes in New Possibilities compared with those who were retired ($M = 19.7$, $SD = 7.06$) or on disability ($M = 17.88$, $SD = 6.40$), all $ps < .05$. Furthermore, respondents with arthritis who were retired reported significantly more Spiritual Change ($M = 7.5$, $SD = 3.68$) compared to those working part time ($M = 3.47$, $SD = 2.45$), $p < .01$. Moreover, arthritis respondents that were disabled reported significantly more changes in Appreciation of Life ($M = 12.83$, $SD = 4.57$) compared with those working part-time ($M = 8.41$, $SD = 4.96$), $p < .05$. For the respondents with IBD at Time 2, there was also a significant effect of employment status on posttraumatic growth, $F(4, 172) = 2.95$, $p < .05$. Follow-up analyses showed that respondents who were disabled reported significantly more changes in Appreciation of Life ($M = 13.38$, $SD = 3.55$) compared to those who were retired ($M = 6.33$, $SD = 3.06$), $p < .05$.

Given the large proportion of respondents from Canada and the United States, and the differences in healthcare services offered in each country (e.g., universal healthcare services in Canada versus fee-for-service and/or healthcare services provided by employers in the United States), it is possible that differences in posttraumatic growth scores might differ. That is, having difficulty accessing adequate healthcare services and

treatment might be related to lower levels of posttraumatic growth. Therefore, a one-way ANOVA was conducted for each illness group, comparing country with reports of posttraumatic growth. The results for the arthritis group showed that posttraumatic growth was higher for those living in Canada ($M = 75.77$, $SD = 23.79$) compared to those living in the United States ($M = 64.67$, $SD = 25.19$), and this difference was significant, $F(1, 192) = 9.85, p < .01$. However, an opposite pattern was observed for the IBD group, whereby those living in Canada reported lower posttraumatic growth scores ($M = 70.23$, $SD = 23.56$) compared to those living in the United States ($M = 75.68$, $SD = 24.23$), and this difference was significant, $F(1, 325) = 4.15, p < .05$). These results are inconclusive with regards to healthcare services available in each country but suggest that living in Canada or the United States somehow effects reports of posttraumatic growth.

Personal resources

Optimism. Dispositional optimism was measured only at Time 1 and the means across the two illness groups reflect moderately optimistic expectations. There were no differences between the two illness groups with regards to dispositional optimism. For the arthritis group, greater optimism was associated with higher levels of overall posttraumatic growth at Time 1 ($r = .22, p < .01$) and Time 2 ($r = .22, p < .01$). Likewise for the IBD group, greater optimism was associated with higher levels of overall posttraumatic growth at Time 1 ($r = .25, p < .01$) and Time 2 ($r = .19, p < .05$).

Hope. Dispositional hope was measured only at Time 1. The Hope Agency subscale reflects confidence in one's ability to initiate and maintain actions while Hope

Pathways subscale reflects the belief in one's ability to generate routes or courses of action. There were no differences between the two illness groups with regards to dispositional hope. Although the means for both hope subscales were relatively high, signaling the presence of hope, the means for the hope pathways subscale were somewhat higher for each illness group although not at a significant level. However, there was no significant correlation between the two hope subscales and overall posttraumatic growth at Time 1 or Time 2 for individuals with arthritis. In contrast, Hope Agency was significantly correlated with posttraumatic growth at Time 1 ($r = .25, p < .01$) and Time 2 ($r = .21, p < .01$). Likewise, the hope pathways was also significantly related to posttraumatic growth at Time 1 ($r = .21, p < .01$) and Time 2 ($r = .20, p < .01$).

Religion. The Intrinsic Religion subscale was used to assess the extent to which one's religion is viewed as a valuable end in its own right. Both illness groups showed moderate levels of intrinsic religiousness. However, a one-way ANOVA showed that the arthritis group reported significantly higher Intrinsic Religion scores at Time 1 compared to the IBD group, $F(1, 589) = 18.24, p < .001$, and marginally higher at Time 2, $F(1, 278) = 3.10, p < .08$. Despite these group differences, Intrinsic Religion measured at Time 1 was significantly correlated with overall posttraumatic growth for individuals with arthritis at Time 1 ($r = .26, p < .01$) and Time 2 ($r = .32, p < .01$), and for individuals with IBD at Time 1 ($r = .22, p < .01$) and Time 2 ($r = .20, p < .01$).

Spirituality. The External/Ritual subscale of the SIBS was used to measure spiritual activities and rituals and a belief in an external power. Both illness groups

showed moderate levels of intrinsic religiousness. However, similar to Intrinsic Religion, a one-way ANOVA showed that the arthritis group reported higher levels of spirituality than the IBD group at both Time 1, $F(1, 589) = 13.29, p < .001$, and Time 2, $F(1, 278) = 4.74, p < .05$. However, spirituality measured at Time 1 was significantly related to overall posttraumatic growth at Time 1 and Time 2 for both illness groups. In particular, for individuals with arthritis, higher levels of spirituality was significantly related to more posttraumatic growth at Time 1 ($r = .27, p < .001$) and Time 2 ($r = .38, p < .001$), and for individuals with IBD, higher levels of spirituality was significantly related to more posttraumatic growth at Time 1 ($r = .29, p < .001$) and Time 2 ($r = .25, p < .001$).

Social Resources

Social support. Inspection of the mean level of social support values shows that both illness groups reported receiving adequate levels of social support, or "almost as much as I would like". However, a one-way ANOVA revealed that the respondents with IBD reported higher levels of social support compared to the respondents with arthritis at Time 1, $F(1, 590) = 4.39, p < .05$, and marginally more at Time 2, $F(1, 278) = 3.76, p = .054$. Nonetheless, higher levels of social support measured at Time 1 was significantly related to higher levels of overall posttraumatic growth at Time 1 ($r = .24, p < .001$) and Time 2 ($r = .22, p < .05$) for the arthritis group, and higher levels of overall posttraumatic growth at Time 1 ($r = .31, p < .001$) and Time 2 ($r = .18, p < .05$) for the IBD group.

Receptivity of social network. Both illness groups reported agreement that they had an adequate social network with which they felt able to express their feelings and concerns. Similar to the social support findings reported above, a one-way ANOVA showed that respondents with IBD reported having a stronger perceived receptivity of a social network than respondents with arthritis at Time 1, $F(1, 590) = 3.81, p < .05$, and at Time 2, $F(1, 278) = 8.04, p < .01$. However, receptivity of a social network measured at Time 1 was only significantly related to posttraumatic growth at Time 1 for the arthritis and IBD group, $r = .14, p < .05$ and $r = .23, p < .001$, respectively.

Health-related Burden

Acute health conditions. The mean number of acute health conditions reported by respondents with arthritis at Time 1 was 5.06 with the three most common being headaches ($n = 142$, 66%), insomnia ($n = 131$, 60.9%), and acute digestive problems ($n = 94$, 43.7%). For the respondents with IBD, the mean number of acute health conditions reported at Time 1 was 4.46 with the three most common being headaches ($n = 266$, 70.6%), allergies ($n = 193$, 51.2%), and acute digestive problems ($n = 234$, 62.1%). Overall, respondents with arthritis reported experiencing a greater number of acute health conditions than respondents with IBD at both Time 1 and Time 2, $F(1, 590) = 8.46, p < .01$ $F(1, 277) = 4.60, p < .05$, respectively. Acute health conditions for both illness groups were not related to overall posttraumatic growth at Time 1 or Time 2.

Chronic health conditions. The mean number of chronic health conditions reported by respondents with arthritis at Time 1 was 3.33 with the most common, other

than arthritis, being chronic headaches (n = 106, 49.5%) and back problems (n = 106, 49.5%). For respondents with IBD, the mean number of chronic health problems was slightly lower at 2.79, with the most common being headaches (n = 185, 48.9%), arthritis (n = 112, 29.6%) and back problems (n = 86, 22.8%). The number of reported chronic conditions differed between the illness groups, whereby respondents with arthritis reported more than respondents with IBD at Time 1 and Time 2, $F(1, 590) = 13.46$, $p <$ .001 $F(1, 277) = 26.95$, $p < .001$, respectively. However, the number of chronic health conditions was not related to overall posttraumatic growth at Time 1 or Time 2 for either illness group.

With regards to the distress associated with chronic health conditions, respondents with IBD reported that they were distressed or bothered by their chronic health conditions to a greater extent than respondents with arthritis at Time 1, $F(1, 588) = 20.41$, $p < .001$. Similar to the number of chronic health conditions, the distress associated with chronic health conditions was not related to overall posttraumatic growth at Time 1 or Time 2 for either illness group.

Impact of arthritis on daily functioning. Only the respondents with arthritis completed the AIMS, which assessed how arthritis affected their ability to function in daily life over the past week, specifically focusing on mobility and dexterity. Overall, individuals with arthritis reported that they were able to do many of the daily functions related to mobility with some difficulty and daily functions related to dexterity without much difficulty at both Time 1 and Time 2. However, only experiencing difficulty related

to dexterity was significantly associated with higher levels of posttraumatic growth at Time 1 ($r = .16, p < .05$).

Impact of IBD on daily functioning. Only the respondents with IBD completed the IBDQ which measures symptom severity and how IBD has affected them during the past two weeks. Inspection of the means suggested their IBD-related symptoms affected respondents somewhat to moderately within the past two weeks, both at Time 1 and Time 2. However, the extent to which IBD symptoms affected respondents was only significantly related to posttraumatic growth at Time 1 ($r = .11, p < .05$), whereby the affect of experiencing more IBD-related symptoms was related with higher levels of posttraumatic growth at Time 1.

Event and health-related factors

Years diagnosed. The individuals with arthritis reported living with their illness for a significantly longer period of time (11.79 years) than individuals with IBD (9.87 years), $F(1, 560) = 5.40, p < .05$. However, the number of years living with their illness was not related to overall posttraumatic growth at Time 1 or Time 2 for either illness group.

Disease-onset severity. At the time of diagnosis, both the arthritis and IBD group were asked to think back to when they were diagnosed and report their symptom. Both illness groups reported that the onset of their disease was moderate to severe. However, the respondents with IBD reported their symptoms to be more severe, $F(1, 590) = 5.05, p$

$< .05$). Despite this finding, disease-onset severity was weakly yet significantly related to posttraumatic growth at Time 1 for respondents with arthritis ($r = .14, p < .05$).

Also of note, more than a third of respondents with IBD (36.2%) reported having had surgery related to their condition while the vast majority (91.4%) was currently taking medication of which 62.4% reported that their medication was somewhat successful in managing their symptoms. Comparatively, about a fifth (20.6%) of respondents with arthritis reported having had surgery related to their condition, and the majority (85.9%) were currently taking medication of which only half (55.3%) reported was relieving their symptoms. For the arthritis group, 66 (30.1%) reported having to use some sort of aid or device, with 40 (18.7%) using a cane, 10 (4.7%) using a walker, 5 (2.3%) using crutches, and 11 (5.1%) using a wheelchair.

Stress. The mean levels of perceived stress in the past month were moderate for both illness groups. There were no significant differences between the two groups on their average level of stress experienced at Time 1 or Time 2. However, only higher levels of perceived stress measured at Time 1 was significantly related to higher levels of overall posttraumatic growth for the IBD group at Time 1 ($r = -.15, p < .01$ and Time 2 ($r = .16, p < .05$).

Previous crisis or trauma experience. The mean number of past crises or traumas reported by respondents with arthritis was 5.16. Of these, the most common types of crises or traumas experienced were death of a loved one ($n = 137$, 63.7%), a family

members' life-threatening illness (n = 119, 55.3%), their own disability not resulting from an accident (n = 161, 74.9%), and childhood emotional abuse (n = 72, 33.5%). For the respondents with IBD, the mean past crises or traumas or crises reported was 3.95, significantly lower than the arthritis group, $F(1, 590) = 26.36$, $p < .0001$. For the IBD group, the most common types of crises or traumas experienced were similar to those reported by the arthritis group, and included death of a loved one (n = 183, 48.5%), a family members' life-threatening illness (n = 192, 50.9%), their own disability not resulting from an accident (n = 155, 41.1%), and divorce of parents (n = 103, 27.3%). In addition to experiencing more crises or traumas, a one-way ANOVA revealed that the arthritis group experienced marginally more distress from these events compared to the IBD group, $F(1, 590) = 3.40$, $p = .07$. Although respondents with IBD reported experiencing fewer crises or traumas and less associated distress compared to respondents with arthritis, it was only the IBD group who showed a significant correlation between the number of crises or traumas and their associated distress with overall posttraumatic growth at Time 2, $r = .14$, $p < .07$ and $r = .16$, $p < .05$, respectively.

Cognitive Appraisals and Coping

Sense-making. When asked if they try to find meaning or make sense of their illness, respondents with arthritis or IBD reported to do this "a little" to "somewhat" at Time 1 and Time 2. Looking across Time 1 and Time 2 separately for each illness group, a paired-samples t test showed that Sense-Making decreased for each group, $t(103) =$

2.55, p<.01 for respondents with arthritis, and $t(176) = 3.12, p < .01$) for respondents with IBD. Moreover, Sense-Making at Time 1 was significantly related to posttraumatic growth at Time 1 ($r = .24, p < .01$) and Time 2 ($r = .23, p < .01$) for respondents with arthritis, and at Time 1 ($r = .24, p < .01$) and Time 2 ($r = .25, p < .01$) for respondents with IBD. Furthermore, years diagnosed was associated with sense making, whereby respondents with arthritis or IBD who had been living with their illness for a shorter period of time tried to find more meaning ($r = -.25, p < .01$) and ($r = -.20, p < .01$), respectively.

Benefit-finding. Participants were asked to indicate if they could identify any benefits that had resulted as a consequence of their illness. At Time 1, 60.7% ($n = 130$) of respondents with arthritis and 73% ($n = 276$) of respondents with IBD could identify at least one benefit. At Time 2, a larger proportion of respondents with arthritis could identify at least one benefit (68.9%, $n = 71$) and a nearly equal proportion of respondents with IBD could identify at least one benefit (73.9%, $n = 130$). A chi square test revealed that at only Time 1, respondents with IBD could identify a greater number of benefits compared to respondents with arthritis, $\chi^2 (2, 592) = 8.22, p < .01$.

The benefit-finding subscale of the ICQ was used to also measure perceived benefits of some sort of health-related hardship. Inspection of the means showed that most respondents with arthritis or IBD agreed that there were benefits resulting from their illness as assessed at Time 1 and Time 2. For respondents with arthritis, the three most common benefits included "dealing with my illness has made me stronger" ($n = 111$,

51.9%), "my illness taught me to enjoy the moment" (n = 111, 51.9%), and "I have learned to live with my illness" (n = 122, 57%). For the respondents with IBD, the three most common benefits included "dealing with my illness has made me stronger" (n = 258, 68.3%), "I have learned a great deal" (n = 226, 59.7%), and "I have learned what is important in life" (n = 206, 54.5%). The mean difference in benefit-finding across for the illness groups was significant at both study times, with respondents with IBD indicating to have found more benefits than respondents with arthritis at Time 1 and at Time 2, $F(1, 590) = 7.79, p < .01$ and $F(1, 277) = 9.29, p < .01$, respectively.

Being able to identify benefits at Time 1 was strongly related to posttraumatic growth at Time 1 and Time 2 for the arthritis group (r = .74 and r = 70, ps < .001) and IBD group (r = .75 and r = .60, ps < .001). Moreover, for both the arthritis and IBD group, the longer one had been living with their illness was weakly yet significantly related to the amount of benefits identified, with $r = .12, p < .05$ for the arthritis group and $r = .14, p < .05$ for the IBD group.

Control beliefs. The CBI assessed health control beliefs, and the two subscales used in this study was the Chance Control which assessed whether they believed that managing their symptoms was due to chance or luck and the Adaptive Control subscale which assessed whether they thought that they could manage their symptoms. Overall, both illness groups reported that that they agreed that they could manage their illness symptoms at Time 1 and Time 2; however, they also very mildly agreed that managing their symptoms was due to luck or chance. A one-way ANOVA showed that the groups

differed on Adaptive Control at Time 1, $F(1, 590) = 4.99, p < .05$. In particular, respondents with arthritis reported higher levels of Adaptive Control beliefs than respondents with IBD. When looking at the correlations with posttraumatic growth, higher levels of Adaptive Control beliefs at Time 1 was moderately related to posttraumatic growth at Time 1 and Time 2 for the arthritis group ($r = .31$ and $r = .30, ps < .01$) and the IBD group ($r = .34, r = .28, ps < .01$). A greater belief in Chance Control at Time 1 was related to less posttraumatic growth at Time 2 for respondents with arthritis only ($r = -.21, p < .01$).

Coping. Inspection of the means of Adaptive coping (e.g., positive reframing, acceptance, emotional support) across both Time 1 and Time 2 revealed that both illness groups tended to use these coping strategies a fair to a medium amount, whereas both groups tended to engage in Maladaptive coping strategies (e.g., substance abuse, denial, disengagement) to a lesser extent. Paired-samples *t*-tests for each illness group showed that respondents with arthritis used Adaptive coping more than Maladaptive coping at Time 1, $t(213) = 21.94, p < .001$, and Time 2, $t(103) = 18.99, p < .001$. Likewise, respondents with IBD used Adaptive coping more than Maladaptive coping at Time 1, $t(377) = 31.41.94, p < .001$, and Time 2 $t(175) = 24.61, p < .001$.

With regards to the relation being the two coping strategies and posttraumatic growth, the results showed that, for respondents with arthritis, Adaptive coping measured at Time 1 was positively related to posttraumatic growth at both Time 1 ($r = .54, p < .01$) and Time 2 ($r = .51, p < .01$) whereas Maladaptive coping measured at Time 1 was

negatively related to posttraumatic growth at Time 1 (r = -.20, p < .01). Similarly for respondents with IBD, Adaptive coping measured at Time 1 was positively related to posttraumatic growth at both Time 1 (r = .53, p < .01) and Time 2 (r = .443, p < .01) but Maladaptive coping was unrelated to posttraumatic growth at either time.

Testing a Model of Posttraumatic Growth

In order to examine the factors related to posttraumatic growth, an SEM model was proposed that considered the roles of six latent variables and three measured variables on Posttraumatic Growth. The six latent variables included Positive Outlook, Spirituality, Stressors, Social Support, Symptom Control Beliefs, and Adaptive Coping strategies. The measured variables included Years Diagnosed, Sense-Making, and Benefit-Finding. The hypothesized model is present in Figure 1. The reader will recall that the ovals represent the latent variables and rectangles represent measured variables. Absence of a line connecting variables implies lack of a hypothesized direct effect.

As Figure 1 illustrates, it was hypothesized that Positive Outlook, Spirituality, Stressors, Social Support and Years Diagnosed indirectly would effect Posttraumatic Growth through Adaptive Cognitive Appraisals, and Coping Strategies. It was also hypothesized that the Cognitive Appraisal variables (i.e., Symptoms Control Beliefs, Sense-Making, and Benefit-Finding) would have a direct effect on Adaptive Coping, and an indirect effect on Posttraumatic Growth through Adaptive Coping. Last, it was hypothesized that Adaptive Coping would have a direct effect on Posttraumatic Growth. The following sections first describe the results of structural model of Posttraumatic Growth for the arthritis group. This is followed by the results of structural model of Posttraumatic Growth for the IBD group.

Testing a model of posttraumatic growth: Arthritis group. The hypothesized model provided a marginal fit to the data, $\chi^2(318, N = 214) = 583.52, p < .01$; goodness-

of-fit index CFI = .917, NNFI = .901, IFI = .919, and RMSEA = .063 (.055-.071). Table 12 presents the models tested, χ^2, goodness-of-fit indices, and the chi square difference ($\Delta\chi^2$) tests. Modification indices were inspected and showed that correlating the errors associated with depression and arthritis mobility distress would reduce χ^2 by approximately 16. It seemed reasonable that those experiencing higher levels of mobility issues as a result of their disease would also experience higher levels of depressive symptomatology, therefore these error terms were allowed to correte. As part of the goal in modeling is the development of a parsimonious, good-fitting model with unimportant parameters deleted (Tachnick & Fidell, 2001). The standardized regression estimates were inspected and those that were not significant and did not result in a significant decrease in model fit were trimmed from the final model. Specifically, the paths from Social Support to Sense-Making, Years Diagnosed to Symptom Control Beliefs, Years Diagnosed to Benefit-Finding, and Spirituality to Benefit-Finding were removed from the final model. The final model provided a better fit to the data, χ^2 (321, N = 214) = 566.86, $p < .01$, goodness-of-fit indices CFI = .923, NNFI = .909, IFI = .925, and RMSEA = .060 (.052-.068). The final model with significant standardized coefficients is presented in Figure 4.

Direct effects. As shown in Figure 4, the majority of the parameter estimates were significant and in the expected direction. Positive Outlook had a significant positive direct effect on Symptom Control Beliefs, Benefit-Finding, and Sense-Making. Spirituality only had a positive direct effect on Sense-Making. Stressors had a negative

Table 12

The Models Tested, χ^2, Goodness-of-fit Indices, and the Chi Square Difference ($\Delta\chi^2$) Tests for the Arthritis Group

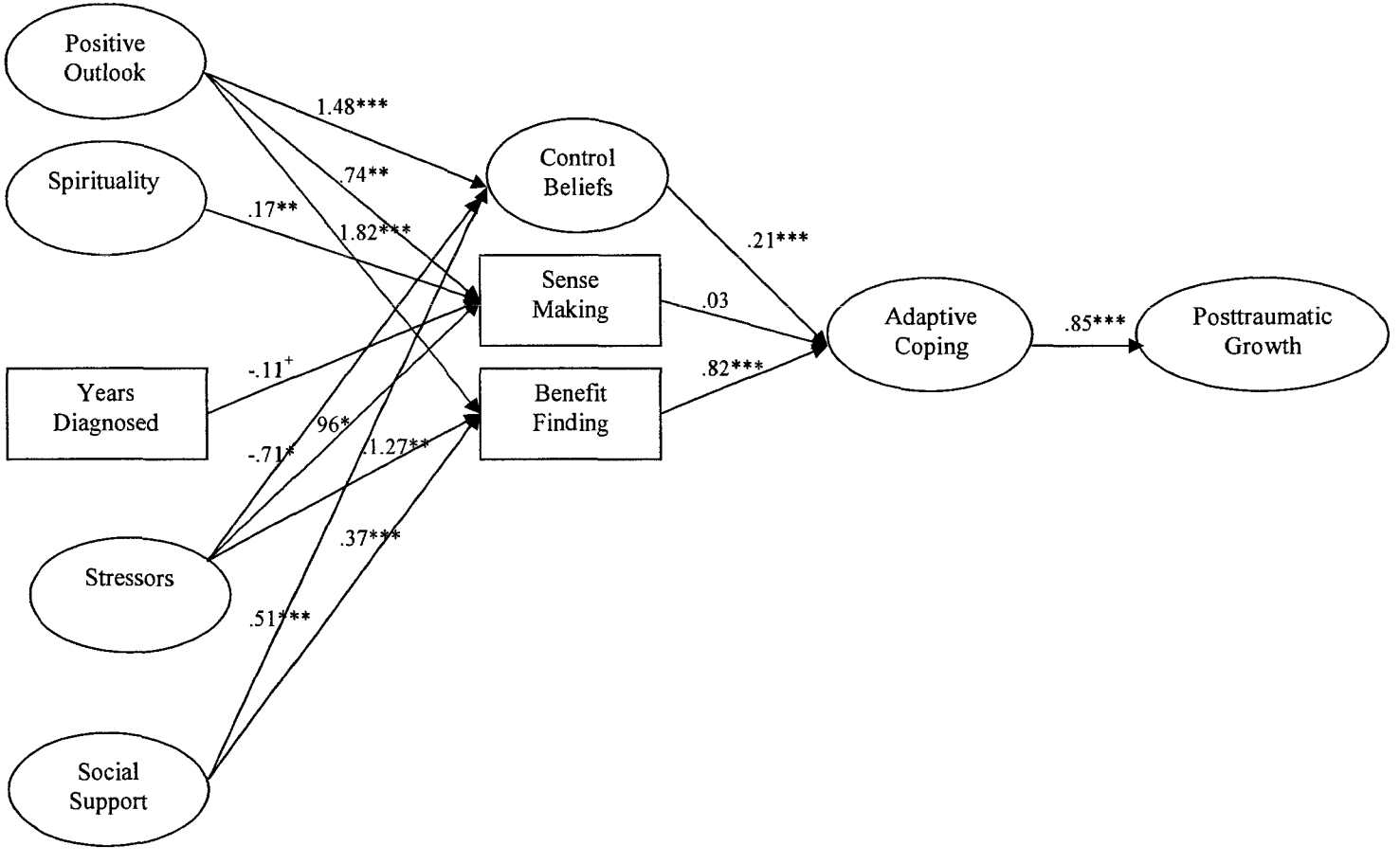
Model	Description	χ^2	*df*	CFI	NNFI	IFI	RMSEA	CI	$\Delta\chi^2$
1	Hypothesized model	583.52	317	.917	.901	.919	.063	.055-.071	
2	Correlated error term	565.65	316	.922	.907	.924	.061	.053-.069	17.87***
3	Path removed: Social support → Sense-making	565.66	317	.923	.908	.924	.061	.053-.069	0.24
4	Path removed: Years diagnosed → Adaptive control beliefs	566.10	318	.923	.908	.924	.061	.053-.069	0.21
5	Path removed: Years diagnosed → Benefit-finding	566.15	319	.923	.909	.925	.060	.052-.068	0.05
6	Path removed: Spirituality → Benefit-finding (final model)	566.86	320	.923	.909	.925	.060	.052-.068	0.71

Note. CFI = Comparative fit index; NNFI = Non-Normed fit index; IFI = incremental fit index; RMSEA = root mean square error of approximation; CI = 90% confidence interval.

*** p <.001.

Figure 4

Hypothesized Model for Predicting Posttraumatic Growth among Respondents with Arthritis



direct effect on Symptom Control Beliefs, and a strong positive direct effect on both Sense-Making and Benefit-Finding. Social Support had a positive direct effect on Symptom Control Beliefs and Benefit-Finding. Years Diagnosed has a weak and marginally significant ($p = .09$) negative direct effect on Sense-Making. Of the cognitive appraisal variables, only Symptom Control Beliefs and Benefit-Finding had a significant positive direct effect on Adaptive Coping. And finally, Adaptive Coping had a strong positive direct effect on Posttraumatic Growth, which supported Hypothesis 6.

Indirect effects. Indirect effects, as well as the significance of these effects, were tested using AMOS 16.0 bootstrapping procedures as described by Shrout and Bolger (2002). From each data set, 1000 bootstrap samples using random sampling with replacement were generated, and the full mediation model was tested 1000 times with the bootstrap samples. In addition, the mediation effect estimated by multiplying 1000 pairs of path coefficients for the indirect effect. Maximum likelihood estimation was used to estimate the effects. To determine the significance of this effect at the .05 level, 95% confidence intervals (CI) were used whereby the estimates of the mediation must exclude zero (Shrout & Bolger, 2002). Because the structural model included several classes of mediating variables, the indirect effects of each latent or measured variable were tested sequentially by constraining the paths between the predictors and mediators to zero.

Hypothesis 2 stated that personal resources (e.g., higher levels of positive outlook and having a higher degree of intrinsic religiousness and spirituality) would be indirectly associated with reports of Posttraumatic Growth through cognitive appraisals and coping

strategies. There was partial support for this hypothesis in that Positive Outlook had a positive indirect effect on Adaptive Coping ($\beta = 1.24, p < .01$) and Posttraumatic Growth ($\beta = 1.03, p < .01$), mediated through Benefit-Finding. Spirituality did not have an indirect effect on Posttraumatic Growth.

Hypothesis 3 stated that social resources (e.g., reporting higher levels of social support) will be indirectly associated with reports of Posttraumatic Growth through cognitive appraisals and coping strategies. This hypothesis was supported in that Social Support had a significant indirect effect on Adaptive Coping ($\beta = 1.45, p < .01$) and Posttraumatic Growth ($\beta = 1.35, p < .01$) through Symptom Control Beliefs; Benefit-Finding and Sense-Making did not have a significant indirect effect on Posttraumatic Growth. For Hypothesis 4, which stated that event and health-related factors (e.g., reporting higher levels of disease severity at diagnosis, reporting poorer health status, experiencing higher levels of disease-related symptoms, perceiving more stress and depressive symptomatology) would be indirectly associated with reports of Posttraumatic Growth through cognitive appraisals and coping strategies was supported, whereby Stressors had an indirect effect on Posttraumatic Growth ($\beta = 1.35, p < .01$), mediated by Benefit-Finding and Adaptive Coping. Stressors also had a significant indirect effect on Adaptive Coping ($\beta = 1.42, p < .01$), also mediated by Benefit-Finding.

Of the cognitive appraisal variables, both Symptom Control Beliefs and Benefit-Finding had a positive indirect effect on Posttraumatic Growth, ($\beta = .17, p < .01$) and ($\beta = .69, p < .01$), respectively. Both variables were mediated through Adaptive Coping.

This finding supported Hypothesis 5, which stated that cognitive appraisal variables would be indirectly associated with reports of posttraumatic growth through coping strategies.

Testing a model of posttraumatic growth: IBD group. The hypothesized model provided marginal fit to the data, $\chi^2(318, N = 377) = 747.01, p < .01$; goodness-of-fit index CFI = .922, NNFI = .907, IFI = .907, and RMSEA = .062 (.054-.065). Table 12 presents the models tested, χ^2, goodness-of-fit indices, and the chi square difference ($\Delta\chi^2$) tests. Modification indices were inspected and showed that correlating the errors associated with optimism and hope pathways would reduce χ^2 by approximately 18. Allowing these error terms to correlate seemed reasonable in that after inspecting each variable, there seemed to be considerable overlap in item content. In order to develop a more parsimonious model, the standardized regression estimates were inspected and those that were not significant and did not result in a significant decrease in model fit were trimmed from the final model. Specifically, the paths from Years Diagnosed to Symptom Control Beliefs, Social Support to Sense-Making, Years Diagnosed to Sense-Making, and Spirituality to Benefit-Finding were removed from the final model. The final model fit the data well although not outstanding, χ^2 (321, $N = 377$) = 734.70, $p <$ .01, goodness-of-fit indices CFI = .924, NNFI = .911, IFI = .925, and RMSEA = .053 (.053-.064). The final model with significant standardized coefficients is presented in Figure 5.

Table 13

The Models Tested, χ^2, Goodness-of-fit Indices, and the Chi Square Difference ($\Delta\chi^2$) Tests for the IBD Group

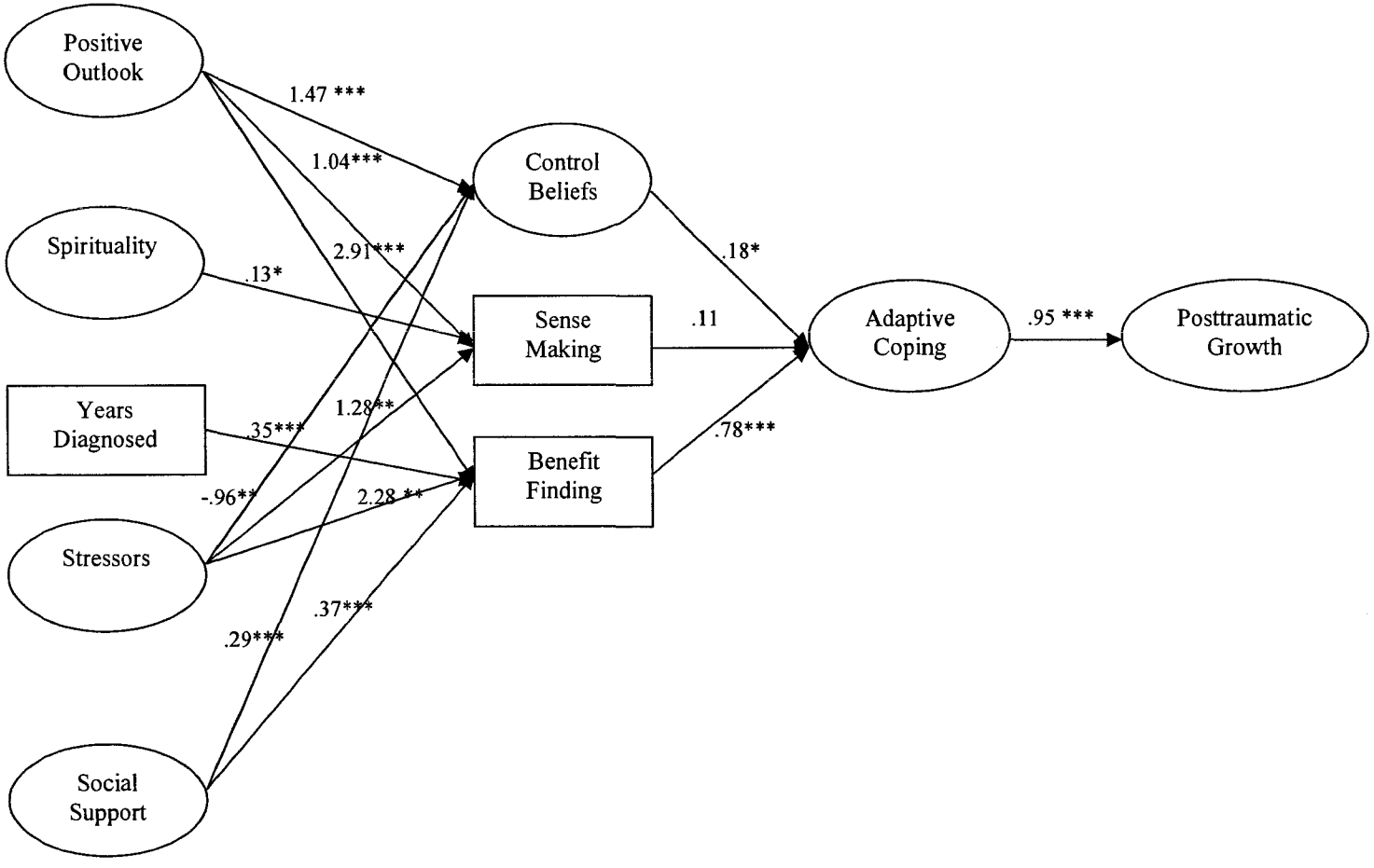
Model	Description	χ^2	*df*	CFI	NNFI	IFI	RMSEA	CI	$\Delta\chi^2$
1	Hypothesized model	747.01	318	.922	.907	.923	.060	.054-.065	
2	Path removed: Years diagnosed→ Adaptive control beliefs	747.04	319	.922	.907	.923	.060	.054-.065	0.03
3	Path removed: Social support → Sense-making	748.54	320	.922	.907	.923	.060	.054-.065	1.50
4	Path removed: Spirituality → Benefit-finding	750.22	321	.922	.908	.922	.060	.054-.065	1.68
5	Correlated error term	732.39	320	.925	.911	.926	.059	.053-.064	17.83***
6	Path removed: Years diagnosed→ Sense-making (final model)	734.70	321	.924	.911	.926	.059	.053-.064	2.31

Note. CFI = Comparative fit index; NNFI = Non-Normed fit index; IFI = incremental fit index; RMSEA = root mean square error of approximation; CI = 90% confidence interval.

*** $p < .0001$.

Figure 5

Hypothesized Model for Predicting Posttraumatic Growth among Respondents with Inflammatory Bowel Disease



Direct effects. As shown in Figure 5, the vast majority of the parameter estimates were significant and in the expected direction. Positive Outlook had a significant positive direct effect on Symptom Control Beliefs, Benefit-Finding, and Sense-Making. Spirituality only had a positive direct effect on Benefit-Finding. Stressor had a negative direct effect on Symptom Control Beliefs, and a strong positive direct effect on both Sense-Making and Benefit-Finding. Social Support had a positive direct effect on Symptom Control Beliefs and Benefit-Finding. Years Diagnosed had a weak yet significant positive direct effect on Benefit-Finding. Of the cognitive appraisal variables, only Symptom Control Beliefs and Benefit-Finding had a significant positive direct effect on Adaptive Coping. And in support of Hypothesis 6, Adaptive Coping had a strong positive direct effect on Posttraumatic Growth.

Indirect effects. The results of the bootstrapping analyses provided partial support for Hypothesis 2, which stated that personal resources (i.e., Positive Outlook and Spirituality) would be indirectly related to Posttraumatic Growth through cognitive appraisal variables and Adaptive Coping. The results showed that Positive Outlook had a significant indirect effect on Adaptive Coping through Symptom Control Beliefs ($\beta = .11$, $p < .05$) as well as through Benefit-Finding ($\beta = 1.60$, $p < .01$). Furthermore, Positive Outlook had a significant indirect effect on Posttraumatic Growth ($\beta = .11$, $p < .05$), which was mediated by Symptom Control Beliefs and Adaptive Coping, which supports Hypothesis 2. Also in support of Hypothesis 2, Positive Outlook had a significant indirect effect on Posttraumatic Growth ($\beta = 1.51$, $p < .01$), which was mediated by Benefit-

Finding and Adaptive Coping. Spirituality had no significant indirect effect on Posttraumatic Growth, which did not support of Hypothesis 2.

Hypothesis 3 stated that social resources (i.e., Social Support) would be indirectly related to Posttraumatic Growth through cognitive appraisal variables and Adaptive Coping. In support for this hypothesis, Social Support had a significant indirect effect on Adaptive Coping ($\beta = .16, p < .05$) and Posttraumatic Growth ($\beta = .15, p < .05$), mediated through Benefit-Finding.

Hypothesis 4 stated that event and health-related stressors (i.e., Stressors) would be indirectly related to Posttraumatic Growth through cognitive appraisal variables and Adaptive Coping. Similar to the findings just mentioned, Stressors had a significant indirect effect on Adaptive Coping ($\beta = .85, p < .01$) and Posttraumatic Growth ($\beta = .80, p < .01$), mediated through Benefit-Finding, therefore providing support for Hypothesis 4. There was no significant indirect effect on Years Diagnosed on Posttraumatic Growth or Adaptive Coping.

The only cognitive appraisal variables to have a significant indirect effect on Posttraumatic Growth through Adaptive Coping were Symptom Control Beliefs and Benefit-Finding; Sense-Making did not. This is, in support of Hypothesis 5, Symptom Control Belief was significantly related to Posttraumatic Growth ($\beta = .17, p < .01$) through Adaptive Coping. Similarly, Benefit-Finding was significantly related to Posttraumatic Growth ($\beta = .74, p < .01$) through Adaptive Coping.

Predictors of Posttraumatic Growth at Time 2

Using Schaefer and Moos' (1992) model as a theoretical framework, two hierarchical multiple regression analyses were conducted to determine whether the addition of the five posttraumatic growth subscales improved prediction of posttraumatic growth at Time 2 beyond that afforded by positive outlook, health burden, cognitive appraisal and coping variables. Prior to analyses, all predictor variables collected at Time 1 were examined and only those that revealed a significant correlation to the dependent variable were entered into the model. The results for the arthritis group are presented first, followed by the results for the IBD group.

Predictors of posttraumatic growth at Time 2: Arthritis group. The first hierarchical multiple regression was conducted with overall posttraumatic growth at Time 2 as the dependent variable. Personal factors (optimism, spirituality) were entered in the first step, social resources (social support) was entered in the second step, health-related factors (perceived stress, arthritis-related symptoms) were entered in the third step, cognitive appraisals and coping (sense-making, benefit-finding, symptom control, and adaptive coping) were entered in the fourth step, and the five posttraumatic growth subscales (relating to others, new possibilities, personal strength, spiritual change, and appreciation of life) were entered in the last step.

Table 14 presents the standardized regression coefficients (β), the adjusted R^2, and the ΔR^2 after entry of each set of predictors. Among the variables entered into the first step, higher levels of optimism was a marginally significant predictor of posttraumatic growth at Time 2 whereas stronger spirituality was a significant predictor;

both predictors explained 17% of the variance. Social support was entered in the second step but was not a significant predictor, explaining only 1% additional variance of posttraumatic growth at Time 2; optimism and spirituality remained the same. At the third step, perceived stress and arthritis-specific stress were not significant predictors, explaining only 1% additional variance of posttraumatic growth at Time 2; spirituality remained a significant predictor. In the fourth step, the cognitive appraisal variables and adaptive coping were entered whereby only benefit-finding was a significant predictor, explaining an additional 35% of the variance of posttraumatic growth at Time 2; spirituality remained a marginally significant predictor. With the addition of the five PTGI subscales in the final step, an additional 12% of variance was explained. The only variables to remain significant predictors of posttraumatic growth at Time 2 were the PTGI subscales relating to others and appreciation of life, as well as having less arthritis-specific dexterity problems. Together the group of predictors accounted for 65% of the variance in posttraumatic growth scores at Time 2 for individuals with arthritis.

Predictors of posttraumatic growth at Time 2: IBD group. A second hierarchical multiple regression was conducted with overall posttraumatic growth at Time 2 as the dependent variable. Personal factors (optimism, spirituality) were entered in the first step, social resources (social support) was entered in the second step, health-related factors (perceived stress, IBD-related symptoms) were entered in the third step, cognitive

Table 14

Stepwise Hierarchical Multiple Regression Showing the Relation of Personal Factors, Social Resources, Health-related Factors, Cognitive Appraisals and Coping with overall Posttraumatic Growth at Time 2 for the Arthritis Group

Step and independent variables measured at Time 1	Posttraumatic growth at Time 2		
	Beta	*t*	ΔR^2
1. Personal resources			
Optimism	.18	1.91^{+}	
Spirituality	.37	3.98***	.17***
2. Optimism	.16	1.71^{+}	
Spirituality	.37	4.04***	
Social resources			
Social support	.10	1.06	.01
3. Optimism	.11	0.91	
Spirituality	.38	4.02***	
Social support	.09	0.88	
Health-related factors			
Perceived stress	-.08	-0.64	
Mobility	-.01	-0.05	
Dexterity	-.02	-0.17	.01
4. Optimism	-.09	-0.91	
Spirituality	.14	1.69^{+}	
Social support	.02	0.27	
Perceived stress	-.07	-0.65	
Mobility	.04	0.40	
Dexterity	-.13	-1.43	
Cognitive appraisals and coping			

Sense-making			
Benefit-finding	.08	0.88	
Adaptive control	.58	5.72***	
Adaptive coping	.05	0.54	.35***
	.10	0.93	
5. Optimism	-.08	-0.90	
Spirituality	.10	0.88	
Social support	-.03	-0.37	
Perceived stress	-.06	-0.58	
Mobility	.06	0.76	
Dexterity	-.18	-2.09*	
Sense-making	.03	0.33	
Benefit-finding	.20	1.60	
Adaptive control	.11	1.33	
Adaptive coping	-.06	-0.61	
PTGI subscales			
Relating to others	.22	1.91*	
New possibilities	.05	0.38	
Personal strength	-.06	-0.50	.12***
Spiritual change	.17	1.24	
Appreciation of life	.33	2.57**	
Total equation ($N = 100$) $R^2 = 0.65$, Adjusted $R^2 = 0.59$			

$^{+}$ $p < .09$; * $p < .05$; ** $p < .01$; *** $p < .001$.

appraisals and coping (sense-making, benefit-finding, symptom control, and adaptive coping) were entered in the fourth step, and the five posttraumatic growth subscales (relating to others, new possibilities, personal strength, spiritual change, and appreciation of life) were entered in the last step.

Table 15 presents the correlations between the criterion and predictor variables, the standardized coefficients (β), the adjusted R^2, and the ΔR^2 after entry of each set of predictors. Among the variables entered in the first and second step, higher levels of optimism and stronger spirituality were significant predictors of posttraumatic growth at Time 2, explaining 9% of the variance. In the second step, higher levels of optimism and stronger spirituality remained significant predictors of posttraumatic growth at Time 2, but not social support. In the third step, IBD-related symptoms and stress were not significant predictors, explained only an additional 1% of the variance of posttraumatic growth at Time 2; stronger spirituality remained a significant predictor. The cognitive appraisal variables and adaptive coping were entered in the fourth step, and sense-making, benefit-finding and adaptive coping were significant predictors, explaining an additional 31% of the variance; spirituality was no longer significant. The five PTGI subscales were entered in the final step and explained an additional 15% of the variance. The only variables to remain significant predictors of posttraumatic growth at Time 2 were relating to others and new possibilities, and benefit-finding to a marginal degree. Together the group of predictors accounted for 56% of the variance in posttraumatic growth scores at Time 2 for individuals with IBD.

Table 15

Stepwise Hierarchical Multiple Regression Showing the Relation of Personal Factors, Environmental Factors, Cognitive Appraisals, and Coping Strategies with overall Posttraumatic Growth for the IBD Group

	Posttraumatic growth at Time 2		
Step and independent variables measured at Time 1	*Beta*	*t*	ΔR^2
1. Personal resources			
Optimism	0.18	2.49*	
Spirituality	0.24	3.33**	.09*
2. Optimism	0.16	2.10*	
Spirituality	0.25	3.38***	
Social resources			
Social support	0.07	0.95	.01
3. Optimism	0.12	1.37	
Spirituality	0.25	3.41***	
Social support	0.06	0.73	
Health-related factors			
IBD symptoms	-0.08	-0.79	
Perceived stress	0.01	0.16	.01
4. Optimism	0.03	0.38	
Spirituality	0.04	0.54	
Social support	0.01	0.21	
IBD symptoms	-0.01	-0.18	
Perceived stress	-0.02	-0.33	
Cognitive appraisals and coping			
Sense-making			
Benefit-finding	0.14	2.06*	

Adaptive control	0.46	5.98***	
Adaptive coping	0.04	0.62	.31***
	0.17	2.22*	
5. Optimism	0.03	0.42	
Spirituality	0.01	0.07	
Social support	-0.02	-0.31	
IBD symptoms	-0.03	-0.36	
Perceived stress	-0.01	-0.19	
Sense-making	0.08	1.35	
Benefit-finding	0.17	1.71^{+}	
Adaptive control	-0.03	-0.48	
Adaptive coping	0.04	0.61	
PTGI subscales			
Relating to others	0.30	3.66***	
New possibilities	0.22	2.43*	
Personal strength	0.08	0.96	.15***
Spiritual change	0.10	1.19	
Appreciation of life	-0.01	-0.16	
Total equation ($N = 174$) $R^2 = 0.56$, Adjusted $R^2 = 0.52$			

$^{+}p < .09$; * $p < .05$; ** $p < .01$; *** $p < .001$.

Outcomes of Posttraumatic Growth

Before examining the predictors of posttraumatic growth, the relationships between posttraumatic growth at Time 1 and the psychosocial well-being variables (positive and negative affect, satisfaction with life) at Time 2 were examined using correlations. The table of correlations is presented in Table 16. As depicted in the table, for the arthritis group, lower levels of Negative Affect were significantly associated with appreciation of life (r = -.22 and r = -.22, both $ps < .05$) and personal strength (r = -.24 and r = -.22, both at $p < .05$). Positive Affect was associated with higher levels of personal strength ($r = .26, p < .01$), new possibilities ($r = .26, p < .01$), and relating to others ($r = .20, p < .05$). Satisfaction with Life was moderately and positively associated with each of the five subscales.

A somewhat different pattern of correlations was observed for the IBD group. As seen in Table 16, Negative Affect was not significantly associated with any of the PTGI subscales; although negative affect was marginally related to personal strength (r = -14, p = .07). Higher levels of Positive Affect was related to higher levels of appreciation of life ($r = .20, p < .01$), personal strength ($r = .26, p < .01$), new possibilities ($r = .28, p <$ .01), and relating to others ($r = .28, p < .01$). Similarly, Satisfaction with Life was positively associated with personal strength ($r = .21, p < .01$), new possibilities (r = .22, $p < .01$), and relating to others ($r = .26, p < .01$).

In order to determine if posttraumatic growth at Time 1 predicts positive outcomes at Time 2, a series of stepwise hierarchical multiple regressions were

conducted separately for the arthritis and IBD groups. Each of the outcomes (Positive Affect, Negative Affect, Satisfaction with Life) served as the dependent variables, controlling for age and years diagnosed in the first step, and health distress (acute and chronic health problems, and illness-specific distress as measured by the mobility and dexterity subscales of the AIMS for arthritis group and the IBDQ for the IBD group) in the second step. The five PTGI subscales were entered in the final step. A threshold of $p < 0.05$ set for retention in the model, and $p = 0.10$ for removal. A regression analyses was not performed for Negative Affect for the IBD group as bivariate correlations revealed no significant association between these variables and posttraumatic growth at Time 2.

Predictors of positive and negative affect. For Positive Affect in the arthritis group, of the variables entered in the first two steps, being younger ($\beta = -.31, p < .01$), having more mobility ($\beta = .24, p < .05$) and chronic health problems ($\beta = .22, p < .05$) were significantly related to positive affect at Time 2, accounting for 14.5% of the variance. Despite being significantly correlated with posttraumatic growth at Time 2, none of the five PTGI subscales were significant predictors when entered in the final step; only age ($\beta = -.35, p < .001$) and mobility ($\beta = .24, p < .05$), but not chronic health problems, remained significant predictors. The final model indicated that being younger and experiencing a moderate amount of mobility problems in daily functioning were significant predictors of Positive Affect at Time 2. Together, all variables accounted for 20.2% of the variance in the final model.

For Negative Affect in the arthritis group, a similar pattern of results emerged although the regression coefficients were reversed. In the first and second steps, only age ($\beta = .18, p < .05$) and mobility problems ($\beta = -.22, p < .05$) were significant predictors of negative affect at Time 2, accounting for 3.8% of the variance. When the five PTGI subscales were entered into the model at the final step, none were significant predictors of Negative Affect; age ($\beta = .23, p < .05$) and mobility problems ($\beta = -.20, p < .05$) remained significant. The final model suggests that being older and experiencing lower levels of mobility problems in daily functioning were significant predictors of Negative Affect at Time 2. Together, all variables accounted for only 9.3% of the variance in the final model.

For the IBD group, a different pattern of predictors of Positive Affect were observed. None of the control variables entered in the first two steps were significantly related to Positive Affect at Time 2. However, when the five PTGI subscales were entered in the final step, the results showed that relating to others ($\beta = 1.18, p < .05$) and spiritual change ($\beta = -1.91, p < .05$) were both significant predictors of Positive Affect at Time 2. The final model suggests that regardless of age or years diagnosed, individuals with IBD who report higher levels of changes in relating to others and spirituality are more likely to report higher levels of Positive Affect at Time 2. Together, all variables accounted for only 13.1% of the variance in the final model.

Predictors of satisfaction with life. For the arthritis group, age and years diagnosed were not significantly related to Satisfaction with Life at Time 2. When the

health distress variables were entered in step two, only mobility issues ($\beta = -3.96, p < .0001$) was significant. Despite being moderately correlated with Satisfaction with Life, none of the five PTGI subscales were significant predictors of posttraumatic growth when entered in the final step; only mobility problems ($\beta = -3.97, p < .001$) remained significant. The final model suggests that individuals with arthritis who report having lower levels of mobility issues are more likely to report Satisfaction with Life at Time 2. Together, all variables accounted for only 26.6% of the variance in the final model.

For the individuals with IBD, age and years since diagnosis were not related to Satisfaction with Life at Time 2 when entered in the first step. Of the health distress variables entered in the second step, only IBD-symptom distress ($\beta = .29, p < .001$) was significantly related to Satisfaction with Life, accounting for 7.5% of the variance. With the addition of the five PTGI subscales entered in the final step, only relating to others ($\beta = .19, p < .05$) was a significant predictor; IBD-symptom distress also remained significant ($\beta = .26, p < .001$). The final model suggests that individuals with IBD who experience less symptom distress and have experienced more changes in relating to others are more likely to report being satisfied with life at Time 2. Together, all variables accounted for only 15% of the variance in the final model.

CHAPTER IV

Discussion

Rather than focusing on negative outcomes, researchers in the area of stress and coping have turned their attention to consider how adversity may give rise to posttraumatic growth. Although interest in this area is steadily increasing, relatively few empirical studies to date have investigated the factors that may facilitate the experience of posttraumatic growth. Consequently, there exists no consensus regarding what are the most important predictors. However, there is some agreement that several categories of variables, such as personal resources, event and health-related characteristics, stressors, social resources, and cognitive appraisal and coping strategies, are likely to be particularly relevant predictors (Calhoun & Tedeschi, 1998; Park, 1998; Schaefer & Moos, 1992).

In the present study, I applied Schaefer and Moos' (1992) conceptual model of Positive Outcomes from Life Crises to examine the role of these six classes of variables in accounting for the extent of posttraumatic growth reported by individuals diagnosed with arthritis or IBD. The results of this study advance our understanding of at least three important aspects of posttraumatic growth: the rate with which posttraumatic growth is reported among individuals with arthritis or IBD, the processes that may give rise to this growth, and the adjustment correlates associated with this growth. The following sections review the major findings and highlight whether they lend support to theory and previous research, note the study limitations and strengths, discuss the implications of the findings, and describe avenues of possible future research.

The Positive Side of Health-Related Adversity

The results from this study indicate that the experience of positive changes since diagnosis was common among individuals with arthritis or IBD. At Time 1 and Time 2, 65% of individuals with arthritis, and 73% and 78% of individuals with IBD, reported that their disease had positively affected their life. This study is consistent with previous findings that a chronic and potentially life-threatening diagnosis can lead to positive outcomes (Affleck, et al., 1987; Affleck, Tennen & Gershman, 1985; Frazier et al., 2001; McMillen et al., 1997; Milam et al., 2004; Thompson, 1985). For example, Milam et al. (2004) found that 59% of individuals diagnosed with HIV/AIDS reported positive changes as a result of their disease. The analyses of the qualitative date showed that the types of positive effects reported were consistent with previous qualitative research (Davis & McKearney, 2003; Davis & Nolen-Hoeksema, 2001) and the themes identified generally followed Tedeschi and Calhoun's (1998) hypothesized five-factor model of posttraumatic growth. That is, participants in both illness groups reported that they had experienced changes in the areas of relating to others, new possibilities, personal strength, appreciation of life, and spirituality.

However, a sixth theme was identified, which was labeled psychological preparation. While this theme seemed somewhat related to personal strength (e.g., being more self-reliant, knowing that they can handle difficult situations), it was more focused and involved issues not well captured on the rather broad personal strength theme. Specifically, this theme involved being mentally ready for possible future flare-ups or crises, and having the appropriate strategies and tools in place to adjust and "rebuild" as

quickly and efficiently as possible. While one cannot conceivably prepare for every possible future crisis, one can prepare for a few basic situations. Participants in both illness groups explained that they made improvements in their perceived ability to manage such stress by building resources in the areas of social support, using a variety of coping skills, and improving health through diet, rest and exercise.

This new theme supports Janoff-Bulman's (1992) conceptualization of psychological preparedness to a large extent. According to her theorizing, psychological preparedness involves changes in one's assumptive world, whereby people are better prepared for subsequent adversities, and thus, less traumatized by them. Indeed, living with a chronic illness, especially one in which the disease course is unpredictable, implies that multiple crises (e.g., flare-ups, emergencies) are likely to occur sometime in the future; consequently, the individual may experience a "shattering of assumptions" more than once. As noted by Janoff-Bulman, dealing with adversity involves coming to terms with these shattered assumptions and re-establishing an assumptive world that incorporates one's experiences as a victim with all prior illusions, and it is this rebuilding of one's assumptive world that leads to greater psychological protection. Thus, psychological preparedness may be a missing link in one's arsenal when coping with a chronic illness. The present study findings lend support to the role of inoculation to traumatic stress. That is, having experienced trauma and crises in the past helps one cope or "bounce back" more effectively when they encounter subsequent traumas or crises. In a chronic illness context, this "immunization" may be particularly important given the unpredictability and uncontrollability of health-related stressors. Further research that

explores both the behavioural and cognitive components of psychological preparedness that may play a role in coping with adversity may offer useful insights into effective treatment strategies for individuals with chronic illnesses.

The Negative Side of Health-Related Adversity

It is important to note, however, that in addition to positive changes, participants in both illness groups reported that their illness had negatively affected their lives. The qualitative analysis showed that some of the negative changes experienced by the arthritis group included social factors (e.g., feeling isolated from others, and perceiving others view them negatively), psychological changes (e.g., increased negative affect, feelings of shame, loss of "ideal" self), and financial constraints (e.g., increased medical costs, loss of job due to illness). While there was some overlap in themes, respondents in the IBD group also indicated negative changes related to freedom restrictions (e.g., restrictions to diet and activities, pre-planning social outings), social factors (e.g., feeling isolated from others, losing friends because they do not understand the illness, feeling awkward or uncomfortable in social situations), psychological changes (e.g., becoming more shy and/or reclusive, experiencing lower self-esteem and self-confidence), future uncertainty (e.g., unsure when their next flare up will occur, worry that their health will worsen over time), and financial constraints (e.g., increased medical costs, loss of job due to illness).

Identity Shifts and Regaining Control Beliefs

However, the fact that participants identified positive effects in addition to these negative effects perhaps may signal an ongoing effort to restore control beliefs. In the

aftermath of a trauma, control beliefs are challenged and individuals are motivated to restore them (Rothbaum et al., 1982). Consistent with Rothbaum et al.'s idea of secondary control (i.e., attempting to "fit in" with the world), what becomes evident upon reflecting on the qualitative data is that the participants experienced an identity shift. For example, in order to regain control, the majority of participants re-established an assumptive world that incorporates their experiences as a "victim," thus involving both positive and negative aspects. In fact, it is here that the apparent contrast in self-identity is evident. It seems that there is an agonizing or painful contrast between their present capabilities and their perceived former or desired self. For instance, participants viewed themselves as more compassionate and empathic towards others with illnesses while at the same time mourned the loss of their desired possible self. This qualitative analysis provides glimpses of the on-going struggle to maintain a positive identity in the context of chronic illness - a perpetual struggle between the positive aspects of the individual's support and coping strategies and the negative aspects of illness-related symptoms and societal discrimination that may jeopardize their efforts. Understanding how people perceive and experience shifts in self-identity may provide insights to the process of adapting to a chronic illness, and thus put health care professionals in a better position to facilitate individuals to adapt to their chronic illness.

Changes in the Types of Personal Growth Experienced

The present study also examined whether the experience of positive and negative effects changed across time. The results showed that the belief that their illness had positively affected their life remained relatively stable across time, which did not support

Hypothesis 1. However, the belief that their illness had negatively affected their life *decreased* across time for both illness groups. The finding that the experience of negative effects decreased over time while the experience of positive effects tended to remain stable seems consistent with Fredrickson's (1998) *broaden and build model.* According to this model, positive emotions (including finding positive meaning) "undo" negative emotions and, over time, create an "upward spiral" in adjustment. However, given that this study assessed positive and negative changes at two points in time, future research should examine the possibility that once posttraumatic growth stabilizes, the experience of negative effects decreases over time.

The experience of personal growth was also examined through the PTGI (Tedeschi & Calhoun, 1996), and the data showed that participants in both illness groups reported relatively high levels of posttraumatic growth at Time 1 and Time 2. Consistent with the findings presented above, overall mean scores of posttraumatic growth remained somewhat stable over time for each illness group and no significant increase in posttraumatic growth at Time 2 was observed. However, when the PTGI subscales were considered separately, the arthritis group showed a significant increase in Relating to Others. This finding provides weak support for Hypothesis 1, which stated that individuals who report posttraumatic growth at Time 1 would report higher levels of posttraumatic growth at Time 2. It is possible that the six-month interval did not provide enough time for participants to experience posttraumatic growth. It is also possible that those who completed the Time 1 survey were already experiencing substantial personal growth, making improvements in growth unlikely at Time 2.

In addition to examining the experience of and change in posttraumatic growth over time within each group, this study also examined the types of posttraumatic growth experienced. With regard to the PTGI subscales, the profile analysis showed that certain subscales were endorsed to a greater degree, although a very similar pattern of results for individuals with arthritis or IBD was observed. Participants in both groups reported that they experienced the most changes in Personal Strength, followed by Relating to Others and Appreciation of Life. The fewest changes were observed in Spirituality for both illness groups. These findings suggest that illness context may play a role in the experience of posttraumatic growth. In addition, these patterns of findings highlight the benefit in terms of understanding the experience of posttraumatic growth as a multidimensional construct rather than a unidimensional construct.

Factors Related to Posttraumatic Growth

A second major goal of this study was to examine the processes that give rise to posttraumatic growth. Although Schaefer and Moos' (1992) theory represents a useful model for understanding posttraumatic growth, few researchers have applied the model to their research. As such, the usefulness of this model for elucidating the factors related to posttraumatic growth represents one of the current gaps in knowledge that exist in the posttraumatic growth literature. Using structural equation modeling, the hypothesized model was generally supported for both illness groups, and highlights the relevant roles of personal factors, event-related characteristics, social resources, cognitive appraisals and coping strategies that are associated with the experience of posttraumatic growth for individuals with arthritis or IBD.

Hypothesis 2. Hypothesis 2 stated that personal factors (higher levels of optimism, hope, and spirituality/religiousness) would be indirectly related to posttraumatic growth through cognitive appraisals and coping strategies. This hypothesis was partially supported. The positive outlook latent variable, which assessed higher levels of optimism and hope, had an indirect effect on posttraumatic growth, and this relationship was mediated through benefit-finding and adaptive coping strategies for both illness groups. This finding supports some previous research (e.g., Davis et al., 1998). However, the relationship between optimism and growth has been somewhat mixed with some studies finding a relationship and while others do not (Tedeschi & Calhoun, 2004). It is possible that the effect of optimism on posttraumatic growth reflects the population being investigated. For example, studies that have not found support for the link between optimism and growth have generally used samples of individuals who have been diagnosed with a life-threatening illness, such as HIV/AIDS (Milam, 2004) or breast cancer (Bellizzi & Blank, 2005; Boyers et al., 2001; Sears et al., 2003). Among the studies that have found such a link, including the present study, have used samples for which there exists no direct or immediate life threat (e.g., Davis et al., 1998). It may be possible that optimism and hope have a beneficial or protective role particularly for individuals who are experiencing a stressful event rather than a potentially life-threatening one.

The finding that Spirituality, which assessed intrinsic religiousness and spirituality, only showed a positive direct effect on Sense-Making for both illness groups but no indirect effect on coping strategies or posttraumatic growth which did not support

Hypothesis 2. These results regarding spirituality are inconsistent with previous research. For example, Park and Fenster (2004) reported that intrinsic religiousness was related to posttraumatic growth through a pathway that involved restraint/religious coping and another that involves threat appraisals. However, there is other research which suggests that spirituality and/or religiousness has a direct effect on growth (Cadell et al., 2003; Calhoun et al., 2000; Milam, 2004). For example, Cadell et al. found that higher levels of spirituality had a direct positive effect on posttraumatic growth whereas Milam (2004) found that religiosity was associated with higher levels of posttraumatic growth. In the present study, both spirituality and intrinsic religiousness were significantly correlated with several of the PTGI subscales, particularly Spiritual Change, for both illness groups at both time points, but they were not related to overall posttraumatic growth scores.

As Dull and Skokan (1995) explain, religious beliefs in particular may help a person adapt to their disease because these beliefs encourage performing positive changes and help improve outlook on life, as well as help the individual find meaning in the stressful event. It may be possible that spirituality exerts a direct effect on posttraumatic growth and thus be more appropriately represented as an independent predictor of posttraumatic growth as suggested by previous research. It is also possible that spirituality falls under the class of cognitive appraisals in that one's spiritual or religious orientation represents a framework for which life events, including adverse events, are interpreted. This idea seems consistent with previous research that suggests spiritual and religious beliefs influence meaning making in the event of a crisis which in turn influence the development of growth (Frankl, 1997). These mixed findings suggest that the relative

roles of spirituality and religiousness in the experience or development of posttraumatic growth are not well understood and thus represent a fruitful avenue for future research.

Hypothesis 3. It was predicted that social resources, such as reporting high levels of social support, would be indirectly related to posttraumatic growth through cognitive appraisal and coping strategies. This hypothesis was supported. For the IBD group, higher levels of social support were indirectly related to posttraumatic growth through adaptive coping and benefit-finding. For the arthritis group, higher levels of social support also had an indirect effect on posttraumatic growth, but it was mediated by control beliefs. Reconciling the reasons why this relationship was mediated through different variables (i.e., benefit-finding versus control beliefs) for the two illness groups requires further research in that it may highlight the relevance of disease context. Compared to participants with arthritis, participants with IBD tended to engage in more forms of social support with others who had the same illness. For example, in the present study, one of the key findings observed during the qualitative analyses of the positive and negative effects the disease had had on their life, was that the IBD group had a greater tendency to seek out social support from similar others. In fact, giving and receiving support from others with their disease was a prominent theme and was identified as a positive change. Such interactions with similar others may offer the opportunity for one to identify possible benefits or the "silver lining" of their disease more readily than if they were not as socially inclined.

According to theories of social support (e.g., Sarason, Sarason, & Gurung, 1997) and communal coping (e.g., Lyons, Mickelson, Sullivan & Colne, 1998), communication in social relationships can facilitate the management of illness-related stress. After being diagnosed with IBD, people may experience a loss of their former social network for a variety of reasons (i.e., rejection due to illness stigma or loss of close friends and partners because of the disease) and may find it difficult to reveal their illness to loved ones (Derlega, Winstead & Folk-Barron, 2000). Because of the stigma often associated with the disease, it makes senses that these individuals may prefer to seek social support from similar others, and it is possible that such a context is essential for growth to occur. That is, given that individuals with IBD tend to seek support from similar others, the indirect link between social support and growth suggests that social resources may enable individuals with IBD the opportunity to interpret and find benefits in the stressful experience in a less threatening way because of the positive or supportive social context.

However, a large proportion of respondents from the IBD group (42.3%) reported being "never married." It is possible that they sought the support of similar others because they had fewer social resources compared to participants who were married or living with an intimate partner. This social support context may provide opportunities for these individuals to discuss and process illness-related issues, which in turn may help them to decrease its threat and help them to identify benefits and grow from the experience. For the arthritis group, higher levels of social support may provide opportunities for learning effective ways of managing symptoms and the benefit of maintaining the belief that one can control the severity of their symptoms (e.g., getting

enough rest and more exercise). One implication of this finding is the importance that disease-context or social-relationship context may serve in gaining a more complete understanding of the factors associated with posttraumatic growth.

Hypothesis 4. It was expected that event and health-related factors (e.g., reporting higher levels of disease-onset severity, being diagnosed for a longer period of time, experiencing higher levels of disease-related symptoms) would be indirectly related to posttraumatic growth through cognitive appraisals and coping strategies. Partial support was found for this hypothesis. For both illness groups, years diagnosed was unrelated to posttraumatic growth. In fact, years diagnosed was only related to sense-making for the arthritis group and benefit-finding for the IBD group.

For the arthritis group, individuals living with their illness for a shorter period of time tended to engage in more sense-making than did those who had been living with their illness for a longer period of time. For the IBD group, the longer one had been living with their disease facilitated being able to identify benefits. Previous research examining the link between years diagnosed and posttraumatic growth is somewhat mixed. For example, the present findings are consistent with previous research that found no relationship with time since diagnosis (Tedeschi & Calhoun, 1996; Milam, 2004) yet contradictory with research that found time an important factor in fostering posttraumatic growth (Cordova et al., 2001; Park et al., 1996; Seigel et al., 2005). This suggests, again, that this relationship may depend on the population being studied.

For both illness groups, a greater number of stressors was indirectly linked to posttraumatic growth - a relationship mediated through adaptive coping and benefit-finding. This finding supported Hypothesis 4. However, previous research has found a direct link of stressors to growth, whereby larger amounts of physical symptoms and distress was associated with greater growth (Cordova et al., 2001; Sears et al., 2003). In fact, the arthritis group reported substantially more health-related stressors compared the IBD group, particularly with regard to physical symptoms (i.e., mobility), which supports Tedeschi and Calhoun's (1998) theorizing that positive outcomes in part derive from some enduring distress from a trauma or hardship. It is possible that the greater physical symptomatology experienced by the arthritis group disrupted pre-existing schemas or worldviews to a greater extent which in turn provided them an opportunity for growth (Janoff-Bulman, 1992; Park, 1998).

Hypothesis 5. It was predicted that cognitive appraisals (i.e., control beliefs, sense-making and benefit-finding) would be indirectly related to posttraumatic growth through coping strategies. This hypothesis was supported across both illness groups whereby higher levels of benefit-finding and symptom control beliefs had an indirect effect on posttraumatic growth through adaptive coping. These results suggest that some cognitive appraisal variables facilitate growth. Although the link between cognitive processes and growth is not consistently reported in the literature, the findings from this study are consistent with previous research which finds that cognitive appraisals are related to growth through coping strategies (Armeli et al., 2001; Park & Cohen, 1993; Park & Fenster, 2004) and highlight the complex pathways that may lead to growth.

With regards to control beliefs, a greater sense of adaptive control was expected to facilitate growth because this expectancy is more likely to be related to approach coping, which in turn may foster growth. The indirect effect of control beliefs is inconsistent with the findings reported by Seigel et al., (2005) who found that perceived control over health was not related to posttraumatic growth among individuals with HIV/AIDS after controlling for reappraisal coping. This finding suggests that perhaps the effect of control beliefs on posttraumatic growth is accurately represented as being mediated through adaptive coping strategies, which is what the present study found.

Concerning benefit-finding, it may seem paradoxical that a large proportion of participants in both illness groups report experiencing negative changes as a result of their disease yet are still able to identify benefits deriving from their illness which lead to growth. Rather than being unrealistically optimistic, it is more likely that these people were reappraising and finding benefits in their most flexible (i.e., non-illness) domains (Calhoun & Tedeschi, 1998). However, sense-making was not related to posttraumatic growth in the present study. This finding is consistent with some previous research. For example, among women diagnosed with breast cancer, Manne et al. (2004) found that sense-making was only marginally associated with posttraumatic growth.

The link between sense-making and benefit-finding. The relation between sense-making and benefit-finding is somewhat unclear. Janoff-Bulman and Frantz (1997) have suggested that in order to come to terms with a "senseless" or "meaningless" trauma, an individual must put aside the unsolvable the issue of making sense of the event and

instead focus on identifying benefit or personal value to it. Identifying benefits of the experience may not help one make sense of the loss as much as provide a distraction from it (Davis & Nolen-Hoeksema, 2001). For example, learning the significance and valuing relationships does not help explain why the event or crisis happened, but it may help to take some of the pain away from not understanding why the crisis occurred. In this sense, it appears that making sense of the event does not seem to aid one in deriving benefits. For example, Davis & Nolen-Hoeksema (2001) found that whether the bereaved family member was able to find benefit in the loss was not significantly related with his or her ability to make sense of it. Moreover, the factors that predict sense making do not predict one's ability to derive benefits (Davis et al., 1998). According to these researchers, finding meaning in adversity seems to reflect a different set of processes.

However, some theorizing suggests that sense-making is a prerequisite for benefit-finding. For example, socio-cognitive models of coping and adjustment (e.g., Parkes, 1988; Taylor, 1983) propose that making meaning of the event plays a key role in the process of adjusting to adversity because it serves to maintain two aspects of our sense of self that often are most threatened by adversity: our sense of self worth and our fundamental beliefs about how the world works. In the present study, sense-making measured at Time 1 was moderately correlated with benefit-finding at Time 2 for the arthritis group ($r = .20, p < .05$) and the IBD group ($r = .21, p < .01$). Thus, an alternative model of posttraumatic growth could incorporate a direct path from sense-making to benefit-finding. Given that sense-making has been examined rather inconsistently in the positive growth literature, future research should explore the possibility that sense-

making has an indirect effect on posttraumatic growth through benefit-finding, particularly for chronic illness populations.

Hypothesis 6. It was predicted that coping strategies, particularly more adaptive coping, would be directly related to posttraumatic growth. This hypothesis was largely supported across both illness groups. These findings are consistent with previous research on coping and posttraumatic growth among breast-cancer survivors (Bellizzi & Blank, 2006; Carver et al., 1993; Stanton & Snider, 1993) as well as HIV/AIDS patients (Seigel et al., 2005). These results suggest that Adaptive Coping may be a critical component in facilitating posttraumatic growth.

Overall, these findings are consistent with Moos and Schaefer's (1993) theoretical model and the classes of factors that promote growth. That is, the results from the present study show that there is some support for the role of personal factors, social resources, event and health-related factors, cognitive appraisals, and coping strategies in relating to posttraumatic growth. As mentioned above, there were some unexpected direct and indirect effects related to posttraumatic growth, but the overall structure of the model and magnitude of the standardized regression coefficients were fairly consistent across the two illness groups.

Posttraumatic Growth and Later Well-Being

The third goal of this study was to explore the adjustment correlates of this growth. The results showed that posttraumatic growth measured at Time 1 was significantly related to well-being variables measured at Time 2. For example, higher

levels of appreciation of life, personal strength and new possibilities were associated with lower levels of negative affect at Time 2 for the arthritis group. Higher levels of appreciation of life, personal strength, new possibilities and relating to others were associated with improved satisfaction with life and positive affect for both illness groups. Regression analyses showed that some of the PTGI subscales measured at Time 1 predicted several well-being variables at Time 2 after controlling for age, years diagnosed, and health distress. Specifically, higher levels of spiritual change predicted more positive affect at Time 2 for individuals with IBD, whereas relating to others predicted more satisfaction with life at Time 2 for individuals with IBD.

It appears that growth is perhaps more strongly linked to positive states of mind rather than negative affectivity, which is consistent with the findings from previous research that posttraumatic growth is more closely linked with positive outcomes than negative outcomes (Tomich & Helgeson, 2002). However, the majority of research to date focuses on the link between posttraumatic growth primarily negative adjustment outcomes such as depression (Park & Fenster, 2004; McMillan, 1997), and as suggested by the present study, future research should test the hypothesis that posttraumatic growth is more strongly related to positive adjustment outcomes.

Limitations and Strengths

This study involved several limitations that warrant mention. One limitation involves examining what may be considered a continuous process through two assessments. Although collecting data at two time points allows some opportunity to study how posttraumatic growth changes over time, causal inferences cannot be made.

Moreover, the time frame of six months between data collection was arbitrary. It is possible that six months was too short to assess the experience of posttraumatic growth or perhaps it was too long to assess changes that might occur soon after a stressful event.

Another limitation involves the sample. The majority of the sample was Caucasian, female, well-educated, and of a higher socioeconomic status, therefore the findings may not generalize to other ethnic or socioeconomic groups. Furthermore, participants were primarily recruited through the Internet. There are some studies that report Internet-accessed samples and traditional samples are comparable on a number of demographic variables, but can vary in terms of sex and age, whereby participants recruited through the Internet are more likely to be younger and male (e.g. Birnbaum, 1999; Smith & Leigh, 1997).

However, there is also some evidence that samples recruited through the Internet are different from comparable samples recruited from more conventional methods with regards to health distress and poorer quality of life (Jones et al., 2007; Soetikno, Mrad, Pao, & Lenert, 1997). For example, Soetikno et al. found that individuals with ulcerative colitis who were recruited through a webpage were younger and had more severe disease than those recruited through general surgical clinics. In the present study, it is possible that participants recruited through the Internet were experiencing greater symptom severity and poorer health-related quality of life compared to a similar sample recruited from the community. However, as the purpose of this study was to examine the experience of posttraumatic growth as a result of a health-related adversity, including a sample of participants with a wider range of disease severity may actually be an

advantage. In fact, recruiting participants through the Internet allowed access to individuals who may have been in living in geographically remote areas or individuals who may have had limited access to the community due to their symptoms.

Moreover, participants in this study were recruited from a variety of sources on the Internet, such as illness-specific social support websites, several general psychology survey websites, illness-specific websites (e.g., the Arthritis Society), as well as free online classified ad websites. This approach was used in an effort to recruit a diverse sample with regards to sociodemographic characteristics and disease severity, as well as to ensure, for example, that participants who completed the survey were not simply seeking social support.

Although online recruitment allowed collecting a large sample in a relatively short amount of time, some difficulty was experienced when participants were attempted to be contacted for the Time 2 survey. In most cases, the email address provided was no longer active; thus, unless the participant provided some other means of being re-contacted (e.g., telephone number, alternative email address), they did not have the opportunity to complete the Time 2 survey. As such, the final sample at Time 2 may not be representative of the larger population of individuals with arthritis or IBD. While the sample at Time 2 was still quite large, the sample at Time 2 was not quite large enough, particularly for the arthritis group, to test the model of posttraumatic growth using structural equation modeling. Given the number of parameters included in the model, a fairly large sample (>200) is recommended for testing such complex structural models

(Kline, 2004). Given these limitations, it is recommended that these results be replicated on a larger and more demographically diverse sample of individuals with arthritis or IBD.

Although not quite a limitation as much as an observation, there was a difference in the number of individuals with IBD or arthritis who completed the surveys. Individuals with arthritis who completed the survey anecdotally shared that they found the survey lengthy and, given that their disease commonly effects their smaller joints, it was difficult for them to type for an extended period. Alternative methods of collecting online surveys should be considered to accommodate certain illness populations. For example, online survey methods that employ a "save and resume" function would allow participants to take a necessary break from completing the survey. Unfortunately, such alternative methods were not available at the time data for this study were collected. It is possible that the lengthiness of the survey prevented some individuals with arthritis from wanting to participate in the study or prevented them from completing the survey.

However, the difference in sample size could also reflect the fact that individuals with IBD were particularly keen on "sharing their story" relative to the individuals with arthritis. Arthritis is a more common disease and is frequently researched, whereas IBD is a far less prevalent disease and has comparatively received less attention with regards to the psychosocial aspects related to coping and adjustment with their disease. In fact, one observation made during the recruitment process was the ease of recruiting individuals with IBD compared to individuals with arthritis.

Implications

This research has some important implications for therapeutic work. While clinicians and other health-care providers recognize that crises and hardships are associated with negative outcomes, these same circumstances may afford an opportunity for growth and positive change. These findings suggest that posttraumatic growth may have benefits for those who experience it. Moreover, this research highlights some of the factors through which posttraumatic growth may occur.

It is possible that therapists may use this information to facilitate posttraumatic growth. For example, therapists could encourage individuals to use benefit finding or adaptive coping strategies. In addition, the finding that social support directly relates to posttraumatic growth for individuals with IBD implies that this may be a critical resource for this illness population. However, as noted in a critique of the positive psychology movement, pressuring individuals to think positively is not always adaptive (Held, 2002). In fact, Speigel and Classen (2000) noted that cancer patients often complain of the "prison of positive thinking" because they are continuously encouraged by others to look on the bright side.

Directions for Future Research

This study represents one of the first attempts to examine posttraumatic growth from a theoretical perspective. However, the fact that previous research in this area generally does not apply theoretical frameworks presented a disadvantage of testing plausible alternative models. As mentioned earlier, one alternative model could include spirituality having a direct effect on posttraumatic growth. Religious and/or spiritual

beliefs represent a relevant aspect of a person's worldview. Also mentioned earlier, another alternative model involves exploring the link between sense-making and benefit-finding, and how these two variables influence the experience of posttraumatic growth. Whether sense-making exerts an indirect effect on posttraumatic growth through benefit-finding or exerts a direct effect on posttraumatic growth is presently inconclusive. Future research that examines these processes would help advance our current understanding of the factors relevant to personal growth.

Furthermore, as the present study used cross-sectional data to test the model of posttraumatic growth, the relationships between the study variables and posttraumatic growth cannot be truly considered predictors and outcomes. This area of research would benefit by testing such a model of growth using a longitudinal design as this approach would help clarify any causal roles. One of the obvious strengths of this study, however, was permitting participants to specify additional positive or negative changes they experienced beyond those provided by the PTGI. The findings for the qualitative analyses suggest that there are a number of factors, both positive and negative, that may be relevant to individuals with arthritis or IBD that have not been fully captured on existing growth instruments. Qualitative research may be a useful approach in elucidating some of these domains in order to explore the experience of posttraumatic growth among these illness populations more completely.

Future research is also needed to examine the possible impact that physician and/or specialist accessibility and treatment availability has on the experience posttraumatic growth. In this study, the majority of participants were recruited from

Canada or the United States – each country representing a vastly different healthcare system. Obtaining adequate healthcare in the United States can be excessively difficult and costly as healthcare coverage is largely tied to the healthcare package provided by employers or is available for a fee. In contrast, Canada has a universal healthcare plan whereby physicians and/or specialists and treatment options are more readily available. The issue of healthcare services was highlighted in the comments made by participants in this study. For example, a large proportion of participants in both illness groups commented that they experienced financial constraints, generally due to the expensive treatment and healthcare services, as one of the most troubling negative effects of their illness.

When reports of posttraumatic growth were compared by country (Canada versus the United States) for each illness group, the results showed that individuals living with arthritis in Canada reported more posttraumatic growth than those living in the United States. However, for individuals with IBD living in Canada, they reported *lower levels* of posttraumatic growth compared to those living in the United States. This study did not directly assess issues related to healthcare services (e.g., physician or treatment availability), therefore explaining these mixed results is difficult. These differences may reflect a variety of aspects unique to each country, including its healthcare system. Thus, future research needs to explore to what extent physician or treatment availability, or even satisfaction with adequate healthcare services, is related to posttraumatic growth. It is possible that experiencing difficulty accessing adequate healthcare services represent a key stressor that influences the extent to which posttraumatic growth is experienced.

Conclusion

Posttraumatic growth is an exciting new area of research with important implications. For example, being able to accurately identify the factors contributing to the experience of posttraumatic growth may help design interventions that support such personal growth. This study adds to the still small but growing area of research aimed at identifying the factors that give rise to personal growth. The findings of this study generally support the hypotheses that positive outlook, stressors, social resources, cognitive appraisals and coping strategies contribute positively to posttraumatic growth among individuals with arthritis or IBD. Most importantly, this study demonstrates that posttraumatic growth is not something experienced only among individuals facing a life-threatening illness or acute trauma, but rather, it can also be experienced among individuals living with a chronic illness. The belief that one has grown from a traumatic experience, such as a living with an incurable chronic illness, may have the potential to counteract feelings of distress and victimization, which may help these individuals regain positive perceptions about themselves and their world.

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Appendix A: Consent Form for Time 1 Survey

UNIVERSITY OF WINDSOR

LETTER OF INFORMATION FOR CONSENT TO PARTICIPATE IN RESEARCH

Title of Study: Adjustment to (Arthritis/Inflammatory Bowel Disease): Self-perceptions and personal growth over time: Part 1

You are asked to participate in a research study conducted by Rebecca Purc-Stephenson, M.A., from the Department of Psychology at the University of Windsor. The current study has received funding from the Social Sciences Human Research Council (SSHRC) and will contribute to the completion of Rebecca Purc-Stephenson's dissertation. This research is being conducted under the supervision of Dr. Fuschia Sirois.

If you have any questions or concerns about the research, please feel free to contact Rebecca Purc-Stephenson at (519) 253-3000 ext. 4704, or purcste@uwindsor.ca.

PURPOSE OF THE STUDY

The purpose of this study is to investigate personal growth and adjustment to (arthritis/Inflammatory bowel disease (IBD)), and how each of these may change over time. In addition, this study will explore the role of personal characteristics (e.g., optimism, hope, previous life crises), event-related factors (e.g., illness severity), and coping responses (e.g., coping strategies) in the adjustment to (arthritis/IBD). This is the first phase of a two-part study. By participating in this study you will be eligible to be invited to participate in the second follow-up study in approximately six months.

PROCEDURES

If you volunteer to participate in this study, we would ask you to do the following things:

You will be asked to complete a survey online. The survey includes background questions about you and your health, as well as questions about your personal characteristics, your illness experiences, your social relationships, mood, and well-being. You will also be asked to create a personal code so that we can link this survey to a follow-up survey that you will be invited to complete in approximately six months. However, by agreeing to participate in this survey you are not committing to participate in the follow-up survey. In order to contact you for the follow-up survey we will ask you to provide a contact email address. This information will only be used to invite you to participate in the follow-up study and to contact you should you win one of the incentive draws.

This survey takes approximately 40 minutes to complete. You may complete the survey at a location of your choice. The completed survey will be sent to researchers with you IP address as

the only other identifying information attached to your survey. If you prefer completing a paper copy of the survey, please e-mail your mailing address to sirois11@uwindsor.ca and we will send you a survey package in the mail along with a postage paid return envelope to return the completed survey.

POTENTIAL RISKS AND DISCOMFORTS
Some people may experience some mild discomfort when asked to focus on their past or present health and/or life experiences, and/or any stress they may have experienced as a result of their illness. Please contact your family physician or healthcare practitioner if you experience stress.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY
By completing the questionnaires about yourself and your illness experience, you may become more aware of your own adjustment and personal growth and of any changes that you may wish to make to improve your well-being. In addition, some questions may help you to view your illness experience from new perspectives which could improve how you cope with some illness-related challenges.

PAYMENT FOR PARTICIPATION
There is no direct compensation for participating in this study. You will be given a chance to win one of several gift certificates worth up to $50 CDN as an incentive for participating. This incentive will be in the form of a gift card/certificate from a major book seller such as Chapters.ca or Amazon.ca for Canadian participants, Amazon.com for American participants, or Amazon.uk for participants from the United Kingdom and Europe. Winners will be able to choose the currency of their gift certificate.

To be eligible for the incentive draws, the survey must be submitted along with the completed personal code and contact information (email address) so that you can be contacted should you win a prize. There will be several of these draws throughout the duration of the study and your contact information will remain part of the eligible entries for each of these draws. However, in the interest of fairness to the other participants, you may win only one prize for the draws in this study.

Should you decide to withdraw from the study after returning the survey package, you will still be eligible to win one of the draws.

CONFIDENTIALITY
Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. In the survey, you will only be asked to provide your email address for future contact but no other identifying information will be requested. All surveys will remain anonymous and only be directly identified by your personal code; therefore your responses on the questionnaires will not be directly associated with your name or email address, and only your self-created personal code will link your email address to your survey responses.

The self-created personal code and email address that you provide will be used only for the purpose of linking the future follow-up survey (should you decide to participate later), and for delivering a gift certificate to you should you win one of the incentive draws. Once both studies

are over, the code will be destroyed and your name, email address, and any other identifying information will be deleted from our database. Surveys will be stored in a secure location accessible only to the researchers directly involved in the study. As well, any forms containing personal information, such as email requests for paper mail-in surveys, will be stored in a place that is secure. If a report of this study is sent to a scientific journal, all information will be presented in a way that protects your confidentiality. For example, information included will reflect group information. Following the guidelines of the Canadian and American Psychological Associations, data will be retained for a period of 10 years after which time it will be disposed of in a secure manner.

PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time, without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw your survey from this research if circumstances arise which warrant doing so. You also have the option to remove your data from the study should you decide to do so.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS

Once the research is complete a brief report explaining the findings from this study will be available for those interested. The report will be available on the study website (www.uwindsor.ca/PTG_ Arthritis) by March 2008.

SUBSEQUENT USE OF DATA

The data for this study may be used in subsequent research on coping with arthritis. By completing and submitting the survey package you agree that this data can be used in subsequent studies.

RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time before submitting the survey electronically, and discontinue participation without penalty. This study has been reviewed and received ethics clearance through the University of Windsor Research Ethics Board. If you have questions regarding your rights as a research subject, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4; telephone: 519-253-3000, ext. 3916; e-mail: lbunn@uwindsor.ca.

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

Rebecca Purc-Stephenson

Rebecca Purc-Stephenson, M.A.
Department of Psychology
University of Windsor

It is recommended that you print out a copy of this letter of information for your records.

Appendix B: Consent Form for Time 2 Survey

UNIVERSITY OF WINDSOR

LETTER OF INFORMATION FOR CONSENT TO PARTICIPATE IN RESEARCH

Title of Study: Adjustment to (Arthritis/Inflammatory Bowel Disease (IBD)): Self-perceptions and personal growth over time: Part 2

You are asked to participate in a research study conducted by Rebecca Purc-Stephenson, M.A., from the Department of Psychology at the University of Windsor. The current study has received funding from the Social Sciences Human Research Council (SSHRC) and will contribute to the completion of Rebecca Purc-Stephenson's dissertation. This research is being conducted under the supervision of Dr. Fuschia Sirois.

If you have any questions or concerns about the research, please feel free to contact Rebecca Purc-Stephenson at (519) 253-3000 ext. 4704, or purcste@uwindsor.ca.

PURPOSE OF THE STUDY

The purpose of this study is to investigate personal growth and adjustment to (arthritis/IBD), and how each of these may change over time. In addition, this study will explore the role of personal characteristics (e.g., optimism, hope, previous life crises), event-related factors (e.g., illness severity), and coping responses (e.g., coping strategies) in the adjustment to (arthritis/IBD). This is the follow-up study.

PROCEDURES

If you volunteer to participate in this study, we would ask you to do the following things:

You will be asked to complete a survey online. The survey includes background questions about you and your health, as well as questions about your personal characteristics, your illness experiences, your social relationships, mood, and well-being. You will also be asked to create a personal code so that we can link this survey to your previous survey.

This survey takes approximately 25 minutes to complete depending on how much you choose to write. You may complete the survey at a location of your choice. The completed survey will be sent to researchers with you IP address as the only other identifying information attached to your survey. If you prefer completing a paper copy of the survey, please e-mail your mailing address to sirois11@uwindsor.ca and we will send you a survey package in the mail along with a postage paid return envelope to return the completed survey.

POTENTIAL RISKS AND DISCOMFORTS
Some people may experience some mild discomfort when asked to focus on their past or present health and/or life experiences, and/or any stress they may have experienced as a result of their illness. Please contact your family physician or healthcare practitioner if you experience stress.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY
By completing the questionnaires about yourself and your illness experience, you may become more aware of your own adjustment and personal growth and of any changes that you may wish to make to improve your well-being. In addition, some questions may help you to view your illness experience from new perspectives which could improve how you cope with some illness-related challenges.

PAYMENT FOR PARTICIPATION
There is no direct compensation for participating in this study. You will be given a chance to win one of several gift certificates worth up to $50 CDN as an incentive for participating. This incentive will be in the form of a gift card/certificate from a major book seller such as Chapters.ca or Amazon.ca for Canadian participants, Amazon.com for American participants, or Amazon.uk for participants from the United Kingdom and Europe. Winners will be able to choose the currency of their gift certificate.

To be eligible for the incentive draws, the survey must be submitted along with the completed personal code and contact information (email address) so that you can be contacted should you win a prize. There will be several of these draws throughout the duration of the study and your contact information will remain part of the eligible entries for each of these draws. However, in the interest of fairness to the other participants, you may win only one prize for the draws in this study.

Should you decide to withdraw from the study after returning the survey package, you will still be eligible to win one of the draws.

CONFIDENTIALITY
Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. In the survey, you will only be asked to provide your email address for future contact but no other identifying information will be requested. All surveys will remain anonymous and only be directly identified by your personal code; therefore your responses on the questionnaires will not be directly associated with your name or email address, and only your self-created personal code will link your email address to your survey responses.

The self-created personal code and email address that you provide will be used only for the purpose of linking the follow-up survey to your previous survey and for delivering a gift certificate to you should you win one of the incentive draws. Once both studies are over, the code will be destroyed and your name, email address, and any other identifying information will be deleted from our database. Surveys will be stored in a secure location accessible only to the researchers directly involved in the study. As well, any forms containing personal information, such as email requests for paper mail-in surveys, will be stored in a place that is secure. If a report of this study is sent to a scientific journal, all information will be presented in a way that protects your

confidentiality. For example, information included will reflect group information. Following the guidelines of the Canadian and American Psychological Associations, data will be retained for a period of 10 years after which time it will be disposed of in a secure manner.

PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time, without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw your survey from this research if circumstances arise which warrant doing so. You also have the option to remove your data from the study should you decide to do so.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS

Once the research is complete a brief report explaining the findings from this study will be available for those interested. The report will be available on the study website (www.uwindsor.ca/PTG_IBD) by March 2008.

SUBSEQUENT USE OF DATA

The data for this study may be used in subsequent research on coping with IBD. By completing and submitting the survey package you agree that this data can be used in subsequent studies.

RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time before submitting the survey electronically, and discontinue participation without penalty. This study has been reviewed and received ethics clearance through the University of Windsor Research Ethics Board. If you have questions regarding your rights as a research subject, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4; telephone: 519-253-3000, ext. 3916; e-mail: lbunn@uwindsor.ca.

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

Rebecca Purc-Stephenson

Rebecca Purc-Stephenson, M.A.
Department of Psychology
University of Windsor

It is recommended that you print out a copy of this letter of information for your records.

Pass it on: Feel free to send this page to other people you know with arthritis who might be interested in completing the survey.

Appendix C: Explanation of the Study

Explanation of the Study: Adjustment to (Arthritis/Inflammatory Bowel Disease (IBD)): Self-perceptions, past experiences, personal growth and well-being over time.

Research on adjustment to chronic illness, including (arthritis/inflammatory bowel disease (IBD)), suggests that our personal characteristics, past experiences, and the way we perceive ourselves can influence how we deal with illness-related challenges. For example, being someone who tends to be more optimistic, has dealt with a previous hardship, and sees oneself as having benefited from having a chronic illness may help you experience personal growth. Personal growth may include positive changes in you relationships, an increased sense of personal strength, appreciation of life, and enhanced sense of spirituality. Such changes in personal growth may buffer such stress and improve overall well-being.

Because the purpose of this study is to examine how your personal characteristics, past experiences, and the way we perceive ourselves are related to your adjustment to (arthritis/IBD) over time, you will be contacted and invited to participate in a follow-up study in approximately six months. You can decide at that time if you wish to participate in the second study. Please keep your personal identification code that you created so that we can link your survey responses from the two studies.

I understand how tiring it can be to complete such a survey and I truly appreciate the time you have given to this research. Your responses will help increase our understanding of the factors that may contribute to the adjustment and well-being of people who live with a chronic illness.

Thank you again for participating in this research. Your time and efforts are greatly appreciated!

Rebecca Purc-Stephenson, M.A.

Department of Psychology

University of Windsor

Appendix D: Sociodemographics

Age: _____ Sex: ☐ Female ☐ Male

What is your highest level of education?

☐ some high school ☐ some college or university ☐ some graduate school
☐ high school graduate ☐ college/university graduate ☐ graduate degree

Are you currently employed?

☐ full-time ☐ part-time ☐ not at all ☐ retired ☐ disabled

What is your first language? _____

What ethnic background do you most identify with? (For example: Caucasian, French Canadian, Italian, East Indian, etc.): _____

What is your relationship status? (please check the one that applies best to you)

☐ married/living with an intimate other ☐ never married
☐ separated/divorced ☐ widowed

What was your household income last year (before taxes)? (please check the one that applies best to you)

☐ Under $14,999 ☐ $75,000 - $89,999
☐ $15,000 - $29,999 ☐ $90,000 - $104,999
☐ $30,000 - $44,999 ☐ $105,000 - $119,999
☐ $45,000 - $59,999 ☐ $120,000 - $134,999
☐ $60,000 - $74,999 ☐ Over $135,000

Have you been diagnosed with any psychiatric or mental health conditions? (e.g., clinical depression, anxiety, panic attacks, etc.)

☐ No
☐ Yes

If yes, please list all:_____

Appendix E: Personal Resources

Optimism

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, please indicate how much you agree or disagree with each statement.

1	2	3	4
I agree a lot	I agree a little	I neither agree nor disagree	I DISagree a little

In uncertain times, I usually expect the best.	1 2 3 4
It's easy for me to relax.	1 2 3 4
If something can go wrong for me, it will.	1 2 3 4
I'm always optimistic about my future.	1 2 3 4
I enjoy my friends a lot.	1 2 3 4
It's important for me to keep busy.	1 2 3 4
I hardly ever expect things to go my way.	1 2 3 4
I don't get upset too easily.	1 2 3 4
I rarely count on good things happening to me.	1 2 3 4
Overall, I expect more good things to happen to me than bad.	1 2 3 4

Dispositional Hope

Read each item carefully. Using the scale shown below, please indicate what best describes YOU and check the appropriate box.

1	2	3	4
Definitely False	Mostly False	Mostly True	Definitely True

I can think of many ways to get out of a jam.	1 2 3 4
I energetically pursue my goals.	1 2 3 4
I feel tired most of the time.	1 2 3 4
There are lots of ways around any problem.	1 2 3 4
I am easily downed in an argument.	1 2 3 4
I can think of many ways to get the things in life that are most important to me.	1 2 3 4
I worry about my health.	1 2 3 4
Even when others get discouraged, I know I can find a way to solve the problem.	1 2 3 4
My past experiences have prepared me well for my future.	1 2 3 4
I've been pretty successful in life.	1 2 3 4
I usually find myself worrying about something.	1 2 3 4
I meet the goals that I set for myself.	1 2 3 4

Intrinsic/Extrinsic-Revised Scale

Directions: The following items deal with various types of religious ideas and social opinions. We should like to find out how common they are. Please indicate the response you prefer, or most closely agree wit*h, by circling the corresponding to your choice in the right margin.* If none of the choices expresses exactly how you feel, then indicate the one which is closest to your own views. If no choice is possible, you may omit the item.

There are no "right" or "wrong" choices. There will be many religious people who will agree with all the possible alternative answers.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neutral	Moderately Agree	Strongly Agree

I enjoy reading about my religion	1 2 3 4 5
It doesn't much matter what I believe so long as I am good	1 2 3 4 5
It is important to me to spend time in private thought and prayer	1 2 3 4 5
I have often had a strong sense of God's presence	1 2 3 4 5
I try hard to live all my life according to my religious beliefs	1 2 3 4 5
Although I am religious, I don't let it affect my daily life	1 2 3 4 5
My whole approach to life is based on my religion	1 2 3 4 5
Although I believe in my religion, many other things are more important in life	1 2 3 4 5

The Spiritual Involvement and Beliefs Scale

The following questions ask you about your spiritual involvement and beliefs. Please answer the following questions by checking your response

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

A person can be fulfilled without pursuing an active spiritual life.	1 2 3 4 5
A spiritual force influences the events in my life.	1 2 3 4 5
Prayers do not really change what happens.	1 2 3 4 5
Participating in spiritual activities helps me forgive other people.	1 2 3 4 5
I believe there is a power greater than myself.	1 2 3 4 5
I have a personal relationship with a power greater than myself.	1 2 3 4 5

Appendix F: Social Resources

Social Support

Here is a list of some things that other people do for us or give us that may be helpful or supportive. Please read each statement carefully and click the column that is closest to your situation. Give only 1 answer per row.

1	2	3	4	5
As much as I would like	Almost as much as I would like	Some but would like more	Less than I would like	Much less than I would like

I have people who care what happens to me.	1 2 3 4 5
I get love and affection.	1 2 3 4 5
I get chances to talk to someone about problems at work or with my housework.	1 2 3 4 5
I get chances to talk to someone I trust about my personal and family problems.	1 2 3 4 5
I get chances to talk about money matters.	1 2 3 4 5
I get invitations to go out and do things with other people.	1 2 3 4 5
I get useful advice about important things in life.	1 2 3 4 5
I get help when I'm sick in bed.	1 2 3 4 5

The following questions ask you about your social network. Please respond to each item using the scale provided.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

I have people to talk to about my worries concerning arthritis/IBD.	1 2 3 4 5
I feel free to express all my feelings about arthritis/IBD to those close to me.	1 2 3 4 5
There are people I can count on whenever I want to talk about my experience with arthritis/IBD.	1 2 3 4 5

Appendix G: Event and Health-Related Characteristics

Brief Health History

This section deals with health issues you have experienced that are either temporary or over a short period of time (acute), or that can repeatedly occur over a longer period of time (chronic).

ACUTE OR TRANSITORY HEALTH PROBLEMS:
Please indicate which ones you are currently experiencing, or can remember experiencing within the past six months. – Please check all that apply

	Back problems		Insomnia		Allergies
	Sprains or muscle strains		Infections		Skin problems/rashes
	Headache		Flu, cold or fever		Reproductive/menstrual problems
	Acute digestive problems (constipation, heartburn, etc.)		Dental problems		Other acute problems: please specify e.g., bone fractures, etc.

CHRONIC OR RECURRING HEALTH PROBLEMS:

Please indicate which of the following health issues you have been diagnosed with – check all that apply under "YES". For those problems you do have please indicate how much this problem or its symptoms has bothered you in the past 6 months by checking the appropriate box.

YES		not bothered	mildly bothered	moderately bothered	very much bothered	extremely bothered
	Chronic migraines or headaches					
	Heart disease &/or high blood pressure					
	Asthma					
	Diabetes					
	Cancer					
	Arthritis, Fibromyalgia, Lupus, etc.					
	Inflammatory Bowel Disease (Crohn's, colitis)					
	Multiple Sclerosis					
	Chronic Fatigue syndrome					
	Irritable Bowel Syndrome (IBS)					
	Liver disease					
	Lung disease					
	Kidney disease					
	Chronic back problems					
	Other chronic condition: _____ Please specify – e.g., sickle cell disease, psoriasis, etc.					

Do you have a physical disability? NO [ ] YES [ ] If YES, please describe:

_____

_____

Your Health – Arthritis

What is the main type of arthritis that you have? (please check one only)

☐ Rheumatoid Arthritis
☐ Systemic Lupus Erthematosis
☐ Ankylosing Spondylitis
☐ Reiter's Syndrome (Reactive arthritis)
☐ Gout
☐ Osteoarthritis/Degenerative Arthritis
☐ Fibromyalgia
☐ Scleroderma
☐ Psoriatic Arthritis
☐ Other:_____

Arthritis Impact Measurement Scales

In this section, we are interested in learning how your illness effects your ABILITY TO FUNCTION IN DAILY LIFE. Please check the response which best describes your usual abilities OVER THE PAST WEEK:

Are you able to:

1 Without ANY difficulty	2 With SOME difficulty	3 With MUCH difficulty	4 UNABLE to do

Dress yourself, including tying shoelaces and doing buttons?	1 2 3 4
Shampoo your hair?	1 2 3 4
Stand up from a straight chair?	1 2 3 4
Get in and out of bed?	1 2 3 4
Lift a full cup or glass to your mouth?	1 2 3 4
Open a new milk carton?	1 2 3 4
Cut your meat or other hard foods?	1 2 3 4
Walk outdoors on flat ground?	1 2 3 4
Climb up five steps?	1 2 3 4
Wash and dry your body?	1 2 3 4
Take a tub bath?	1 2 3 4
Get on and off the toilet?	1 2 3 4
Reach and get down a 5-pound object from just over your head?	1 2 3 4
Bend down and pick up clothing from the floor?	1 2 3 4
Open car doors?	1 2 3 4
Open jars which have previously been opened?	1 2 3 4
Turn faucets off and on?	1 2 3 4
Run errands and shop?	1 2 3 4
Get in and out of a car?	1 2 3 4
Do chores such as vacuuming or yard work?	1 2 3 4

Please check any AIDS or DEVICES that you usually use for any of these activities:

☐ Cane
☐ Walker
☐ Crutches
☐ Wheelchair
☐ Other: _____

Your Health – IBD

What is the main type of IBD that you have? (please check one only)
☐ Crohn's Disease
☐ Ulcerative Colitis
☐ Other: _____

IBDQ

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

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

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

Your Health

These questions are about how you feel and how things have been with you during the **past month**. For each question, please circle **one** number for each question that comes closest to the way you have been feeling.

0 None of the time	1 A little of the time	2 Some of the time	3 A good bit of the time	4 Most of the time	5 All of the time

Did you feel worn out?	0 1 2 3 4 5
Did you have a lot of energy?	0 1 2 3 4 5
Did you feel tired?	0 1 2 3 4 5
Did you have enough energy to do the things you wanted to do?	0 1 2 3 4 5
Did you feel full of pep?	0 1 2 3 4 5

Illness Severity

When were you first diagnosed with arthritis/IBD (month, year)?

_____

Have you ever had any surgeries for arthritis/IBD?
☐ Yes
☐ No

Please list any medications that you are currently taking for arthritis/IBD:

_____

Have these medications been successful in relieving your symptoms for arthritis/IBD?
☐ Yes
☐ No

Please take a moment and think back to the time when you were first experiencing symptoms of arthritis/IBD.

Some people experience the symptoms of their illness long before they are ever diagnosed with their condition, whereas other people experience a sudden onset of symptoms that disrupt their life. What was your experience? When did you first start experiencing symptoms of arthritis/IBD? (month, year)?

_____

The following three questions ask you to consider your health at the time when you were first diagnosed. Please use the following scale to rate your condition.

	None	Mild	Moderate	Severe
How would you describe your symptoms in general?	☐	☐	☐	☐
How would you describe the distress you typically experienced?	☐	☐	☐	☐
How would you describe the pain you usually had?	☐	☐	☐	☐

Perceived Stress

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, please indicate with a check how often you felt or thought a certain way.

1	2	3	4	5
Never	Almost never	Sometimes	Fairly often	Very often

In the last month, how often have you been upset because of something that happened unexpectedly?	1 2 3 4 5
In the last month, how often have you felt that you were unable to control the important things in your life?	1 2 3 4 5
In the last month, how often have you felt nervous and "stressed"?	1 2 3 4 5
In the last month, how often have you felt confident about your ability to handle your personal problems?	1 2 3 4 5
In the last month, how often have you felt that things were going your way?	1 2 3 4 5
In the last month, how often have you found that you could not cope with all the things that you had to do?	1 2 3 4 5
In the last month, how often have you been able to control irritations in your life?	1 2 3 4 5
In the last month, how often have you felt that you were on top of things?	1 2 3 4 5
In the last month, how often have you been angered because of things that were outside of your control?	1 2 3 4 5
In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	1 2 3 4 5

Center for Epidemiological Studies Depression Scale

For each of the following statements, tell us how often you felt or behaved this way during the **past 2 weeks**:

1	2	3	4
Rarely or none of the time	Some or a little of the time	Occasionally or a moderate amount of the time	Most of or all of the time

You were bothered by things that don't usually bother you.	1 2 3 4
You did not feel like eating - your appetite was poor.	1 2 3 4
You felt that you could not shake off the blues even with help from your family and friends.	1 2 3 4
You had trouble keeping your mind on what you were doing.	1 2 3 4
You felt depressed.	1 2 3 4
You felt that everything you did was an effort.	1 2 3 4
You had crying spells.	1 2 3 4
You enjoyed life.	1 2 3 4
You felt hopeful about the future	1 2 3 4
You could not get going.	1 2 3 4

Trauma Questionnaire

Please complete all of the following questions. Please check **YES** if you have experienced any of the following events. If yes, please indicate how distressing the event was using the following scale:

0 Not distressing at all	1 Somewhat distressing	2 Moderately distressing	3 Very distressing	4 Extremely distressing

Yes	Event	0 1 2 3 4
	Death of an immediate family member	0 1 2 3 4
	Your own life-threatening illness	0 1 2 3 4
	Immediate family member's life-threatening or serious illness	0 1 2 3 4
	Your own disability not resulting from an accident	0 1 2 3 4
	Immediate family member's disability not resulting from an accident	0 1 2 3 4
	Your own disability resulting from an accident	0 1 2 3 4
	Immediate family member's disability resulting from an accident	0 1 2 3 4
	Personal injury or property loss as a result of a fire, severe weather, or disaster	0 1 2 3 4
	Childhood emotional abuse	0 1 2 3 4
	Childhood physical abuse	0 1 2 3 4
	Childhood sexual abuse	0 1 2 3 4
	Sexual assault by a stranger, acquaintance, or someone close to you	0 1 2 3 4
	Physical abuse by a stranger, acquaintance, or someone close to you	0 1 2 3 4
	Robbery, a theft involving force or threat of force	0 1 2 3 4
	A break-in to your home, car, or office	0 1 2 3 4
	Military war zone or combat experience	0 1 2 3 4
	Witnessing someone being seriously injured or killed	0 1 2 3 4
	Divorce of parents	0 1 2 3 4
	Some other distressing, extraordinary, stressful, or shocking event or situation. Please specify: _____	0 1 2 3 4

Appendix H: Cognitive Appraisals

Sense-Making

The following questions ask you to consider your thoughts about your illness that may have occurred in the past month. Using the scale provided below, pleases respond to each item.

1 Not at all	2 A little	3 Somewhat	4 A great deal

How often have you tried to find some meaning in the illness experience?	1 2 3 4
How often have you tried to understand why you were diagnosed with arthritis/IBD?	1 2 3 4
How often have you found yourself thinking about the reason for your illness?	1 2 3 4

If you have ever tied to find meaning in your illness experience, how do you answer this? Please provide your response below.

_____
_____
_____
_____
_____

Benefit-Finding

Sometimes people who experience a hardship like being diagnosed with a chronic illness find some positive aspect in the experience. For example, some people feel they learn something about themselves or others. Have you found anything positive in this experience?

☐ Yes
☐ No

If yes, what do the benefits include? Please provide your response below.

_____
_____
_____
_____
_____

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 clicking one of the numbers from 1 to 6 following the statement that corresponds to your answer. Use the following scale to answer:

1 Strongly disagree	2 Disagree	3 Mildly disagree	4 Mildly agree	5 Agree	6 Strongly agree

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

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

Control Beliefs Inventory

The following statements concern the different ideas that people have about their health. Some of these statements refer to your general state of health and others refer to specific times when you are experiencing illness symptoms.

Please read each statement carefully and answer according to how much you agree with each statement by circling a number from 1 to 6. Please answer according to the following scale:

1	2	3	4	5	6
STRONGLY DISAGREE	**DISAGREE**	**MILDLY DISAGREE**	**MILDLY AGREE**	**AGREE**	**STRONGLY AGREE**

If I am lucky I will stay healthy.	1 2 3 4 5 6
My health depends on forces beyond my control.	1 2 3 4 5 6
I can take control of my health by managing my day-to-day symptoms.	1 2 3 4 5 6
If I make the effort, I can manage my illness.	1 2 3 4 5 6
How soon I recover from an illness depends on how lucky I am.	1 2 3 4 5 6
There are things that I can do to make my health problem easier to deal with.	1 2 3 4 5 6
I believe that I can do more to control my symptoms.	1 2 3 4 5 6
If I am fortunate my health will improve.	1 2 3 4 5 6
If I do the right things I can make my symptoms more manageable.	1 2 3 4 5 6
Regardless of circumstances, there are things I can do to improve my health.	1 2 3 4 5 6
My health is determined by circumstances beyond my control.	1 2 3 4 5 6

Appendix I: Coping Responses

Coping

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. 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 don't do this at all	I usually do this a little bit	I usually do this a medium amount	I usually do this a lot

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
I try to grow as a person as a result of the experience.	1 2 3 4
I look for something good in what is happening.	1 2 3 4
I learn something from the experience.	1 2 3 4

Appendix J: Outcomes of Life Crises and Transitions

Effects of arthritis/IBD on your life

We would like to ask you about the positive and the negative effects that arthritis has had on your life. We will first ask about the negatives.

Nowadays, to what extent do you feel that arthritis has negatively affected your life?

☐ Not at all
☐ A little
☐ Somewhat
☐ Quite a bit
☐ A great deal

Could you please describe the negative effect(s) it has had on your life?

_____
_____
_____

Nowadays, to what extent do you feel that arthritis/IBD has had a positive effect on your life?

☐ Not at all
☐ A little
☐ Somewhat
☐ Quite a bit
☐ A great deal

Could you please describe the positive effect(s) it has had on your life?

_____
_____
_____

Posttraumatic Growth Inventory

Indicate for each statement below the degree to which this change occurred in your life as a result of your crisis, using the following scale:

0	1	2	3	4	5
I did not experience this change	I experienced this change to a very small degree	I experienced this change to a small degree	I experienced this change to a moderate degree	I experienced this change to a great degree	I experienced this change to a very great degree

My priorities about what is important in life.	0 1 2 3 4 5
An appreciation for the value of my own life.	0 1 2 3 4 5
I developed new interests.	0 1 2 3 4 5
A feeling of self-reliance.	0 1 2 3 4 5
A better understanding of spiritual matters.	0 1 2 3 4 5
Knowing that I can count on people in times of trouble.	0 1 2 3 4 5
I established a new path for my life.	0 1 2 3 4 5
A sense of closeness with others.	0 1 2 3 4 5
A willingness to express my emotions.	0 1 2 3 4 5
Knowing that I can handle difficulties.	0 1 2 3 4 5
I'm able to do better things with my life.	0 1 2 3 4 5
Being able to accept the way things work out.	0 1 2 3 4 5
Appreciating each day.	0 1 2 3 4 5
New opportunities are available which wouldn't have been otherwise.	0 1 2 3 4 5
Having compassion for others.	0 1 2 3 4 5
Putting effort into my relationships.	0 1 2 3 4 5
I'm more likely to try to change things which need changing.	0 1 2 3 4 5
I have a stronger religious faith.	0 1 2 3 4 5
I discovered that I'm stronger than I thought I was.	0 1 2 3 4 5
I learned a great deal about how wonderful people are.	0 1 2 3 4 5
I accept needing others.	0 1 2 3 4 5

Appendix K: Perceptions of well-being

Positive Affect & 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 TIME FRAME. 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		guilty		irritable		determined
	distressed		scared		alert		attentive
	excited		hostile		ashamed		stressed
	upset		enthusiastic		inspired		active
	strong		proud		nervous		afraid

Psychological Well-Being Scale

Using the 1 - 7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

1	2	3	4	5	6	7
Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree

In most ways my life is close to my ideal.	1 2 3 4 5 6 7
The conditions of my life are excellent.	1 2 3 4 5 6 7
I am satisfied with my life.	1 2 3 4 5 6 7
So far I have gotten the important things I want in life.	1 2 3 4 5 6 7
If I could live my life over, I would change almost nothing.	1 2 3 4 5 6 7

Appendix L: Qualitative Analysis of Positive Effects

1. Relationships

a) Wanting to help others who have the disease.

I am able to communicate in a more functional way and have a expanding passion to work with and help others empower them selves. (Arthritis)

I have a whole lot of empathy for others with these problems, especially our elderly people. Through knowing what kinds of help and understanding, relationships, resources etc that I notice I need or wish for, I certainly have empathy for others and can understand and respect them. So many people h have never experienced these things don't know how to respond or to help those that do. They also don't know how much they take for granted. Chronic stuff breeds empathy and compassion, and a practical approach to people with chronic health issues. (Arthritis)

b) Wanting to help others who are affected by the disease, particularly in the form of informational and emotional support (mostly for the IBD group).

I am more understanding of people with illness, either temporary or chronic. I like to share advice with them. (IBD)

made wonderful new friends who support me and understand what I go through. (IBD)

c) Forming stronger and more intimate relationships.

...pay more attention to my family and friends (Arthritis)

...being a part of a crohn's community, never having to explain myself for being sick. (IBD)

Oh yes. I have learned so much about the science behind this disease and the social interactions between the chronically ill and the healthy. It is surprising how difficult it can be for some ill folks to associate with the healthy, and how easy it is for healthy people to dismiss the ill... (IBD)

d) Appraising friendships.

...also, sadly you figure out who your real friends are when your sick. Can be very upsetting to lose them at the time, but after a while your glad to realize your way better off with out them. (IBD)

...it allows me to see who my real friends are. (Arthritis)

2. New Possibilities

...developing new interests and exploring life paths that they had never considered before. (IBD)

Also, I am able, to some degree, to develop some creative abilities that were always on the back burner - painting and writing. (Arthritis)

It has given and may give me more school or job opportunities as I'm considered having a medical disability. It has helped me learn things about life and medicine I might not otherwise have known. (IBD)

Gave me a chance to slow down and re-evaluate my life. (Arthritis)

I have pursued areas of knowledge that i would not have, such as chinese medicine and have been influenced to different ways to lead your life and manage your health. (IBD)

Although I can't do many things I once did, I now can do many things I did not have time for before. I read more, which is a great pleasure. (Arthritis)

...placed me in a position to help others with RA that I wouldn't have experienced. (Arthritis)

3. Personal Strength

I completely changed my lifestyle to a more healthier one, ... never thought I had it in me to do that. (Arthritis)

I had no idea that I am as strong as I am... if I can live through this, I can live through almost anything. (IBD)

I think I am a brave person. I feel like even though I have my ups and downs with feeling lonely that at the end of the day that I can make it on my own. (Arthritis)

I do believe I am a stronger person most of the time. (IBD)

4. Appreciation of Life

I appreciate the important things in life now ... try to live for the moment. (Arthritis)

After one of my surgeries I got an infection and went sepsis and almost died. I am extremely grateful for every day I have on this earth. And the fact that, that happened

when I was young, I was 28 makes me even more appreciative of the life I have even though it is really tough at times and I am scared a lot of the time. (IBD)

If you have an incurable illness that you know you will be treating for the rest of your life, you have to stop and think I'm alive and I am thankful. (IBD)

5. Spiritual Change

Getting off of the treadmill of modern life has given me time for the spiritual practice that I never had time for before. (Arthritis)

I have developed a strong spiritual life outside of any organized religion. This practice has given me strength to not give up entirely. Otherwise, I have contemplated suicide sometimes. (IBD)

I was wondering if it was true does god never give you more than you can handle, then I realized I don't really believe in god I pray to mother earth and father time, thanking them for allowing me to get through one more sunrise to see it set again (IBD)

6. Psychological preparedness

I know what to expect for my next flare-up. Even though I don't know when that might happen, and I try to get enough rest and exercise more now then I used to...I'm ready for it! I know I can deal with it better next time. (Arthritis)

I wouldn't be the same person if I hadn't got the disease. Its hard to explain but I feel like I've gained strength through already experiencing some of the weakest and worst moments of my life. I know that there isn't much life can throw at me that I can't get through, based on what I've gone through already. But I also feel like I've taken just about all I can. (IBD)

...I am reflective and introspective, and although I try to keep a positive outlook, its hard... there is little optimism in the way I see life, I was brutalized, and terrorized by the men in my life and now I am being attacked by my own immune system, systematically, destroying the intestine, the rectum, the joints, the outlook, I have not and will not escape the crohns, but I am sure going to fight like hell in letting it be the reason I have a mid life crisis or fall to pieces next time. (IBD)

Appendix M: Qualitative Analysis of Negative Effects

Negative effects for the arthritis group

1. Social Issues

a) Social isolation

Push people close to me away as a result of my frustration.

I can't do the things I used to anymore. I can't go shopping without running a mental check of all my joints. I can't participate in university groups that I would like to, eg climbing.

Would be married and have children by now maybe. But, because I have a disability I get rejected all the time because of it by men. I get told that their families aren't going to accept me, or my life is too stressful for them, or they just looking for a good time. As you get older, I find life gets more lonely. It is quite depressing at times and hard to deal with.

I don't like identifying to a sickness. I am everything but my sickness. Yet, how it stops me from being part of the crowd...

...also fatigue is a social-life killer!

b) Negative perceptions from friends or family members

I lost a lot of my friends originally because they didn't believe me and wouldn't accept that I had a disease and instead gossiped about me behind my back. Thankfully, some of them have now realised that I do have a disease and are now nice to me.

2. Psychological Changes

a) Negative mood changes

It is quite depressing at times and hard to deal with.

I feel sad a lot of the time. I am in pain a lot of the time and I feel exhausted all the time.

not feeling like doing anything. Not feeling like excersising and not know what my limits are. I get frustrated.

This disease sucks. There is nothing good about it and it hasn't done anything positive for me. I don't cherish my life more because in a few more years I could be even more disabled. I constantly see people who are wasting their lives and I always think that I led an active life before this and they are the ones who should suffer, not me.

b) A sense of identity-loss or loss of their "desired" self.

Had to retire prematurely (6 years ago) from teaching, which was my passion.

Being on Prednisone throughout elementary and high school hasn't been easy. I feel as if I would have been an 5'3- - 5'4, slim, fit women, who works out on a regular basis, doing activities such as different types of dance, sports. Would have been a mechanic and/or some other big shot career (owning a business that is glamorous), and/or model. Maybe I would be living somewhere else in the world like Arizona, but I have to worry about medical bills if I moved there.

Not be able to pursue a dancing career.

c) Negative self-perceptions

My smaller joints have started to become disfigured so it makes me very self concious.

...loss of mobility and freedom in general, feel at times I am unable to take care or my child and that I am a bad parent.

I cannot work. My mind works way too fast for my body. I plan something then realize it was too big a project to do. I would love to work. I make plans then sometimes have to cancell because I am too sore. I get andry when I see other doing what I want to do.

3. Financial Constraints.

I am no longer working and my disability insurance stopped.

Financially. The cost of the drugs.....do you eat or take your drugs?

Negative effects for the IBD group

1. Freedom Restrictions

a) Food or diet restrictions

I have to take meds 4 times a day no matter where I am. I have to avoid certain foods.

I tend to be conscious of what I eat and the stresses in my life as I don't want to be contributing to an inflammation.

I can't eat the foods I like (fruits and veggies).

Having a colostomy has certainly limited me as I have no control over my bowels (either they'll move early in the morning of for 12 hrs straight). With that being said, I can't wear certain clothes, and have to be very cautious of when I go out "just in case".

I've stopped going places where there are crowds and few washrooms...I'd never make it to the toilet.

b) Being unable to participate in social activities

Due to medications that I have taken in the past, I have bursitis which at times limits my ability to participate in activities with my family.

A hidious illness that hasn't been good for anyone. There is no positive to the illness.

When its bad, which can just come on anytime, it controls my life, I cant go out shopping, I cant go out for meals, its even flared up while on holiday and I could not leave the hotel room for most of the week. I find it hard to start new relationships because its embarissing having to talk about it too someone that you dont really know all that well.

2. Future Uncertainty

Other days I'm afraid to go out because I can never tell when symptoms will suddenly occur in public (and this is especially stressful and embarassing!).

I am aware that with Cronhs there is no way to predict whether it will get worse even if I follow all the doctor's suggestions--so I live with a constant sense of limited control.

I am scared to be out socially in case I have to use a bathroom and one isn't available.

Drugs have some terrible side effects, and some of these side effects are frightening even if I know the odds of developing these side effects are very small (blindness, cancer, nerve death)

3. Psychological Issues

a) Experienced depressed mood and negative affect

It has caused my bitterness and likely depression at times which I may not have experienced otherwise as strongly

When i was first diagnosed i became very depressed, i couldn't focus at work, was very irritable and i cried a lot. I believe that it has caused unrepairable damage to my work reputation even though i would now consider myself in remission.

b) Personality changes

I also used to be a much more positive and upbeat person.

Severely affected my confidence, especially not knowing when im going to urgently need the toilet.

I was sick at a point in my life when I was developing social skills at school, making me more reclusive than I likely would have been.

c) Negative self-perceptions

My self esteem is non exsistent. I have gained weight, and have lots of acne now thanks to the medications. I hate the way I look sometimes.

Having chronic pain and no energy to do the things I would like... my mind says go and my body says forget it...

4. Social Issues

a) Social isolation

IBD doesn't allow me to do the things in life I want to.It has kept me from jobs, and social outings

b) feeling negative perceptions from friends and family as noted in the arthritis group.

On top of that .. I get tired so easily... People just don't get it. They look at the outside and see a girl who looks fine. They can't see the inside and how much it hurts. I've learned to hide the pain/discomfort behind a smile. The people that I encounter in my life don't understand the disease making it easier for them to talk about me & critisize me.

I've also lost quite a number of friends who couldn't deal with me being sick.

c) Feeling embarrassed and awkward in social situations

I find it hard to start new relationships because its embarissing having to talk about it too someone that you dont really know all that well.

5. Financial Constraints

Prior to receiving full benefits coverage i was paying more than i could afford for prescriptions

I also have trouble dealing with the fact that I am still not financially independent - I feel a lot of guilt about having to be supported by my parents.

VITA AUCTORIS

Rebecca Josette Purc was born March 12, 1978 in Haliburton, Ontario. In 2000, Rebecca changed her last name to 'Purc-Stephenson' to acknowledge her stepfather Gary Stephenson. In June 2001, she graduated from the University of Guelph in Guelph, Ontario with a Bachelor of Arts Honours degree in Psychology. In May 2002, she graduated from Conestoga College in Kitchener, Ontario with a Post-Graduate Diploma in Human Resources Management. In September 2002, Rebecca enrolled in the Graduate Program for Applied Social Psychology at the University of Windsor. She completed her Master's Degree in Psychology in October of 2004. In June 2008, Rebecca successfully completed her doctorate.