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The role of self-blame and responsibility in adjustment to Inflammatory Bowel Disease

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Abstract

Objective: Roesch and Weiner's (2001) theoretical model of adjustment to chronic illness was adapted to examine the role of attributions, avoidant coping strategies, and disease severity in the psychological adjustment of people with inflammatory bowel disease (IBD). **Research**

Method/Design: People with IBD ($N = 259$) completed an online survey including measures of health-related self-blame and responsibility attributions, disease severity, avoidant coping strategies, and psychological adjustment indices (coping efficacy, acceptance, and helplessness).

Results: Structural equation modeling revealed that avoidant coping mediated the relationship between attributions and psychological adjustment. Attributions of self-blame were directly related to increased avoidant coping, which were in turn associated with poor adjustment. Beliefs about responsibility were associated with decreased use of avoidant coping strategies and subsequently improved psychological adjustment. Higher scores on disease severity were linked to the use of avoidant coping strategies and poor psychological adjustment. **Conclusions:**

Distinguishing between self-blame and responsibility attributions has important implications for understanding the psychological adjustment of individuals with IBD, and may be useful for creating intervention strategies aimed at enhancing the psychological functioning of people with IBD.

Keywords: attributions; psychological adjustment; avoidant coping strategies; Inflammatory Bowel Disease

Introduction

Inflammatory bowel disease (IBD) is a chronic illness with no known etiology that affects approximately one in 350 Canadians (Bernstein et al., 2006) and nearly one in 220 Americans (Loftus, 2004). Crohn's disease (CD) and ulcerative colitis (UC) are the two most common types of IBD and share similar clinical courses and symptoms (Searle & Bennett, 2001). Although both diseases involve the digestive system, CD can effect anywhere in the intestinal tract whereas UC is generally situated in the inner layer of the colon and large intestine. IBD is associated with significant discomfort and functional disability, as symptoms can include stomach pain, rectal bleeding, diarrhoea, weight loss, nausea and fatigue (Hall, Rubin, Dougall, Hungin, & Neeley, 2005; Walker, Gelfand, Gelfand, Creed, & Katon, 1996).

Research on inflammatory bowel disease (IBD) has largely focused on the disease's pathology and treatment, with relatively fewer studies addressing the psychosocial issues that concern people living with IBD. Because symptoms can vary in severity and be associated with uncertain and unpredictable stages of remission and relapse (Hall et al., 2005), this potentially disabling disease can deeply impact an individual's psychological functioning (Crane & Martin, 2004; Hall et al., 2005; van der Zaag-Loonen, Grootenhuis, Last, & Derkx, 2004). For example, people with IBD can feel helpless and embarrassed by the consequences of their disease, as some suffer from frequent stools, associated smells, pain, stomach noises, and rumbling.(van der Zaag-Loonen et al., 2004). Consequently, individuals with IBD commonly report distress, anxiety, depression, decreased well-being, poor quality of life, and social isolation (Dudley-Brown, 2002; Graff et al., 2006; Mackner & Crandall, 2006).

Two phenomena that have received considerable interest with respect to adjustment in chronic illness populations are coping behavior (Crane & Martin, 2004; van der Zaag-Loonen et

al., 2004) and causal attributions (Chaney et al., 1996; Roesch & Weiner, 2001; Taylor, Lichtman, & Wood, 1984; Weinman, Petrie, Sharpe, & Walker, 2000). This study considers these two factors and their involvement in adjustment to IBD.

Research has shown that people assign causality to events that occur in their lives in order to understand, manage, and predict their environment (Weiner, 1986). Although such cognitive appraisals are highly subjective and not necessarily based in fact (Faller, Schilling, & Lang, 1995), they can have a profound influence on psychological adjustment and behavior change following a stressful life event (Butler, Chalder, & Wessely, 2001; Chaney et al., 1996; Janoff-Bulman, 1979; Roesch & Weiner, 2001; Taylor, 1983; Taylor et al., 1984; Ullman, 1997). Furthermore, the type of attributions made may mean the difference between poor and good adjustment.

Although some studies have found that self-blame is associated with poor adjustment (Chaney et al., 1996; Faller et al., 1995; Glinder & Compas, 1999; Janoff-Bulman, 1979), others have not (Gotay, 1985; Taylor et al., 1984). A more nuanced view of self-blame was first proposed by Janoff-Bulman (1979) who suggested that self-blame can be conceptualized in two ways which are distinguished by the source of the blame. She posited that blaming one's character or disposition was a form of characterological self-blame that is associated with maladaptive outcomes as it focused on a source that could not be changed or controlled. On the other hand, blame can be directed at some action or behavior, termed behavioral self-blame, over which the person has some measure of control. Behavioral self-blame was proposed to be associated with adaptive outcomes, as it enables the person to maintain their self-worth, assumptions about the world, and perceptions of control.

Other researchers have also proposed different ways of viewing self-blame (Faller et al., 1995; French, Maissi, & Marteau, 2005; Glinder & Compas, 1999; Shaver & Drown, 1986). They suggest that inconsistent research findings are the result of not distinguishing between self-blame and responsibility, two concepts that have historically been used interchangeably but can have differential effects on adjustment. Similar to Janoff-Bulman's (1979) conceptualization, these two constructs are related, and distinguished by perceptions of control over the source of the blame. Self-blame is distinct from responsibility in that it is the belief that one has in some way *intentionally* brought about negative outcomes, which can lead to psychological distress (Shaver & Drown, 1986). In contrast, accepting responsibility for the cause of the event is associated with perceptions of control (Wortman, 1975), and consequently positive adjustment (Roesch & Weiner, 2001).

The coping strategies or styles that individuals use to manage the stressful experiences associated with chronic illness have been identified as important determinants of health-related quality of life and psychological functioning (Crane & Martin, 2004; Folkman & Lazarus, 1980; McCabe & Battista, 2004; Penley, Tomaka, & Wiebe, 2002). There is no general consensus regarding which coping strategies may be most effective in enhancing psychological well-being; however, avoidant coping strategies have consistently been shown to negatively impact adjustment (Desmond, 2007; Desmond & MacLachlan, 2006; Penley et al., 2002). Previous research suggests that people with IBD may have a tendency to use avoidant strategies to cope with the unique stressors related to their illness (Jones, Wessinger, & Crowell, 2006; van der Zaag-Loonen et al., 2004) and these strategies are linked to significant reductions in health-related quality of life (Mussell, Bocker, Nagel, & Singer, 2004). In fact, physicians may promote avoidant coping by advising people with IBD to limit their social activities (Crane & Martin,

2004). Avoidant coping strategies, such as behavioral and mental disengagement, substance use/abuse, denial, and catastrophizing, have also been associated with psychological distress in other chronic illness populations, including people with fibromyalgia and breast cancer (Carver et al., 1993; Davis, Zautra, & Reich, 2001).

When avoidant coping is construed more broadly to include appraising situations in a way that focuses on the positive and avoids the negative, the links to adjustment are less straightforward. For example, cognitive adaptation theory (Taylor, 1983) suggests that such positive illusions may facilitate adjustment to threatening events such as chronic illness by enhancing perceptions of control. Moreover, it has been argued that a related construct, benefit finding, is not necessarily a proxy for denial, as it is linked to less distress and better psychological outcomes across a variety of illness populations (Affleck & Tennen, 1996). Recent evidence suggests, however, that benefit finding may predict poor adjustment over time (Tomich & Helgeson, 2004).

In this study, Roesch and Weiner's (2001) theoretical framework guided the investigation of the role of attributions and coping strategies in psychological adjustment to IBD. Their model suggests that attributions influence adjustment through two mechanisms: 1) a direct effect on psychological adjustment and 2) an indirect effect on adjustment through the use of specific coping strategies.

In developing their model, these authors examined the causal attributions and coping behavior associated with a number of serious illnesses, such as cancer, heart disease, chronic headaches, spinal cord injuries and arthritis. Attributions were coded to reflect three underlying dimensions originally proposed by Weiner's (1986) *attributional theory of motivation*: locus of causality, stability and controllability. Psychological adjustment was measured by reductions in

psychological distress (depression/anxiety), positive affect and well-being and normative social functioning. Their findings revealed that when individuals attributed the cause of their illness to internal, unstable and controllable factors (responsibility), they reported using adaptive forms of coping, which ultimately lead to better adjustment. Controllability was both directly and indirectly related to psychological adjustment. That is, participants who attributed a greater amount of control over their illness were better adjusted. Attributing the cause to internal, stable and uncontrollable factors (self-blame) resulted in the use of avoidant coping, which led to poor psychological adjustment. Similar associations among self-blame and psychological adjustment, as well as avoidant coping methods and negative adjustment have been reported in IBD populations (Sainsbury & Heatley, 2005). For this reason we focused only on the role avoidant coping in the relationship between attributions and adjustment. Also of specific interest to the present study was whether the same pattern of relationships proposed by Roesch and Weiner's (2001) theoretical model can be expected in an IBD population.

The current study also attempts to extend this model by examining the role of disease severity and how it affects the proposed relations among coping strategies, attributions, and adjustment to IBD. Previous research suggests that increased disease severity is associated with poor adjustment in people with IBD (Canavan, Abrams, Hawethorne, Drossmans, & Mayberry, 2006; Sainsbury & Heatley, 2005), therefore, we proposed that disease severity will directly influence psychological adjustment.

The aim of the present study was to apply Roesch and Weiner's (2001) model to understanding adjustment in an illness population not previously examined through this conceptual lens, and to test the proposed associations using structural equation modeling (SEM), a statistical technique frequently used to evaluate causal or theoretical relationships among

concepts (Byrne, 2002). The advantage of using SEM is that all of the variables under study are tested simultaneously, rather than through a step-wise process, to determine the extent to which the model is representative of the data. Given the paucity of research on adjustment in this illness population, we were particularly interested in understanding how overall health-related attributions, rather than attributions relating to specific causes, were linked to avoidant coping and adjustment to IBD. Psychological adjustment in this study was assessed with measures of helplessness, illness acceptance, and coping efficacy. Specifically, we examined the differential associations that self-blame and responsibility attributions had with psychological adjustment through two mechanisms: 1) directly, and 2) indirectly through the use of avoidant coping. We then examined the impact of disease severity on the associations between attributions, avoidant coping strategies and psychological adjustment.

Method

Participants and procedure

The present study involved a secondary analysis of data collected from a larger study aimed at understanding the psychological aspects of living with IBD. Clearance from the institutional research ethics board was received for both the initial data collection and for the secondary analysis. Participants were recruited through notices placed in gastroenterologists offices in the Ottawa, Ontario area and on online support groups and message boards specifically aimed at people with Crohn's disease, ulcerative colitis, or IBD in general. Participants were included in the study if they self-reported having Crohn's disease, ulcerative colitis, or some other form of IBD. Verification of disease status was accomplished through requesting information about current medications and any surgical history related to IBD. Individuals who self-reported having irritable bowel syndrome (IBS) or did not answer the medication and

surgery history questions were excluded. Table 1 summarizes the sample characteristics for the total sample, stratified by participants included and excluded in the analyses. The majority of respondents in the final sample were women, Caucasian, and had Crohn's disease. The "other" types of IBD listed included microscopic and collagenous colitis.

Participants were given the choice of completing the survey online or having the survey mailed to them if they lived in Canada or the United States. Of the 291 participants recruited, 255 participants completed the survey package online and 36 participants completed the survey by mail. Participants who completed the survey online read an electronic letter of information and conveyed their consent to participate by clicking a on a button which linked them to the online survey. Survey responses were anonymously submitted to a secure server.

Measures

The mail-in and online survey packages contained the same questions and measures, which included a set of demographic questions and measures of attributions, coping and psychological adjustment.

Attributions. An original measure, the 8-item Health Attribution Scale (HAS) (Sirois & Gick, 2002), assessed attributions of self-blame and responsibility for one's state of health. During the scale development, the authors rationally derived twelve items based on the conceptualizations of responsibility and self-blame suggested by Glinder and Compass (1999), and then piloted them before reducing the item pool down to the eight items. This measure has been previously validated in a general medical population (Sullivan, Sirois, & Gick, 2002), and was found to have two distinct factors: responsibility and self-blame. Sample items include "it's up to me to avoid unhealthy behaviors" (responsibility), and "if I get sick I am to blame" (self-

blame). Responses were rated on a six-point Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*).

Because the original scale had only been validated with a general medical sample rather than a chronic illness sample, an exploratory factor analysis was conducted with the current sample to assess the underlying factor structure of this measure and its psychometric properties. Two distinct factors emerged and together they explained 47.5% of the total variance: self-blame consisted of six items ($\alpha = .78$), and reflected attributions for one's health that focused on uncontrollable factors; beliefs about responsibility comprising two items focused on controllable behaviors that could impact one's state of health ($r = .64$).

Coping. The 28-item Brief COPE (Carver, 1997) assesses 14 coping styles. Of specific interest to the current study were coping styles that reflect avoidant coping strategies: behavioral disengagement, denial and substance use. Items were rated on a 4-point frequency response scale ranging from 1 (*I usually don't do this at all*) to 4 (*I usually do this a lot*). In this study, cronbach's alpha coefficients demonstrated adequate to good reliability for these three subscales (range = .73-.94, $n = 285$).

Psychological adjustment outcomes. The 18-item Illness Cognition Questionnaire (ICQ) (Evers et al., 2001) assesses three distinct illness cognitions (Helplessness, Perceived Benefits and Acceptance), associated with adjustment to chronic illness. Helplessness reflects re-evaluating a chronic condition in a way that emphasizes its aversive nature, acceptance reflects re-evaluating the chronic condition in a way that diminishes its aversive meaning, and perceived benefits reflects adding a positive meaning to the disease. Acceptance is associated with long term psychological adjustments, whereas Helplessness has been linked to poorer adjustment and functioning across different chronic illness populations (Evers et al., 2001). The 6-item

Acceptance and Helplessness subscales were examined as outcome variables, whereas the Perceived Benefits subscale was examined to clarify the nature of avoidant coping. Participants rated the extent to which they agreed with each statement on a 4-point scale ranging from 1 (*not at all*) to 4 (*completely*). The scales demonstrated good psychometric properties in the current sample, yielding alpha coefficients of .88 for the Helplessness subscale, .90 for the Acceptance subscale, and .89 for the Perceived Benefits subscale.

Coping efficacy was assessed with the coping efficacy scale (Gignac, Cott, & Badley, 2000), a 3-item instrument that measures the extent that individuals feel that they are coping effectively with the emotional aspects, the day to day problems, and the symptoms of their illness. Coping efficacy has been associated with markers of psychological adjustment in other chronic illness samples, and can be viewed as an outcome of successful coping efforts. For example, in studies of people with arthritis, the coping efficacy scale was associated with lower psychological distress and better adaptation (Gignac et al., 2000), fewer depressive symptoms (Sale, Gignac, & Hawker, 2008), and self-perceived independence (Wang, Badley, & Gignac, 2004). Items were rated on a 5-point Likert scale with responses ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The scale demonstrated good internal consistency in the current study ($\alpha = .79, n = 286$).

Disease severity. IBD severity was assessed with the 10-item bowel symptoms subscale of the Inflammatory Bowel Disease Questionnaire (IBDQ; Guyatt et al., 1989). The IBDQ is a well-validated measure of disease related dysfunction in IBD populations (McColl, Han, Barton, & Welfare, 2004). Participants rated the severity and frequency of their bowel symptoms within the past two weeks on a 7-point Likert scale ranging from 1 (*more frequent than before*) to 7 (*no increase or normal*). Items are summed for an overall IBDQ bowel symptom score, with lower

values indicating greater symptom severity. This subscale demonstrated good internal consistency in the current study ($\alpha = .88$).

Data analysis

Pearson correlations were used to determine the associations among attributions, avoidant coping strategies and psychological adjustment variables. Structural equation modeling was then performed using AMOS 7.0 (Arbuckle, 1999) to test the relationships between the variables included in the study (Figure 1). To test the role of avoidant coping strategies in the relationship between attributions and adjustment a mediation analysis was conducted using the technique recommended by Holmbeck (1997).

Structural equation modeling was conducted using a two-step process (Kline, 2005). The first step tests the relationships between avoidant coping strategies and psychological adjustment and the measures that comprise these variables (the measurement model). The second step tests the structural model or the direct relationships between the latent variables. Self-blame and responsibility attributions mean scores were added to the structural model as observed variables, and their direct and indirect relationships to avoidant coping and psychological adjustment were tested. Finally, an additional model including disease severity was tested in order to elucidate the effect of disease severity on psychological adjustment.

A chi-square statistic was used to assess model fit, although this statistic is known to be sensitive to departures from normality and sample size. Therefore in addition to the chi-square, several other fit indices recommended by Weston, Gore, Chan, and Catalano (2008) were also used: 1) CFI, in which values over 0.90 indicate reasonably good fit and values above 0.95 suggesting very good fit; 2) RMSEA, in which values between 0.05 and 0.08 indicate reasonably good fit; and 3) SRMR, in which smaller values indicate better model fit (Weston et al., 2008)

Results

Data screening

Normality was assessed by visually examining histograms of all variables and by examining skewness and kurtosis values. All variables were below the critical values of skewness and kurtosis (Stevens, 2002), however, a moderate departure from multivariate normality was found, as the multivariate kurtosis value was 17.29, which exceeds its critical value of 11.0. Log transformations on all variables were performed and there were no differences found in the results yielded from the using the transformed and untransformed variables. Therefore, all further analyses were performed with the untransformed variables. Bivariate scatterplots of pairs of variables indicated that the assumptions of linearity and homoscedasticity were met. Multicollinearity was not an issue, as none of the correlations between indicator variables exceeded .85 (Weston et al., 2008). All scale reliabilities were assessed to ensure that latent variables were reliably measured by the selected indicator variables and were found to have acceptable alpha levels of above 0.70 (range = .73-.94; Kline, 2005). Using Mahalanobis distance ($p < .001$), four multivariate outliers were deleted from the analyses. Of the 291 people with IBD who completed the survey, 27 respondents were excluded due to missing data for the variables of interest, and one respondent who reported having IBS and did not answer the surgery and medication history questions was excluded. This left a final sample of 259 participants.

Intercorrelations among measured variables

Means, standard deviations and bivariate correlations for all measured variables are presented in Table 2. Consistent with previous research, self-blame was positively associated with avoidant coping and negatively related to acceptance. Beliefs about responsibility were

negatively associated with avoidant coping and positively associated with acceptance and coping efficacy. Attributions of self-blame and beliefs about responsibility were positively correlated. The associations of benefit finding with the two avoidant coping scales were assessed to provide conceptual clarity regarding the nature of avoidant coping. Perceived benefits were unrelated to denial and substance use, and significantly and negatively correlated with behavioral disengagement

Evaluating the measurement model

The measurement model assessed the hypothesized relationship among the latent variables of avoidant coping and psychological adjustment. This model yielded a good fit of the data, $\chi^2(8, N=259) = 16.78, p < .05$; CFI=.97, RMSEA=.07(90%CI:.02-.10), SRMR =.02. However, substance use was not a significant predictor of avoidant coping, nor did it show any significant correlations among the other adjustment outcomes. This result is not surprising given the study population.. Individuals with IBD take multiple medications to manage their illness, many of which produce harmful effects on the liver and stomach when taken in conjunction with alcohol. Substance use was therefore not an acceptable measure of avoidant coping for our sample. Research suggests that retaining an indicator variable when it is not an adequate measure of a construct, has lower reliability or is not correlated with other indicators that are measuring the same variable may have a large impact on some fit indices and result in increased sensitivity to model misspecification (Jackson, 2007; Weston et al., 2008). One option would be to remove substance use from the analysis, leaving only two indicators measuring avoidant coping (Weston et al., 2008). Jackson (2007) suggests that the number of indicator variables per factor is an important determinant of model fit and when there are only a few acceptable measures of a construct, it is best to have a larger sample size (i.e., above 200). For these reasons, we opted to

remove substance use from the following analyses. The measurement model was re-assessed without substance use and this model provided a better fit of the data, $\chi^2(4, N = 259) = 3.44, n.s.$; CFI = 1.00, RMSEA = .00 (90%CI: .00-.08), SRMR = .04. 35% and 34% of the variance was explained for the latent variables of avoidant coping and psychological adjustment respectively.

Evaluation of the Structural Model

A maximum likelihood estimation testing the hypothesized mediation relationship between attributions, avoidant coping and adjustment was assessed using the steps recommended by Holmbeck (1997). The first step tested the direct relationship between health attributions and psychological adjustment. This model was only found to adequately fit of the data, $\chi^2(4, N=259) = 15.29, p=.000$; CFI=.94, RMSEA=.11 (90%CI: .05-.16), SRMR =.03, given that RMSEA index was above the recommended value (Weston et al., 2008). Both self-blame ($\beta=0.33, p=.000$) and responsibility ($\beta=0.28, p=.000$) were significant predictors of adjustment. The second step assessed the mediation model (Figure 1) which yielded good model fit, $\chi^2(12, N = 259) = 17.76, n.s.$; CFI = .98, RMSEA = .04 (90%CI: .00-.08), SRMR = .04, with the direct paths between attributions, coping and adjustment all significant in the predicted directions. The final step involved testing the mediation effect under two conditions: 1) when the direct path between health attributions and psychological adjustment is constrained or forced to equal 0 and 2) when the path between these two variables is not fixed to 0. Assessing the improvement in overall fit of the data is based on the significance of the difference between these two chi-square values (Holmbeck, 1997). If there is a mediation effect, then the additional path between attributions and psychological adjustment should not improve the fit. In this case, the additional paths did not improve model fit, $\chi^2_D(2, N = 259) = 0.10, n.s.$, demonstrating that avoidant coping fully mediates the relationship between attributions and psychological adjustment.

The effect of disease severity on adjusting to IBD was tested by adding a direct path between disease severity and psychological adjustment and allowing disease severity, self-blame and responsibility attributions to covary. This model resulted in poor model fit, $\chi^2(16, N = 259) = 44.55, p = .000$; CFI = .93, RMSEA = .08 (90%CI: .05-.11), SRMR = .07. Examining the model's modification indices revealed that fit would significantly improve if the unanalyzed association between disease severity and avoidant coping was taken into account, as disease severity was positively related to avoidant coping. Thus, an additional path from disease severity to avoidant coping was added, which improved the model's overall fit, $\chi^2_D(1, N=259) = 16.22, p < .01$. This indicated that higher disease severity was associated with increased use of avoidant coping strategies and poor psychological adjustment (Figure 2).

Discussion

In this study we found support for Roesch and Weiner's (2001) hypothesis that attributions have an indirect effect on psychological adjustment to chronic illness through their association with avoidant coping strategies. Attributions of self-blame were associated with increased use of avoidant coping strategies and ultimately poor psychological adjustment. Beliefs about responsibility for one's health were associated with decreased avoidant coping, and therefore, better psychological adjustment. When disease severity was taken into account, the relationships among attributions, avoidant coping and adjustment reduced slightly but remained statistically significant. Specifically, increased disease severity was linked to increased avoidant coping strategies and poor adjustment.

Consistent with previous research, the present findings revealed that self-blame and responsibility attributions have differential effects on psychological adjustment (Glinder & Compas, 1999; Rich, Smith, & Christensen, 1999; Shaver & Drown, 1986). In the current study,

these two attributions were related, such that those who blamed themselves felt responsible for their illness and vice versa, which is consistent with previous conceptualizations of these constructs (Shaver & Drown, 1986). The differences between self-blame and responsibility attributions are similar to those noted by Janoff-Bulman (1979) between characterological and behavioral self-blame. Participants who attributed the source of the blame for their state of health to themselves and not their behavior reported greater use of avoidant coping strategies, less acceptance of the limitations and difficulties that come with living with a chronic illness and coped less effectively with illness-related stress. Moreover, the conceptualization of avoidant coping in the current study was not associated with benefit finding, a construct suggested by some to reflect an adaptive form of avoidant coping. If the source of the blame was their own behaviour, participants attributed responsibility for their state of health and reported using few avoidant coping methods, greater acceptance of the imitations and difficulties that come with living with a chronic illness, and coping more effectively with illness-related stress. This echoes the findings of other research linking self-blame to poor adjustment (Chaney et al., 1996; Glinder & Compas, 1999; Janoff-Bulman, 1979; Sainsbury & Heatley, 2005; Ullman, 1997). Alternatively, attributions of responsibility may provide people with IBD with a sense of control over the actions they take to manage their health and may facilitate the assimilation of difficult events and personal change (Janoff-Bulman & Schwartzberg, 1991), promote adaptive coping and consequently better psychological adjustment (Chaney et al., 1996; Roesch & Weiner, 2001; Wortman, 1975). Further research is needed to elucidate the relationship between attributions of responsibility and control in people with IBD.

Our findings revealed that self-blame and responsibility attributions may not directly influence adjustment, as hypothesized by Roesch and Weiner (2001). The lack of support for this

hypothesis may be due to the fact that we examined health-related attributions rather than the global causal attributions suggested by Weiner's (1986) framework. Health-related attributions may play a role in adjustment but perhaps only in combination with coping behaviour. Furthermore, we did not investigate this theoretical model using other forms of coping, which if used may have produced results directly in line with the hypothesized relationships. Future investigations could examine this model including adaptive coping strategies, such as problem solving and social support seeking, known to be associated with adjustment in other chronic illness populations (Desmond & MacLachlan, 2006). Finally, the lack of support for this finding suggests the importance of investigating alternative hypotheses and models with respect to adjustment to IBD. For example, there is evidence to suggest individual difference variables, such as optimism and neuroticism, play a role in coping and adjusting to chronic illness (Carver et al., 1993; Sainsbury & Heatley, 2005). Additionally, some research suggests that mood influences attributions and in turn psychological adjustment (Crane & Martin, 2004; Weiner, 1986). These alternative hypotheses should be addressed in future research.

Consistent with our hypothesis, disease severity was a significant predictor of adjustment to IBD and an important addition to the proposed model. Increases in disease severity were related not only to poor psychological adjustment, but to the use of avoidant coping strategies. In particular, the use of behavioral disengagement strategies were linked to greater disease severity and, therefore, may be the avoidant strategy of choice among those with more severe symptoms. This proposition is consistent with other research which found that recent symptom exacerbations in people with multiple sclerosis were related to depression and the use of other avoidant coping strategies, such as detachment (Warren, Warren, & Cockerill, 1991). Given that symptom flare-ups are characteristic of IBD, it may be that during these episodes people turn to

avoidant coping strategies to deal with their illness, which in turn influence health-related attributions and adjustment. This interpretation is in line with research indicating that those with IBD use avoidant coping strategies to deal with the stressors associated with their illness (van der Zaag-Loonen et al., 2004) and that increased disease activity is associated with poor health-related quality of life (Larsson, Loof, Ronnblom, & Nordin, 2008).

Several limitations need to be considered when interpreting the present findings. The majority of participants in this study were recruited from the Internet and therefore, may not be representative of people with IBD in general. Evidence from other studies suggests that individuals with IBD recruited from the Internet report a wider range of symptoms, higher disease severity, and lower health-related quality of life as compared to those recruited from clinics (Jones, Bratten, & Keefer, 2007; Soetikno, Mrad, Pao, & Lenert, 1997). Accordingly, it is possible that the people in this sample had problems adjusting to their IBD and were online looking for assistance. From this perspective it would appear that this sampling method may favour those who use adaptive coping methods over avoidant ones. Nonetheless, a study that used similar online recruitment methods yielded a sample of people with chronic tinnitus who had levels of depression and coping difficulties that were comparable to those found in community recruited samples (Sirois, Davis, & Morgan, 2006). Thus, the issue may not be that online recruited samples potentially exclude people who use avoidant coping, but that any methods used to recruit participants to a study about their illness that rely on self-selection, including clinic-based or community-based recruitment strategies, may result in including fewer people who use avoidant coping strategies.

Using online data collection methods may, however, be viewed as a potential strength of the study. Consistent with the suggestion of Krantz and Dalal (2000) that online studies produce

samples that are larger and more heterogeneous than those obtained from the community, recruiting via the Internet allowed for the inclusion of a large, and somewhat international sample of people with IBD. Moreover, recent evidence suggests that data collected online are as good quality as the data obtained from traditional community-based recruitment (Gosling, Vazire, Srivastava, & John, 2004). Despite these strengths, the majority of participants in this study were North American, Caucasian, women, and reported having Crohn's Disease (CD). According to recent epidemiological evidence, Ulcerative Colitis (UC) and CD have similar prevalence rates in Canada (Bernstein et al., 2006) and, although prevalence rates are beginning to equalize, UC is slightly more prevalent than CD in the United States (Loftus, 2004).

A final limitation involves the cross-sectional nature of the data collected which limits any firm conclusions regarding the causal directions suggested by our findings. Further investigation of the model tested with longitudinal methods is warranted given the study design. Even so, the use of an empirically supported theory with structural equation modelling, a powerful technique for testing posited causal relations between variables, provides an appropriate initial test of the role of avoidant coping and causal attributions in the process of adjustment.

Implications for Clinical Practice

Despite these limitations, we believe that the present study offers important insights for health practitioners regarding the development of effective interventions for people with IBD. Our findings suggest that distinguishing between self-blame and responsibility attributions has several implications for understanding psychological adjustment to IBD. Self-blame attributions in particular may contribute to the use of maladaptive forms of coping and ultimately poor adjustment. For health practitioners, it may be beneficial to make these distinctions to inform

effective practices that promote adaptive coping skills for adjusting to IBD. As suggested by Janoff-Bulman and Schwartzberg (1991), individuals may need help rebuilding their worldviews to include taking responsibility for changing their state of health in order to facilitate positive personal adaptation and adjustment to their IBD.

By extending Roesch & Weiner's (2001) theoretical framework, the current study suggests that disease severity influences adjustment to IBD. Accordingly, interventions that focus on symptom management may be important for promoting adaptive coping methods and positive adjustment to IBD.

Future Research Directions

A prospective examination of the associations among health-related attributions, avoidant coping strategies and psychological adjustment would help clarify the causal relationships suggested by the current cross-sectional design. Such an investigation may help to determine whether health-related attributions are fluid and therefore part of the ongoing process of adjusting to IBD over time. A longitudinal study is particularly important when examining adjustment to IBD because of the unpredictable nature of this disease over time. Also, future investigations may focus on the influence of self-blame and responsibility attributions on more adaptive forms of coping, and how this in turn impacts psychological adjustment. Furthermore, replicating this model using a more ethnically diverse sample is clearly warranted. Nonetheless, the current findings suggest that this model has important clinical implications for understanding adjustment to IBD. Examining if these findings hold for other illness populations may therefore be a fruitful area for future investigation.

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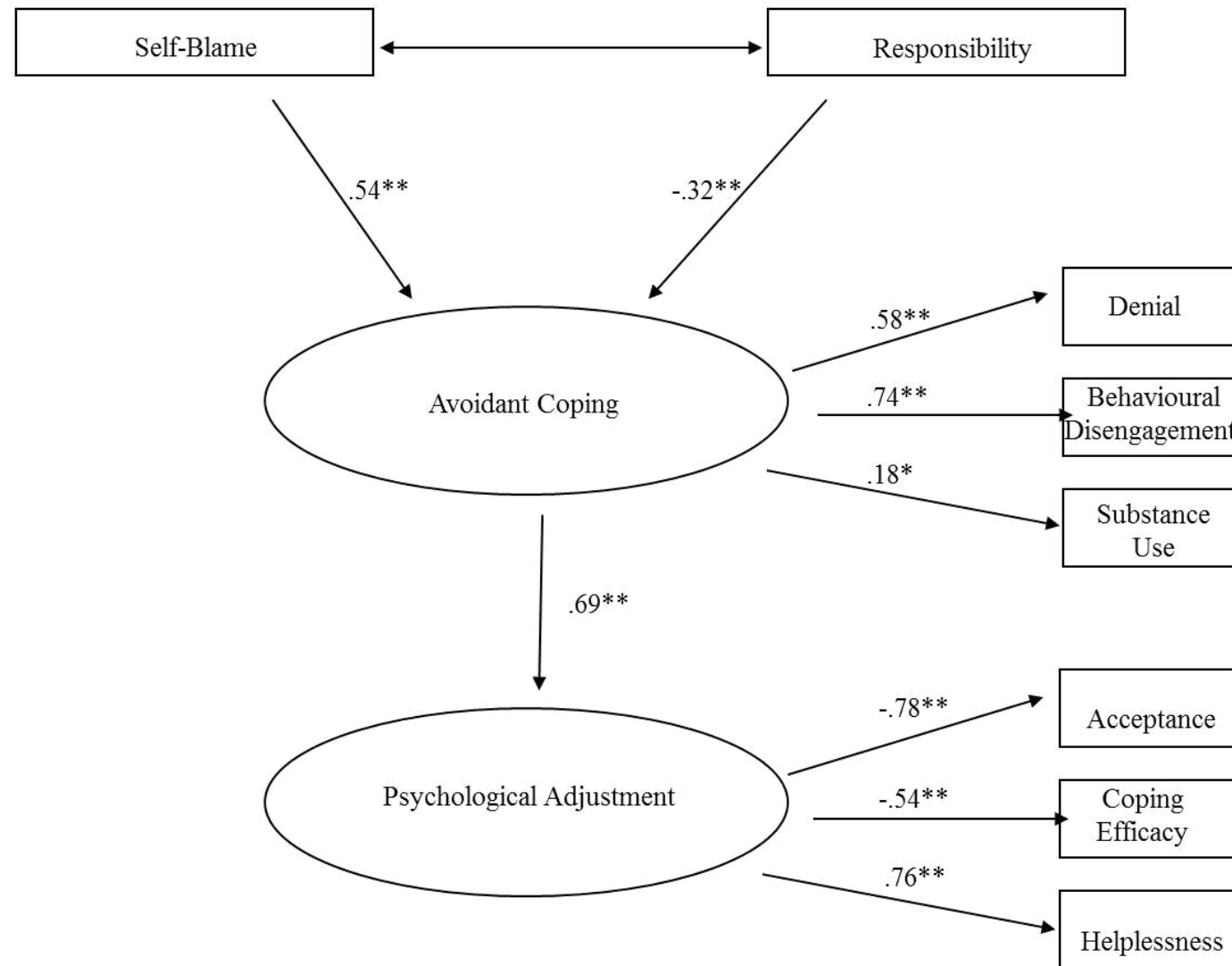
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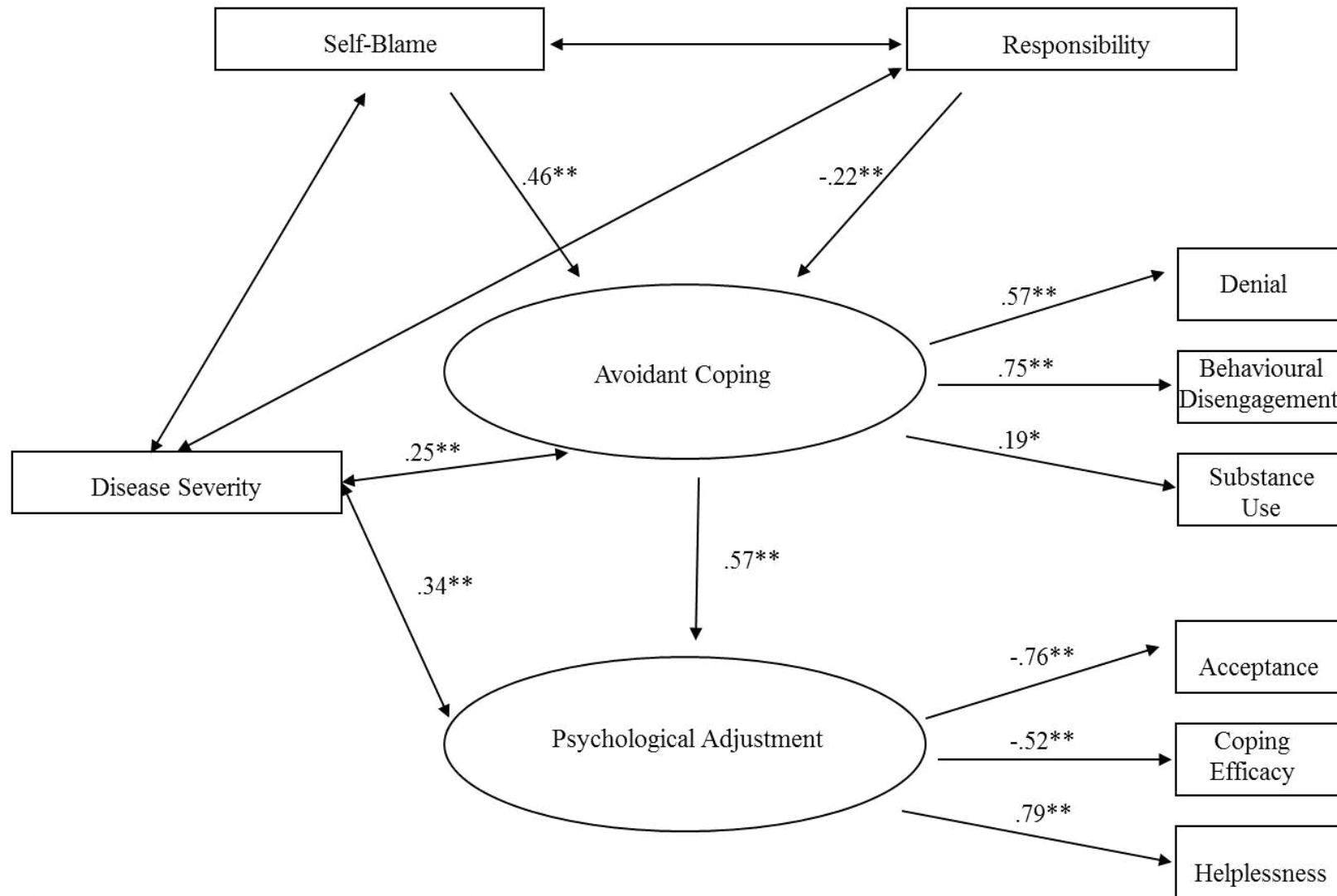
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Figure 1.



Note. Values reflect standard regression weights

Figure 2.



Note. Values reflect standard regression weights