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Insecure Attachment Moderates Women's Adjustment to Inflammatory Bowel Disease Severity

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Author's Note

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This paper is based in part on data from Fuschia Sirois' (2003) doctoral thesis. Voth & Sirois (2009) independently report a secondary analysis of Sirois (2003) on attributions of blame and responsibility for illness, and their relationship to adjustment in men and women with inflammatory bowel disease.

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Abstract

Objective: Insecure attachment was explored as a moderator of the relationship between disease severity and psychosocial variables in a study of adjustment in women with inflammatory bowel disease. *Methods:* Participants were 218 women recruited through notices placed in the community, in gastroenterologists' offices, and through online postings to support groups and message boards specifically for people with Crohn's disease, colitis, or inflammatory bowel disease in general. Participants completed a mail-in or online survey assessing severity and frequency of symptoms, attachment style (separated into anxious and avoidant subscales), perceived social support, negative affect, and efficacy of coping with inflammatory bowel disease. *Results:* Anxious and avoidant attachment were correlated positively with disease severity and negative affect, and negatively with perceived social support and coping efficacy. Hierarchical regressions indicated that disease severity was most strongly associated with negative affect for high avoidant attachment, as compared to moderate and low avoidant attachment. Disease activity was inversely related to both perceived social support and coping efficacy for high and moderate, but not low, anxious attachment. *Conclusion:* Our study indicates that attachment moderates associations between disease severity in women with different kinds of inflammatory bowel disease, and psychological indicators of adjustment. Limitations and relationship to previous research on attachment and health are discussed.

Key words: attachment style; inflammatory bowel disease, coping with inflammatory bowel disease

Insecure Attachment Moderates Women's Adjustment to Inflammatory Bowel Disease Severity

Attachment theory is useful in describing the different ways in which people relate to others in times of stress. Originally developed by Bowlby to describe relationships between infants and their primary caregivers (Bowlby, 1969), attachment theory is relevant to patterns of relating to others throughout an individual's lifetime (Bowlby, 1988). In particular, early experiences with primary caregivers guide future experience and behavior, thereby influencing factors such as whether or not distress is acknowledged, and support is sought during times of stress. While parents are the main attachment figures for children, significant others such as romantic partners are important in adult populations (Ainsworth, 1978; Bowlby, 1969, 1988; Mikulincer & Shaver, 2007).

Conditions under which the attachment system can be activated include separation from the attachment figure, and distressing external (e.g., threat of attack) or internal (e.g., pain) stimuli (Bowlby, 1969). Because internal conditions engaging the attachment system include symptoms of physical illness that can be distressing, attachment theory is a useful framework within which to study individual differences in psychosocial responses associated with symptoms or illness (see also Feeney, 2000; Hunter & Maunder, 2001; Maunder & Hunter, 2008; Mikail, Henderson, & Tasca, 1994; Mikulincer & Shaver, 2007)).

Research with healthy populations indicates associations between illness behaviour, such as symptom reporting or medical visits, and attachment styles. Avoidant attachment, which is characterized by downplaying of distress and reluctance to seek help for it (Mikulincer & Shaver, 2007), was inversely associated with visits to health professionals in a general sample of undergraduate students (Feeney & Ryan, 1994) and women in a primary care health maintenance organization (HMO; Ciechanowski, Walker, Katon, & Russo, 2002). Anxious attachment,

which is associated with exaggeration of distress and constant help seeking (Mikulincer & Shaver, 2007), was positively related to symptom reporting in both undergraduates (Feeney & Ryan, 1994) and women in an HMO (Ciechanowski et al., 2002). Patients in the Netherlands visiting their general practitioner for psychological problems had higher scores in anxious attachment, while those visiting for physical health problems had higher avoidant attachment (Zech, de Ree, Berenschot, & Stroebe, 2006).

The role of attachment style on illness behaviour in chronic illness has been studied primarily in diabetes. Compared to diabetics who endorse a secure attachment style, characterized by comfort in acknowledging distress and seeking appropriate support for it (Mikulincer & Shaver, 2007), avoidantly attached diabetics adhered less to treatment plans (Ciechanowski et al., 2004). Compared to securely and anxiously attached patients with diabetes, those with avoidant attachment who reported poor communication with their physicians had lower adherence to glucose monitoring and poorer glucose control (Ciechanowski, Katon, Russo, & Walker, 2001).

Taken together, research suggests that attachment styles predict illness behaviour in a general sample and in people with diabetes. However, little research has been conducted on the role of attachment in other psychosocial variables important for adjustment to chronic illness, such as negative affect and social support. Indeed, conceptualizations of adjustment to chronic disease suggest that low negative affect and mastery of disease-related adaptive tasks are key components (Stanton, Revenson, & Tennen, 2006). Although both insecure (i.e., avoidant or anxious) attachment (Mikulincer & Shaver, 2007) and chronic illness (Taylor & Aspinwall, 1990) tend to be associated with anxiety and depression (Katon, 1996), little attention has been paid to the role of attachment in well-being or emotional adjustment - as measured by variables

such as anxiety, depressive symptoms, or general negative affect - in chronic illness. Insecure attachment has been linked to depression (Ciechanowski, Sullivan, Jensen, Romano, & Summers, 2003; Meredith, Strong, & Feeney, 2007) and self-efficacy (Meredith, Strong, & Feeney, 2006) in individuals with chronic pain, and also people with diabetes (Ciechanowski et al., 2004; Ciechanowski et al., 2001). However, the interaction of attachment with chronic illness variables, such as glucose control in diabetes, on depression or self-efficacy was not examined.

In a recent review of attachment and health, Maunder proposed an interactive hypothesis, which is that insecure attachment may moderate the relationship between disease activity and psychobiological variables (Maunder & Hunter, 2008). That is, whether disease activity and psychobiological variables are associated may depend upon the type or level of insecure attachment. In support of this hypothesis, insecure attachment was found to moderate the association between depressive symptoms and disease activity in people with the inflammatory bowel disease (IBD) of ulcerative colitis (Maunder, Lancee, Hunter, Greenberg, & Steinhart, 2005), a chronic illness of inflammation of the large intestine that alternates between periods of active disease (or “flare-ups”) and remission (Maunder et al., 2005). In particular, ulcerative colitis disease activity was positively associated with depression only in those with moderate or high, but not low, attachment anxiety. Results for avoidant attachment were less clear; a positive association between depression and self-reported disease activity was found for high, but not low or medium, avoidance; however, the result was not replicated when disease activity was rated by physicians.

Turning to the variable of social support, its positive effects have been demonstrated in dealing with stress (Cohen & Wills, 1985), and maintaining health and buffering illness (House & Landis, 1988; Taylor, Klein, Gruenewald, Gurung, & Fernandes-Taylor, 2003). Moreover,

insecure attachment is inversely associated with perceived social support (e.g., Ditzen et al., 2008) (see Mikulincer & Shaver, 2007 for a review) but studies have been conducted primarily with a general sample rather than people with chronic illness. Perceived rather than actual support is important because actual social support does not guarantee that the support received adequately meets individual needs (Helgeson, 1993); this may be especially important in the case of anxiously attached persons with chronic illness, where seeking support may become more pronounced in times of stress, yet judged to be unsatisfactory (Mikail et al., 1994).

To the best of our knowledge the role of attachment in perceived social support – a potentially stress-buffering variable – has not been previously examined in a sample of individuals with chronic illness. Indeed, in discussions of adjustment in people with chronic illness that emphasize the importance of interpersonal processes and relationships such as marriage (DeVellis, Lewis, & Regan Sterba, 2003; Revenson, 2003), there was no mention of attachment, perhaps because attachment theory and health psychology tend to be associated with different research literatures (Ryff & Singer, 2000).

Purpose of the present study

The overall purpose of the present study was to explore the role of attachment as it relates to adjustment and perceived social support in people with chronic illness; as noted, the relationship between attachment and these psychosocial variables has received little empirical attention in people with chronic illness. We applied Maunder and Hunter's (2008) hypothesis that insecure attachment moderates associations between disease activity and psychobiological variables to test an analogous hypothesis: that insecure attachment moderates associations between disease severity and psychosocial variables of adjustment and perceived social support. We chose inflammatory bowel disease in part because Maunder and colleagues (2005) had

demonstrated a moderating effect of attachment between ulcerative colitis disease activity and the psychobiological variable of depression. In addition, because of the frequent unpredictability and uncontrollability of relapses, and the upsetting and embarrassing nature of symptoms (including abdominal pain, fever, uncontrollable bloody diarrhea, nausea and vomiting), people with inflammatory bowel disease experience distressing symptoms on an intermittent but regular basis (Hall, Rubin, Dougall, Hungin, & Neeley, 2005), and thus this disease is a prime candidate for activation of the attachment system in response to increases in symptoms.

Our sample included primarily people with Crohn's Disease as well as persons with ulcerative colitis, and was a secondary analysis of self-report data collected for a previous study of adjustment in people with inflammatory bowel disease (Sirois, 2003). Because our study was a secondary analysis, the original data were not gathered with the purpose of investigating the moderating role of attachment. Nonetheless, we were able to incorporate available measures and use statistical analyses that would address our hypothesis. In addition to variables of disease severity, attachment and perceived social support, we included efficacy of coping with the disease and a general measure of negative affect as measures of adjustment.

Based on attachment theory and previous research, we predicted the following. Disease severity will be associated with increased negative affect and lower efficacy of coping, and lower perceived social support in the case of high, but not low, insecure attachment. We predicted stronger effects for anxious attachment because avoidant attachment is associated with high self reliance, low support seeking and low acknowledgement of negative affect.

Method

Participants

The initial sample consisted of 291 adults who were primarily women (75.2%). Two participants were excluded because of a self-reported diagnosis of irritable bowel syndrome instead of inflammatory bowel disease. Because there were relatively few male participants and factor analysis of the attachment measure used in the present study is done separately for women and men (Simpson, Rholes, & Nelligan, 1992), and other important psychosocial variables used in the present study (e.g., social support) are known to vary with gender (Taylor & Sirois, 2009), only women were included as participants. The final sample included 218 women who had been diagnosed with ulcerative colitis (26.5%), Crohn's disease (65.1%), or some other form of inflammatory bowel disease (8.4%) (e.g., microscopic colitis); the average age was 35.16 ($SD = 11.41$).

The mean time since a diagnosis of inflammatory bowel disease was 9.16 years ($SD = 8.14$). Thirty-three percent of participants had been hospitalized during the last year, 40% had had surgery, and 77.5% had experienced a recent flare up. Most of the participants were Caucasian (91.3%). Most participants lived in the United States (61%) or Canada (27%).

Measures

Disease severity. Inflammatory bowel disease severity was measured by the 10-item bowel symptoms subscale of the Inflammatory Bowel Disease Questionnaire (IBDQ; Guyatt et al., 1989), which is a widely used measure of disease related activity in populations with inflammatory bowel disease (Han, McColl, Steen, Barton, & Welfare, 1998). Scores on the IBDQ are summed for a total score of disease severity. Because many participants' data were collected online, confirmation of disease activity by physician examination could not be conducted. However, previous research has demonstrated that self-report indices such as the IBDQ correlate well with physician-confirmed measures of disease activity (McColl, Han,

Barton, & Welfare, 2004). Participants rated the severity (e.g., troubled by pain) and frequency (e.g., how many bowel movements) of symptoms within the past 2 weeks on a 7-point Likert-type scale ranging from 1 (more frequent than ever before) to 7 (no increase or normal), with a mid-point of 4 as “moderately frequent”. In the present study, scores were reversed before summing such that higher IBDQ scores reflect greater symptom severity. The bowel symptom subscale has demonstrated good internal consistency in a sample of patients with inflammatory bowel disease ($\alpha = .81$) (Han et al., 1998). The alpha coefficient for the current study was .89.

Attachment style. Participants completed a 13-item measure that assesses attachment style. Two subscales are constructed by averaging items on two factors following factor analysis with varimax rotation (Simpson et al., 1992). Higher scores on the avoidant subscale (8 items; e.g., “I’m somewhat uncomfortable being too close to others”) reflect greater avoidance, and higher scores on the anxious subscale (5 items; e.g., “I often worry that my partner(s) don’t really love me”) reflect greater anxiety. Four of the 13 items are worded in a negative direction (e.g., “I rarely worry about my partner leaving me” for anxious attachment) and responses are scored on a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree), with a mid-point of 4 as “neither agree nor disagree”. The attachment measure has demonstrated good internal consistency, with an alpha coefficient of .81 for the avoidant index and .61 for the anxious index (Simpson et al., 1992). For the current study, factor analysis yielded subscales of avoidant ($\alpha = .87$) and anxious attachment ($\alpha = .74$). Validity of the two subscales of anxious and avoidant attachment is supported by associations with behavior in laboratory based studies of interactions with relationship partners, and self-reports of relationship patterns (Mikulincer & Shaver, 2007).

Social support. Perceived social support was assessed with the Duke-UNC Functional Social Support questionnaire, a widely used and accepted measure (Broadhead, Gehlbach, De Gruy, & Kaplan, 1988). Eight items are rated on a 5-point Likert-type scale with responses ranging from 1 (much less than I would like) to 5 (as much as I would like), with a mid-point of 3 as “some but would like more”. Items include both emotional aspects of social support (e.g., love and affection) and more practical aspects (e.g., help when sick in bed). Scores are summed with higher scores reflecting greater perceived social support. A validation study with 656 adults found that low scores on the Duke-UNC significantly predicted living alone, poor subjective health, and greater chronic morbidity (Bellon Saameno, Delgado Sanchez, Luna del Castillo, & Lardelli, 1996). The Duke-UNC Functional Social Support questionnaire has demonstrated good internal consistency ($\alpha = .96$; Broadhead et al., 1988). The alpha coefficient for the current study was .89.

State negative affect. State negative affect (PANAS) (Watson, Clark, & Tellegen, 1988) was used to measure negative mood during the last week by 10 items indicating negative moods of various types (e.g., distressed, scared, hostile) that are rated on a 5-point Likert-type scale ranging from 1 (very slightly or not at all) to 5 (extremely), with a mid-point of 3 as “moderately”. Scores are summed with higher scores indicating higher negative affect. This measure demonstrates good internal consistency, with $\alpha = .85$ in a large, normative sample ($n = 660$; Watson et al., 1988) and alpha of .91 in the current sample. State negative affect as measured by the general PANAS is significantly associated with other state measures of anxiety, depressive symptoms, and general distress ($n = 660$; Watson et al., 1988).

Coping efficacy. A three-item coping efficacy scale (Gignac, Cott, & Badley, 2000) was included to assess the individual’s confidence to manage or cope with the emotional, physical,

and day to day aspects of living with IBD. The three items are: “I am successfully coping with the symptoms of my condition (physical); “I am successfully coping with the day to day problem that living with my condition creates (day to day); and “I am successfully coping with the emotional aspects of my condition” (emotional). These items, which were created for use with a chronic illness population, have been associated with well-being (Zautra & Wrabetz, 1991) and adaptation to arthritis in a sample of older adults (Gignac, 2000). Each of the emotional, physical, and day to day coping items is scored on a 5-point Likert-type scale with responses ranging from 1 (strongly disagree) to 5 (strongly agree), with a mid-point of 3 as “mildly disagree”; higher scores reflect greater coping efficacy. Because the three items of the scale are highly correlated (as was found by Gignac et al), we used a total summed score which has demonstrated good internal consistency with other illness populations ($\alpha = .79$; Gignac et al., 2000), and had good internal consistency in the current study ($\alpha = .90$).

Procedure

Participants were recruited through notices placed in the community, in the offices of several gastroenterologists, and through online postings to support groups and message boards specifically for Crohn’s disease, ulcerative colitis, or IBD in general. For online communities with restricted access to the general public, the moderator of the notice board gave permission prior to posting the study notice. Community participants who were interested in participating were mailed the survey. Participants recruited online could complete the survey online or have it mailed to them if they lived in the United States or Canada; the majority (85%) completed the survey online.

Approval was obtained from the university psychological research ethics committee. All participants were informed of the confidential nature of the study, and that their data were coded

and their names would not be associated with the data. Participants who completed the survey online were told additionally in their initial letter of information that a third-party server would strip their data of their email address before forwarding us their responses. Participants who completed the study online were brought to the survey by clicking on a button in the information letter that indicated their consent to participate. Once participants had completed the survey, they received a debriefing letter (online participants were brought to it by clicking a button at the end of the survey) that provided a general description of the study, together with contact information for the investigators and other university personnel in case they had any questions about the study or its conduct, and a suggestion to contact their family doctor in case they had concerns about their health.

Data analysis strategy

Pearson product moment correlations were computed to assess associations among variables. In order to test the hypothesis that insecure attachment moderates the relationship between disease severity and psychosocial dependent variables, separate hierarchical regressions were conducted for potential moderators of anxious and avoidant attachment. After entering disease severity on the first block, attachment was entered on the second block, in order to determine any unique contribution of attachment after controlling for disease severity; the interaction of disease severity and attachment was included on the third block. Before computing the interaction term (cross product) of anxious or avoidant attachment and disease severity, scores were centred by subtracting the mean, in order to reduce any multicollinearity between correlated variables (Tabachnick & Fidell, 2007).

Simple slope analyses of only the significant interactions found in the hierarchical regressions were conducted using the unstandardized regression coefficients in order to

determine slopes that were significantly different from zero (Aiken & West, 1991). Graphs of the simple slope analyses of only the significant interactions were plotted in order to interpret them. Significant interactions were plotted by choosing points 1 *SD* above and 1 *SD* below the mean of disease severity, and levels of avoidant and anxious attachment 1 *SD* below, at, and above the mean (Aiken & West, 1991; Preacher, Curran, & Bauer, 2006). These groupings of 1 *SD* above the mean, at the mean, and 1 *SD* below the mean were done only for the purpose plotting the interaction to interpret it; otherwise, all analyses were conducted on the continuous variables.

Results

Preliminary analyses

Variables were screened for missing data, normality of distributions and outliers. Eight participants were deleted due to missing data on one or more variables required for analyses. Missing data on the 210 remaining participants was not a significant problem, as it comprised less than 5% of the total, and occasional missing data were replaced by mean values (Tabachnick & Fidell, 2007). There were no significant univariate or multivariate outliers. Variables were normally distributed, except for social support, which was negatively skewed, and negative affect, which was positively skewed. Social support and negative affect were transformed (reflect square root and square root, respectively (Tabachnick & Fidell, 2007)), but because results of analyses were similar for transformed data, only results of the untransformed data analyses are reported.

Table 1 reports the means of variables, along with the range of scores for interpretation of mean values (see also methods for details of scale values) and Table 2, their intercorrelations. Table 1 indicates that disease severity was positively correlated with negative affect, and both anxious and avoidant attachment. Disease severity was negatively associated with perceived

social support and coping efficacy. Anxious and avoidant attachment were each associated positively with negative affect, and, negatively, with social support and coping efficacy.

Main analyses

In separate hierarchical regressions, after controlling for disease severity in step 1, avoidant and anxious attachment each significantly predicted each dependent variable of negative affect, perceived social support, and coping efficacy (all $ps < .01$). Tables 3 and 4 indicate the results of regressions only where the interaction between attachment and disease severity was significant in step 3 of the hierarchical regression. Unstandardized (B) and standardized (β) regression coefficients are reported for disease severity, attachment, and their associated interaction. The R^2_{ch} for each step reported in Tables 3 and 4 indicates the unique amount of variance contributed by all variables added at each step.

Table 3 indicates that anxious attachment moderated the association between disease severity and both 1) social support and 2) coping efficacy. For social support, after all three variables were in the equation, $F(3,206) = 39.99, p < .001$, and R^2 was .37 (adjusted $R^2 = .36$); this suggests that just over one-third of variability in perceived social support was predicted by disease severity, anxious attachment, and their interaction. Simple slope analysis of the significant interaction indicated that disease severity was significantly and inversely related to perceived social support for both high (simple slope = $-0.17, t = -4.04, p < .001$) and moderate (simple slope = $-0.10, t = -3.37, p < .001$), but not low ($p > .4$) anxious attachment.

For coping efficacy, $F(3,206) = 8.28, p < .001$, and R^2 was .11 (adjusted $R^2 = .10$). Analogous to the results with the dependent variable of social support, disease severity was significantly related to lower coping efficacy only for high (simple slope = $-0.08, t = -3.70, p < .001$) and moderate (simple slope = $-0.05, t = -3.19, p = .002$) but not low ($p > .33$) anxious

attachment.

As noted previously, these groupings of participants according to level of attachment (high, moderate or low) are conducted for purposes of interpreting the interactions only, as suggested by Aitken and West (1991) and Preacher et al. (2006). In order to better interpret the results of the simple slope analyses reported above, the interactions between anxious attachment and disease severity (as measured by the IBDQ) on dependent variables of perceived social support and coping efficacy are plotted in Figures 1 and 2, respectively. Figures 1 and 2 indicate that whether disease severity is associated with lower perceived social support and lower coping efficacy depends on the level of anxious attachment. In particular, for women who are low in anxious attachment, disease severity is not associated with lower perceived social support or lower efficacy in coping with their disease. In contrast, disease severity is associated with lower perceived social support and lower coping efficacy for women with moderate and, especially, high anxious attachment.

Anxious attachment did not moderate the association between disease severity and negative affect. However, Table 4 indicates that disease severity and avoidant attachment interacted significantly in predicting negative affect, $F(3,206) = 28.21$, $p < .001$, $R^2 = .29$ (adjusted $R^2 = .28$); almost 30% of variability in negative affect was predicted by disease severity, avoidant attachment, and their interaction. Simple slope analysis of the significant interaction indicated that disease severity and negative affect were positively and significantly related for all levels of avoidant attachment (high: simple slope = 0.34, $t = 6.05$, $p < .001$; moderate: simple slope = 0.25, $t = 6.66$, $p < .001$; and low: simple slope = 0.17, $t = 3.07$, $p = .002$).

Figure 3 plots the significant interaction between disease severity and avoidant

interaction on negative affect in order to better interpret the results of the simple slope analysis. As indicated in Figure 3, the degree to which disease severity is positively associated with negative affect depends on the level of avoidant attachment. Although related at all levels of avoidant attachment, disease severity is most strongly and positively associated with negative affect for women scoring high in avoidant attachment.

Avoidant attachment did not moderate the association between disease severity and perceived social support, or the association between disease severity and coping efficacy. In addition, none of the two way interactions between anxious and avoidant attachment, nor the three-way interactions of anxious and avoidant attachment with disease severity were significant in the present study.

Discussion

Summary of results

Overall, our findings support our hypothesis that insecure attachment would moderate the association between disease severity and psychosocial variables. Our results indicate that insecure attachment moderated the relationships found between disease severity in people with inflammatory bowel disease and perceived social support, negative affect, and adjustment, as measured by efficacy of coping with the disease. Our prediction that results would be stronger for anxious rather than avoidant attachment was generally supported. Disease severity was associated with both low perceived social support and low coping efficacy only when anxious attachment was moderate or high. Although disease severity was associated with negative affect at all levels of avoidant attachment, the relationship was strongest for high avoidance.

Relation to previous research

In a study of people with the inflammatory bowel disease of ulcerative colitis, Maunder

et al. (2005) found that attachment moderated associations between ulcerative colitis disease activity and depression. Those findings supported Maunder and Hunter's (2008) hypothesis of insecure attachment as a moderating variable between disease activity and psychobiological variables. Taken together, our results on people with inflammatory bowel disease and those of Maunder et al. (2005) suggest that attachment may play a moderating role between inflammatory bowel disease activity and both psychobiological and psychosocial variables.

Sample size in our study precluded separation of data according to specific diagnosis of Crohn's disease or ulcerative colitis. However, when the largest subsample of people with inflammatory bowel disease (i.e., those with Crohn's disease) was analyzed separately, identical results were found as when we used the entire sample. Together with Maunder et al.'s (2005) findings with ulcerative colitis patients, the results suggest that attachment may be a moderating variable in people with Crohn's disease or ulcerative colitis.

In addition, our results indicate that the association between insecure attachment and poor perceived social support that is found in a general sample (Mikulincer & Shaver, 2007) is also found in a sample of people with chronic illness. Anxious and avoidant attachment were each associated with low perceived social support in our study of people with inflammatory bowel disease. However, disease severity was associated with low perceived social support only when anxious, but not avoidant, attachment was moderate or high. This finding fits with previous theory and research suggesting that, in times of increased distress (such as disease severity), the avoidantly attached tend to be self-reliant and do not seek out others to provide increased support, while the anxiously attached want more support but may perceive the support they receive to be inadequate (Mikail et al., 1994; Mikulincer & Shaver, 2007; Simpson et al., 1992).

Turning to the results of avoidant attachment, we note that avoidant attachment has been

associated with disengaging or diverting coping strategies to deal with negative affect in a general sample (Maunder & Hunter, 2008), and in people coping with chronic illnesses of breast cancer and chronic leg ulcers (Schmidt, Nachtigall, Wuethrich-Martone, & Strauss, 2002). Avoidant coping itself has been associated with increased disease severity in people with inflammatory bowel disease (Graff et al., 2009; Sirois, 2009; Voth & Sirois, 2009). We speculate that diverting strategies that may be associated with avoidant attachment might not be effective in regulating negative affect associated with increased disease severity in people with inflammatory bowel disease.

Overall, our results also add to recent findings by Graff and colleagues (2009) that well-being and perceptions of control are poorer in patients with inflammatory bowel disease during times of disease activity. Our study suggests that individual differences in attachment may be one factor associated with potential differences in perceived control or well-being when disease severity is high in people with inflammatory bowel disease (Sirois, 2009).

We note that Voth and Sirois (2009) also conducted a secondary analysis that drew from the same original self-report data (Sirois, 2003) that were analyzed in the present study. However, Voth and Sirois used both men and women, and, more important, the purpose and findings were separate and independent from our present study. In particular, Voth and Sirois differentiated the effects of the more harmful attribution of self-blame from those of the attribution of responsibility to psychological adjustment in people with inflammatory bowel disease. Although Voth & Sirois did include coping efficacy as one measure of adjustment (others were helplessness and acceptance), they did not examine attachment at all, nor did they explore the role of insecure attachment in moderating the relationship between disease severity and variables of negative affect, coping efficacy, and perceived social support that were used in

the present study. Thus, our study makes a separate and unique contribution.

Limitations

Limitations of the study include only self-reports, and no medical diagnoses or evaluation of disease severity. In addition, medical evaluation of disease severity would be especially important in replicating the present results related to avoidant attachment because, as noted previously, attachment avoidance was not a moderator of associations between depression and disease activity when the latter was assessed by physicians and not self reported (Maunder et al., 2005). However, the fact that anxious and avoidant attachment moderated associations between disease severity and different psychosocial factors (e.g., anxious but not avoidant attachment moderated the relationship between disease severity and social support) is evidence against an argument that our results are driven by overall increased reporting in insecure attachment.

We note that the hypothesis that the development of, or fluctuations in, disease itself may alter attachment style (Mikulincer & Shaver, 2007) has not been addressed in our study, or other primarily cross-sectional studies of chronic illness and attachment. However, stability of attachment in patients with ulcerative colitis over the course of illness fluctuations was found in one study in which attachment was measured twice (Maunder & Hunter, 2008).

In addition, the present study included only women with inflammatory bowel disease who were primarily Caucasian, and results may not generalize to men or more ethnically diverse populations. The use of the Internet for recruitment of participants has implications for the generalizability of the findings. There is some evidence that individuals with inflammatory bowel disease recruited from the Internet differ from those recruited from clinics on several important disease-related dimensions. For example, people with inflammatory bowel disease recruited from the Internet tend to report greater disease severity, a wider range of symptoms,

and lower quality of life (Jones, Bratten, & Keefer, 2007; Soetikno, Mrad, Pao, & Lenert, 1997). This methodology may, however, be viewed as a strength of the study as it yielded a sample that was larger and more heterogeneous than a community recruited sample. Other research indicates that the quality of data collected on-line is as good as that collected via traditional community-based means (Gosling, Vazire, Srivastava, & Oliver, 2004).

Clinical implications

Coping efficacy is linked to well-being and adaptation to illness (Gignac, 2000; Zautra & Wrabetz, 1991), and social support buffers distress in times of illness or stress (Taylor & Sirois, 2009). Associations between disease severity and both low perceived social support and coping efficacy in the anxiously attached suggest that, when disease activity is high in women with inflammatory bowel disease, anxious attachment may be a risk factor for poor adjustment to the disease.

We speculate further that secure attachment may be a protective factor in adjustment in people with inflammatory bowel disease in times of relapse. Although fairly stable in adulthood, attachment style may be modified through experiences such as a supportive life partner (Mikulincer & Shaver, 2007). Moreover, an empirically validated marital intervention based on attachment theory has been applied successfully in couples with children suffering from chronic illness (Cloutier, Manion, Gordon Walker, & Johnson, 2002; Gordon Walker, Johnson, Manion, & Cloutier, 1996), and explored in a small sample of couples where the woman has breast cancer (Couture-Lalande, Greenman, Naaman, & Johnson, 2007). Identification of persons with inflammatory bowel disease with insecure attachment styles may be helpful not only to determine those at risk for poor adjustment, but also to provide extra support and, possibly, interventions to facilitate adjustment.

Conclusions

The role of attachment in perceived social support and adjustment as received little empirical attention in people with chronic illness. Our results support theoretical discussions suggesting the importance of attachment in health and illness (Maunder & Hunter, 2008; Ryff & Singer, 2000). In particular, the current results indicate that insecure attachment moderates the relationship between disease severity and negative affect, perceived social support, and efficacy in coping with inflammatory bowel disease. Providing adequate support and strategies for coping and regulation of negative affect may be important in insecurely attached women when their inflammatory bowel disease is active. Future research will indicate whether attachment acts as a moderating factor in chronic illnesses other than inflammatory bowel disease.

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Table 1

Means and Standard Deviations of Variables (N = 210)

Variable (range of possible scores)	<i>M (SD)</i>
Total disease severity (7-70)	31.46 (13.54)
Total perceived social support (8-40)	31.36 (7.22)
Total negative affect (10-50)	19.91 (8.62)
Total coping efficacy (3-15)	9.83 (3.22)
Mean anxious attachment (1-7)	3.21 (1.29)
Mean avoidant attachment (1-7)	3.68 (1.25)

Table 2

Correlations Among Disease Severity, Psychosocial Variables, and Attachment Styles

Variable	Correlations				
	2.	3.	4.	5.	6.
1. Disease severity (IBDQ)	-.274**	.450**	-.237**	.179**	.204**
2. Social support	-	-.273**	.213**	-.564**	-.440**
3. Negative affect		-	-.457**	.416**	.356**
4. Coping efficacy			-	-.215**	-.294**
5. Anxious attachment				-	.441**
6. Avoidant attachment					-

** $p < .01$ * $p < .05$

Table 3

Hierarchical Regressions of Anxious Attachment and Disease Severity

DV	Step	Predictor	<i>B</i> (<i>SE</i>)	β	R^2_{ch}	F_{ch}
Social support						
	1.	Disease severity	-.146 (.036)	-.274**	.075	16.899**
	2.	Disease severity	-.095 (.030)	-.179**		
		Anxious	-2.967 (.318)	-.532**	.274	86.947**
	3.	Disease severity	-.101 (.030)	-.189**		
		Anxious	-2.886 (.316)	-.517**		
		Anxious x disease severity	-.053 (.021)	-.140**	.019	6.299*
		Intercept	31.530 (.404)			
Coping efficacy						
	1.	Disease severity	-.056 (.016)	-.237**	.056	12.402**
	2.	Disease severity	-.049 (.016)	-.205**		
		Anxious	-.445 (.168)	-.179**	.031	7.003**
	3.	Disease severity	-.051 (.016)	-.216**		
		Anxious	-.408 (.167)	-.164*		
		Anxious x disease severity	-.024 (.011)	-.144*	.020	4.723*
		Intercept	9.909 (.214)			

Note. DV = Dependent variable

** $p < .01$, * $p < .05$

Table 4

Hierarchical Regression of Avoidant Attachment and Disease Severity

DV	Step	Predictor	<i>B</i> (<i>SE</i>)	β	R^2_{ch}	F_{ch}
Negative affect						
	1.	Disease severity	.286 (.039)	.450**	.202	52.739**
	2.	Disease severity	.251 (.039)	.393**		
		Avoidant	1.906 (.417)	.276**	.073	20.862**
	3.	Disease severity	.253 (.038)	.398**		
		Avoidant	1.828 (.415)	.265**		
		Avoidant x disease severity	.069 (.032)	.127*	.016	4.622*
		Intercept	19.678 (.516)			

Note. DV = Dependent variable

** $p < .01$, * $p < .05$

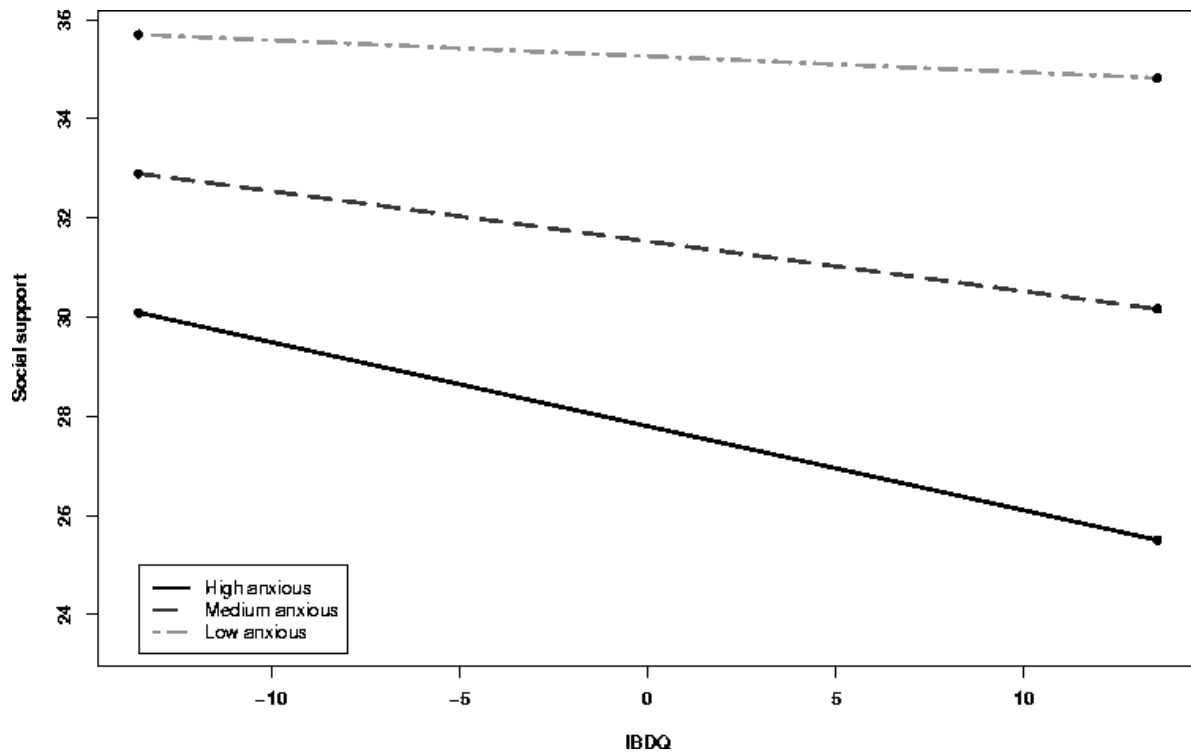


Figure 1. Anxious attachment moderates effect of inflammatory bowel disease severity (as measured by IBDQ; higher score = higher severity) on perceived social support.

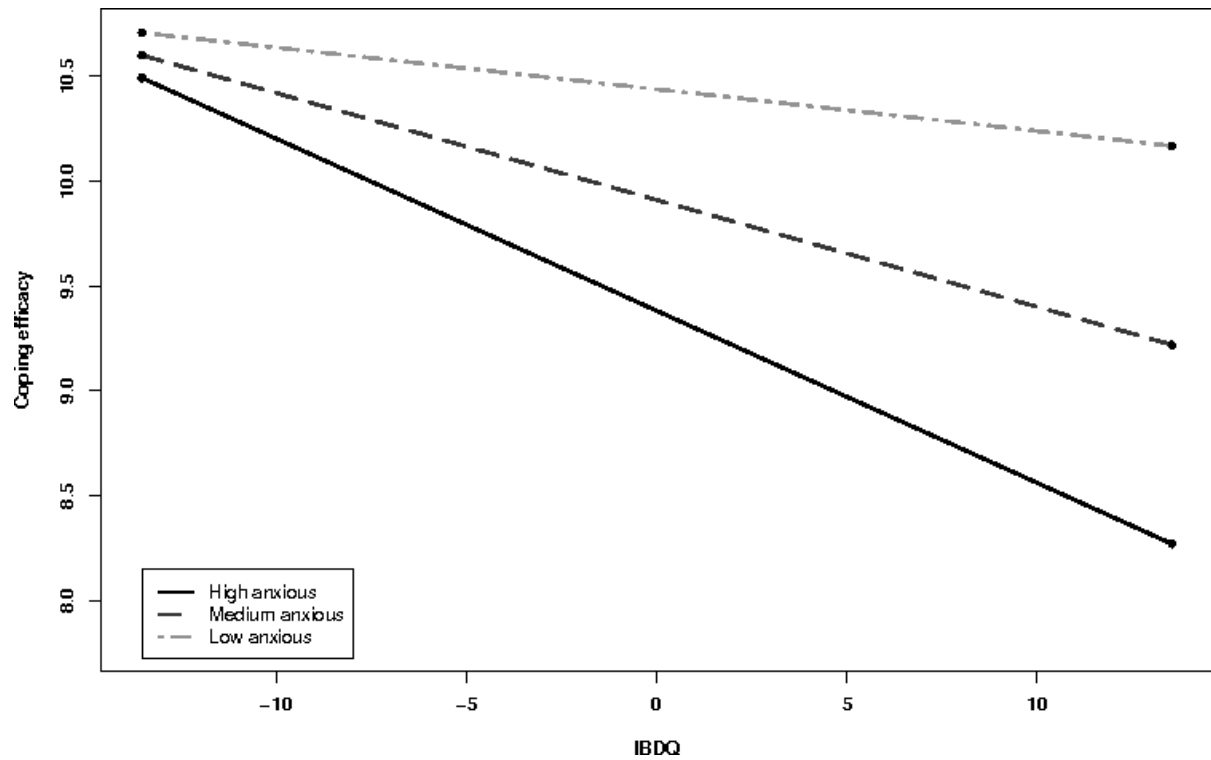


Figure 2. Anxious attachment moderates effect of inflammatory bowel disease severity (as measured by IBDQ; higher score = higher severity) on coping efficacy.

