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COGNITION AND THE BODY: SOMATIC ATTRIBUTIONS IN IRRITABLE BOWEL SYNDROME

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Abstract. How do somatic causal attributions for symptoms relate to treatment seeking behaviour in Irritable Bowel Syndrome (IBS)? How might a tendency to make somatic attributions influence an individual's cognitive representation of their illness once a diagnosis of IBS is established? In Study 1 attributions about symptoms were investigated in treatment-seekers and non treatment-seekers with IBS. Treatment-seekers had an increased tendency to make somatic attributions for both gastrointestinal symptoms and physiological symptoms characteristic of anxiety and depression, although they did not differ from non treatment-seekers in the severity of these symptoms or in their reports of psychological distress. Treatment-seekers also perceived themselves to be significantly less resistant to illness and to be significantly more likely to have poor health in the future than non treatment-seekers. In Study 2, 20 treatment seekers with chronic symptoms of IBS completed measures of mood and of the degree to which they viewed a range of symptoms as a part of their IBS. Physiological symptoms of anxiety and depression were seen as a part of IBS by a considerable proportion of the sample. Higher levels of depression were associated with an increased tendency to see physiological symptoms of anxiety and depression and even symptoms of colds as ''a part of'' IBS. It is concluded that a somatic attributional style may contribute both to initial treatment seeking for symptoms of IBS and the subsequent maintenance and exacerbation of the disorder once a diagnosis is established.

Keywords: IBS, attributions, symptoms, cognition, illness representation, depression, (mis)interpretation.

Introduction

Irritable Bowel Syndrome (IBS) is the most common functional bowel disorder and accounts for between 20% and 50% of all referrals to gastroenterologists in the UK (Farthing, 1995). The symptoms of IBS (abdominal pain associated with changes in stool form or frequency) are benign and biological markers for the disorder have not been identified. Whilst up to 20% of the general population in western countries report symptoms of IBS when questioned only a proportion of these individuals, approximately one third, seek medical help (Jones & Lydeard, 1992). Further, although the majority of individuals who seek treatment for IBS respond to established medical treatments, some individuals remain distressed and disabled by their bowel symptoms (Corney & Stanton, 1990). Those individuals who are referred to

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outpatients clinics appear to differ from individuals with IBS symptoms who do not seek medical treatment and individuals who have been managed by their GP in Primary Care. Furthermore, outpatients are most likely to have failed to respond to conventional treatment for IBS. Research increasingly suggests that a consideration of psychological processes is critical in order to understand why some people seek medical treatment for IBS symptoms whilst others do not, and why amongst this treatment-seeking group some individuals remain chronically affected by symptoms (Drossman et al., 1999). This paper addresses the contribution of one such psychological process – a tendency to make somatic causal attributions for physical symptoms, in both the decision to seek treatment for IBS symptoms (Study 1) and in the maintenance of symptoms in chronic IBS (Study 2). In the following section research concerning cognitive and behavioural processes in IBS is briefly reviewed to place the reported studies in context.

Cognitive and behavioural processes in irritable bowel syndrome

Learned illness behaviour. When compared to individuals with Peptic Ulcer Disease, treatment-seekers with IBS report an increased incidence of parental reinforcement of illness behaviour during childhood (Whitehead, Winget, Fedoravicius, Wooley, & Blackwell, 1982). This learning history has been associated with an increased perception of vulnerability to illness in adulthood, as well as to an increase in the impact of common symptoms on daily life (Crane & Martin, 2002). Those who seek treatment for symptoms and are identified as IBS patients may have generic illness-related learning experiences that predispose them to experience symptoms as relatively more distressing and debilitating.

Psychological stress. Psychological stress has been implicated as a factor that contributes both to the generation of gastrointestinal symptoms (e.g. Craig & Brown, 1984) and to the exacerbation of existing gastrointestinal disorder. Whitehead, Crowell, Robinson, Heller and Schuster (1992) have demonstrated that whilst stress-related gastrointestinal symptom exacerbation is observed in all individuals, the effect is more pronounced in people with IBS. Having IBS is also a source of great stress for patients, and negative automatic thoughts related to symptoms (for example ''I will humiliate myself if I have symptoms at work'') are commonly reported (Toner, Segal, Emmont, & Myran, 2000).

Negative affect. Lydiard and Falsetti (1999) report that in two large-scale population studies, associations between symptoms of IBS and symptoms of anxiety and depression were identified, with equivalent increased rates of psychiatric disturbance in treatment-seeking and non treatment-seeking individuals. Among outpatients, the proportion of individuals with IBS fulfilling the diagnostic criteria for at least one psychiatric disorder, typically anxiety or depression, is approximately 50% (Creed & Guthrie, 1987). Patients with IBS also report more disease phobia and hypochondriasis than those with depression or with organic gastrointestinal disease (Gomborone, Dewsnap, Libby, & Farthing, 1995).

Avoidance and safety seeking behaviour. The fact that IBS symptoms provoke anxiety that results in avoidance (for example of social situations) and safety behaviours (such as using laxatives or carrying clean underwear) has been highlighted (e.g. Salkovskis, 1989). Individuals with more chronic and severe IBS avoid particular foods, physical activities, social and sexual activity, and other situations that are thought to worsen symptoms. The

restrictions imposed on everyday life are likely to produce frustration and depression and changes in diet and physical activity level will have a direct impact on gastrointestinal function. For example, reductions in physical activity will lead to slowed bowel transit (Ditto, Miller, & Barr, 1997; Oettle, 1991).

Symptom monitoring. Illness preoccupation and illness-related distress are likely to increase an individual's tendency to monitor for symptoms, illness behaviour in response to symptoms, and the anxiety that observed symptoms produce (Warwick & Salkovskis, 1990). Monitoring and detection of bowel symptoms is likely to be increased in situations where bowel symptoms are expected to occur (for example, after eating certain foods, e.g. Mayer, Thompson, & Dent, 1999). Recent functional neuro-imaging studies suggest that individuals with IBS may become hyper-vigilant to gastrointestinal sensations (Silverman et al., 1997).

Causal attributions and biases. Individuals with IBS who are referred to hospital outpatient clinics are more likely to attribute their symptoms to organic bowel disease and less likely to attribute them to stress or other factors than those who seek medical help only from their General Practitioner (van der Horst et al., 1997). Individuals with IBS underestimate the impact of stressful situations on their life (Drossman, 1994), but have been shown to overestimate their risk of developing a well-publicized, but unrelated health problem (Crane & Martin, in press, b), suggesting that a tendency to minimize psychological risks and maximize somatic risks may be present in people with IBS. Further rumination about symptoms appears to increase the likelihood that gastrointestinal symptoms are detected, as well as increasing the perceived severity of symptoms that do occur (e.g. Crane & Martin, in press, a).

Presence and interpretation of secondary somatic symptoms. Additional symptoms, such as fatigue, sweating, breathlessness and urinary problems are frequently reported by individuals with IBS (Welch, Hillman, & Pomare, 1985). Some of these symptoms are likely to represent the physiological components of anxiety and depression, which commonly co-occur with IBS (Creed & Guthrie, 1987). These symptoms may be interpreted as additional signs of a feared serious illness (e.g. bowel cancer), increasing disease conviction and distress (Warwick & Salkovskis, 1990). Indeed, it has been demonstrated that the presence of non-specific symptoms is associated with treatment seeking for IBS (Jones & Lydeard, 1992; Sandler, Drossman, Nathan, & McKee, 1984). Once a diagnosis of IBS is well established these symptoms may be viewed as a part of IBS, increasing the perception of the disorder as a serious, pervasive and debilitating condition.

The above review of cognitive and behavioural predisposing and maintaining factors in irritable bowel syndrome is not exhaustive, and interactions between different processes during the course of the disorder remain to be established. This paper addresses the possible contribution of one of the processes described, the tendency to make somatic attributions for physical symptoms, in both the initial decision to consult a doctor about IBS symptoms (Study 1), and in the long term maintenance of IBS (Study 2).

Study 1

Causal attributions for physical symptoms and treatment-seeking status in IBS

Individuals differ in the types of attributions that they make concerning the cause of common symptoms, with three basic dimensions of explanation: somatic – due to a physical problem;

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psychological – due to a psychological process; or normalizing – the symptoms are the result of some transient, non-threatening physiological or environmental state (Robbins & Kirmayer, 1991). Most individuals vary their attributions for the physical symptoms and bodily sensations they experience as a function of the context in which symptoms occur. However, some individuals are particularly likely to make specific types of attribution. For example, those who are health-anxious are prone to make somatic attributions for symptoms, whilst those with generalized anxiety make more psychological attributions (MacLeod, Haynes, & Sensky, 1998). Similarly, individuals with panic disorder are prone to misinterpret innocuous bodily sensations in a catastrophic manner (Salkovskis & Clark, 1993). A tendency to attribute somatic symptoms to physical disease may increase the likelihood that gastrointestinal symptoms will provoke distress and lead to treatment seeking.

Previous studies have considered beliefs and fears about the causes of IBS symptoms both prior to (Thompson, Heaton, Smyth, & Smyth, 2000) and following (van der Horst et al., 1997) diagnosis, although these studies have not systematically investigated causal attributions for different types of gastrointestinal symptom. Rather research has focused on individuals' beliefs about the cause of their current disorder (e.g. stress, diet, cancer, lifestyle). In addition, studies have not considered specific symptom-related attributions in individuals who have never consulted a doctor for their IBS-like symptoms. To do so is important because the act of referral to specialists may itself increase a patient's uncertainty and disease conviction, hence making it difficult to establish the degree to which differences in symptom attributions between primary care patients and outpatients are a cause, as opposed to a consequence, of doctors' referral behaviour.

The specificity of attributional biases in individuals with IBS is uncertain and there are several possibilities concerning their nature. A tendency to make somatic attributions may only be present when an individual reasons about their current gastrointestinal disorder (Thompson et al., 2000; van der Horst et al., 1997). It is also possible that a tendency to make somatic attributions may be present for a range of discrete gastrointestinal symptoms (bloating, diarrhoea, indigestion) but not when symptoms affecting other bodily systems (breathlessness, fatigue) are considered. Alternatively, individuals with IBS may show evidence of somatic biases in causal attributions for a wide range of non-specific symptoms in addition to those of IBS.

Although previous research has not addressed attributions about discrete gastrointestinal and non-gastrointestinal symptoms in IBS, there is indirect evidence to suggest that a pervasive tendency to make somatic attributions may be present. For example, the presence of non-specific symptoms is associated with treatment seeking for gastrointestinal symptoms (Jones & Lydeard, 1992), individuals with IBS feel more vulnerable to, and worry more about an unrelated medical condition than controls (Crane & Martin, in press, b) and outpatients with IBS report abnormal illness attitudes such as a high level of disease phobia and hypochondriasis (Gomborone et al., 1995). These findings suggest that reasoning about a range of symptoms may distinguish treatment-seekers with IBS from those who do not seek treatment.

Study 1 sought to address the nature and specificity of attributional biases in IBS. It was hypothesized that a tendency to make somatic attributions would distinguish individuals who had sought treatment for IBS symptoms from those who had not. It was further hypothesized that because the tendency to make somatic attributions may be related to general perceptions of vulnerability to illness whose origins precede the onset of IBS that there

would also be evidence of attributional biases for non-gastrointestinal symptoms. Study 1 therefore examined attributions for gastrointestinal and non gastrointestinal symptoms, as well as general health beliefs in treatment-seekers and non treatment-seekers with IBS.

Method

Participants were recruited from amongst students at eight colleges of Oxford University. Approximately 700 students (80–100 from each college) were contacted by email and asked if they would be interested in taking part in a questionnaire study concerning health attitudes and health-related behaviour. The first few students whose surname began with each letter of the alphabet were selected. Of those who were emailed, 498 individuals expressed an initial interest and were sent a questionnaire via the internal post. Questionnaires were returned free of charge via internal mail. In total 268 useable questionnaires were returned within the 5-week deadline, representing a response rate of 38% Participants who did not return the questionnaire within the period were not sent a reminder as students were out of residence during the vacation that followed the distribution of the questionnaires.

Measures

Identification of irritable bowel syndrome. Questions incorporating the Rome I Diagnostic Criteria for IBS (Thompson, Creed, Drossman, Heaton, & Mazzacca, 1994; see Appendix 1) were used to identify cases of IBS in this study. These criteria have been widely employed in IBS research, both in diagnostic interviews and in postal questionnaires (Boyce, Koloski, & Talley, 2000; Gick & Thompson, 1997). There is still some doubt over whether the Rome II Criteria for IBS are too restrictive or identify the same patients diagnosed using previous criteria for IBS (e.g. Boyce et al., 2000; Mearin et al., 2001). Questionnaire-based identification of individuals with IBS is a well established method in community studies of IBS prevalence, particularly as it would be problematic to suggest that individuals in the community who had not previously been concerned or sought medical treatment for IBS symptoms be subjected to physical examination for the purposes of research. Questions concerning their treatment-seeking behaviour for gastrointestinal symptoms and questions concerning any diagnosis or explanation that individuals had been given by their doctor were also included. Individuals reporting that they had visited their doctor on one or more occasions to seek treatment for their bowel symptoms were classified as treatment-seekers. Individuals fulfilling the diagnostic criteria for IBS but reporting an alternative diagnosis that could account for gastrointestinal symptoms (e.g. lactose intolerance, ulcerative colitis) were eliminated from the IBS group and included in the control group. Twenty-eight participants fulfilled the diagnostic criteria for IBS, with 13 individuals classified as ''treatment-seekers''.

Physical Symptoms Attribution Questionnaire. A physical symptom attribution questionnaire was devised, drawing upon the Symptom Interpretation Questionnaire (Robbins & Kirmayer, 1991) and the Body Sensations Interpretation Questionnaire (Clark et al., 1997), but adding items dealing with gastrointestinal symptoms. Each of the 21 items contained an initial statement describing a somatic symptom (e.g. diarrhoea, dizziness, sweating), and then three possible explanations for the symptom: one psychological, one somatic and one

normalizing explanation (with the order in which the explanations were presented counterbalanced across items). The instructions to participants were: ''Below are sets of descriptions of bodily signs and sensations. Try to imagine yourself experiencing each type of sensation. Three possible explanations for each sensation are given. Read each one and then decide which is most similar to what would come into your mind if you experienced the sensation.'' Participants were asked to rank the explanations from most similar to least similar to what would come into their mind if they experienced the symptom described.

Of the 21 items, 8 dealt with gastrointestinal symptoms (nausea, diarrhoea, indigestion, stabbing abdominal pain, ache in the stomach and bowels, constipation, bloating and heartburn) and 10 items dealt with non-specific symptoms associated with anxiety and depression (heart pounding, fatigue, sweating, sleep disturbance, feeling drained, confused thought, hot and cold spells, shortness of breath, loss of appetite and dizziness). The three remaining items described symptoms of prolonged headache, numbness and tingling in hands and feet and increased appetite. The potential somatic explanations for symptoms were chosen to be fairly threatening, for example a stomach ulcer, breathing problem, brain tumour or nervous system dysfunction, such that they would be likely to provoke anxiety if an individual considered themselves to be suffering from the condition in question. Nine of the symptoms (four gastrointestinal, four physiological symptoms of psychological stress, one other somatic symptom) were placed in a real-world context that suggested the presence of a psychological stressor (but which did not exclude other possible causes of the symptom). Examples of each type of item are shown in Appendix 2.

The Hospital Anxiety and Depression Scale (Snaith, 1993). This scale provides a measure of anxiety and depression uncontaminated by the presence of physical illness. A recent review of the psychometric properties of the HADS carried out by Herrmann (1997) reports that the internal consistencies range from 0.80 to 0.93 for the anxiety sub-scale and 0.81 to 0.90 for the depression sub-scale, that test-retest reliability is good over short intervals ($r >$ 0.80) and that the sensitivity and specificity of the English version of the HADS have been found to be good (17 studies with sensitivities and specificities of 0.8 or higher are reported). A score of 8–10 on each sub-scale is suggested as an indication of borderline anxiety or depression and a score of more than 10 as indicating a probable mood disorder (see Snaith, 1993).

Somatic Symptoms Scale. Participants were asked about the presence or absence during the last 3 months of 25 somatic symptoms. For each symptom participants indicated either that they had not experienced the symptom, or that they had experienced it and it was of mild, moderate or severe intensity. The symptoms are listed in Appendix 3. The scale has good internal reliability (Cronbach's alpha = 0.82, $p < .001$). In addition, participants were asked whether they had experienced any major health problems in the last year. If participants had experienced a major health problem they were asked to provide brief details.

Health Perceptions Questionnaire. The Health Perceptions Questionnaire (Ware, 1976) sub-scales of sick-role rejection, health outlook, sickness orientation, resistance to illness and health worry were included. Other measures of illness impact and childhood learning experiences were included in the questionnaire. The findings related to these measures are reported elsewhere (Crane & Martin, 2002).

Results

Population characteristics

The mean age of the sample was 21.2 years (*SD* 2.78). Of the 268 individuals who completed the questionnaire, 28 participants (11.6% of the total sample) fulfilled the diagnostic criteria for irritable bowel syndrome and did not report an alternative diagnosis that could account for symptoms. The relatively low incidence was to be expected given the young mean age of participants in this study. More of the individuals with IBS were female (75% of the IBS group versus 50% in the whole sample, $\chi^2 = 7.14$, $df = 1$, $p<.01$), and 13 were treatment-seekers. Again these figures are comparable to other community studies.

Comparisons between individuals with IBS and healthy controls

Somatic symptoms. The individuals fulfilling the diagnostic criteria for IBS in this sample had characteristics similar to those identified in previous research. Chi-squared analysis (using two-tailed significance tests) indicated that in addition to increased reports of diarrhoea ($\chi^2 = 6.94$, $df = 1$, $p < .05$) and constipation ($\chi^2 = 9.33$, $df = 1$, $p < .01$), individuals with IBS were more likely to report fatigue ($\chi^2 = 8.38$, $df = 1$, $p < .01$), sweating ($\chi^2 = 7.402$, $df = 1$, $p = .01$), genitourinary problems ($\chi^2 = 5.617$, $df = 1$, $p < .05$) and eye and ear problems ($\chi^2 = 5.64$, $df = 1$, $p < .05$). Since participants with IBS were no more likely to report other types of common symptom (for example coughs, sore throat or nasal congestion) this suggests that the above findings are not simply the result of a general response bias.

Anxiety and depression. The Hospital Anxiety and Depression Scale provides a cut-off score of 8 or more on each sub-scale to indicate the presence of probable clinically significant anxiety and probable clinically significant depression. Significantly more of the individuals with IBS (46%) than controls (28%) reported anxiety of this level ($\chi^2 = 5.048$, $df = 1$, $p < .05$). Probable clinically significant depression was reported by 25% of individuals with symptoms of IBS compared to only 10% of individuals without such symptoms. Although the proportion of individuals with probable depression did not differ significantly between the groups a higher mean level of depression was reported by individuals with IBS ($F = 6.74$; df = 1, 267; p = .01).

Treatment-seeking status

The participants who fulfilled the diagnostic criteria for IBS ($N = 28$) were divided into two groups: those who had sought treatment ($N = 13$) and those who had not ($N = 15$). The analyses that follow compare these two groups in terms of their demographic and psychological characteristics and their somatic attributional style.

Demographic information. The treatment-seekers did not differ significantly from non treatment-seekers in terms of their sex ($\chi^2 = 0.109$, $df = 1$, $p < .54$) or their age ($F = 0.06$, $df = 1, 27$; $p = .81$), or in the level of anxiety or depression (anxiety: $F = 0.06$, $df = 1, 27$; $p = .82$; depression: $F = 0.00$, $df = 1, 27$; $p = 1.0$), indicating that individuals who seek medical help for their IBS symptoms are not necessarily more psychologically distressed

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than those who do not. Previous studies identifying treatment seeking and non treatment seeking individuals from a larger community sample have had similar findings (e.g. Talley, Boyce, & Jones, 1997).

Symptom reports. The number of gastrointestinal symptoms ($F = 0.04$, $df = 1, 27$; $p = .84$) and non-gastrointestinal symptoms ($F = 2.12$, $df = 1,26$; $p = .16$) reported by the two groups also did not differ significantly. Treatment-seekers did not report having experienced more of the symptoms mentioned in the non-specific symptom attribution questions in the last 3 months ($F = 0.26$; $df = 1,27$; $p = .61$), indicating that treatment seeking does not always lead to selection of individuals by symptom profile. Finally, the number of symptoms perceived by participants to be severe also failed to distinguish the groups ($F = 1.57$; $df = 1, 26$; $p = .22$) indicating that treatment-seekers are not necessarily more likely to rate their symptoms as ''severe''. Thus differences in symptom-related attributions cannot be accounted for by differences between the groups in symptom prevalence, perceptions of symptom severity, or level of psychological distress.

Symptom attributions

Individuals ranked possible explanations for symptoms from ''most likely'' to ''least likely'' to explain the symptom described. Each explanation ranked most likely was assigned a score of 3, next most likely a score of 2, and least likely a score of 1. Scores for each type of explanation (somatic, psychological, neutral) were summed to produce a score corresponding to the total weighting given to each type of attribution across items (all items, gastrointestinal items etc.). SPSS version 10 was used to carry out the analysis and effect sizes were calculated using the Eta Squared (η^2) statistic as a measure of effect size. As a guide η^2 of .01 indicates a small effect size, η^2 of .06 indicates a moderate effect size, η^2 of .14 indicates a large effect size (Cohen, 1988).

Overall attributional style. Treatment-seekers were more likely than non treatment-seekers to make somatic attributions across all 21 items ($F = 5.28$; $df = 1, 26$; $p < .05$, $\eta^2 = .17$). The two groups did not differ in the number of neutral ($F = 3.00$, $df = 1, 26$, $p = .1$, $\eta^2 = .08$) or psychological ($F = 1.23$, $df = 1, 24$, $p = .3$, $\eta^2 = .04$) attributions made.

Gastrointestinal symptom attributions. Treatment-seekers made more somatic attributions for the gastrointestinal symptoms described ($F = 4.31$; $df = 1, 26$; $p<.05$, $\eta^2 = .14$), supporting the findings of previous studies that showed that those who have progressed further through the healthcare system are more likely to attribute their bowel problems to organic disease. The finding indicates that somatic attributions are more common for specific gastrointestinal symptoms (e.g. diarrhoea, bloating) as well as when attributions are made about IBS as a whole. The number of neutral attributions ($F = .84$, $df = 1, 26$, $p > .3$, $\eta^2 = 0.3$) and psychological attributions ($F = 1.34$, $df = 1, 26$, $p > .2$, $\eta^2 = .05$) did not differ significantly.

Attributions for physiological symptoms of anxiety and depression. Despite reporting equivalent levels of psychological distress, treatment-seekers made more somatic attributions ($F = 5.25$; $df = 1, 28$; $p < .05$, $\eta^2 = .17$) for non-specific symptoms characteristic of anxiety and depression. Treatment-seekers showed a reduced tendency to make neutral attributions that was approaching significance ($F = 3.50$, $df = 1, 26$, $p = .07$, $\eta^2 = .12$). They

did not differ from non treatment-seekers in the number of psychological attributions made ($F = .134$, $df = 1, 26$, $p = .13$, $\eta^2 = .01$). The increased tendency to make somatic attributions identified in treatment-seekers with IBS does not appear to be specific to gastrointestinal symptoms.

Contextual attribution. Treatment-seekers were more likely than non treatment-seekers to make somatic attributions even when the symptom was placed in a context that indicated the presence of a psychological stressor ($F = 6.51$; $df = 1, 26$; $p < .05$, $\eta^2 = .20$). The number of neutral attributions ($F = 2.26$, $df = 1, 26$, $p = .1$, $\eta^2 = .08$) and psychological attributions ($F = .247$, $df = 1, 26$, $p > .2$, $\eta^2 = .05$) did not differ significantly. This finding is important, because in real life situations symptoms occur in the context of ongoing life events. This result suggests that treatment-seekers with IBS may be more likely to make somatic attributions for symptoms than non treatment-seekers even when the symptom occurs in the context of a stressful life event.

Health beliefs

Despite having equivalent psychological and physical symptom profiles, differences between treatment-seekers and non treatment-seekers were identified on two sub-scales of the Health Perceptions Questionnaire. Treatment-seekers perceived themselves to be significantly less resistant to illness than non treatment-seekers ($F = 19.07$; $df = 1, 26$; $p < .001$, $\eta^2 = .42$), more strongly endorsing statements such as 'I seem to get sick a little easier than other people''. In addition, treatment-seekers had a significantly more negative health outlook ($F = 5.75$; $df = 1, 26$; $p < .05$, $\eta^2 = .18$) more strongly endorsing statements such as ''I will probably be sick a lot in the future''.

Study 2

Attributions about non-specific symptoms in persistent IBS

Study 1 suggests that treatment-seekers with IBS have an increased tendency to make somatic attributions for symptoms. Those people with a somatic attributional style may be more likely to fear that they are suffering from a serious bowel disease, promoting treatment seeking behaviour. However, IBS symptoms are chronic and persist after organic diseases have been ruled out. In addition, whilst anxiety may initially relate to the potential causes of symptoms (e.g. ''what if I have bowel cancer?''), over time it appears to become more focused on consequences of having IBS (e.g. ''what if I have an accident?''). The impact of a somatic attributional style may alter as an individual's cognitive representation of IBS develops. For example, before a diagnosis of IBS is established somatic symptoms of anxiety or depression may initially be attributed to a feared disease (for example, sweating or fatigue may be seen as signs of cancer). Once a diagnosis of IBS is well established, however, attributions are likely to change in line with an individual's current representation of their illness. As a result a tendency to make somatic attributions for physiological symptoms of anxiety and depression may still be present, but be reflected in the degree to which these symptoms are regarded as a part of IBS (rather than due to stress). The salience of an individual's IBS illness schema may influence the degree to which symptoms are interpreted within the context of IBS, with negative affect in part determining schema salience (Crane &

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Martin, in press, a). Study 2 examines beliefs about non-specific symptoms in individuals who identify themselves as IBS sufferers. The impact of negative affect on an individual's tendency to attribute non-specific symptoms to IBS was also examined.

A tendency to view non-specific symptoms such as those arising from anxiety or depression as symptoms of IBS may lead to a perpetuation of the disorder. Firstly, the likelihood that an individual will recognize the impact of psychological stress on their health and take remedial action to counteract it will be reduced. Secondly, if additional non-specific symptoms are seen as a part of IBS this will increase the degree to which IBS is perceived as a disabling, distressing condition and may contribute to continued treatment seeking and increased illness behaviour. It was hypothesized that individuals who had sought medical help and developed chronic IBS would view a range of non-specific symptoms, but particularly those arising from anxiety or depression, as a part of their disorder. Further, it was hypothesized that an increasing level of depression would be associated with an increase in the level of non-specific symptoms and an increase in the degree to which these symptoms were seen as a part of IBS.

Method

Participants

Participants in Study 2 were recruited through an article in a local newspaper that requested volunteers with IBS. The article described IBS in some detail and also outlined other conditions that are *not* related to IBS (e.g. inflammatory bowel diseases, bowel cancer). Each individual who responded to the request for volunteers with IBS was contacted by telephone for an informal discussion of the study (time commitment, confidentiality etc.) and those who remained interested in participating were sent an information sheet and consent form. Twenty-four individuals returned a consent form and were sent a diary. The diary contained questions to screen for IBS according to the Rome I Criteria. Individuals were included in the study if they reported symptoms fulfilling the Rome I Criteria and/or reported a doctor's diagnosis of IBS and at least two current supporting symptoms (see Appendix 1). Two individuals failed to return their diaries and two individuals completed diaries but were eliminated from the study because they did not fulfill the study inclusion criteria, leaving 20 individuals who completed all measures. Diagnoses of IBS were not confirmed with the individual's general practitioners although all individuals identified themselves as IBS sufferers. We are confident that our sample represents individuals with more chronic and severe IBS as they occur in the community due to the duration of participant's symptoms, the level of medical investigation that participants reported and the fact that none of the participants reported another physical illness that might account for symptoms when questioned.

In addition to completing a daily symptom diary the participants completed a range of questionnaires including the mood and attribution measures described below.

Measures

Common symptoms. Participants reported the bothersomeness of a range of non-specific symptoms over the previous 4 weeks on a scale ranging from 0 = not at all bothersome to

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4 = extremely bothersome. Three groups of symptoms were considered: gastrointestinal symptoms (wind, diarrhoea, constipation, abdominal pain, nausea and indigestion), non-specific symptoms of anxiety and depression (fatigue, dizziness/faintness, breathlessness, hot and cold spells/sweating, dry mouth, confusion, and palpitations/racing heartbeat/chest pain) and symptoms of colds (sore throat/fever, runny nose/nasal congestion, cough, swollen glands and headaches).

Symptom attributions. A measure of the degree to which participants believed each of the symptoms listed above to be ''a part of'' their IBS was also taken on a separate day. For each symptom participants indicated their belief on a visual analogue scale ranging from 0 = ''definitely not part of my IBS'', to 10 = ''definitely part of my IBS''.

Mood. Participants completed the Hospital Anxiety and Depression Scale (described in Study 1 measures). Participants also completed daily ratings of mood (anxiety, anger, depression and happiness) over a period of 5 days on visual analogue scales ranging from 0 = not at all happy (angry/anxious/depressed) to 100 = extremely happy (angry/anxious/depressed).

Results

Participant characteristics

Nineteen of the 20 participants had received a doctor's diagnosis of IBS. The remaining patient, who was self-diagnosed, fulfilled the Rome I Criteria for irritable bowel syndrome. Of those who had received a doctor's diagnosis, 15 fulfilled the Rome I Criteria for IBS.

Demographic information

The sample contained 16 women and 4 men. The mean age of the sample was 46.37 years (*SD* = 16.30, range 20–70). The educational level of the sample was varied. Eight individuals had completed higher or post-graduate education, 6 had completed further education or an apprenticeship, 6 participants had not been educated beyond secondary school. One person did not specify their educational level.

Number of doctor visits for IBS

The mean number of primary care visits (to the General Practitioner or Practice Nurse) for IBS symptoms was 8.2 (*SD* = 6.6, range 2–20). Thirteen individuals had been referred to an outpatient clinic. Of those referred, seven had attended between three and five times and five had attended outpatients on more than five occasions.

Psychological state

Cut off scores of 8 on each sub-scale of the Hospital Anxiety and Depression Scale were used to assess levels of anxiety and depression of probable clinical significance in the sample. All 20 participants reported anxiety of this severity (*M*=13.30, *SD*=3.04, range 8–20) with around 55% of participants reporting this level of depression (*M*=8.35, *SD*=3.10, range 3–15).

Symptom reports

Correlation was used to determine whether there was an association between levels of anxiety and depression and the level of reported gastrointestinal symptoms, cold symptoms or physiological symptoms of anxiety or depression. This revealed that physiological symptoms of anxiety and depression were significantly correlated with total depression rating over the previous 5 days ($r = 0.58$, $N = 20$, $p < .01$), total anxiety over the previous 5 days ($r = .47$, $N = 20$, $p < .05$) and HADS depression score ($r = 0.56$, $N = 20$, $p = .01$). Increased report of gastrointestinal symptoms was associated with increased HADS anxiety score ($r = 0.53$, $N = 20$, $p < .05$). No significant relationship was observed between mood ratings and reports of cold symptoms. Low mood was associated with increased report of physiological symptoms of anxiety and depression, but not with a general increase in the tendency to report physical symptoms (for example, symptoms of colds).

Attribution of non-specific symptoms to IBS

Each symptom was rated on a visual analogue scale ranging from 0 (definitely not part of my IBS) to 10 (definitely part of my IBS). The number of participants rating each of the physiological symptoms of anxiety or depression at 5 or more on this scale suggests that these symptoms are commonly included in the cognitive representation of IBS. For example, 50% of participants rated fatigue at this level, 15% dizziness or faintness, 20% dry mouth, 20% feelings of confusion or disorientation, 25% palpitations, racing heartbeat or chest-pain, 30% hot or cold spells and sweating, and 5% breathlessness. Very few individuals rated cold symptoms at this level, almost certainly due to the fact that these symptoms form part of an alternative, well established, illness representation. Nevertheless, 5% rated sore throats at this level, 5% swollen glands, and 30% headaches.

Pearson's correlation coefficients were calculated to examine the association between low mood and the tendency to view physiological symptoms of anxiety and depression, cold symptoms and gastrointestinal symptoms as ''a part of'' IBS. This analysis revealed that as ratings of daily depression increased so too did the degree to which physiological symptoms of anxiety and depression were seen as ''a part of'' IBS ($r = 0.583$, $N = 20$, $p < .01$). Depression on the HADS was also associated with this tendency ($r = .459$, $N = 20$, $p < .05$). Analysis revealed that increases in depression were also associated with a significant increase in the degree to which the symptoms of colds were seen as ''a part of'' IBS ($r = 0.479$, $N = 20$, $p < .05$), even when current experience of cold symptoms was controlled using partial correlation ($r_c = 0.47$, $df = 17$, $p < .05$). There were no significant relationships between either measures of daily mood or measures of anxiety and depression and the tendency to view gastrointestinal symptoms as ''a part of'' IBS. This may be due to a ceiling effect since each of the gastrointestinal symptoms was rated at 5 or more by a large proportion of the sample (90% wind, 75% diarrhoea, 80% constipation, 100% abdominal pain, 55% nausea, 65% indigestion). Thus, as would be expected, there appears to be considerable consistency in individuals' cognitive representations of the core symptoms of IBS.

Discussion

Study 1 suggests that treatment seeking for IBS is associated with an increase in the tendency to make somatic attributions for both gastrointestinal symptoms and other non-specific

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symptoms, particularly those characteristic of anxiety and depression. This finding is an important extension of previous research (van der Horst et al., 1997), because studies comparing attributions for IBS in outpatients and Primary Care patients cannot rule out the possibility that referral behaviour itself has contributed to patients' causal attributions. In Study 1 individuals who had visited a doctor and who were presumably reassured that their symptoms were not due to organic bowel disease still showed an increased tendency to make somatic attributions for a range of gastrointestinal symptoms, relative to individuals with similar symptoms who had received no such reassurance. These individuals typically reported seeing their GP on only one or two occasions and can therefore be considered as a sample whose symptoms are currently being managed in Primary Care. It has been argued that referral to specialists may contribute to outpatients' tendency to make somatic attributions. However, it seems less plausible to suggest that the experience of treatment seeking in Primary Care would lead to changes in the attributional style of treatment-seekers, particularly as it would be necessary to argue that these changes also altered attributions about non-gastrointestinal symptoms. Rather, it seems more likely that pre-existing differences in illness attitudes and attributional style influence the decision to seek treatment.

Previous research has suggested that individuals with IBS feel more at risk of an unrelated health problem than controls (Crane & Martin, in press, b) and score more highly on measures of disease phobia and hypochondriasis (Gomborone et al., 1995). The current study found very large effects of treatment seeking status on level of perceived resistance to illness and health outlook. Since reductions in perceived resistance to illness are associated with parental reinforcement of illness behaviour (Crane & Martin, 2002), which is increased in adults with IBS (Whitehead et al., 1982), the finding of large differences between treatment-seekers and non treatment-seekers in perceived resistance to illness adds to the evidence that pre-existing differences in health attitudes and attributional style may determine initial illness behaviour in response to symptoms of IBS.

During the initial stages of IBS, before a diagnosis is established, stress resulting from the attribution of bowel symptoms to physical disease may itself contribute to a worsening of symptoms of IBS (Whitehead et al., 1992). Although in this study there was no significant difference between treatment-seekers and non treatment-seekers in level of anxiety (despite both groups reporting more anxiety than controls), treatment seeking participants had presumably received reassurance from their doctor prior to participation. Studies examining changes in attributions and symptom-related anxiety prior to and during consultation are required to establish the impact of these factors on illness behaviour and symptom experience in IBS.

Psychological stress produces physiological symptoms (e.g. fatigue, palpitations) and Study 1 suggests that these symptoms are also more likely to be interpreted as signs of illness by those who seek treatment. As a result, psychological stress may indirectly compound disease conviction, firstly through an exacerbation of gastrointestinal symptoms and secondly through the generation of other symptoms that may be interpreted as additional evidence of feared disease. Thus a vicious cycle may develop in individuals with a somatic attributional style and negative health beliefs. Gastrointestinal symptoms are more likely to be attributed to physical disease in such individuals, promoting treatment seeking and creating additional psychological stress. Such stress will worsen gastrointestinal symptoms and be associated with additional somatic symptoms, which may themselves contribute to disease conviction and reinforce illness behaviour. Thus, rather than non-specific symptoms

being seen as evidence for the role of psychological stress in symptom onset, they may reinforce the belief that symptoms are the result of a physical disease.

Differences between treatment-seekers and non treatment-seekers could not be explained by differences in the number and severity of symptoms reported by the two groups. Further, treatment-seekers were more likely to make somatic attributions even where the context in which a symptom was presented suggested that a psychological explanation was plausible. This may relate to the finding that those with IBS have a tendency to underestimate or minimize the impact of psychological stressors on physical health (Drossman, 1994).

Study 2 suggests that somatic attributions for non-specific symptoms may also contribute to the maintenance of IBS once a diagnosis is established, although the type of somatic attribution made may differ. Participants in Study 2 identified themselves as IBS sufferers and had chronic symptoms of IBS. Thus, they are likely to have elaborate illness representations (Rutter, 2001) within which gastrointestinal symptoms are interpreted. Study 2 suggests that once a diagnosis of IBS is well established rather than physiological symptoms of anxiety and depression being attributed to, and potentially fuelling fears of, serious illness, these symptoms may become incorporated into the cognitive representation of IBS. Indeed, a similar process seems to occur in chronic fatigue syndrome (Moss-Morris & Petrie, 2001). As the level of depression increases so too does the tendency to view non-specific symptoms as ''a part of'' IBS. Depression about chronic illness and over-generalization in the attribution of symptoms to IBS may perpetuate perceptions of IBS as a frustrating, unmanageable disorder in the same way that ''depression about depression'' has been shown to maintain affective symptoms over time (Teasdale, 1997). Indeed, research suggests that low mood and depression increase the degree to which an individual's self schema and illness schema become enmeshed (Pincus & Morley, 2001). The increasing tendency to view non-specific symptoms as a part of IBS as depression increases may be indicative of increased integration of illness and self-schemas or enhanced salience and accessibility of the IBS schema. As a result, somatic symptoms are more likely to be interpreted in the context of IBS and may over time be assimilated to the illness representation. A similar process has also been observed clinically in diabetes where a tendency to attribute fatigue to diabetes is noted to be particularly common amongst patients with depressed mood (Watkins, Drury, & Taylor, 1990).

Limitations

Both studies are cross-sectional and employ small samples. It is therefore not possible to determine causal relationships between the variables or to be certain of the degree to which the findings can be generalized to other populations with symptoms of IBS, especially as Study 1 used a student sample with a low mean age. Study 1 primarily addressed attributions about symptoms that might be exacerbated by psychological stress. Further research should address the possible differences between attributions for arousal reactive symptoms (e.g. palpitations) and arousal non-reactive symptoms (e.g. dry skin) in people with IBS. In addition, it will be important to examine the degree to which a somatic attributional style is characterized by a general tendency to see symptoms as signs of illness (promoting general illness behaviour) as compared to a tendency to make catastrophic attributions of serious disease (promoting anxiety).

Implications for treatment

As indicated by both the current study and previous studies, the tendency of treatment-seekers to make somatic attributions seems to persist following consultation and to be associated with negative health beliefs (e.g. Lucock, Morley, White, & Peake, 1997; Lucock, White, Peake, & Morley, 1998). Addressing fears about the causes of gastrointestinal symptoms is therefore likely to be essential to the successful management of IBS. Indeed, as outlined by Salkovskis and Bass (1997), addressing fears about the causes of symptoms may actually lead to a reduction in symptom severity. It may also be beneficial to give patients the opportunity to discuss any other physical symptoms that they are experiencing in addition to those of IBS during initial consultation in primary care. This will decrease the ambiguity of reassurance and the likelihood that the patient leaves an appointment worried because they have failed to mention what they consider to be a potentially important symptom. Patient's perceptions of the range of symptoms that form ''a part of'' IBS may be quite different from those of their doctors.

Further, there is a high degree of co-morbidity between IBS and other functional disorders such as chronic fatigue syndrome and fibromyalgia. It is quite possible that treatment-seekers with IBS are also, due to their health beliefs and attributional style, more vulnerable to the development of a range of functional disorders should symptoms of these disorders (such as fatigue) occur. Thus addressing general somatic attributional style may have important preventative functions in certain individuals, reducing the likelihood that other chronic conditions will develop or be maintained following the successful treatment of IBS.

The relationship between stress and the exacerbation of IBS symptoms is clearly described in the majority of self-help literature and as a component of cognitive-behavioural therapies for IBS (e.g. Greene & Blanchard, 1994; van Dulmen, Fennis Mokkink, & Bleijenberg, 1996). However, a clear explanation of the fact that additional non-specific somatic symptoms may result from the stress of having IBS, rather than being evidence of unidentified organic disease would also be beneficial to patients with a general tendency to make somatic attributions. Stress management interventions have been effective in the treatment of IBS (e.g. Rumsey, 1991; Shaw et al., 1991) and it would be informative to consider the impact of these approaches on non-specific as well as gastrointestinal symptoms. Some psychological approaches to the management of IBS have included a variety of components (e.g. relaxation, education, CBT) and so it is difficult to isolate the ''active ingredient''. However, a recent trial using CBT with IBS patients in Primary Care and in the community has produced promising results (Darnley, 2002) indicating the potential contribution of this approach to the management of both treatment resistant and less severe forms of the disorder.

For the patient who is very resistant to the idea that anxiety or depression has a role to play in their experience of gastrointestinal symptoms, addressing somatic attributions about other types of symptom, and which are more easily generated in therapeutic experiments (e.g. racing heartbeat or breathlessness), could provide a starting point. Over time challenging somatic attributions about non-specific symptoms characteristic of anxiety and depression may facilitate a re-evaluation of the relationship between gastrointestinal symptoms and stress in IBS.

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Appendix 1

The Rome I diagnostic criteria for irritable bowel syndrome

1) *Continuous or repeated discomfort or pain in the lower abdomen over the past three months that is:*

   a) Relieved by a bowel movement
      and/or
   b) Associated with a change in stool frequency (i.e. having more or fewer bowel movements)
      and/or
   c) Associated with a change in the consistency of the stool (e.g. the stool is softer or harder)

2) *Two or more of the following supporting symptoms on at least one-fourth of occasions or days in the past three months:*

   a) More than three (4 or more) bowel movements in *a day*
   b) Less than three (2 or fewer) bowel movements in *a week*
   c) Hard or lumpy stools
   d) Loose or watery stools
   e) Straining during a bowel movement
   f) Urgency – having to rush to the bathroom for a bowel movement
   g) Feeling of incomplete emptying after a bowel movement
   h) Passing mucus (white material) during a bowel movement
   i) Abdominal bloating, fullness or swelling

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Appendix 2

Sample items from the Somatic Attributions Questionnaire

Contextual Item: You have experienced a bereavement. As time passes you notice that you have lost your appetite for food. Why might this be?

a) Appetite varies from time to time, it is nothing unusual
b) It is part of the process of grieving
c) It is the first sign of a serious illness

Non-Contextual Item: You start suffering from episodes of indigestion. Why might this be?

a) You are under emotional stress
b) You are developing some kind of food intolerance
c) You are not keeping to regular meal times

Appendix 3

The 25 symptoms on the Somatic Symptoms Scale

Cough
Runny nose
Sore throat or fever
Swollen glands
Unaccountable tiredness or fatigue
Changes in appetite for food
Skin irritations (e.g. itching, rashes)
Asthma or respiratory allergies
Constipation
Heartburn or indigestion
Stiff or aching muscles or joints
Headaches or migraine
Difficulty falling asleep
Difficulty concentrating
Dizziness or faintness
Breathlessness
Nausea, vomiting or ''upset stomach''
Racing heartbeat or palpitations or chest pain
Sweating or hot and cold spells
Pain in the neck, back or shoulders
Genitourinary problems
Discomfort in the eyes or ears
Numbness or tingling
Waking earlier than you wish
Diarrhoea

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