A Metacognitive Perspective on Somatic Symptom Reporting

A thesis submitted to the University of Manchester for the degree of Doctor in Clinical Psychology (ClinPsyD) in the Faculty of Medical and Human Sciences.

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The first part of this thesis explores the potential role of metacognitive beliefs and strategies in functional somatic symptoms. Current models and treatments of functional somatic symptoms focus on cognitive models and cognitive behavioural treatments which show modest treatment effects (for example, Brown, 2004; Deary, Chalder and Sharpe, 2007). A metacognitive account is discussed based upon supervisory regulatory executive function theory (SREF; Wells and Matthews, 1994) and research is systematically reviewed which may support such an account. Current research offers limited indirect support for metacognitive factors playing a role in the difficulties of people suffering from functional somatic symptoms. This paper concludes that further research is needed in this promising area.

The second part of the thesis describes a cross-sectional correlational study which examines the relationship of somatic symptom reporting in primary care with metacognitive beliefs, finding a significant association for the first time. Fifty patients were recruited from general practice surgeries took part in the study. Support for the novel Metacognitive Health Questionnaire measure was also found. This measure showed significant associations between health specific metacognitive beliefs and body focussed attention, health preoccupation and distress. This measure also showed significant associations with illness behaviours and thought control strategies. Each of these findings is in line with SREF theory. This study provides preliminary support for the role of metacognition in symptom reporting.

The third part of the thesis critically evaluated issues salient to the study including methodologically, supervisory, ethical and clinical issues. The interpretations of the literature review and findings of the research paper are limited by the lack of direct findings to support a metacognitive account, and the cross sectional nature of this study. It is hoped that the prospective study which the research study reported forms part, will offer more robust insights into the role of metacognition in symptom reporting, and that future studies will examine this area further.
Declaration

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Part 1: Literature review

A Metacognitive Perspective on Functional Somatic Symptoms

This review was prepared in line with the journal guidelines for “Clinical Psychology Review” and submitted for publication. A copy of the author information pack is available in Appendix A.

Word Count: 8386 (excluding references)
Abstract

Contemporary cognitive models and research are described and appraised, and limitations to these approaches suggested. A metacognitive account of health related distress is discussed, with reference to supervisory regulatory executive function (SREF) theory, with negative perseverative appraisals (worry, rumination and threat monitoring) of symptom related cognitions (bodily sensations, mood, thoughts and images) as a central feature. SREF theory outlines how attempts to cope with changes in cognition are driven by maladaptive metacognitive beliefs, which lead to extreme negative appraisals (with themes of danger and uncontrollability) being given to symptom related cognitions. Research evidence is then systematically reviewed that examines the possible explanatory role of metacognition in understanding symptom severity, health related preoccupation, distress and disability in functional somatic symptoms. Current research offers limited support for metacognitive factors playing a role in illness related suffering in this nascent area. Recent research begins to offer support for the potential role of metacognitive beliefs in syndrome presentations. Supportive research is mainly limited to correlational studies and further research is needed. In particular, prospective studies examining metacognitive beliefs relating to health complaints in relation to symptom reporting, health related distress and preoccupation are clearly warranted.

Keywords:

Functional somatic syndromes, metacognitive beliefs, worry, attention, thought suppression
Highlights:

- Cognitive models offer an explanatory framework for functional somatic symptoms, but there is paucity of evidence supporting cognitive maintenance processes for these difficulties, and treatment studies offer limited support.
- Alternative metacognitive processes are outlined, and their application to functional somatic symptoms described.
- Cross-sectional and prospective research supports the role of worry, rumination and maladaptive attentional focus in illness preoccupation, symptom severity, disability and distress.
- Research supports a possible role for metacognitive beliefs in the aetiology and maintainence of functional somatic symptoms.
1. Introduction

Functional somatic symptoms are disabling subjective experiences of detrimental changes in the body without objective observable physical abnormalities (Wessely, Nimnuan and Sharpe, 1999). Functional symptoms are seen widely in primary care, and have been estimated to account for between 20-35% of primary care consultations (Peveler, Kilkenny and Kinmouth, 1997; Kroenke, 2003), and as such are the single most prevalent class of symptoms in primary care (Henningsen, Zimmerman and Sattel, 2003).

Diagnostically, functional somatic symptoms are grouped into syndromes such as chronic fatigue (CFS), irritable bowel syndrome (IBS), fibromyalgia (FM) and non-cardiac chest pain (NCCP), although there are high rates of co-morbidity between functional somatic syndromes, and the scientific validity of such syndromes has been questioned (see Fink, Toft, Hanson, Ørnbol and Olesen, 2007).

Functional somatic syndromes are associated with increased rates of traumatic life events (Roelofs and Spinhoven, 2007), psychiatric co-morbidity, and personality difficulties (Barsky and Borus, 1999) and, overall, this group of patients experience increased levels of intrapersonal and interpersonal distress. This group of patients also report more negative illness perceptions, greater health care usage, greater preoccupation with physical symptoms and resistance to medical reassurance when compared with patients with non-functional symptoms (Frosthom, Oernboel, Christensen, Toft, Weinman and Fink, 2007; Fink and Schröder, 2010). Brown (2004/2006a) has suggested that metacognition may help maintain these difficulties, and that therapeutic techniques aiming to reduce maladaptive metacognitions can be successfully applied to patients with
functional somatic symptoms. This paper aims to outline to what extent it can be argued that metacognition can be said to be an explanatory factor in the presentations of patients with functional somatic symptoms.

Metacognition refers to the conscious monitoring and control of cognition (verbal thoughts, mood, mental imagery, and internal sensations), and is said to govern how we respond to and make sense of conscious experience (Nelson and Narens, 1990). Evidence supports the relationship between maladaptive metacognitions, as described by supervisory regulatory executive function (SREF) theory (Wells and Matthews, 1994), and psychological disorders such as obsessive compulsive disorder, depression, post-traumatic stress and generalised anxiety disorder (see Wells, 2008).

SREF theory puts forward that these disorders are maintained by a cognitive attentional syndrome (CAS). The CAS is said to consist of negative intrusive cognitions, persistent repetitive negative thinking (worry and rumination), excessive self-focussed attention on thoughts and feelings, and excessively focussing on sources of perceived threat (‘threat monitoring’; Wells and Matthews, 1994). The CAS also includes unhelpful coping behaviours (for example, avoidance, checking and reassurance seeking); and unhelpful and excessive attempts to control aversive cognitions (‘thought control’ strategies (see Wells and Davies, 1994)); which are unhelpful because they negatively influence the way a person interacts with the World, their bodies and their thoughts. Pilowsky’s (1986) description of the ‘abnormal illness behaviours’ seen in functional somatic complaints as “the persistence of a maladaptive mode of experiencing, perceiving, evaluating, and responding to one’s own health status” (p.76), mirror the description of the CAS. This paper will first look at existing psychological accounts of functional somatic symptoms
review their efficacy before going on to examine the case for a metacognitive approach in more detail.

1.1 The conundrum of functional somatic symptoms

Fundamental questions that arise when considering functional somatic symptoms are what causes people to become preoccupied with illness; to focus excessively on their bodies; and to exhibit illness behaviours such as excessively utilising health care? Clearly, psychological factors are at play here, and much work has been done to try and make sense of, and understand the reporting of functional somatic symptoms, with a number of psychological accounts put forward (see Brown, 2004 for a historical overview). Features that appear to be associated with and contribute towards functional somatic syndromes that appear across research strands include the role of excessive body focused attention (see Barsky, Goodson, Lane and Cleary, 1988; Kirmayer and Taillefer, 1997; Brown, 2004), abnormal illness behaviours (see Pilowsky, 1969), negative affectivity (see Watson and Pennebaker, 1989) and unhelpful beliefs about illness (see Pennebaker and Skelton, 1981). Psychological models have been put forward which attempt to integrate the above factors in an explanatory framework using cognitive and integrative process formulations, which outline utilising cognitive behavioural treatment techniques (for example, Brown, 2004; Deary, Chalder and Sharpe, 2007).

The role of worry and rumination has also been implicated by researchers as explanatory factors, with one prospective study of health anxious patients showing that worry and rumination predicted somatic symptoms, help seeking and disability (Looper and Kirmayer, 2001). In the psychiatric literature worry and rumination (which can be defined as ‘unproductive repetitive negative thinking’ (Segerstrom, Tsao, Alden and
Craske, 2000) are seen as trans-diagnostic concepts and measures of worry and rumination correlate with well-being and depressive symptoms across diagnostic categories (Kertz, Bigda-Peyton, Rosmarin and Bjorgvinsson, 2012). Prospective studies of depressive and symptom focused rumination show this to be a significant predictor of future symptoms (Noelen-Hoeksema, 2000; Huffzinger, Reinhard and Kuehner, 2009). Evidence also supports the view that these processes are a contributing factor to health related distress. For example, Marcus, Hughes and Arnau (2008) examined whether a ruminative coping style was associated with health anxiety when affect was controlled for, and structural equation modelling suggested that rumination was both directly, and indirectly associated with health anxiety, via its strong relationship with negative affect. They concluded that “a more complete model of health anxiety should include not only cognitive contents (‘what’) but also cognitive style (‘how’)” (p.495). This paper will look to see whether there are grounds to extending this conclusion to models of the closely related area of functional somatic symptoms.

1.2 Psychological Treatments

Despite the growing consensus around shared processes in the development and maintenance of functional somatic syndromes, psychological treatments have been shown to have limited efficacy (see Sumathipala, 2007; Kroenke and Swindle, 2000), with some studies showing that treatment gains made during therapy are lost at follow up (for example, Mayou, Bryant, Sanders, Klimes and Forfar, 1997). The average effect size in a review of psychological treatments was reported to be modest (Cohen’s δ=0.68), with the true effect size likely to be lower due to publication bias (Allen, Woolfolk, Escobar, Gara, and Hamar, 2002). Better treatments are clearly warranted, particularly given the distress,
disability, lowered quality of life and economic costs associated with functional somatic symptoms. Significant improvements in treatment require a better understanding of aetiology, and a clear framework for working therapeutically with people with functional somatic symptoms. Brown (2007) argued that improved methodology in research studies, integration of biological and psychological accounts, and models that clearly outline how change and improvement should be brought about, would allow this research area to develop and treatments to improve.

1.3 Strengths and Limitations of Contemporary Cognitive Models

To outline the current state of theories regarding functional somatic symptoms, Deary et al. (2007) and Brown’s (2004) influential models of medically unexplained symptoms are discussed. Deary et al. (2007) describe a “broadly conceptualised” (p.791) cognitive behavioural model which includes vicious cycles of interacting cognitive processes which are said to cause symptoms and distress. The mechanisms this paper describes include attentional processes – which are linked to attributional biases, rumination and physiological arousal, mediated by a cognitive process described as “physiological sensitization”, to create unexplained symptoms. Deary et al. describe that “experimentally, attention is a hard variable to isolate” (p.786), and their account largely describes attention to perceived bodily sensations being caused by developmentally influenced filtering biases as part of an automatic “cognitive unconscious”. This model offers a number of hypothetical theoretical components, with limited empirical evidence to support them, and discusses that the maintenance processes described are “lacking in solid proof of their interaction in vicious circles, although the model reviewed assumes this interaction” (p.788). This model does show strength in trying to integrate theoretical cognitive and
biological maintenance processes, but the research discussed in doing so, is indistinct and the process mechanisms unclear.

Brown’s integrative cognitive (2004) model, which builds upon a clearly conceptualised model by Kirmayer and Taillefer (1997), is perhaps more clearly realised than Deary, Chalder and Sharpe’s (2007) model. It again attempts to integrate theoretical accounts, and appears more systematic in its attempts to describe cognitive processes at play in people that develop functional symptoms. Brown’s (2004) model describes two cognitive systems which guide attentional processes, the primary attentional system (PAS) and secondary attentional system (SAS). The PAS, which is placed below conscious awareness, automatically selects the “most ‘active’ hypothesis” (Brown, 2006b, p.44), influenced by the interaction of sensory information and learned memory based schemata, which leads to the conscious experience of unexplained symptoms. The SAS represents higher level thinking processes, operating above the level of the PAS, which is open to executive control, representing active attempts to cope with PAS level representation of illness. Brown’s model (2004) includes feedback loops, which include the influence of illness behaviours, worry and rumination, and attribution style on creating attentional focus on symptoms, which in turn activates the PAS. It also described the role of emotional arousal, physiological disturbance and past trauma in influencing the symptom representation (PAS). This model clearly integrates observable phenomena seen in patients with functional somatic symptoms, but it is not clear in this model’s description, how it can be tested or explained in accessible terms to patients, and it again relies on difficult to examine unconscious processes. Brown (2006b) describes this model as giving a “detailed rationale for the use of CBT” (p.46).
It could be argued that the limited efficacy of psychological treatments may reflect the limited explanatory power of the psychological models on which they are based. The majority of treatment and research studies in this area rely on cognitive behavioural models and treatment. Cognitive behavioural models are increasingly more “broadly conceptualised”, and include a wider range of treatment targets, techniques and concepts than Beck’s original schema theory outlines (1967). However, they do not always offer coherent underlying theoretical frameworks for doing so (for example, increasingly cognitive behavioural treatments include techniques to tackle the process of worry, without elaborating how this process relates to ‘negative automatic thoughts’, underlying ‘core beliefs’ or ‘schemas’).

Cognitive accounts, thus far, have not offered clear testable explanatory processes by which excessive body focussed attention develops and is maintained (although cognitive behavioural theorists clearly implicate attentional processes, see Clark, 1999). They do not always offer a coherent explanation of why the continuous appraisal of perceived symptoms comes to prevail (having the belief or conscious experience that you may be seriously ill does not necessitate that you will spend all your time thinking about your illness). Maladaptive coping behaviours related to functional somatic symptoms have been expertly described (Pillowsky, 1969/1986), but psychological accounts do not clearly relate how these behaviours are related to maladaptive attentional focus to the body, or how they relate to perseverative appraisals. As Deary et al. (2007) comment, there is very little literature in this area examining illness behaviour directly. It seems apparent, that a better understanding of the processes that lead to these maintaining factors is sorely needed, beyond a two dimensional cognitive maintenance model.
With this in mind, this review will evaluate the applicability of the SREF metacognitive transdiagnostic theory of psychological distress, to functional somatic symptoms, in an attempt to explain how maladaptive perseverative appraisals (worry and rumination), maladaptive attentional focus (threat monitoring) and unhelpful coping behaviours and distress develop and are maintained. The review will focus on studies concerning the functional somatic complaints of chronic fatigue syndrome (CFS), irritable bowel syndrome (IBS), fibromyalgia (FM) and non-cardiac chest pain (NCCP) all of which are seen relatively frequently in primary care settings, often with co-morbid symptoms of chronic pain, insomnia / poor sleep, depression or generalised anxiety (GAD). The review will examine the research evidence which relates to whether metacognitive strategies outlined in SREF theory such as worry, rumination and threat monitoring, as well as higher level beliefs thought to drive these strategies (metacognitive beliefs) can be observed in functional somatic syndromes.

2. Metacognition

Metacognition has been described as “cognition about cognition” (Metcalf and Shimamura, 1994), and is the process of monitoring, appraising and controlling the content of conscious cognition to achieve identifiable goals (such as managing health). Nelson and Naren’s (1990) proposed a metacognitive model which described the flow of information between two levels of mental representations, the object level and the meta-level. The object level can be described as ongoing conscious experiences such as thoughts, images and sensations, which are continuously monitored and relayed to the meta-level, which attends to and appraises these experiences. The meta-level contains models of how to respond to and control these conscious experiences once they have been appraised (for
example, having a behavioural plan to turn down the volume if a speaker is too loud, in response to conscious sensations of amplitude and pain at the object level). These meta-level control processes are said to regulate thoughts, emotions, sensations or behaviour.

2.1 Metacognitive Experiences, Beliefs and Strategies

From this description of metacognition, it is possible to divide metacognition into metacognitive experiences, metacognitive beliefs and metacognitive monitoring and control strategies (see Wells, 2008 for a wider discussion), that is, how you experience, think about and respond to cognition. A brief outline of metacognitive experiences, strategies and beliefs is given below:

**Metacognitive Experience** - An unhelpful metacognitive experience would be negatively appraising normal cognitive or physiological events as symptoms of physical or mental illness, for example, appraising your normal internal sensations of your heart beating as a sign of heart disease (see White, Craft and Gervino, 2010), or experiencing thoughts about your bowel or mild visceral sensations in the bowel as threatening (see Naliboff et al. 1997). In essence, these are faulty appraisals of object-level experiences at the meta-level.

**Metacognitive Beliefs** – Metacognitive beliefs can be described as a set of beliefs which govern how a person responds to and makes sense of cognitions at the object level. An example of an unhelpful metacognitive belief could be ‘ruminating about my (cognitions related to my) health will help me to make sense of it’ (an example of a positive metacognitive belief) or ‘it’s impossible to stop worrying about my (cognitions related to my) health’ (a negative metacognitive belief). Positive beliefs support the supposed
usefulness of repeated appraisal of illness cognitions (worry and rumination) and negative beliefs support the supposed uncontrollability and harm caused by worry and rumination. In essence, positive beliefs help commence the perseverative appraisal and illness behaviours, and negative beliefs prevent a person from realising that it is possible to stop thinking about and responding to illness cognitions as if something were wrong.

Metacognitive beliefs may also govern attentional strategies to look out for potential threat (‘threat monitoring’) and strategies such as avoiding or trying to suppress health cognitions to try to reduce distress (‘I should try hard not to think about my upsetting thoughts / bodily sensations to reduce distress’). Metacognitive beliefs can also include negative appraisals around harm caused by the process of worry and rumination itself, with beliefs such as ‘worry (about worry) can harm my body’ seen in patients with generalised anxiety disorder (GAD) (see Wells, 2008).

These beliefs may give rise to maladaptive metacognitive strategies that can take the form of behavioural or cognitive attempts to reduce negative cognitions (i.e. unpleasant thoughts, sensations or emotions). Support for the role of metacognitive beliefs in maintaining psychological disorders comes from studies of obsessive compulsive disorder where metacognitive beliefs proved a more accurate predictor of symptom reduction during exposure and response prevention therapy than cognitions of responsibility and perfectionism (Solem, Tellefsen Halland, Vogel, Hansen and Wells, 2009). The first psychological therapy model which aimed to tackle metacognitive beliefs directly was for GAD, a recent randomised controlled trial (van der Heiden, Muris, van der Molen, 2012) of this treatment reported that 91% of those treated were diagnosis free post treatment, and this study demonstrated a large effect size in reducing worry (Cohen’s $\delta= 2.39$) as
measured by the Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger and Borkovec, 1990).

The metacognitions questionnaire (MCQ; Cartwright-Hatton and Wells, 1997) or its short form the metacognitions questionnaire 30 (MCQ-30; Wells and Cartwright-Hatton, 2004) has been used to measure metacognitive beliefs in research studies examining SREF theory in psychological disorders, and has been shown to be associated with or predictive of symptoms in a wide range of disorders including psychosis, depression, obsessive compulsive disorder and generalised anxiety (see Wells, 2008). The MCQ and MCQ-30 are both self-report questionnaires made up of five factors: (i) positive beliefs about worry (believing that worrying helps to solve problems and avoid negative consequences); (ii) negative beliefs about the uncontrollability and danger of worry; (iii) cognitive confidence (evaluating confidence in attention and memory); (iv) negative beliefs concerning the consequences of not controlling thoughts; and (v) cognitive self-consciousness (the tendency to focus on and monitor thought processes) (Wells and Cartwright-Hatton, 2004).

*Metacognitive Strategies* – Metacognitive monitoring and control strategies can be cognitive or behavioural processes. They govern how a person pays attention to and cognitively or behaviourally responds to metacognitive experiences. In psychological disorders, some of these processes are thought to be maladaptive and backfire, maintaining symptoms, preoccupation, distress and maladaptive beliefs about the self and the World. Cognitive control strategies may include unsuccessful attempts to avoid, distract oneself from, or control aversive cognitions (‘thought control’ see Wells and Davies, 1994); as well as worry; rumination and threat monitoring. Aversive intrusive thoughts are common
in patients with health complaints (Freeston, Gagnon, Ladouceur, Thibodeau, Letarte and Rhéaume, 1994), and research by Wells and Papageorgiou, (1994) suggest that active worry propagates these intrusions. These worry processes can be expressed behaviourally by excessive reassurance seeking, avoidance, checking or other unhelpful coping behaviours. ‘Stop signals’ (see Myers, Fisher and Wells, 2009) may also be used to decide when to stop appraising negative metacognitive experiences (for example ‘when my mind goes blank’ or ‘when I feel completely well’).

2.2 Metacognitive Therapy

Wells and Matthews’ SREF theory has inspired a number of therapeutic techniques to treat emotional disorders (collectively Metacognitive Therapy; see Wells, 2008) which principally aim to reduce worry, rumination and threat monitoring. Metacognitive Therapy appears to be highly efficacious, maintains change well and is brief, although the evidence base is limited to unblinded randomised controlled trials, brief case series and open trials (van der Heiden et al., 2012; Papageourgiou and Wells, 1998; Wells, Fisher, Myers, Wheatley, Patel and Brewin, 2008). Metacognitive Therapy aims to work on the higher level processes of cognition (metacognitions) rather than working directly with the content of cognition attempting to change ‘how’ people experience and respond to cognitions, rather than directly attempt to change ‘what’ people think, to aid them to reduce preoccupation, distress and disability.

2.3 Metacognition and Health Anxiety
The suggestion of relating metacognitive beliefs, strategies and therapy techniques to health concerns was discussed in the original Wells and Matthews (1996) paper outlining the SREF model. Despite this, the model has mainly been examined in psychological disorders, whilst research into the applicability of metacognition to health concerns has until recently been limited to a few papers in the area of health anxiety, an area closely related to functional somatic symptoms. These papers have found significant associations between MCQ subscales of metacognitions related to negative beliefs about worry and cognitive self-consciousness, and levels of health anxiety (Bouman and Meijer, 1999); and significant reductions across subscales during cognitive behavioural group therapy treatment of health anxiety (Buwalda, Bouman and Van Duijin, 2008). This last finding may be of significance, as it suggests that cognitive behavioural treatments for health anxiety may work by indirectly reducing maladaptive metacognitive beliefs. The metacognitive therapy treatment technique of attention training (ATT) has been evaluated in the treatment of health anxiety in a small case series and a controlled trial (Papageourgiou and Wells, 1998; Cavanagh and Franklin, 2000), with significant reductions in health related worry, illness beliefs, disease conviction and body focused attention reported. Brown (2006b) suggests that the metacognitive therapy techniques of attention training, detached mindfulness, and worry modulation can be applied successfully to patients with functional somatic symptoms.

Although this paper takes the form of a narrative review, in order to give an overview of separate but related research areas which may support the role of metacognition, key areas such as the relationships between metacognitive thinking strategies and metacognitive beliefs with functional somatic symptoms will be tackled systematically below. The review will aim to demonstrate the limitations of the research evidence so far.
in this nascent area and suggest research strategies to test and evaluate this metacognitive account.

3. **Outline of the systematic review of metacognitive strategies and beliefs**

As discussed, metacognitive theory highlights the role of metacognitive thinking strategies and beliefs in the maintenance of disorder and distress. To examine whether functional somatic symptoms are associated with metacognitive thinking strategies and beliefs, a systematic search was performed in March 2012 using OvidSP, searching the electronic bibliographic databases PsychINFO from 1990-2012, MEDLINE from 1990-2012, and EMBASE from 1990-2012. Study reports were included which examined common functional somatic syndromes (with the following terms in a ‘title’ search: ‘irritable bowel syndrome’, ‘fibromyalgia’, ‘chronic fatigue syndrome’, and ‘non-cardiac chest pain’) together with the ‘key concepts’ searched related to metacognition of: ‘worry’, ‘rumination’, ‘hypervigilance’, ‘attention’ and ‘thought suppression’, ‘metacognition’ and ‘metacognitive beliefs’. Search results were limited to academic articles of outpatient studies, using quantitative methodology published in English and excluding neuropsychological studies. Papers using unpublished questionnaire measures of worry and rumination (see Marshall, Lockwood, Adams, Bradley, Joy and Fenton, 2000) and measures with an internal consistency of Cronbach’s $\alpha$ less than 0.7 were excluded as Bland and Altman (1997) suggest that a level lower than this is statistically unsatisfactory (a flow chart outlining how papers were identified and included in the review can be seen in Appendix B).
An initial 59 abstracts were identified in the systematic search, which yielded 16 relevant research papers included in this review. Reference sections from review articles concerned with cognitive models of functional somatic syndromes / medically unexplained symptoms were also searched, which provided another 13 relevant research papers, making 29 in total. In total 89 abstracts were considered, with 52 rejected due to not meeting criteria for the review, 37 papers were read in total, with 7 papers excluded due to including unpublished or unvalidated questionnaire measures examining worry and rumination, and one paper containing qualitative research. A number of other published theoretical papers and review articles identified during the systematic search are included to give context to these identified research studies.

4. Are functional somatic symptoms associated with maladaptive metacognitive coping strategies such as worry, rumination, threat monitoring and thought suppression?

4.1 Worry and Rumination

Worry and rumination about events in life are universal phenomena, but in individuals with functional somatic symptoms, the levels of these activities may be much more pronounced, or differ experientially (the appraisals may elicit much more serious and harmful potential consequences and be perceived as uncontrollable due to beliefs about the uncontrollability or harm caused by cognitive processes such as worry or rumination). Worry and rumination about illness might be characterised by extended periods of verbal inner thoughts aimed at answering questions such as ‘If my symptoms are a sign of disease what could happen to me?’, or ‘Why do I feel like I do?’, or ‘What could I have done to
stop myself feeling this way?’. The difficulty with asking such questions may be that they lead people to perceive that something is wrong, and to consider evidence to support the perceived difficulties, or to relate to the perceived difficulties as if something were wrong. For example, you could answer some of these questions by thinking ‘I feel so bad because there is a problem with my intestine’ or ‘If I’d been more cautious in the past, and checked my body for signs of illness, I wouldn’t feel this way now’.

Although some of the answers to these questions may appear identical to negative automatic thoughts described in a cognitive behavioural model, the key difference from a metacognitive viewpoint is that these thoughts are clearly not ‘automatic’ or ‘involuntary’, they result from willed attempts to try to solve a problem, which if much of the time is spent thinking this way, may indicate strongly held underlying positive metacognitive beliefs about the usefulness of worry and rumination to make sense of or find answers to perceived health problems.

Research studies support a potential role of worry and rumination in functional somatic symptoms. A recent large scale population based cross sectional study of 2299 people registered with a general practice in North West England (Aggarwal, McBeth, Zakrzewska, Lunt and McFarlane, 2006), examining IBS, CFS, chronic orofacial pain and chronic widespread pain, examined their association with health anxiety, psychological distress and recent life events. Scores on the Health Anxiety Questionnaire (Lucock and Morley, 1996) subscales of health worry, preoccupation and reassurance seeking behaviour were significantly associated with people reporting more than one physical symptom (odds ratio (OR) 3.6, 95% confidence interval (CI) 2.9-4.4). Higher levels of health worry and preoccupation were reported for those classified as having chronic orofacial pain, IBS and
CFS (47%, 48% and 57% respectively) compared to those patients who did not meet criteria for a functional syndrome (22%). Although these results do not offer a causal relationship with functional somatic syndromes with worry, it suggests that these conditions are associated with high levels of worry.

In a cross sectional study examining illness worry in patients with fibromyalgia (FM, \( n=20 \)) and rheumatoid arthritis (RA, \( n=23 \); Robbins, Kirmayer and Kapusta, 1990), the extent of worry was highly correlated with symptomology and reported levels of physical disability in the FM group (\( r=.51 \) and .52 respectively; \( p<0.05 \)) but not the arthritis group (\( r=0.26 \) and 0.02 respectively; NS). Despite the RA group reporting significantly higher levels of physical disability, none of the people with RA reported giving up activities because of their illness, although 20% of the FM group reporting doing so. The level of worry was equivalent across both groups, suggesting the focus of worry may be a significant factor in their presentation, perhaps indicating more negative appraisals of health related cognitions and worry processes. This study suggests the possibility of a causal role of worry on symptomology and levels of disability in the FM group, as worry was not related to symptom levels and distress in the arthritis group, an illness with an identifiable and disabling pathology. The study was limited by its small sample size, cross sectional design, lack of multivariate analysis, and its failure to control for factors such as depression.

FM has been strongly associated with poor sleep, with 99% of people with FM reporting poor sleep in one study (Theadom, Cropley and Humphrey, 2007). Disturbed REM sleep has been shown to cause skin hypersensitivity in experimental studies (Wei, Ma, Wang and Pertovaara, 2008) and has been associated with catastrophic worry (Harvey
and Greenall, 2003) and maladaptive metacognitive beliefs (Waine, Broomfield, Banham and Espie, 2009). The association of disturbed sleep with FM suggest that non-pathological physiological changes, perhaps in part maintained by increased arousal related to negative perseverative appraisals of illness are involved in the maintenance of this disorder (see Hamilton, Atchley, Karlson, Taylor & McCurdy, 2012 for a wider discussion of sleep and FM).

Worry has also been measured in studies of IBS (for example, Lackner and Quigley, 2005; Hazlett-Stevens, Craske, Mayer, Chang and Naliboff, 2003). Lackner and Quigley (2005) examined trait worry with the PSWQ in 186 consecutively referred patients with IBS (Rome II diagnosis) and found that scores were significantly positively associated with the emotionally unpleasant aspects of pain, particularly suffering. Worry and ‘catastrophizing’ were entered into a standard regression analysis with control variables such as somatisation and trait anxiety (although this did not include symptoms of anxiety and depression), which accounted for 47% of the variance in suffering, with only worry and ‘catastrophizing’ remaining significant predictors. The difficulty with measuring a concept such as ‘catastrophizing’, which is common in the cognitive behavioural research literature, is that there is no clear operationalization of what this is, other than being a ‘thinking error’, but seems to amount to thinking the worst (or perhaps more accurately described as worrying about the worst). A metacognitive account would only see catastrophizing as problematic if it was appraised as uncontrollable. A metacognitive account would explain excessive ‘catastrophizing’ as the metacognitive experience resulting from negative metacognitive beliefs around the uncontrollability and danger of cognitions (including physical sensations), and positive metacognitive beliefs such as ‘it helps to think the worst so that I’m prepared’.
Hazlett-Stevens et al (2003) also used the PSWQ to measure trait worry in student participants with \( n=77 \) and without IBS \( n=626 \); defined by Rome II criteria), and found that those with IBS had significantly higher levels of trait worry \( (p<0.01) \), and more firmly held beliefs that the physical sensations associated with anxiety were harmful \( (p<0.01; \) as measured by the Anxiety Sensitivity Index (Reiss, Patterson, Gursky and McNally, 1986)). A similar study by Drews and Hazlett-Stevens (2008) also found a significant association between trait worry and IBS, as well as a significant association of GAD with IBS. The beliefs reported in Hazlett-Stevens et al. (2003) study are redolent of the metacognitive belief ‘worry (about worry) will harm my body’, with increased anxiety caused by overly negative appraisals of normal physiological and perhaps worry processes potentially causing the increased autonomic arousal observed in IBS (Manabe, Tanaka, Hata, Kusunoki and Haruma, 2009), which may lead to exacerbation of observable symptoms seen in IBS of diarrhoea and constipation. A metacognitive account might suggest that such symptoms may be exacerabated by uncontrollability beliefs about worry, causing perseverative negative appraisals to continue, enhancing sympathetic tone. Strongly held negative beliefs about the need to control thoughts would cause negative cognitions to become more aversive and threatening, thus further increasing arousal and sympathetic tone. This would open the possibility that having the belief that worry can harm your body may increase the likelihood of physiological disturbance and physical symptoms, which in turn lends support to this appraisal; put simply, a vicious circle.

Illness worry in chronic fatigue syndrome has been examined by Taillefer, Kirmayer, Robbins and Lasry (2002, 2003). Taillefer et al. (2002) used a 12 item Illness Worry measure based on the well-validated Illness Behaviour Questionnaire (Pilowsky and
Spence, 1983), to examine the tendency to worry about and be convinced that one is ill, and to be more sensitive to pain and illness than other people, in people with chronic fatigue ($n=45$) and multiple sclerosis ($n=40$). In the CFS group, greater illness worry was associated with worse physical functioning, depressive symptoms and more somatic attributions when fatigue was controlled for. The level of functional impairments reported by the CFS group was greater than the MS group. Taillefer et al. (2003) examined the same sample of patients and reported significantly higher levels of worry as measured by the Illness Worry measure in CFS. There were no differences in levels of depressive symptomology across the patient groups, although neuroticism, depressive symptoms and a somatic attributional style were predictors of illness worry across both groups.

4.2 Threat Monitoring

The metacognitive concept of threat monitoring is similar to the concept of hypervigilance seen in cognitive behavioural accounts of chronic pain and functional somatic syndromes. A key difference in the metacognitive account is that threat monitoring can be seen as a deliberate conscious strategic process which results in greater attentional focus on and conceptual processing of areas of concern, rather than an automatic and involuntary bias. Whilst cognitive models do allow that people make deliberate attempts to identify threat, a metacognitive approach may provide a unifying theoretical framework that identifies what is common and essential in existing models, and offers clear strategies to reduce threat monitoring. A metacognitive perspective on threat monitoring encompasses a range of idiosyncratic active ways of looking out for internal and external signs of threat, such as searching for information on illnesses on the internet; checking or monitoring the mind or body for signs that something is wrong; and excessive
healthcare utilisation. These behaviours would be underpinned by metacognitive beliefs regarding the most appropriate ways of identifying and responding to threat, such as ‘if I expect the worst then I’ll prevent harm’ and metacognitive beliefs that coping behaviours are helpful, that therapy would challenge.

Threat monitoring is said to increase the sense of subjective perception of threat or danger, increase and enhance conscious attentional focus on threat, cause bias towards illness cognitions, and can help to initiate maladaptive metacognitive coping strategies such as worry, rumination, thought control and maladaptive coping behaviours, as strategies used to try to reduce symptoms or prevent serious illness, or reduce distress (see Wells, 2008). A metacognitive account would not necessarily predict that patients would display greater levels of general hypervigilance on experimental tasks (the tendency to be distracted by task irrelevant stimuli related to perceived difficulties (Eysenck, 1991) but would predict that experimental paradigms that reduce attention to the body would demonstrate decreases in distress and disability across a short time course. A metacognitive account would also predict that experimental designs which present neutral or ambiguous stimuli related to perceived health concerns would be interpreted more negatively, and that attentional bias should be observed in the presence of a threatening stimuli (towards or away from) when a subject’s attention is not allocated to competing task demands.

A number of experimental studies have tried to establish whether general hypervigilance to somatic and emotion related stimuli play a role in FM with equivocal results with some methodologically sound studies reporting no effects of expectancy or hypervigilance on pain (for example, Petzke et al. (2003). There is not space here to
consider all of this literature fully, for a review of the findings from research studies on general hypervigilance in the FM literature see Rollman (2009) and Fillingam (2005). The mixed findings reported in these studies may be as a result of the idiosyncratic signals patients may normally focus upon (internal sensations or thoughts rather than experimentally induced pain); the effects of poor sleep on task performance (Gonzalez et al. 2010 reported significantly slower reaction times on a Stroop task with people with FM compared to healthy controls but no significant main effects); statistical underpowering due to low sample size; and the possible hypersensitivity / hyperalgesia experienced by patients which may be in part be caused by dispositional factors or impaired sleep, which is ubiquitous in patients with FM. Killgore (2010) summarises that acute sleep deprivation results in slowed reaction times, significant reduction in pain tolerance for cold and heat, and is associated with reports of “spontaneous pain, including general physical discomfort, body pain, headache, muscle pain and stomach pain”. It would seem sensible for future experimental studies on FM to control for the effects of sleep.

In line with other cognitive process models and a metacognitive account, an experimental study by de Gier, Peters and Vlaeyen (2003) suggests that strategies that can reduce attention to threat could reduce disability; they found that patients with FM performed significantly better on a physical task when distracted by completing a cognitive task performed at the same time ($F(1,73)= 111.07, p < 0.01$). A recent small scale randomised controlled trial of an Attentional Modification Paradigm (AMP) in FM has shown clinically significant reductions in pain, suggesting that interventions which reduce maladaptive attentional focus may show promise in treating FM (Carleton, Richter & Asmunden, 2011).
Experimental evidence has been cited to support the role of hypervigilance to symptom related stimuli, including visceral stimulation, and reaction times to mood and symptom related words in IBS. Mertz, Naliboff, Munakata, Niazi and Mayer (1995) reported a significantly lowered threshold for aversive sensations and increased perception of intensity of sensations using anorectal manometry (inflation of a balloon causing distension in the lower bowel) which the authors cited as evidence to support hypervigilance. Work by Naliboff et. al (1997) extend these findings, showing that people with IBS are more likely to appraise neutral visceral gut sensations as aversive.

These findings may reflect dispositional hypersensitivities to gut sensations, or reflect unhelpful conscious attempts to look out for potential threat, labelling non-threatening sensations as aversive. Posserud, Svedlund, Wallin and Simren (2009) compared age and gender matched patients with IBS \( (n=36) \) to patients with identified gastrointestinal disease \( (n=40) \). They found that the patients with IBS were significantly faster at recognising words relating to the gastrointestinal system and negative affect when presented via tachistoscope \( (p=0.04 \) and \( p=0.03 \) respectively). This evidence was cited as evidence that people with IBS are biased towards gut and mood information, in comparison to patients with gastrointestinal disease with known pathology. Recently, Chapman and Martin (2011) have found a response bias towards pain related words in patients with IBS using a cueing task; this response bias was associated with increased symptom reporting and sick leave. This evidence of attentional response bias towards illness related information, may help to explain the findings of Crane and Martin (2002), who reported that patients with IBS report a significantly higher perceived health risk from the unrelated disorder of deep vein thrombosis compared to a control group and patients with asthma.
Body vigilance has also been identified as a contributory factor in models of non-cardiac chest pain (NCCP) (Mayou, 1998). White, Craft and Gervino (2010) examined the role of body vigilance, cardiac anxiety and interoceptive fear of pain in NCCP. A sample of 229 people with NCCP were shown to be significantly more attentive to cardiac compared to gastrointestinal sensations ($p<0.001; \delta=.94$). NCCP patients who met diagnostic criteria for an anxiety disorder were significantly more body vigilant compared to those who did not ($p<0.05, \delta=.66$). A latent variable path model showed that body vigilance and cardiac anxiety predicted interoceptive fear that in turn predicted pain. The authors concluded that NCCP “may persist partly due to conscious hypervigilance to and fear of cardiac congruent body sensations, particularly among anxious patients” (p.394). It seems possible that this vigilance is related to metacognitive beliefs around the importance of focusing on the body (for example, ‘monitoring my body for signs of illness will prevent my illness getting worse’). One controlled trial of cognitive behaviour therapy (CBT) for non-cardiac chest pain (Mayou, Bryant, Sanders, Bass, Klimes and Forfar, 1997) showed no significant effect on levels of distress, number of troubling physical symptoms and number of pain free days 6 months after treatment. The failure to significantly reduce distress over time in this trial may in part be due to the failure to explicitly challenge faulty metacognitions and strategies around monitoring for signs of threat.

In chronic fatigue, Moss-Morris and Petrie (2003), similarly to the Gonzalez et al. (2010) paper, report slowed processing compared to healthy controls on a Stroop task, but no significant main effects of general hypervigilance on mood and symptom related words on this task. However, the CFS patients did show a significant interpretation bias in an ambiguous cues task towards somatic words ($t(47) = 3.77, p < .001$). Hou, Moss-Morris, Bradley, Peveler and Mogg (2008) report a visual cueing task which demonstrated a bias
towards threat related stimuli at a stimulus onset asynchrony of 500ms in CFS in comparison to health controls (one-sample \( t \)-test \( (10) = 2.62, p = .03 \)). A mediational study of CBT effects on fatigue and disability in CFS by Wiborg, Knoop, Prins and Bleijenberg (2011) found that decrease in the focus on fatigue contributed significantly to the treatment effect of CBT for CFS. This suggests that reducing the time spent threat monitoring or focusing on perceived physical symptoms reduces the experience of being fatigued, and in turn increases the ability to carry out activities. Therefore, reducing focus on fatigue may become a clear treatment target for CFS. It seems possible that people with CFS have positive metacognitive beliefs around the importance of focusing and attending to perceived symptoms, as well as negative meta-beliefs around not being able to stop focusing on their symptoms and the negative consequences of paying or not paying attention to symptoms; literature which examines the association of metacognitive beliefs and CFS symptoms will be discussed presently.

The reported studies findings are in line with a metacognitive account, but do not offer direct support for this. Methodological difficulties such as failing to control for the effects of sleep hamper studies relating to attentional bias in functional somatic symptoms. As these studies do not directly aim to test a metacognitive model, important factors such as measures of self-focussed attention and metacognitive beliefs are not assessed, making it unsound to directly interpret these studies as support for a metacognitive account. These studies also suffer from small sample sizes, and lack of prospective analyses. The methodology of these studies is often fixed on the object level (measures of pain), rather than potentially more helpful meta-level judgments. For example, examining how much of the time is spent focussing on pain, or assessing whether it is possible not to focus on pain,
rather than on examining artificial experimentally induced stimuli, would seem more helpful in understanding how these meta-level judgments impact on distress and disability.

4.3 Thought Suppression

Thought suppression (the process of deliberately trying not to think about and avoid cognitive events such as thoughts, images, emotions and physical sensations) has been widely investigated in psychological problems. In a review article, Wenzlaff and Wegner (2000) highlighted the role of metacognition in thought suppression, in particular the metacognitive belief that “suppression could succeed” in getting rid of unwanted thoughts, as well as the belief of not having control over intrusive thoughts, relating to failed attempts to suppress intrusive thoughts. The SREF model predicts that thought control strategies such as thought suppression are involved in the maintenance of the CAS, as they help maintain attentional focus on the things people are trying to actively avoid, and cause cognitions to be perceived as uncontrollable. There is evidence that thought suppression plays a key role in the maintenance of psychological disorders such as generalised anxiety disorder, obsessive compulsive disorder and post-traumatic stress (see Purdon, 1999).

There were no studies identified in the systematic search on thought suppression in the functional somatic syndromes discussed, although papers were identified in the related area of chronic pelvic pain and chronic pain. In a cross sectional correlational study of patients with chronic pelvic pain (CPP) by Thomas, Moss-Morris and Faquhar (2006), levels of suppression of unwanted thoughts and emotions distinguished CPP patients from healthy controls. Burns et al. (2008) provides some evidence that thought suppression may play a role in chronic pain. Fifty-eight chronic pain patients were randomly assigned to a
suppression or control group and completed a stress inducing experimental computer task. The suppression group was told to suppress anger, and reported significantly greater levels of pain and exhibited more pain behaviours in the stressful task than the control group. However, in a clinical sample of chronic pain patients, Harvey and McGuire (2000) found no immediate increase of pain related thoughts when chronic pain patients were asked to suppress thoughts of pain for 5 minutes, compared to patients told to attend to pain. This study did have some limitations in experimental design, with a small sample size, (n=14 and 12 respectively), and asked patients to actively attend to their pain, which would be likely to result in increased pain related thoughts.

In the wider pain literature, Sullivan, Rouse, Bishop and Johnstone (1997) demonstrated that participants asked to suppress pain related thoughts before immersing their hand in ice water experienced more intrusive thoughts and more pain than participants who were not given suppression instructions. Cioffi and Holloway (1993) found that participants asked to suppress pain during a cold pressor pain induction reported the slowest recovery from pain, and a greater rating of discomfort during the application of a non-aversive vibrating stimulus. Masedo and Esteve (2007) found that a group of students asked to try not to control thoughts and emotions about pain (analogous to the metacognitive therapy technique of detached mindfulness (Wells, 2005)) during a cold pressor test, reported less pain and distress than a group asked to cope spontaneously. A third group asked to suppress thoughts about pain reported the greatest levels of pain and distress. More widely still, suppression of emotions during a writing task was found to result in a significant decrease in CD3 T lymphocyte cells (Petrie, Booth and Pennebaker, 1998), whilst writing about emotional topics increased CD4 T lymphocyte cells. Suppression of expressed emotion in experimental tasks has also been shown to lead to
increased sympathetic activation (Gross, 1998) and increased subjective anxiety (Levitt, Brown, Orsillo and Barlow, 2004) in comparison to controls. This evidence suggests that thought suppression may have effects on the numbers of intrusive thoughts experienced, the level of pain experienced, physiological processes in the body, and a negative impact on emotional well-being in functional somatic syndromes, although the evidence presented is clearly not sufficient to offer strong support for a role for thought suppression in these conditions.

Outside the pain literature, Brown, Danquah, Miles, Holmes and Poliakoff (2010) found a significant association between scores on a measure of functional neurological symptoms (the somatoform dissociation questionnaire; SDQ-20; Nijenhuis Spinhoven, van Dyck, van der Hart and Vanderlinden, 1996) and the time course of attention to touch following a neutral and aversive stimluli, finding evidence for greater body vigilance after the neutral stimulus, and cognitive avoidance of touch after the aversive stimluli. This study suggests that as well as the suppression of aversive thoughts, those with a tendency towards experiencing functional somatic symptoms may also try to suppress or avoid reminders of aversive cognitive events such as sensations or emotions. These findings concur with research by Drew and Hazlett-Stevens (2008) that demonstrated that people with IBS reported greater experiential avoidance.

5. Are functional somatic syndromes associated with maladaptive metacognitions?

Two studies were identified examining the association of metacognitive beliefs with symptoms and distress in chronic fatigue syndrome. A cross-sectional study by Maher-Edwards, Fernie, Murphy, Wells and Spada (2011) examined the association of
metacognitions as measured by the MCQ-30 with symptom severity in chronic fatigue syndrome. The study found that metacognitions were positively associated with measures of symptom severity and were a better predictor of symptoms than anxiety or depression. Hierarchical multiple regression analyses indicated that the cognitive self-consciousness subscale of the MCQ-30 predicted mental and physical symptoms of CFS, and beliefs about the need to control thoughts predicted mental symptoms of CFS. However, the possibility should not be ruled out that the significant associations with maladaptive metacognitions are a result of symptoms rather than a factor in symptom aetiology and maintenance; prospective and treatment studies are needed to clarify this relationship.

A follow up study by the same research group (Maher-Edwards, Fernie, Murphy, Nikcevic and Spada, In Press) interviewed 10 patients with chronic fatigue with the Metacognitive Profiling Interview Template (Wells, 2000) and found evidence of positive and negative metacognitive beliefs relating to illness cognitions (e.g. ‘Maybe I’m over-focusing on it, but I feel I have no choice’), could identify stop signals (signals patients used to decide when to stop focussing on or ruminating about their symptoms (e.g. ‘when I am rested’), and reported using thought control strategies, such as distraction and monitoring of symptoms, to manage symptoms and negative affect. All 10 patients described a perseverative appraisal of their illness, described as a form of rumination in 10 patients and worry in 2 patients. This follow up study offers interesting clinical observation, but cannot be seen to offer clear experimental evidence to support the role of maladaptive metacognitions.
6. Conclusion

The evidence reviewed here could be seen to be in line with a metacognitive account of functional somatic symptoms and may offer preliminary evidence to support such an account, but cannot be seen as necessary or sufficient to definitively support such an account. There does appear to be clear associations with worry and symptom presentations in functional somatic symptoms, when compared to those with non-functional symptoms. The lack of research directly addressing metacognitive strategies or metacognitive beliefs (in particular prospective studies), leads to the conclusion that functional somatic symptoms may be associated with maladaptive metacognition, but cannot be claimed to be a causative factor in patients presentations at present.

Evidence to support the direct effect of threat monitoring is lacking, with research studies needed to examine the presence of metacognitive beliefs around monitoring for threat, combined with outcome measures looking at areas such as attentional focus, illness behaviours and preoccupation. Although Deary, Chalder and Sharpe (2007) claim that it is difficult to assess attention, a metacognitive account would not accept this to be the case, where patients could be asked simple direct questions about their level of body focussed attention and time spent thinking about and focussing on their symptoms.

Future research to address whether the metacognitive SREF account could offer an explanatory model of symptoms and presentations of patients with functional somatic symptoms would address the association with positive and negative beliefs around worry, rumination and threat monitoring; and body focussed attention, preoccupation with symptoms, distress, symptom severity and importantly illness behaviours. It would also be
important to examine how metacognitive beliefs may differ across symptom profiles, as observed in anxiety disorders (Barahmund, 2009), to offer the potential of clear targets for therapeutic intervention.

The research studies discussed are limited in their ambition and focus, and transpose poorly to clinical work. Some of the limitations and lack of firm conclusions garnered from these research studies as a whole may also reflect the limitations and poor explanatory power of the theoretical assumptions or cognitive models they are attempting to test. In particular, the role of worry and rumination appears to have been addressed indirectly in research studies, without an attempt to understand these processes, which may be central to further understanding of functional somatic symptoms. A metacognitive account would see these potential maintaining factors as conscious attempts to cope, and would not rely upon concepts such as schema. This reframes patients as actively attempting to cope with difficulties in ways which maintain them.

Whether the patterns of attentional focus, behaviour and cognitive strategies reported in functional somatic syndromes is due to maladaptive metacognition would need to be examined in research studies focussed directly on examining such questions. The research discussed tries to outline the limitations of current approaches, such as cognitive behavioural therapies, and begins to offers a conceptual account which attempts to negotiate these limitations. Recent accounts of health anxiety and functional somatic symptoms have begun to highlight the limitation of cognitive behavioural approaches, and are moving more towards meta-level process models and understandings of such complaints, such as Knoop, Prins, Moss-Morris and Bleijenberg’s (2010) account of CFS.
which outlines the importance of attentional focus on fatigue, and maladaptive beliefs about fatigue and behaviour.
References


Part 2: Empirical Paper

Are metacognitions associated with physical symptom reporting, health preoccupation, distress and illness behaviours?

This research paper was prepared in line with the guidelines for “Behavioural and Cognitive Psychotherapy”. The author information pack is available in Appendix C.

Word count: 7802 (excluding references)
Abstract

Background: Excessive physical symptom reporting is a major clinical problem, associated with distress, disability and increased healthcare utilisation. Maladaptive metacognitions (beliefs about strategic thought processes such as worry, rumination and attentional monitoring for threat) have been shown to predict health anxiety, but have not been examined directly in relation to symptom reporting.

Aims: The study evaluated the hypothesis that metacognitive beliefs are significantly associated with physical symptom reporting in primary care patients. A secondary aim was to provide a preliminary evaluation of a new metacognitive measure; the metacognitive health questionnaire (MCHQ).

Method: Fifty participants recruited from general practice surgeries took part in the study. Spearman’s rank correlations between meta-beliefs and strategies, physical symptom reporting, health anxiety, catastrophic misinterpretation, health preoccupation and health distress were evaluated in a cross-sectional study of primary care patients.

Results: Clinically significant levels of physical symptoms were reported by the study sample. Negative meta-beliefs about worry and meta-beliefs about the need to control thoughts on the MCQ-30 were significantly associated with levels of physical symptom reporting. Positive and negative meta-beliefs on the MCHQ were significantly associated with health preoccupation, health-related distress, body-focussed attention, illness behaviours and thought-control strategies on the same instrument.
Conclusion: This study provides preliminary support for the hypothesis that metacognitive beliefs are associated with physical symptom reporting, and health-related preoccupation and distress. Further research is needed to refine the MCHQ measure and to establish whether it has superior predictive validity to the MCQ-30 in the physical health domain.

Abstract word count =245

Key words: Symptom reporting, metacognitive, metacognitions questionnaire, somatisation, health anxiety
Introduction

This study aims to begin to understand the relationship between physical symptom reporting and metacognition. Physical symptoms such as fatigue, headaches, back pain, nausea, chest pain and shortness of breath are common in the general population (Rief, Hessel and Braehler, 2001) and a major reason for doctor visits in both primary and secondary care. Research suggests that, in the majority of cases, such physical symptoms do not have a clear organic cause and can therefore be described as somatoform, functional or “medically unexplained” symptoms (Kroenke and Mangelsdorff, 1989; Mayou and Farmer, 2003). Patients with multiple medically unexplained symptoms are often diagnosed with functional somatic syndromes such as irritable bowel syndrome (IBS), chronic fatigue syndrome (CFS) and fibromyalgia (FM). Criticism of the diagnostic and clinical validity and utility of current DSM IV diagnoses (see Ladwig, Marten-Mittag, LaCruz, Henningsen and Creed, 2010) has led to researchers arguing for the need to examine bodily symptoms directly (Sharpe, Mayou and Walker, 2006). One recent paper found that 76% of the symptoms endorsed in primary care on the Patient Health Questionnaire 15 (PHQ-15; Kroenke, Spitzer and Williams, 2002) lacked an identifiable organic basis (Korber, Frieser, Steinbrecher and Hiller, 2011), illustrating the prevalence of such symptoms. Nimnuan, Hotopf and Wessely (2001) examined symptom reporting in secondary care outpatient clinics and found that 50% of patients in secondary care proved to have medically unexplained symptoms, illustrating how commonplace these symptoms are in wider medical settings.

In many cases these unexplained symptoms cause few problems and resolve spontaneously, although some people ultimately become seriously disabled by their
symptoms and / or attend repeatedly with different functional symptoms (see Simon and Gureje, 1999). A study investigating 5-year symptom outcomes in primary care (Jackson and Passomonti, 2005) suggests that most patients experience symptom improvement (81%), although only 56% of symptoms resolved, leaving 25% of reported symptoms unexplained, with the large majority of the unexplained symptoms not associated with psychological disorder.

Physical symptoms are commonly a sign of psychological distress, and the large majority of patients with common mental health difficulties such as anxiety and depression initially present with physical symptoms (Kirmayer and Robbins, 1991). Indeed, in those reporting psychological distress, all types of physical symptom are reported more commonly (De Waal, Arnold, Spinhoven, Eekhof, and van Hemert, 2005). Physical symptom reporting is also related to the extent of chronic disease (Ladwig et al., 2010). Nevertheless, patients who report multiple physical symptoms have been shown to utilise healthcare at twice the rate of other patients, even when psychiatric and medical co-morbidity is accounted for (Barsky, Orav and Bates, 2005). Collectively, such patients have been estimated to cost $236 billion every year in the USA (Barsky et al., 2005). Such patients should not be dismissed as a nuisance however; Gill and Sharpe (1999), reviewing the literature on frequent consulters of general practice, concluded that frequent consulters are likely to “have multiple, complex problems, often including chronic physical disease, with or without psychological and social problems” (p.115).

Kirmayer and Robbins (1991) demonstrated that symptom reporters without co-morbid physical illness could be operationalised into three main types; 1) those reporting high levels of functional somatic distress, 2) health-anxious patients identified via high
levels of illness worry and 3) exclusively somatic clinical presentations of people who met criteria for anxiety and depression. Prospective research in secondary care (Jackson, Fiddler, Kapur, Wells, Tomenson and Creed, 2006) has shown that although somatic symptoms were significantly associated with health anxiety, health anxiety did not significantly predict the number of medical consultations or functional disability in those whose symptoms were not explained, suggesting that this construct may fail to capture health outcomes related to functional somatic symptoms.

Cross-sectional studies show that symptom reporting is associated with the long-term mood disposition towards negative affectivity, which a number of studies have shown to be significantly associated with subjective (but not objective) physical symptom reports (see Watson and Pennebaker, 1989); worries about the risk to health from technology and aspects of modern life (Rief et al, in press); health worry, preoccupation and reassurance seeking (Aggarwal, McBeth, Zakrewska, Lunt and McFarlane, 2006); psychological distress and psychiatric illness (Kroenke, 2003); psychological trauma (Roelofs and Spinhoven, 2007); domestic violence (Macauley et al, 1995); neglect and adversity (Spertus, Yehuda, Wong, Halligan, and Seremetis, 2003); difficulty identifying feelings (De Gucht, Fischler, and Heiser, 2004; Wearden, Lamberton, Crook and Walsh, 2005) and attachment style (Ciechanowski, Walker, Katon and Russo, 2002). Prospective studies indicate that symptom reporting and healthcare use can be predicted by health anxiety and illness behaviours (Kapur, Hunt, McBeth, Creed and McFarlane, 2004); negative illness perceptions (Frostholm et al, 2007); preoccupation and worry about health (Robbins and Kirmayer, 1996; Looper and Kirmayer, 2001); selective attention to the body and negative affect (Kolk, Hanewald, Schagen and Gijsberg van Wijk, 2003).
Given the apparent importance of psychosocial factors in physical symptom reporting and the ineffectiveness of biomedical intervention for these patients (see McLeod, Budd and McClelland, 1997), treatment has focused on psychological interventions such as cognitive behavioural therapy (CBT), which has proven efficacy in the treatment of functional somatic symptoms (Kroenke, 2007; Allen, Escobar, Lehrer, Gara and Woolfolk, 2002). Randomised controlled trials do, however, show modest effect sizes, with a large percentage of people treated not showing any treatment effect, and many of those that do, relapsing (for example Mayou, Bryant, Sanders, Bass, Klimes, and Forfar, 1997). One potential problem with current cognitive behavioural treatments related to health concerns is that they tend to focus primarily on the content of cognition (such as negative automatic thoughts) and hypothesised thinking errors such as catastrophic misinterpretation, fortune-telling and selective abstraction; rather than cognitive processes such as worry that may lead to this content (for example Marcus, Hughes and Arnau, 2008), although these processes are often seen as secondary targets and are loosely formulated. This is beginning to be addressed, with researchers starting to highlight the importance of higher-level thinking processes in functional somatic syndromes such as chronic fatigue syndrome (see Knoop et al., 2010). Specific beliefs around cognitive processes such as the perceived importance of focussing on symptoms, and unhelpful beliefs about coping behaviours such as exercise (Knoop et al, 2010) have been loosely described, although as to how these cognitive processes can be married theoretically to a cognitive behavioural approach remains unclear.

Research suggests that cognitive processes such as worry and selective attention to the body may be central to physical symptom reporting (see Brown, 2004). These are processes that may guide the content of cognition. Unhelpful beliefs about these processes
(for instance, that it is impossible to stop focussing on symptoms) are not directly addressed using traditional cognitive behavioural models based on schema theory (Beck, 1967), although strategies to tackle these processes are incorporated into more recent accounts of psychological disorder (see Clark, 1999), acknowledging their role in difficulties, but not clearly operationalising how they relate to them, beyond describing them as part of a maintenance cycle.

Behavioural maintenance processes are, however, clearly addressed in cognitive behavioural therapy, although therapeutic models posit that negative appraisals lead directly to behaviours (influenced by underlying ‘schemas’). It is quite possible to have negative thoughts and beliefs about illness without checking your body or visiting the doctor, and it may seem more logical to view overarching beliefs about these behaviours as leading to them being carried out (for example ‘my coping behaviours will prevent illness’ or ‘if I don’t carry out my coping behaviours, my health will suffer’) – beliefs that are often implicitly challenged in CBT. Beliefs about these cognitive processes and behavioural strategies (meta-beliefs) would, however, be directly addressed by metacognitive therapy (MCT), a transdiagnostic therapy based on supervisory regulatory executive function theory (SREF; Wells and Matthews, 1994).

Metacognition can be described as the conscious monitoring and control of cognition (verbal thoughts, mood, mental imagery and internal sensations), and is said to govern how we respond to and make sense of conscious cognition (Nelson and Narens, 1990) in the service of our goals. The SREF model predicts that maladaptive meta-beliefs lead to the use of unhelpful strategies for dealing with perceived difficulties, such as thought suppression, threat monitoring, maladaptive coping behaviours (such as
reassurance-seeking, checking and avoidance) and excessive self-focussed attention, resulting in perseverative appraisal processes (worry and rumination) and increased distress. This iterative cycle of unhelpful cognitive and behavioural processes has been termed the cognitive-attentional syndrome (CAS; see Wells, 2008). Common maladaptive metacognitions include “positive” meta-beliefs such as ‘worry will keep me prepared’, which are said to initiate unhelpful control strategies, and “negative” meta-beliefs such as ‘my negative thinking persists no matter how I try to stop it’, which are said to increase the sense of uncontrollability, danger and significance resulting from unhelpful thinking patterns and coping behaviours.

The metacognitions questionnaire (MCQ; Cartwright-Hatton and Wells, 1997) and its 30-item short form (MCQ30; Wells and Cartwright-Hatton, 2004) has been used to measure meta-beliefs in research studies examining SREF theory in psychological disorders, and has been shown to be associated with or predictive of symptoms in a wide range of disorders, including psychosis, depression, obsessive compulsive disorder and generalised anxiety (see, Wells 2008). The MCQ and MCQ30 are both self-report questionnaires made up of five factors: (i) positive beliefs about worry (believing that worrying helps to solve problems and avoid negative consequences); (ii) negative beliefs about the uncontrollability and danger of worry; (iii) cognitive confidence (appraisals of confidence in attention and memory); (iv) negative beliefs concerning the consequences of failing to control thoughts; and (v) cognitive self-consciousness (the tendency to focus on and monitor thought processes) (Wells and Cartwright-Hatton, 2004).

Research in the related area of health anxiety has been shown to be significantly associated with the negative beliefs about worry and need to control thought subscales of
the MCQ, and negative beliefs about health worry and the cognitive self-consciousness subscale of the MCQ were shown to predict health anxiety, when confounds were controlled for (Bouman and Meijer, 1999). Outcomes on cognitive behavioural group treatment of health anxiety have also been shown to be predicted by scores on a Dutch measure of metacognitions about health anxiety (MCHA), allowing the possibility that treatment may work by changing metacognition (Buwalda, Bouman and Van Duijn, 2008). More recent research has suggested that symptoms of chronic fatigue, a functional somatic syndrome, are predicted by the cognitive self-consciousness and cognitive confidence subscales of the MCQ-30 (Maher-Edwards, Fernie, Murphy, Wells and Spada, 2011). The metacognitive therapy techniques of attention training and worry postponement have also been piloted in treating health anxiety and somatic symptoms, with promising preliminary results (Papageorgiou and Wells, 1998; Brosschot and van der Doef, 2006). Bouman and Meijer (1999) suggest the existence of disorder-specific meta-beliefs related to health, which were said to be more predictive of health concerns.

The research highlighted, although preliminary, supports the applicability of SREF theory to symptom reporting, with cross-sectional and prospective studies supporting the contribution of metacognitive strategies and metacognitive beliefs towards patients difficulties. Previous work in the area of obsessive compulsive disorder (Gwilliam, Wells and Hatton, 2004) has also demonstrated that metacognitive beliefs predicted symptoms when cognitions of responsibility were controlled for, suggesting that, in other disorders, metacognitions rather than cognitions may be the key to therapeutic change. In somatic symptom reporting and health anxiety, cognitions relating to catastrophic misinterpretation of bodily processes are hypothesised to be core aspects of cognitive behavioural models of these disorders and primary treatment targets (Salkovskis and Clark, 1993; Warwick and
Salkovskis, 2001; Rief, Hiller and Margraf, 1998; Kirmayer and Looper, 2006). It would be of theoretical and clinical utility to see if metacognitions could predict symptom reporting once such cognitions were controlled for. There is a lack of research examining metacognition and symptom reporting; this study will aim to begin to address this, examining whether SREF theory can be applied successfully.

Study Aims

The primary aim of the study is to examine the associations between physical symptom reporting and metacognitive beliefs and strategies, as the previous work described above suggests that metacognitive beliefs are significantly associated with and predictive of symptoms. No previous study has systematically examined metacognitive beliefs and strategies in this area. The study aims to examine these associations by measuring somatic symptoms using a well validated measure of symptom reporting, the Physical Health Questionnaire 15, and metacognitive beliefs using relevant subscales of the MCQ-30.

The secondary aim of the study is to provide validation to the theoretically derived Metacognitive Health Questionnaire, assessing its internal validity, test re-test reliability and initial predictive validity. Predictive validity will be measured by examining associations between the PHQ-15 and the illness behaviours, thought control strategies, preoccupation and distress subscales of the MCHQ. Finally, the association of health anxiety with catastrophic misinterpretation will be examined.
Method

Study Design and Recruitment

The cross-sectional study data reported here are taken from an on-going wider prospective cohort study conducted in collaboration with a postgraduate student in the Department of Psychology at the University of Manchester, investigating symptom reporting, attention to the body, somatic disturbance and metacognition in patients recruited from primary care. This wider study involves two assessment sessions spaced six months apart, involving the completion of computer tasks of attention to the body and somatic disturbance, and the completion of a battery of self-report questionnaires. The data and findings discussed here involve only select questionnaire measures from the initial assessment session. The study received ethical approval from the north west NHS Research Ethics Committee (reference number 11/NW/0377), and approval from the Manchester Primary Care Trust to recruit from GP practices in Central Manchester who agreed to take part in the study. Two GP practices were initially approached by the author and agreed to take part, with one further practice included after recruitment proved difficult. Patients were recruited to the study from general practitioners’ waiting rooms by the paper’s author and collaborating postgraduate student, and assessed at the University of Manchester by the collaborating postgraduate student. Patients aged 18-50 years, who could read and write sufficiently well to complete self-report measures and experimental tasks and did not suffer from any major sensory impairments were included in the study (the experimental tasks required judgments around touch). Patients over the age of 50 were not included as chronic disease becomes much more prevalent with age, making it
more difficult to differentiate potential causes and predictors of symptom reporting in this age group.

Patients were recruited between November 2011 and May 2012. Fifty individuals (36 females, 14 males) participated in the cross-sectional study reported here, part of the wider on-going prospective experimental study. The mean age of the study participants was 37.0 years (SD=8.5) and the age range was 21-49. The sample defined itself as 77% White European and 23% Black and Minority ethnicity. Patients were given slips by receptionists at GP practices (see Appendix D) on arrival at the surgery, informing them that they may be approached for the research study, and posters were placed in the waiting room advertising the study (see Appendix E). Patients within the age group were approached for the study and given a copy of the patient information booklet (see Appendix F). If they were interested in participating in the study, patients were invited to complete a reply slip contained within the patient information booklet or to give their contact details directly to the researcher. They could indicate that they were not interested in the study by passing the booklet back to the researcher. Patients were followed up a minimum of 24 hours later with a phone call by one of the researchers. The study was then explained again in more detail, offering patients the opportunity to ask further questions and decide whether they wished to be assessed. Assessment sessions took place at the University of Manchester, where the participants could discuss the study again in further detail with examples from the experimental tasks given. Participants were asked if they had any questions and written informed consent (Appendix G) was obtained once participants had indicated that they were happy to proceed. Participants were told that data collected in the study would be anonymous, and that they could withdraw consent to take part in the study at any point.
Procedure

To reduce the burden placed on participants on the day of assessment, self-report questionnaires were completed in two parts, with the first part sent to their home before the study day, to be completed and brought with them, and the rest completed on the study day itself along with the two computerised psychological tasks. The measures in each questionnaire pack are given below, with a description and rationale for the use of measures used in this study given in the Measures section.

Questionnaire pack 1: Charlson comorbidity index (Charlson, Pompei, Ales and MacKenzie, 1987), Health Care Usage (a novel measure devised for the experimental study), State trait anxiety inventory – trait version (Spielberger, 1983), Metacognition Questionnaire 30 (Wells and Cartwright-Hatton, 2004); Cognitions and Beliefs About Health questionnaire (CABAH, Rief, Hiller and Margraf, 1998).

Questionnaire pack 2: Physical Health Questionnaire 15 (Kroenke, Spitzer and Williams, 2002), Health Anxiety Inventory – Short form (SHAI; Salkovskis, Rimes, Warwick and Clark, 2002), Metacognitive Health Questionnaire (a measure devised by the author) and Brief Symptom Inventory (Derogatis, 1993).

The testing sessions (experimental tasks and questionnaires) were approximately two hours in duration. Participants’ handedness was also assessed for the experimental study using the Edinburgh handedness inventory at the beginning of the first session. There were two orders in which participants completed the experimental tasks and questionnaires. Order one: experimental task one (attention task), questionnaires, experimental task two (somatic judgment task). Order two: experimental task two,
questionnaires, experimental task one. Participants were randomised to order one or order two at session one and went on to complete the tasks and questionnaires in the same order at session two. This ordering procedure controls for the possibility that the order in which the tasks are completed affects participant’s responses. Participants were debriefed on the study day and, two weeks after the study day, a further copy of the Metacognitive Health Questionnaire (MCHQ) was sent out to each participant to be completed and returned, until sufficient numbers were returned to complete a test re-test reliability calculation (the minimum number recommended by a University of Manchester statistician was 25).

Data Analysis

It was hoped that around 150 participants would take part in this study, which would allow multiple linear regression analysis, to evaluate predictive validity of the two metacognitive measures (MCQ-30 and MCHQ) on symptom reporting, once known and theoretical confounds, such as trait anxiety, anxiety and depression, health anxiety and cognitions and beliefs about health were controlled for. Unfortunately, it proved much harder to recruit to the study than anticipated and a much smaller sample size was recruited. Initial data analysis aimed to summarise associations between theoretical constructs measured by self-report instruments. It was then hoped that it would be possible to carry out partial correlations, where the association of metacognitive correlates would be examined whilst controlling for known predictors of symptom reporting, health anxiety as measured by the SHAI, depression and anxiety as measured by the BSI depression and anxiety subscales. Cronbach’s alpha was calculated for all of the subscales used in the study in order to understand whether the items forming the subscales could be said to form part of a reliable construct and have an acceptable internal consistency with Cronbach’s
alpha >.7 (Bland and Altman, 1996). This was considered particularly important for the unvalidated MCHQ. Test re-test for the MCHQ was calculated by correlational analysis, which is widely used in other experimental studies.

**Measures**

Patient Health Questionnaire – 15 (PHQ-15)

The PHQ-15 (Kroenke, Spitzer and Williams, 2002) was included in the study as it is a widely used somatic symptom scale of 15 symptoms that together make up approximately 90% of the physical complaints reported in primary care. This measure includes 14 of the 15 most common symptoms identified in DSM IV somatisation disorder. Patients are asked to rate how much each symptom bothered them on a 3-point scale, where 0 equalled “not bothered at all”, 1 indicated “bothered a little” and 2 stood for “bothered a lot”. PHQ-15 scores range from 0-30, with scores of 5, 10 and 15 representing cut-off points for low, medium and high somatic symptom severity, respectively. This measure is reported to have good internal validity, with Cronbach’s α=0.80 in the primary care sample used in the validation study. Scores on this measure are significantly associated with disability and healthcare usage (Kroenke, Spitzer, Williams and Lowe, 2010). Test re-test reliability was not reported.
Metacognitions Questionnaire 30 (MCQ-30)

The well validated MCQ-30 (Wells and Cartwright-Hatton, 2004) was included as it is a widely used measure of maladaptive metacognition and has been found to be predictive of symptoms in psychological disorders, health anxiety and functional somatic symptoms (Solem, Tellefsen Haland, Vogel, Hansen and Wells, 2009; Bouman and Meijer, 1999; Maher-Edwards, et al., 2011). The MCQ-30 (Wells and Cartwright-Hatton, 2004) has 30 items assessing beliefs about thinking. Responses are made on a four-point scale (1: do not agree; 2: agree slightly; 3: agree moderately; 4: agree very much). The measure has five subscales, namely: (1) positive beliefs about worry; (2) negative beliefs about the controllability of worry and corresponding danger; (3) cognitive confidence; (4) negative beliefs about the consequences of failing to control thoughts; and (5) cognitive self-consciousness (focussing attention on aversive thoughts and thought processes). Higher scores on subscales suggest greater difficulties, for example higher scores on the negative beliefs about worry subscale indicates perceived inability to manage worry and perceived harmful consequences resulting from this. This measure has good internal validity and adequate test re-test reliability, with a Pearson’s re-test correlation for the whole scale of 0.75, \( p<.005 \). For the purposes of this study, the subscales related to negative beliefs about worry, negative beliefs about the need to control thoughts, and cognitive self-consciousness were included, as these were areas considered theoretically relevant to this study.
Metacognitive Health Questionnaire (MCHQ)

This unvalidated measure was devised as a clinical metacognitive measure for working with preoccupation and distress related to health. This measure of meta-beliefs aims to capture positive and negative beliefs around worry, rumination and threat monitoring related to physical health concerns. The items on the measure were theoretically derived by the paper’s author, in line with the predictions of SREF theory. In the first section of this measure 14 items aim to capture positive meta-beliefs related to health (such as ‘I must think about my health to make sense of it’) and 18 items aim to capture negative meta-beliefs (such as ‘when I start thinking about my health, I cannot stop’). These are scored on a 0-10 scale with 0 being ‘I don’t believe this at all’ and 10 indicating ‘I agree with this completely’. The second section contains 10 items related to thought-control strategies specifically related to health (for example, ‘I try to control my thoughts’ and ‘I avoid thinking about my symptoms’), making up the thought-control subscale, and 8 items related to unhelpful coping behaviours (for example ‘I check my body’ and ‘I ask someone for reassurance’), making up the illness behaviours subscale. The final section contains five groups of four statements, each of which is rated on a 4 point scale (0-3) assessing frequency of thoughts about health, duration of thoughts about health, body focussed attention, frequency of distressing thoughts about health, and severity of health-related distress. The first three of these questions are summed to make up the preoccupation subscale of this measure (total score of 9); the last two are summed to make up the distress subscale (total score of 6).
Health Anxiety Inventory – Short Form (SHAI)

The SHAI (Salkovskis, Rimes, Warwick and Clark, 2002) is a well validated and widely used measure, included in this study to control for levels of health anxiety, shown previously to predict symptom reporting, as well as examining the association with this measure and symptom reporting, which has not previously been measured. The short form SHAI is designed to measure self-rated health anxiety, with the sensitivity to differentiate those with mild health concerns to those with severe hypochondriasis. The short form contains 14 groups of four statements, where participants choose one of the four statements, scored from 0-3, corresponding closest to their view. The 14 statements are then summed to give a total score out of 42, with higher scores indicating more severe health anxiety. The estimated cut-off score for people meeting DSM IV TR hypochondriasis (American Psychiatric Association, 2000) with this measure is 18 (Rode, Salkovskis, Dowd and Hanna, 2006).

Cognitions and Beliefs about Health (CABAH) Questionnaire

The CABAH (Rief, Hiller and Margraf, 1998) was originally included in the study to examine whether metacognition predicted symptom reporting once maladaptive cognitions and beliefs about health were controlled for. As multiple regression was not possible, it was still used in the analysis, to examine the relationship between catastrophic interpretation of bodily processes, health anxiety and metacognition. This measure contains 31 items corresponding to dysfunctional cognitions and beliefs about health on a 4-point scale (3=completely right, 2=mostly right, 1=mostly wrong, 0=completely wrong). The items on the scale were theoretically derived to correspond to a cognitive behavioural
approach to somatising behaviour. This questionnaire is reported to have good internal consistency and discriminant validity for somatising and hypochondriacal patients (Rief, Hiller and Margraf, 1998). Factor analysis of this measure led to a five-factor solution, giving the following subscales: catastrophising interpretation of bodily complaints, autonomic sensations, bodily weakness, intolerance of bodily complaints and health habits.

1

Brief Symptom Inventory (BSI)

The BSI (Derogatis, 1993) is a well validated and reliable measure of general psychopathology consisting of 53 items, which form nine symptom dimensions: Somatization, Obsession-Compulsion, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism; and three global indices of distress: Global Severity Index, Positive Symptom Distress Index, and Positive Symptom Total. The global indices measure current levels of symptoms and intensity of symptoms, respectively. For this study, only the anxiety and depression subscales were included to control for levels of anxiety and depression using partial correlation. These subscales consisted of 6 items, which could be answered on a 5-point Likert scale (0=not at all, 1=a little bit, 2=moderately, 3=quite a bit, 4=extremely).

1 One of the questions of this measure was missed out by another member of the research team; the question formed part of the 14 items which made up the catastrophising interpretation of bodily processes subscale.
Results

Preliminary Analyses and Exploration of Statistical Assumptions

Missing Data

The data set for the questionnaires was 99.995% complete, with only 7 missed data points on study questionnaires, although one participant did not complete the BSI due to fatigue on the study day. The data set for the re-test of the novel measure was 99.994% complete with 10 missing data points. Missing data was imputed using the missing values analysis function of SPSS 16 (SPSS, 2008) which replaced the data using expectation-maximisation. Little’s test of Missing Completely at Random (MCAR) with missing values (Little, 1988) was not significant for any of the replaced data points.

Tests of Normality

A number of variables appeared non-normally distributed on examination of Q-Q plots (SPSS, 2008), and a Shapiro-Wilk test (Shapiro and Wilk, 1965) was carried out to explore this, as this test is suitable for testing normality in smaller sample sizes. A number of the study variables were positively skewed and distributed non-normally (see Table 1). The PHQ total score, the MCQ need to control thoughts subscale, and the BSI anxiety and BSI depression subscales remained non-normal after log, square root and reciprocal transformation. Where partial correlations were initially planned for the purposes of examining the effect of controlling for health anxiety, anxiety and depression on the
association of MCQ subscales and symptom reporting, they were in fact not conducted as this requires a normal distribution (SPSS, 2008).
### Table 1 Shapiro-Wilk W test for normality of the self-report measures subscales used in the study

<table>
<thead>
<tr>
<th>Questionnaire measure subscale</th>
<th>Shapiro Wilk W Statistic</th>
<th>Significance (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Health Questionnaire 15</td>
<td>.951</td>
<td>.039*</td>
</tr>
<tr>
<td>MCQ: uncontrollability and danger</td>
<td>.941</td>
<td>.011*</td>
</tr>
<tr>
<td>MCQ: need to control thoughts</td>
<td>.937</td>
<td>.000*</td>
</tr>
<tr>
<td>MCQ: cognitive self-consciousness</td>
<td>.896</td>
<td>.157</td>
</tr>
<tr>
<td>MCHQ: positive beliefs</td>
<td>.971</td>
<td>.261</td>
</tr>
<tr>
<td>MCHQ: negative beliefs</td>
<td>.971</td>
<td>.258</td>
</tr>
<tr>
<td>MCHQ thought control</td>
<td>.971</td>
<td>.207</td>
</tr>
<tr>
<td>MCHQ: illness behaviours</td>
<td>.968</td>
<td>.145</td>
</tr>
<tr>
<td>MCHQ: preoccupation</td>
<td>.968</td>
<td>.189</td>
</tr>
<tr>
<td>MCHQ: distress</td>
<td>.870</td>
<td>.000*</td>
</tr>
<tr>
<td>SHAI</td>
<td>.965</td>
<td>.000*</td>
</tr>
<tr>
<td>CABAH: misinterpretation</td>
<td>.896</td>
<td>.129</td>
</tr>
<tr>
<td>BSI: anxiety</td>
<td>.892</td>
<td>.000*</td>
</tr>
<tr>
<td>BSI: depression</td>
<td>.849</td>
<td>.000*</td>
</tr>
</tbody>
</table>

Note: degrees of freedom = 49.

* Significantly non-normally distributed
Descriptive Statistics

Descriptive statistics of relevant variables of interest are shown in Table 2. It can be seen that the median of symptom reporting, as measured by the Physical Health Questionnaire 15, of 9 can be described as between moderate and high levels (see Kroenke, Spitzer and Williams, 2002), with a range that included low to severe levels of symptoms reporting. The median score on the SHAI was below the cut-off score for 18 for hypochondriasis, although a number of patients scored above this level, with a range including low to severe levels of health anxiety. This data suggests that a number of patients may score at levels that would meet criteria for a functional somatic syndrome, somatoform disorder or hypochondriasis. The descriptive statistics also suggest moderate to high levels of preoccupation and mild to moderate levels of distress overall.

Primary analyses: Correlations between metacognitions and physical symptom reporting

As can be seen in Table 3, the MCQ uncontrollability and danger of thoughts and need to control thoughts subscales both show significant moderate associations with total symptom score on the Physical Health Questionnaire 15 ($r_s(50)=.421$, $p=.002$ and $r_s(50)=.341$, $p=0.15$ respectively). A weak but non-significant association was seen with the PHQ 15 and the cognitive self-consciousness subscale ($r_s(50)=.233$, $p=.103$).
## Table 2. Descriptive statistics and internal consistency for study variables

<table>
<thead>
<tr>
<th></th>
<th>Median</th>
<th>Range (minimum-maximum)</th>
<th>Interquartile Range</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHQ15</td>
<td>9</td>
<td>23 (1-24)</td>
<td>5</td>
<td>.723</td>
</tr>
<tr>
<td>SHAI</td>
<td>10</td>
<td>23 (4-27)</td>
<td>7.5</td>
<td>.873</td>
</tr>
<tr>
<td>MCQ uncontrollability and danger</td>
<td>12</td>
<td>18(6-24)</td>
<td>8</td>
<td>.894</td>
</tr>
<tr>
<td>MCQ need to control thoughts</td>
<td>10</td>
<td>17 (6-23)</td>
<td>4.5</td>
<td>.818</td>
</tr>
<tr>
<td>MCQ cognitive self consciousness</td>
<td>14</td>
<td>16 (7-23)</td>
<td>7</td>
<td>.814</td>
</tr>
<tr>
<td>MCHQ positive meta-beliefs</td>
<td>63</td>
<td>121(7-128)</td>
<td>23.93</td>
<td>.754</td>
</tr>
<tr>
<td>MCHQ negative meta-beliefs</td>
<td>62</td>
<td>135 (8-143)</td>
<td>43</td>
<td>.891</td>
</tr>
<tr>
<td>MCHQ thought control</td>
<td>53</td>
<td>73(12-85)</td>
<td>14</td>
<td>.802</td>
</tr>
<tr>
<td>MCHQ illness behaviour</td>
<td>39</td>
<td>62 (4-66)</td>
<td>18.5</td>
<td>.752</td>
</tr>
<tr>
<td>MCHQ preoccupation</td>
<td>6</td>
<td>12 (2-12)</td>
<td>4</td>
<td>.708</td>
</tr>
<tr>
<td>MCHQ distress</td>
<td>2</td>
<td>5 (0-5)</td>
<td>1</td>
<td>.812</td>
</tr>
<tr>
<td>CABAH catastrophic misinterpretation</td>
<td>13</td>
<td>24 (2-26)</td>
<td>7</td>
<td>.582</td>
</tr>
<tr>
<td>BSI Depression</td>
<td>3</td>
<td>20 (0-20)</td>
<td>3</td>
<td>.812</td>
</tr>
<tr>
<td>BSI Anxiety</td>
<td>4</td>
<td>16 (0-16)</td>
<td>7.5</td>
<td>.748</td>
</tr>
</tbody>
</table>
Secondary analyses: Validation of the Metacognitive Health Questionnaire

*Internal Validity*

As can be seen in Table 2, the subscales of the novel measure all demonstrate acceptable internal validity with Cronbach’s $\alpha >.7$, which Bland and Altman (1996) describe as acceptable, with levels $>.8$ described as good.

*Test Re-test Reliability*

A correlation coefficient of $.7$ is widely regarded as acceptable with a correlation of $.9$ seen as excellent. Acceptable test re-test reliability was measured for three of the MCHQ subscales, namely negative meta-beliefs about health ($r(26)=.748, p<.001$), illness behaviours ($r(26)=.771, p<.001$) and preoccupation / body-focussed attention ($r(26)=.707, p<.001$) with positive beliefs about health and health-related distress approaching a satisfactory level ($r(26)=.664, p<0.001$). Thought control and health related distress were less satisfactory with a re-test of $r(26)=.618, p<0.001$ and $r_s(26)=.481, p<.001$.

*Predictive Validity*

As can be seen in Table 3 the positive and negative meta-beliefs subscales do not show significant associations with the PHQ-15 ($r_s(50)=.094, p=.518$ and $r_s(50)=.266, p=.061$ respectively) although the association with the negative meta-belief subscale does approach significance. Moderate significant associations are seen between the illness behaviours subscale and positive and negative meta-beliefs ($r_s(50)=.436, p=.002$ and
between thought-control strategies and both meta-belief subscales ($r_s(50)=.569$ for positive, $p<.001$ and $r_s(50)=.606$ for positive, $p<.001$). Highly significant moderate or strong correlations were observed between the positive and negative meta-beliefs and the preoccupation and distress subscales (with the single item on the preoccupation subscale measuring body-focused attention demonstrating a strong correlation with negative meta-beliefs ($r_s(50)=.564$, $p<.001$)). Of note, the illness behaviours and thought-control strategies subscales both show weak, non-significant associations with the PHQ-15, and again do not show significant association with preoccupation or distress, although in this case both subscales approach significance in relation to preoccupation ($p=0.58$ and $p=0.59$, respectively). The correlation between the positive and negative meta-belief subscales was very strong with $r_s(26)=.729$.

Associations with Health Anxiety and Catastrophic Misinterpretation

At Table 3 demonstrates the SHAI shows significant associations with all of the subscales of the MCQ and MCHQ. Of particular interest are the strong associations observed between the uncontrollability and danger subscale of the MCQ and the negative beliefs subscale of the MCHQ ($r_s(50)=.527$, $p<0.001$ and $r_s(50)=.573$, $p<.001$ respectively). The association with the SHAI and thought-control strategies is also strong. The SHAI is also strongly associated with the PHQ-15 ($r_s(50)=.507$, $p<0.001$), and has moderate and strong associations with the MCHQ preoccupation and distress subscales ($r_s(50)=.484$, $p=.010$ and $r_s(50)=.569$, $p<0.001$ respectively). The CABAH catastrophic misinterpretation subscale is not significantly associated with the SHAI, although it does
show one weak significant association with the uncontrollability and danger subscale of the MCQ ($r_s(50)=.283$, $p=.044$).
Table 3. Spearman’s rank correlations between study measures

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<tr>
<td>1. PHQ 15 total</td>
<td>.421**</td>
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<td>.088</td>
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<tr>
<td>2. MCQ: uncontrollability and danger</td>
<td></td>
<td>.648**</td>
<td>.660**</td>
<td>.365*</td>
<td>.449**</td>
<td>.478**</td>
<td>.308*</td>
<td>.195</td>
<td>.286*</td>
<td>.527**</td>
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<td>3. MCQ: need to control thoughts</td>
<td></td>
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<td>.494**</td>
<td>.412**</td>
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<td>4. MCQ: cognitive self-consciousness</td>
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<td>5. MCHQ: positive beliefs</td>
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<td>6. MCHQ: negative beliefs</td>
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<td>7. MCHQ: illness behaviours</td>
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<td>.570**</td>
<td>.270</td>
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<td>8. MCHQ: thought control</td>
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<td>.269</td>
<td>.335*</td>
<td>.538**</td>
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<td>9. MCHQ: preoccupation</td>
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<td>.529**</td>
<td>.484**</td>
<td>.222</td>
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<td>10. MCHQ: distress</td>
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<td>.569**</td>
<td>.197</td>
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<td>11. Short SHAI</td>
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<td>12. CABAH: catastrophic interpretation</td>
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Note: n = 50; * p < .05; ** = p < .01
Discussion

Evaluation of the study’s main findings

Although it has not possible to carry out multiple linear regression or partial correlation, a number of interesting findings are reported, and one of the studies primary aims has been supported. The results demonstrate that, in this small sample, where participants reported clinically significant levels of symptom reporting and health anxiety, negative meta-beliefs related to the uncontrollability and danger of thoughts and negative meta-beliefs related to the need to control thoughts are significantly associated with symptom reporting. These findings are intriguing as they suggest that the metacognitive SREF model (Wells and Matthews, 1994), which has successfully been applied to a range of psychological disorders, may also be applicable to somatoform disorders and functional somatic symptoms, with the potential for novel treatment strategies.

Another of the study’s primary aims, that of examining the association of metacognitive strategies (thought-control and illness behaviours) with symptom reporting was not supported, although this does not rule out the mediating role of these strategies on health-related preoccupation and distress. Of interest in this small sample was that both thought-control strategies and illness behaviours approached significant associations with health-related preoccupation ($p=0.058$ and $p=0.59$ respectively), as measured by the MCHQ. The failure to find direct associations with metacognitive strategies also does not rule out their potential to prospectively predict symptom reporting, healthcare usage, and health-related distress, a matter upon
which the on-going prospective study, of which this study forms part, will be able to comment upon.

The secondary aims of this study were to provide initial measures of reliability and validity of the Metacognitive Health Questionnaire, by examining internal consistency, test re-test reliability and predictive validity of this measure. Adequate internal consistency was reported on all 6 subscales of this measure, supporting the constructs underlying these subscales. Three of the subscales reported adequate test re-test reliability, including the negative meta-beliefs, illness beliefs, and preoccupation subscales. The positive meta-belief and thought-control strategies subscale approached an adequate level of test re-test reliability, but are likely to require further revision and evaluation. The distress subscale of only two items showed poor test re-test reliability, which is likely to reflect the small number of items, and perhaps also the observation made in primary care, of levels of distress peaking on the day of initial appointments (Kroenke, Spitzer and Williams, 2002).

In terms of initial predictive validity, the MCHQ did not report significant associations with symptom reporting (apart from the preoccupation and distress subscales), although the negative beliefs subscale approached significance. This failure to predict symptoms may reflect the redundancy of some items in this measure, or the failure to capture other explanatory meta-beliefs seen in other metacognitive models such as thought-fusion beliefs, which research supports as explanatory factors in other disorders (see Gwilliam, Cartwright-Hatton and Wells, 2004). Clinically, specific meta-beliefs would not necessarily result in a dose-response pattern with symptoms, singular beliefs around not being able to control
worry can cause severe symptoms and distress and, clinically, positive meta-beliefs hold great significance in the maintenance of difficulties, but their effects are not usually captured in experimental evaluation. This point highlights a conflict inherent in designing a measure for clinical treatment purposes, for it to also hold its own in evaluating research hypotheses, which the MCHQ attempts to do.

For clinical purposes, the MCHQ did show some strengths. The main aim of a practising clinical psychologist is often to reduce levels of preoccupation and distress; the positive and negative meta-beliefs subscales showed highly significant associations with the preoccupation and distress subscales, as well as demonstrating highly significant association with thought-control strategies and illness behaviours. The strong association of negative meta-beliefs with preoccupation may reflect the inclusion of novel meta-beliefs related to body-focussed attention, such as ‘I cannot stop focussing on how my body feels’, which may be implicated in functional somatic disorders such as non-cardiac chest pain. Participants responding may have been affected by contextual effects (experimental variables forming part of the same measure), which future research should aim to control for.

It would be wrong and biased to discuss the findings of current research without highlighting the strengths of the SHAI, the strong associations with symptom reporting, distress and preoccupation which suggests it captures these constructs well, and it appears a valuable clinical measure. The SHAI was additionally shown to be significantly associated with all of the subscales examining maladaptive metacognition and strategies, although it was not significantly associated with the CABAH catastrophic misinterpretation of bodily complaints subscale. Cognitive
behavioural models would predict such a relationship (for example, Warwick and Salkovskis, 1990), this lack of association may, however, reflect the weakness of this measure, which did not show adequate internal consistency in this study.

The significant associations of health anxiety with metacognitive measures is of interest, as one obvious interpretation of this is that maladaptive metacognition may predict levels of health anxiety, as suggested by previous research (see Bouman and Meijer, 1999). Strong associations were observed between negative meta-beliefs on the MCHQ and the uncontrollability and danger of thoughts subscale of the MCQ-30, which appears unsurprising if statements on the SHAI are examined closely (for example, ‘thoughts of illness are so strong that I no longer try to resist them’, ‘if I notice an unexplained bodily sensation I always find it hard to think about other things’ or ‘nothing can take my mind off thoughts about health’), which implicitly seem to capture negative meta-beliefs around worry / rumination and attentional focus. Some other items on this measure could also be argued to tap thought event fusion beliefs (see Gwilliam, Wells and Cartwright-Hatton, 2004), for example, ‘if I hear about an illness I always think I have it myself’.

In fact, on examination of the cognitive behavioural model of health anxiety (see Salkovskis and Clark, 1993), it is possible to argue that it is largely metacognitive in nature, implicating threat monitoring (for example, emphasising focus on body and enhanced bodily perception and scanning for threats), rumination, and unhelpful coping behaviours. The limited evidence reported here suggests that these coping behaviours may, in part, be maintained by positive meta-beliefs related to health, which showed the strongest associations with the illness behaviour
subscale, a relationship predicted by Brown (2004). Further research in this area could lead to such behaviours being reframed from ‘safety-seeking behaviours’ (Salkovskis, 1991) to active (although maladaptive) attempts to cope. Such a view would help somatising and health-anxious patients to be seen as less of a nuisance, and more as people trying hard to manage their distress and preoccupation in a way that research and treatment studies suggest maintains it (see Salkovskis and Warwick, 1986).

Strengths and weaknesses of the study

Given the preliminary nature of the current study, it would be inadvisable to present its findings and arguments without a measure of caution. The study does, however, have a number of strengths, in particular its attempts to examine constituent parts of a metacognitive SREF model (see Wells, 2008), including examining specific coping behaviours in a systematic manner (where little research has been previously carried out in the area of symptom reporting), and attempting to measure thought-control strategies, both of which are believed to maintain the cognitive attentional syndrome, according to a metacognitive model (see Wells and Matthews, 1994). One other strength of the study is its provision, to the author’s knowledge, of a novel approach to symptom reporting, with no previous studies examining maladaptive metacognition or attempting to apply the SREF model in an effort to understand an age-old question of health-related preoccupation and distress without clear pathology. The study may also contribute towards new approaches to understanding and treating symptom reporting, but the findings reported here are clearly preliminary, and the methods and instruments used to evaluate findings
unrefined. Although the data analysed here form part of a larger on-going prospective study, the cross-sectional data reported does not allow causal inferences, and must be interpreted with caution due to unsatisfactory test re-test reliability on some parts of the MCHQ measure. The relationships described may also be influenced by a range of unexplored factors, such as the contribution of anxiety, depression or co-morbid physical illness, which future research should control for.

In terms of the validity of the MCHQ, the failure to find adequate re-test reliability across the whole of this measure may reflect the small sample size, which limits the accuracy of these analyses (Hackshaw, 2008). It may also reflect the fact that the test re-test procedure did not take place under ideal conditions, as the questionnaire was not filled out under the same conditions and in the same location (see Taylor and Kuyatt, 1994). The burden placed on participants by their taking part in the wider experimental study may have also meant that the measure was not completed with full care or attention (the novel measure was the second-to-last measure). The 0-10 scaling of the measure may have also contributed to the lack of adequate test re-test reliability, perhaps causing extreme responding in some participants (see Greenleaf, 1992), an issue that may need addressing. The positive and negative meta-beliefs subscales also had a significant association of greater than .7, which suggests that these constructs may not be sufficiently distinct. A parallel study is currently underway, which will hopefully address some of these difficulties; it aims to factor analyse this measure, hopefully resolving its factor structure and removing redundant items, potentially improving its predictive validity and strengthening the validity of theoretical constructs underlying this measure.
In evaluating the merits of this study, it must also be acknowledged that a large number of correlations were performed between various subscales in the study, leading to the possibility of a number of type 1 errors, although significant associations occurred overwhelmingly in the directions predicted by study hypotheses. The experimental hypotheses that metacognitive beliefs and strategies on the MCHQ would be associated with physical symptom reporting were unsupported, which must add caution to any claims of the clinical utility of this measure, although prospective data from the wider study should offer a more scientifically meaningful evaluation of this measure. Importantly, the measure was significantly associated with health-related preoccupation, attentional focus and distress. As with any other study using self-report measures, demand characteristics and social desirability may have biased findings (see Paulhaus, 1991), and future studies should attempt to control for this. It must also be acknowledged that the group of participants under examination are quite ill defined and may not be representative of those with more chronic difficulties that might warrant psychological intervention. The difficulty in defining health concerns without clear pathology is a problem seen within this area as whole, with the validity and utility of nomenclature and diagnostic categories questioned (Ladwig et al, 2010; Creed, Fink, Henningsen, Rief, Sharpe and White, 2010), metacognition may contribute towards more clearly defining this help-seeking patient group in the future.

As discussed earlier, previous studies have demonstrated predictive validity for metacognition using multiple linear regression symptoms of chronic fatigue (Maher-Edwards et al, 2011) and hypochondriasis (Bouman and Meijer, 1999); the findings reported here add weight to the potential role of maladaptive metacognition
in somatoform and functional disorders. Of the three experimental studies examining metacognition in health concerns, of which this is one, no prospective data has been reported, a matter that should be addressed in future studies. The two previous studies were larger in scale and controlled for confounds such as depression, but did not attempt to systematically examine all of the main aspects of the SREF model, nor propose specific metacognitive beliefs related to health, which could be addressed directly in treatment studies so, although smaller in size, this study could be seen as more ambitious in scope.

Previous prospective research suggests that symptom reporting is predicted by negative affect (Pennebaker and Watson, 1989), illness behaviours (Kapur et al, 2004), body-focused attention (Kolk et al, 2003), and preoccupation and worry about health (Looper and Kirmayer, 2001). The findings of the present study support a relationship between all of these factors and metacognition, future prospective studies may show that metacognition also predicts them.

This study suggests that further research examining metacognition in somatoform and functional somatic syndromes is warranted; although these difficulties reflect the influence of multiple aetiological factors, such research may offer strategies to reduce levels of preoccupation, distress and disability. It would seem valid to pilot metacognitive therapy treatments in this area; a successful brief case series of the metacognitive therapy technique of attention training in hypochondriasis (Wells and Papageorgiou, 1998) suggests that this could form an effective part of such a treatment intervention. A pilot randomised control trial of attention training with symptom reporters would appear to be a logical next step.
Conclusion

In conclusion, this study suggests that maladaptive metacognitive beliefs may play a causal role in excessive symptom reporting, and demonstrated that metacognitive beliefs specific to health concerns are significantly associated with levels of preoccupation and distress, as well as illness behaviours such as reassurance-seeking, bodily checking and avoidance implicated in maintaining health preoccupation (Salkovskis and Warwick, 1990; Papageourgio and Wells, 1998). The results reported here suggest that directly challenging meta-beliefs around worry, rumination and threat monitoring may help to reduce illness behaviours such as reassurance-seeking, and reduce levels of preoccupation and distress. The Metacognitive Health Questionnaire may have promise as a generic therapeutic tool to be used for people suffering from preoccupation and distress related to health concerns; it does, however, need further revision, including studies with service users to understand how well it captures peoples’ difficulties and to what extent it is acceptable to them. The inclusion of items examining clinically important measures of disability and illness conviction should also be considered.


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Part 3: Critical Appraisal

Word count: 4787
Overview

This paper will aim to critically appraise methodological, supervisory, ethical, theoretical and clinical issues relevant to this thesis and its findings. The first section will evaluate and reflect upon the underlying methodology of this current study and its limitations, the supervisory process, and discuss any ethical issues that have arisen during the research. The second section will briefly discuss the study rationale, and theoretical and clinical issues relating to the research discussed in the thesis.

This thesis begins to examine the possibility of metacognitive approaches to distressing, preoccupying and disabling physical health concerns, although the research study described, does not offer a clear causal role for metacognitive beliefs or processes, or direct support for treatment with metacognitive therapy. The research discussed is indicative that such beliefs and processes may play a causal role.

The finding reported here can be seen in the light of emerging evidence examining the efficacy of metacognitive therapy, which shows it to be of great promise in offering brief and efficacious treatment of difficulties such as generalised anxiety, treatment-resistant depression and post traumatic stress (see van Heiden, Muris and van der Holen, 2012; Wells, Fisher, Myers, Wheatley, Patel and Brewin, 2012; Wells and Colbear, 2012). The results of this study suggest that metacognition and metacognitive therapy techniques in the area of physical health merit further research and evaluation.
Evaluating the practical, supervisory and ethical issues

Research Study Design

A cross-sectional correlational design was employed, allowing potential causal associations to be identified, and making it possible to observe if experimental data followed the pattern predicted by the theoretical model. These cross-sectional data do not allow for causal assumptions to be made on specific dependent variables such as levels of symptom reporting and due to the high number of correlations performed, there may be a high risk of type 1 errors. Multivariate analysis in the form of multiple regression and partial correlations were planned, but the sample was smaller than anticipated and the data did not meet statistical assumptions, limiting the statistical analysis which could be performed and the conclusions that could be drawn from the study overall.

Recruitment to the study

It was much more difficult to recruit to the study than anticipated by those involved in the study. Recruitment to the study was a third of the level predicted by the supervisor of this research study. Based on verbal feedback from those approached to take part in general practice surgeries, recruitment difficulties seem to be due to the level of commitment involved for study participants, a matter that was commented upon verbally at the NHS Research Ethics Committee. The questionnaires completed allowed for methodological and scientific rigour, but may have felt burdensome and tiring for subjects not directly benefiting from the findings
of the study. Efforts were made to increase the recruitment rate by the study’s author by approaching two other general practice surgeries, with one agreeing to be involved in the study, although this had a minimal effect on recruitment rates.

**Study Sample**

Although recruiting the study sample from general practice did remove the systematic sampling bias displayed by much postgraduate psychological research of using a student sample (see Good and Hardin, 2008), direct examination of the population of interest may have led to the sample becoming biased by the characteristics of those that agreed to take part in contrast to those that did not. Reasons why people chose not to take part in a study are, of course, difficult to quantify.

The study population are difficult to categorise, due to the lack of a clear diagnoses or knowledge about co-morbid physical illness, although this study followed the principles set by a previous large scale epidemiological study (Ladwig, Martin, LaCruz, Henningsen and Creed, 2010) of examining bodily symptoms directly. The study population was self-selecting and, although it appears to have captured the variables of interest, the findings cannot necessarily be said to generalise to the population as a whole. The study was largely female, which may have biased findings, although the ratio of females to males, is representative of symptom reporters as a whole (Barsky, Peekna, and Borus, 2001). Conversely, as the participants exhibited the variables of interest, the scores on questionnaire
measures did tend to be highly positively skewed, and some measures were significantly non-normally distributed, thus hampering statistical analysis.

Measures

All of the measures used in the study are in Appendix H. At the start of the study, more consideration could have been given to the design of this questionnaire. Initially, the design of the study was subject to time constraints, as the researcher came to this project late - around 8 weeks after other projects had been assigned, due to requested research studies being unavailable. The intellectual challenge placed on the author of becoming familiar with a novel and unknown research area in a short space of time may have impacted on the quality of the questionnaire. Due to the project timescale and amount of time possible to devote to the project, it was not possible to develop the questionnaire systematically, in collaboration with service users.

The questionnaire was also designed with clinical use in mind, and a greater level of consideration could have been given to the requirements of a measure for research purposes, including the use of items that were scalar rather than ordinal in nature. This is a criticism that can be made of the majority of the widely used questionnaire measures used in this study as a whole, the ordinal design of which should contraindicate parametric statistics (see Kahler, Roquausch, Brunner and Himmel, 2008).
Best practice guidelines (McColl et al. 2001) suggest giving due consideration to the question sequencing, including moving from general to specific items, examining salience of items with target audiences, and the utility of the measure for patients, these are areas which need to be examined in future work and suitable modifications made. Care and attention was given to the design and layout of the questionnaire, and attempts were made to render the wording straight-forward enough for general readership, as these guidelines recommend. Rattray and Jones (2007) also recommend pre-planned methods to establish reliability and validity; this was not considered fully at the start of the study, meaning that some subscales of the novel measure appear ad hoc, rather than thought through. Factor analysis is to be conducted on the first section of this measure, as Rattray and Jones (2007) recommend, in a separate study.

The Physical Health Questionnaire 15 (Kroenke, Spitzer and Williams, 2002) although a widely used measure that demonstrates adequate internal consistency and predictive validity for health-related disability and distress, does not appear to have a test re-test analysis reported for this measure. This is not in line with repeatability guidelines for assessing the certainty of measurement results (Taylor and Kuyatt, 1994). This could be seen to reduce the certainty of what this measure is actually measuring, although it is used here as a checklist to establish a level of symptom reporting rather than defining symptoms. Somatisation as a construct does appear to show considerable change over time, and probably should not be seen as a stable construct, but rather a general pattern of responding (see Gureje and Simon, 1999).
Two of the subscales of the Metacognitions Questionnaire 30 (Wells and Cartwright-Hatton, 2004), and four of the subscales of the Cognitions and Beliefs about Health Questionnaire (Rief, Hiller and Margraf, 1998) were not included in the analysis as it was decided to only consider only variables with a theoretical relevance to the research, to reduce the chances of type 1 error due to multiple correlations. The State-Trait Anxiety Inventory – Trait version (Spielberger, 1983) was completed in the study but not reported, as this measure was included as a covariate in a multiple regression analysis. The Charlson co-morbidity index (Charlson, Pompei, Ales and MacKenzie, 1987) was included for the wider prospective study, and had 14 binary ‘yes’ or ‘no’ questions relating to co-morbid health complaints, which did not fit well with correlational analysis and was heavily positively skewed.

Data Analysis

It was calculated that to carry out multiple regression analysis, as was intended, with a minimum of 3 predictor variables to give an anticipated effect size of \( f^2 \) of 0.15, with a statistical power of 80% at a probability level of 0.05 would have required 76 participants, and for 10 predictors this study would have required 119 participants (see Cohen, Cohen, Aiken and West, 2003). This meant that this approach was not a possibility due to the small sample size. Due to the questionnaire measures containing ordinal items and the non-normality of some of the questionnaire subscales, Spearman’s Rank correlation (1904) appeared a suitable analysis.
Correlation was used to assess the repeatability of the novel measure, as is common practice in other research papers. Altman and Bland (1986) criticise this approach, saying it can be “misleading”, as correlation is not an indicator of agreement. The use of the Bland-Altman variation coefficient may have been an appropriate alternative.

Procedure

The study protocol was designed to ensure the same conditions for each participant, including the use of the same experimenter for each testing session, in order to reduce the possibility of inter-experimenter error. The procedure was generally adhered to, although the length of times between sending out questionnaire pack 1 and the initial study day was affected by illness in participants and experimenter. This may have meant that the length of time between the completion of different measures could have varied by up to a month in some instances. Each participant managed to complete the main parts of the study day, although one participant did become fatigued during the testing session, and did not complete the Brief Symptom Inventory (Derogatis, 1993). Some questionnaire measures were completed before the study day to reduce burden on participants. The completion of measures at different time points and under different conditions was not an ideal scenario, and is likely to have affected the associations between variables under examination, although it is hoped that any impact will not have been too significant.

Supervisory Process
The researcher was grateful to his supervisor for allowing him to pursue his own research ideas, and for finding a practical way for him to be able to do this, and benefited greatly from receiving guidance offered from someone with real expertise in the area. Supervision scaffolded the work through often inept or clumsy early attempts at academic writing or argument. It was advantageous to be working with someone who did not necessarily share theoretical viewpoints and who could argue throughout from the perspective of someone with an integrative or cognitive behavioural viewpoint on functional somatic symptoms.

This helped the researcher to think hard upon what theoretically he felt to be the case, to see how this viewpoint differed, and to sometimes argue why he theoretically did not agree, thus helping to develop arguments. It was helpful for the researcher to have his bias in this area challenged, and tested. This process led to the researcher considering other explanations for the difficulties discussed, and to see these difficulties also as part of developmental, systemic and interpersonal processes. The supervisory process met criteria assessed in formal measures of research supervision (see Ng Lee Yen Abdullah, Evans, 2012)

*Working as part of a wider research team*

Working as part of a wider study had a number of benefits and drawbacks. The benefits were the ability to pay together for questionnaire measures exceeding the budget provided, sharing the burden of recruitment and completion of ethics documentation, and offering the possibility of conducting on-going prospective research. Working with a PhD student also provided intellectual and moral support.
It has, through collaboration, been possible to assess a significant number of patients over a relatively short time course, and perhaps offer further findings of theoretical and clinical significance. This collaboration has been a clear strength of this study, allowing more to be achieved than would have been alone, without compromising the theoretical independence of the two studies. The labour for this study was contracted and divided up at the start of the study (see Appendix I), and this division of labour has worked well. The drawbacks involved a lack of autonomy or ability to always be involved directly in decisions made about the study; it also meant in one instance that a questionnaire proof-read and submitted by the researcher, had a question lost when this was reformatted by the PhD student. It may also have been easier to recruit study participants for a smaller cross-sectional design.

**Ethical issues**

The study was approved by the University of Manchester Division of Clinical Psychology (see Appendix J). Ethical approval was also given by the North West NHS Research Ethics Committee. Few concerns were raised about the study at the ethics committee, with the exception of a verbal query regarding the level of involvement required to take part in the study, and minor changes were requested (the letter highlighting the requested changes can be seen in Appendix K).

A number of potential participants in the study discussed psychological difficulties and adverse life events. At these times it was important to stay in the role of researcher, to maintain clear boundaries between professional duties and clinical ones, whilst still offering a sympathetic ear, and empathising with difficulties. The
nature of my role as a trainee clinical psychologist did however appear of comfort to some participants when choosing to take part, and may have aided recruitment. Examination of the data suggests that some participants may have benefited from a referral to a specialist service; the anonymity of this data, however, prevented any such referrals being made, which conflicted with the role of action I would have chosen in my role as a trainee clinical psychologist. As such, in cases where concerns discussed merited a referral of this nature, participants were signposted to appropriate services on the study day.

The burden placed on participants taking part in the study by being involved in this study did seem relatively high. One person complained of fatigue on the study day, and the return of around 50% of re-test questionnaires might be seen to support a view that the demands were perhaps a little high. Nevertheless, this return rate is still much higher than the estimated 23% return rate for postal questionnaires in general psychological research (Edwards et al., 2002).

Involvement in the study may potentially have exacerbated pre-existing preoccupations and concerns about health, by causing participants to focus on perceived difficulties. The study may have acted as a re-inforcer or reminder of these difficulties. These concerns should be balanced with the potential of the study to help understand such difficulties; the opportunity for participants’ to have their difficulties noticed and acknowledged; and by potential benefits from therapeutic strategies that may result indirectly from this study and may help others. Participants were also compensated for their time with £10 for each assessment session, and could withdraw consent at any time during the study. All participants were given
detailed information about the study and what it entailed, gave written informed consent, and were debriefed at the end of the assessment session if necessary. A number of participants I spoke to in the general practice waiting room in the weeks following their participation in the study said they had found the study interesting.

Evaluating Theoretical and Clinical Considerations

Study Rationale

The underlying rationale for this thesis has been to begin to test and evaluate a novel metacognitive model of functional somatic symptoms, based on supervisory regulatory executive function theory (Wells and Matthews, 1994; Wells, 2000), seen in Figure 1 (with the brief explanation for the model given to the research supervisor at the start of the study seen in Appendix L). This hypothetical model was presented to the author’s supervisor as the rationale for the research study and the contents of the Metacognitive Health Questionnaire. The model clearly cannot be supported from the limited evidence reported here, and cannot be described as more than “an idea” at present, but warrants further examination.

The literature review and research study reported in this thesis, do however, begin to offer preliminary support with significant associations observed between all relevant parts of the model examined. Such a model may help to guide metacognitive therapy treatments in reducing distress and preoccupation in disorders such as irritable bowel syndrome and non-cardiac chest pain. This model would
hypothesize a strong role for positive and negative meta-beliefs related to threat monitoring / body-focussed attention. This model would also suggest patients use of cognitive control strategies - attempts to cognitively avoid or suppress sensations, emotions, thoughts or intrusive images. Recent research evidence supports the view that sensations are cognitively avoided in those with a tendency to report medically unexplained symptoms (see Brown, Danquah, Miles and Poliakoff, 2010).

![Diagram of a preliminary metacognitive model of functional somatic symptoms based on the metacognitive SREF Theory (Wells and Matthews, 1994, Wells, 2000)](image)

**Figure 1.** A preliminary metacognitive model of functional somatic symptoms based on the metacognitive SREF Theory (Wells and Matthews, 1994, Wells, 2000)

*Theoretical Considerations*

Although none of the data reported in this study allow causal assumptions, the findings largely followed patterns predicted by the supervisory regulatory executive function theory (SREF; Wells and Matthews, 1994). The research
examined a number of novel predictions, and could be said to be innovative, examining this area from a different perspective. In particular negative metacognitive beliefs about worry and the need to control thoughts were significantly associated with levels of symptom reporting. Metacognitive beliefs were strongly associated with health-related thought control strategies such as worry, cognitive avoidance and thought suppression. They were also significantly associated with unhelpful coping behaviours such as reassurance-seeking, and with body-focussed attention. Importantly, specific meta-beliefs to health were associated with preoccupation and distress. Each of these significant associations would be predicted by SREF theory.

The study could be seen as a starting point, to understanding whether metacognitive therapy may help in reducing preoccupation, distress and unhelpful attentional focus on health concerns and physiological processes. The results reported in the research study suggest that such an approach may be viable.

**Implications for future research and potential clinical applications**

Future research should evaluate further metacognitive beliefs in specific functional somatic disorders, with difficulties such as non-cardiac chest pain and irritable bowel syndrome as suitable initial targets. These are disorders which may be very treatable by psychological interventions, just as panic disorder has become (Clark, 1986). Specific metacognitive profiles have been reported in anxiety disorders such as panic and social phobia (see Barahmund, 2009) and differentiated profiles may be observable across functional somatic syndromes. Prospective and
treatment studies should examine the relationship between metacognitions and therapeutic outcomes; research in obsessive compulsive disorder demonstrate that changes in metacognition predicts therapeutic change (Solem, Haland, Vogel, Hansen and Wells, 2009).

The efficacy of attention training should be evaluated in reducing preoccupation and distress in functional somatic syndromes, as well as specifically examining its effect on reducing conviction in negative meta-beliefs related to rumination and attention. A brief case series already supports its efficacy in treating hypochondriasis (Papageourgiou and Wells, 1998). A recent randomised control trial (Callinan, 2011, unpublished thesis) supports the efficacy of this intervention which was observed to reduce intrusive thoughts and negative affect, and increase attentional flexibility. This could be taught in a single brief intervention sessions, with a recording given to take away for the purpose of practising the discussed technique. This simple intervention could form part of a stepped care model (see Bower, 2005) with more severe difficulties being referred for a brief course of metacognitive therapy. Large effect sizes (Cohen’s $\delta>2$) have been reported in treating distress related to cardiac disease (Paszek 2010, unpublished thesis) suggesting that metacognitive therapy is a viable approach to treating people distressed by their physical health.

Other key metacognitive therapy techniques of detached mindfulness (including worry postponement) (Wells, 2005) should be evaluated in this area, and in particular applied to bodily sensations, as well as thoughts and imagery. Interestingly, one study has shown worry postponement to reduce symptom reporting
Detached mindfulness may form an effective alternative to current cognitive behavioural strategies such as interoceptive exposure (see Craske et al. 2011). One recent experimental manipulation of detached mindfulness (Gkika, 2011, unpublished thesis) suggests superiority over the cognitive behavioural technique of thought challenging, in terms of reducing conviction in negative beliefs and self-focussed attention. It is also likely that cognitive processes such as worry and negative meta-beliefs about worry specifically, are likely to lead to increased levels of autonomic arousal and to impaired sleep (see Waine, Broomfield, Banham and Espie, 2009). Research already supports the association of physical symptoms and worry (Freeston, Dugas, Letarte, Rheaume, Blais and Ladouceur, 1996). This should be investigated further in the context of functional somatic symptoms.

Attempts at understanding the mechanisms by which a therapeutic treatment may create therapeutic change would seem of great importance, both scientifically and therapeutically (see Chambless and Ollendick, 2001). Metacognitive therapy is based on a theory which outlines specific mechanisms of therapeutic change, allowing such mechanisms to be examined and experimentally manipulated to demonstrate efficacy. Therapies without clear empirically supported theory based mechanisms of therapeutic change allow the possibility of iatrogenesis, relapse and the experience of failure in patients and clinicians. It would seem important to understand how future therapies work before they are introduced. Greater certainty supplied by the clear mechanisms of change and specific treatment techniques offered by metacognitive therapy may be of benefit to clinicians, giving them confidence and clear direction during therapeutic interventions.
Summary

This first part of this section reviewed the research study methodology and ethical issues. The researcher believes that this study is a reliable piece of cross-sectional research, with some clear methodological limitations. This study is part of a prospective cohort study, which may offer important findings to help further the understanding and treatment of physical health concerns without clear pathology. The theoretical rationale for the study was discussed and qualified, and theoretical and clinical considerations evaluated that follow from the findings of the research study. Caution must be used in offering interpretation from this study, with the potential for findings to be influenced by theoretical confounds such as co-morbid physical illness. Further research is clearly warranted, as is further research evaluation and refinement of the Metacognitive Health Questionnaire, studies are underway to do this. Although the current study is preliminary in nature, it may form a starting point for future research, which may in turn, provide a basis for empirically supported and theory based treatment interventions.

The level of disability and distress experienced by patients with medically unexplained symptoms warrants the recent policy focus on this area, as part of the Improving Access to Psychological Therapies initiative (Department of Health, 2011). In the future metacognitive therapy may form part of these treatment approaches.

This project has been a steep learning curve for the researcher, who had no knowledge of this area, before commencing this study. Over the course of the study, the complexity, intellectual challenge, and potential for this research area as a whole...
has become apparent, and it is hoped that in the future this area may offer effective psychological treatments.
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# CLINICAL PSYCHOLOGY REVIEW

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- Audience  
- Impact Factor  
- Abstracting and Indexing  
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Clinical Psychology Review publishes substantive reviews of topics germane to clinical psychology. Its purpose is to help clinical psychologists keep up-to-date on relevant issues outside of their immediate areas of expertise by publishing scholarly but readable reviews. Reviews cover diverse issues including psychopathology, psychotherapy, behavior therapy, behavioral medicine, community mental health, measurement, and child development.

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Appendix B: Flow chart outlining the process by which research papers were identified for the systematic review
1. Systematic search using OVID: See text for search terms and electronic databases searched: 59 papers identified

2. 10 literature review reference sections were examined for relevant papers: 30 novel research papers identified

3. 89 abstracts read with 52 papers excluded as they discuss neuropsychological test batteries / cognitive deficits / neuroimaging / pharmacological studies

4. 37 papers read with further 8 papers excluded with unpublished or unvalidated questionnaires / qualitative methodology

5. 29 research papers which met suitability criteria and discussed in review
Appendix C: Author information pack for Behavioural and Cognitive Psychotherapy
Behavioural and Cognitive Psychotherapy

Submission to Behavioural and Cognitive Psychotherapy

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Manuscript preparation

A Word document of the manuscript must be submitted electronically at http://www.manuscriptcentral.com/babep and original figures can be supplied as electronic files. Articles must be typed double-spaced throughout allowing 4 in margins all round. Where unmodified material, e.g., behaviour rating scales, therapy manuals, etc., is referred to in the text, copies should be submitted as an additional document to facilitate review. Articles must be written in English and not submitted for publication elsewhere.

Submissions will be sent back to authors promptly as received. Authors who want a blind review should indicate this at the point of submission either in the article, including details of authorship and other identities information. Submission for blind review is encouraged.

Abbreviations where used must be standard. The Systematic International (SI) should be used for all units. Where non-SI units are used the SI equivalent must also be given. Probability values and power estimates should be given with stated values and degrees of freedom (e.g., 45, .04, 500, .07, p < .01), and such information may be included in either reference in the text. Spelling must be consistent with an article either using British usage (The Oxford English Dictionary) or American usage (Webster's New College Dictionary). However, spelling in the list of references must be literal to each publication.

Details of style not specified here may be determined by reference to the Publication Manual of the American Psychological Association or the style manual of the British Psychological Society.

Articles should conform to the following scheme:

a. Title page. The title should convey the major issues. Author(s) to be given with departmental affiliations and addresses, printed appropriately. A heading of no more than 40 characters should be included.

b. Abstract. The abstract should include the headings: Background, Aim, Method, Results, Conclusions. It should include up to six key words that could be used to describe the article. This should summarise the article in no more than 350 words.

c. Text. This should begin with an Introduction, succinctly introducing the point of the paper to those interested in the general area of the journal. Attention should be paid to the Editorial Statement criteria included online. References within the text should
EDITORIAL STATEMENT

Behavioural and Cognitive Psychotherapy is an international multidisciplinary journal for the publication of original research of an experimental or descriptive nature, that contributes to the theory, practice and evaluation of behaviour therapy. As such, the scope of the journal is very broad and articles relevant to most areas of human behaviour and human experience, which would be of interest to members of the helping and learning professions, will be considered for publication.

As an applied science, the concepts, methodology and techniques of behavioural psychotherapy continue to change. The journal seeks both to reflect and to influence those changes.

While the emphasis is placed on empirical research, articles concerned with important theoretical and methodological issues as well as critical reviews of the behavioural literature are also published. In addition, given the emphasis of behaviour therapy on the experimental investigation of the single case, the journal from time to time publishes case studies using single case experimental designs. For the majority of designs this should include a baseline period with repeated measures, in all instances the nature of the quantitative data and the intervention must be clearly specified. Other types of case reports can be submitted for the Brief Clinical Reports section.

The following types of articles are suitable for Behavioural and Cognitive Psychotherapy:

- Reports of original research employing experimental or correlational methods and using within or between subjects designs.
- Review or discussion articles that are based on empirical data and that have important new theoretical, conceptual or applied implications.
- Brief reports and systematic investigations in single case employing innovative techniques and/or approaches.

Articles should contain original material that has neither been published nor under consideration for publication elsewhere. This applies to articles in languages other than English.

Special Sections of the Journal

Accelerated Publication

The accelerated publication section is intended to accommodate a small number of important papers. Such papers will include major new findings for which rapid dissemination would be of considerable benefit and impact. For example reports of the results of important new clinical trials, innovative experimental results with major implications for theory or practice, other work of unusually high quality.

Empirically Grounded Clinical Interventions

This section is intended for reviews of the present status of treatment approaches for specific psychological problems. It is intended that such articles will draw upon a combination of treatment trials, experimental evidence and other research, and be firmly rooted in phenomenology. It should take account of, but also go beyond, treatment outcome data.

Brief Clinical Reports

Material suitable for this section includes unusual case reports, accounts of potentially important techniques, phenomena or observations, for example descriptions of previously unreported techniques, outlines of available treatment manuals, descriptions of innovative
be given in the form of Jones and Smith (1970) or (Jones and Smith, 1970). Where
there are three or more authors, the first author's name should be included at
author's subsequence citations should be given as Williams et al. (1983). Authors
with the same surname should be distinguished by their initials. The appropriate
positions of tables and figures should be indicated in the text. Footnotes should be avoided
when possible.

d. Reference mode. A list of all cited unpublished or limited circulation material
is included in order of appearance in the text, giving as much information as possible
about data and, if significant.
e. References. All contents in the text should be listed in strict alphabetical order
according to surnames. Multiple references to the same author(s) should be listed
cumulatively, using a, b, etc., entries within the same year. Formulas for journals,
books and chapters should follow these examples:

behaviour therapy: a systematic review. Behavioural and Cognitive Psychotherapy
32, 31-55. doi:10.1017/S0145169203002059


skills. In P.O. Davison and S.M. Davidson (Eds), Behavioural medicine changing

f. Footnotes. The first, and preferably only, footnote will appear at the foot of the first
page of each article, and subsequently may acknowledge previous unpublished
presentation (e.g., dissertation, meeting papers, financial support, study or
technical assistance, or changes in affiliation. A concluding (or only) paragraph must
be the name and full mailing address of the author to whom reprint requests or other
queries should be sent.

g. Tables. Tables should be numbered and given explanatory titles.

h. Figures. Original drawings or prints must be submitted for each line or halftone
illustration. Figures should be clearly labelled and be camera-ready wherever possible.

Proofs, Reprints and Copyright
Proofs of accepted articles will be sent electronically to authors for the correction of
printers' errors; authors' corrections may be charged. Authors submitting a manuscript declare on
the understanding that if it is accepted for publication exclusive copyright of the paper will
be assigned to the Association in consideration of the assignment of copyright. 30 copies of
each paper will be supplied. Further reprints are charged at the current rate; the reprint order
form will be sent with the proofs. The publishers will not put any limitations on the personal
reproduction of the author to unremunerated copies of the paper in other works.
variations of existing procedures, details of self-help or training packages, accounts of the application of existing techniques in novel settings and so on. The focus of clinical reports section is intended to extend the scope of the clinical section. Submissions for this section should be no longer than five manuscript, double-spaced pages (1500-1800 words) and should include no more than ten references, one table or figure and an extended report that contains fuller details. There are no restrictions on the form or format of this basic document. This may, for instance, be a treatment manual or a fullyressed case report, therapy transcript and so on. If a submission is accepted for publication as a short Clinical Report, the author/s must be prepared to send the fuller document to those requesting it, free of charge or at a pro rata cost, with the latter to reflect the cost of materials involved. The extended document will also be mentioned on the journal's website (http://journals.cambridge.org/BJP) and therefore we require an electronic version in Word or PDF format (file metadata will be stripped).

(06/03/2012)
Appendix D: Study slips given to patients at the general practice reception
Understanding Physical Symptoms Research Study

Researchers from the University of Manchester are recruiting people from this GP practice today, for a research study examining physical symptom reporting. You may be approached by a researcher who would like to give you some information about taking part in this study. You are under absolutely no pressure to take part. However, the researchers would be grateful if you would consider taking part in the study.
Appendix E: Study poster
VOLUNTEERS WANTED!

WE ARE LOOKING FOR 150 VOLUNTEERS TO TAKE PART IN A STUDY ON PHYSICAL SYMPTOMS. VOLUNTEERS WILL COMPLETE TWO 2-HOUR SESSIONS (SPACED 6 MONTHS APART) AT THE UNIVERSITY OF MANCHESTER AND FILL IN SOME QUESTIONNAIRES AT HOME

IF YOU ARE INTERESTED IN HELPING US TO IMPROVE OUR UNDERSTANDING OF PHYSICAL SYMPTOMS PLEASE CONTACT US TO OBTAIN FURTHER INFORMATION

For further information and the chance to take part, please contact: Anna Chapman
Email: anna.chapman@postgrad.manchester.ac.uk
Telephone: 0161 306 0428 / 07968 011408

*VOLUNTEERS WILL BE REIMBURSED WITH £20 OF HIGH STREET SHOPPING VOUCHERS ON COMPLETION OF THE STUDY*

This Project is funded by the University of Manchester
Appendix F: Patient information booklet
Participant Information Sheet
Title of project: Understanding Physical Symptoms Study

Introduction
We would like to invite you to take part in our research study. Before you decide we would like you to understand why the research is being done and what it could involve for you. Please take the time to read the following information carefully. You can discuss this information with one of the researchers or your friends and family if you wish.

To save people time, we have divided this booklet into two sections. Part 1 is a short description of the study and what is involved. We ask everyone to read this part. If you are not interested after reading Part 1 then there is no need for you to carry on reading. If you think you might be interested then please read Part 2. This gives you more detailed information about the study and what you should do if you want to take part.

Please contact us if anything is unclear or if you would like more information (our contact details are provided at the back of this leaflet).

PART 1

What is the purpose of this study?
Physical symptoms (e.g. headaches) are a part of everyday life. We know that everyone experiences physical symptoms differently. For example, some people with a cold will experience lots of unpleasant symptoms, but someone else with the same cold will hardly experience any symptoms at all. We want to understand why this happens. To do this we hope to recruit people with physical symptoms and collect different kinds of information from them.

Why have I been invited?
You have been asked to take part simply because you are visiting your GP surgery today. We are aiming to recruit about 150 English-speaking participants, aged 18-50yrs, from GP surgeries in central Manchester.

Do I have to take part?
No. It is entirely up to you whether or not you take part. If you decide not to we will completely respect your decision and it will not affect the care you receive from your GP in any way. If you decide to take part you will be asked to sign a consent form confirming that you are voluntarily taking part in the study. You will still be free to withdraw from the study at any time without having to give a reason.

What will happen to me if I take part?
The study consists of a few parts, which we will describe in the following sections.

Part 1: Confirming your participation
We will contact you and ask you some brief questions about your age and your current health. This will tell us if you are eligible to take part. We will also give you more information about the study and you will have the opportunity to ask any questions. If you are eligible to join the study at this stage, and are happy to take part, we will book you an appointment at the University of Manchester. We will also send you a questionnaire booklet to complete at home, which will take about 20 minutes to fill out, and should be brought to your first appointment.

**Part 2: Your first appointment**
We will explain the study again and check that you understand what will happen if you take part in the study. If you agree to take part in the study, we will ask you to sign a consent form. You will then be asked to participate in two simple computer-based tasks and to fill in another questionnaire booklet. The first computer task involves detecting a painless vibration through your finger. The second computer task involves measuring your reaction times after you have been presented with different pictures on a computer screen. Your appointment will last for approximately two hours.

**Part 3: After your first appointment**
About three weeks after your first appointment we will send a proportion of our participants another short questionnaire to complete and return to us. We will contact you again about three months after your first appointment to let you know when your second appointment will be.

**Part 4: Your second questionnaire pack (about five months after the first)**
About five months after your first appointment, you will be sent another questionnaire pack to complete. The questionnaire pack will be the same as the one sent to you at the beginning of the study. We will also contact you to confirm your second appointment and then send a reminder 24hrs before it.

**Part 5: Your second appointment (six months after the first)**
The second appointment will be the same as the first appointment, just six months later. After the second appointment you have completed the study. The study will run until all participants have attended for their second appointment. The research will be fully completed in 2013.

**Expenses and payment**
You will be reimbursed with £10 shopping vouchers for each appointment you attend. This is to compensate you for any inconvenience or expense associated with taking part.

**What are the possible disadvantages and risks of taking part?**
The risks to you from taking part in this study are very small. It is possible that you could be upset by some of the questions in the questionnaires or by the pictures in one of the computer tasks. Some of the questions in the questionnaires are quite personal, such as how often you have thoughts of death or dying and whether you agree with statements like “worrying could harm my body”. You may find the computer tasks tiring, as they require you to concentrate in a darkened room. Once you have completed the tasks and the light is switched back on your tiredness
should go away. In one of the computer tasks you will be shown pictures, some of which are quite unpleasant (e.g. pictures of physical injuries or of crashed cars). The pictures are similar to the sort of images you may see in everyday medical dramas (e.g. Casualty) and documentaries. We will show you some examples of the pictures used in the computer task at the beginning of the appointment to make sure you are still happy to take part. If you are upset by any of the questions or pictures in this study you can talk it through with the researcher. If you are still upset after discussing your concerns, we will direct you to appropriate sources of support.

What are the possible benefits of taking part?
This study is unlikely to help you directly, but will hopefully help us to develop better treatments for physical symptoms.

What happens when the research study stops?
If you indicate that you are interested, we will send you a summary of the results of the study. All results will be anonymous and you will not be able to identify your own individual results in the report.

What if there is a problem?
We do not expect there to be a problem. However, any complaint or concern about the way you have been dealt with during the study will be addressed. Detailed Information on how to do this is given in Part 2.

Will my taking part in the study be kept confidential?
Yes, all information about you will be handled in confidence, in accord with good ethical and legal practice. The details are included in part two.

THIS COMPLETES PART 1 OF THE BOOKLET.

If the information in Part 1 has interested you and you are considering participation, please read the additional information in Part 2 before making any decision.

PART 2

In this section we provide further information about the study and give answers to some frequently asked questions.

What will happen if I don't want to carry on with the study?
If you withdraw from the study, we will destroy all your personal details on file. We will ask you for consent to retain any data from questionnaires or computer tasks you have completed up to that point, if you do not consent to this, your data will be destroyed. If we are unable to make contact with you, then your data will be kept.

Will my taking part in this study be kept confidential?
All the information that is collected about you during the course of this study will be kept strictly confidential. To protect your privacy, a unique code number will be assigned to you. All of your research data (such as your responses on the questionnaires) will be identifiable by this code number only. Any personally identifiable information (such as your name and address) will be stored separately from your research data. The code number will be the only thing that links your personal details with your research data. We will keep all personally identifiable information in locked filing cabinets, or in encrypted computer files.

To ensure our research is conducted properly our data may occasionally be monitored, for example by the University of Manchester, or the NHS. This procedure is routine and carried out by fully qualified officials. Data confidentiality is preserved at all times. At the end of the study the confidential records will be kept for a minimum of 10 years and then destroyed. The confidential handling, storage and disposal of data are in accordance with the Data Protection Act, 1998.

**Will my GP be involved in the study at all?**
Your GP has given us permission to approach patients from their practice about this study. This is where their involvement in the research ends. This means that your GP will not normally be told about your participation in the study and none of the data we collect from you will be passed to your GP or any other healthcare professional. As we will not be analysing the data until after the study is complete, we are not able to comment on or respond to individual participants’ results. If you have any concerns about any aspect of your health you should contact your GP.

In the rare event that a participant tells us in person of serious imminent danger (e.g. a risk of them harming themselves or others) then we are obliged to tell that person’s GP and any other relevant services. Similarly, if a person has a strong negative reaction to taking part in the study (for example, they are unusually upset by the tasks or questionnaires and they tell us that there is a risk of them harming themselves or others) then we are also obliged to tell that person’s GP and any other relevant services.

**What if there is a problem?**
We do not expect there to be a problem. If you do have a concern about any aspect of this study, then you should ask to speak to the researcher (Anna Chapman: 0161 306 0428) who will do her best to answer your questions. If she is unable to resolve your concern, or you wish to make a complaint regarding the study, please contact a University Research Practice and Governance Co-ordinator on 0161 2757583 / 0161 2758093 or by email at research-governance@manchester.ac.uk. In the event that something does go wrong and you are harmed during the research, and this is due to someone’s negligence, then you may have grounds for a legal action for compensation against the University of Manchester. However, you may have to pay your legal costs.

**What will happen to the results of the research study?**
The results of this study will help us to understand why some people experience more symptoms than others. We hope to publish the results of this research in
medical journals but you will not be indentified personally in any report or publication.

**Who is organising and funding the study?**
This study is organised and funded by the University of Manchester.

**How can I be sure that the research is ethical?**
All research in the NHS is looked at by an independent group of people, called a Research Ethics Committee, to ensure that it meets strict ethical standards. This study has been reviewed and given a favourable opinion by the North West – Greater Manchester East Research Ethics Committee.

**Where can I get further information?**
If you would like more information or have any queries, please feel free to contact us using the details below.

**What should I do if I want to take part?**
If you decide that you are interested in taking part in the Understanding Physical Symptoms Study, please fill in the reply slip on the last page of this booklet and return it to us either by post (using the freepost envelope provided) or to the researcher who gave it to you. We will then contact you to discuss the details of the study further before you decide. Alternatively, if the study researcher is still present, you can give your contact details to them directly.

**Study contact Information**
**Trial researchers:** Anna Chapman / Philip Milner  
Address: School of Psychological Sciences, 2nd Floor Zochonis Building, Brunswick Street, University of Manchester, M13 9PL.  
Tel: 0161 306 0428 Mobile: 07968011408  
Email: anna.chapman@postgrad.manchester.ac.uk/philip.milner@postgrad.manchester.ac.uk

**Principal Investigator:** Dr. Richard Brown  
Address: School of Psychological Sciences, 2nd Floor Zochonis Building, Brunswick Street, University of Manchester, M13 9PL. Tel: 0161 306 0400

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**Thank you for considering taking part in this study**

**IF YOU ARE INTERESTED IN THIS STUDY, PLEASE COMPLETE THIS REPLY SLIP AND RETURN IT TO US IN THE FREEPOST ENVELOPE PROVIDED INSIDE THIS BOOKLET OR HAND IT TO THE RESEARCHER WHO GAVE IT TO YOU**

Name: ………………………………………………………………………………………………………………………………………………………………………
Telephone No:

Email:

Address:

Preferred time and method of contact:
Appendix G: Informed consent form
Consent form

Title of Project: Understanding Physical Symptoms Study

If you are happy to participate please complete and sign the consent form below

<table>
<thead>
<tr>
<th>Please Initial Box</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I confirm that I have read the participant information sheet dated January 2011, Version 1 on the above project and have had the opportunity to consider the information and ask questions and had these answered satisfactorily.</td>
<td></td>
</tr>
<tr>
<td>2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason and without detriment to my medical care or legal rights being affected</td>
<td></td>
</tr>
<tr>
<td>3. I agree that any anonymous data collected may be passed to other researchers.</td>
<td></td>
</tr>
<tr>
<td>4. I understand that data collected during the study, may be looked at by individuals from the University of Manchester, from regulatory authorities or from the NHS Primary Care Trust, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records.</td>
<td></td>
</tr>
<tr>
<td>5. I agree to take part in the above project</td>
<td></td>
</tr>
<tr>
<td>6. If you wish to receive a summary copy of the results please initial the box and indicate your preferred method of contact and details;</td>
<td></td>
</tr>
<tr>
<td>.................................................................</td>
<td></td>
</tr>
<tr>
<td>.................................................................</td>
<td></td>
</tr>
</tbody>
</table>

Name of participant: ........................................ Signed: ............................
Date: ............................

Name of person taking consent: ................................. Signed: ............................
Date: ............................

When completed: 1 for participant; 1 (original) for researcher site file
Appendix H: Study measures
This questionnaire looks at how people think about, try to make sense of, and cope with physical health concerns. There are no right or wrong answers. The time you spend completing this measure is greatly appreciated.

Listed below are a number of beliefs that people may have about health and illness, please could you rate how much you believe each of them out of 10, with 0 being ‘I don’t believe this at all’ to 10 ‘I agree with this completely’.

1. I must pay close attention to how my body is working
2. I must be ‘on guard’ where my physical health is concerned
3. It is difficult to shift my attention away from my body
4. Worrying about my health prevents serious illness
5. Looking for threats to my health will keep me well
6. I cannot ignore thoughts about my health
7. It is impossible to stop focusing on how my body feels
8. I cannot stop dwelling on my health
9. Thinking about my health will motivate me to do something about it
10. I have little control over my health concerns
11. Monitoring my body for signs of illness keeps me safe
12. Worrying could harm my body
13. I try to ignore thoughts about my health
14. I must think about my health to make sense of it
15. Focusing on how my body feels keeps me stable
16. It helps to think the worst so that I’m prepared
17. If I notice symptoms, I must take them seriously
Listed below are a number of things that people can do when they are concerned about their physical health. Please could you rate out of 10 how much you do each of these things with a score of 0 being ‘never’ and 10 being ‘always’.

<table>
<thead>
<tr>
<th>Score out of 10</th>
<th>Score out of 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>I try to distract myself</td>
<td>I try to control my thoughts</td>
</tr>
<tr>
<td>I try to reason things out</td>
<td>I worry about how to cope</td>
</tr>
</tbody>
</table>

18. I try to push thoughts about my health out of my mind
19. I cannot stop focusing on how my body feels
20. Paying attention to how my body feels will keep me well
21. It is difficult not to focus on my symptoms
22. When I worry it helps me to understand my health problems
23. Thinking about threats to my health in the future helps me cope
24. When I start thinking about my health I cannot stop
25. Worrying about my health helps to keep me well
26. It’s not normal to keep thinking about my health
27. I must be weak to keep thinking about my health
28. All I can do is wait and hope my illness goes away
29. Thoughts about my health continue, no matter how I try to stop them
30. It’s impossible to stop worrying about my health
31. Something bad would happen if I didn’t worry about my body
32. I try to avoid thoughts about my health
33. If I dwell on why my body feels this way I’ll find answers
34. I try hard not to focus on how my body feels
35. I have no control over my health / symptoms
36. Strong sensations in my body are dangerous
37. My symptoms are a sign that my body will never be well
38. Thinking about the causes of illness will help me prevent it
<table>
<thead>
<tr>
<th>Score out of 10</th>
<th>Score out of 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>I try not to think about health</td>
<td>....</td>
</tr>
<tr>
<td>I analyse why I feel this way</td>
<td>....</td>
</tr>
<tr>
<td>I avoid thinking about symptoms</td>
<td>....</td>
</tr>
<tr>
<td>I use alcohol or drugs to cope</td>
<td>....</td>
</tr>
<tr>
<td>I check my body</td>
<td>....</td>
</tr>
<tr>
<td>I behave more cautiously</td>
<td>....</td>
</tr>
<tr>
<td>I try to rest more</td>
<td>....</td>
</tr>
</tbody>
</table>

Listed below are a number of questions about how much your health preoccupies and distresses you, please circle the option which is closest to how things have been for you over the **last week**.

**How often do you have thoughts about your health?**

(Please circle a number)

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I have no thoughts about my health, or I think about it less than once a week</td>
</tr>
<tr>
<td>1</td>
<td>I think about my health at least once a week</td>
</tr>
<tr>
<td>2</td>
<td>I think about my health at least once a day</td>
</tr>
<tr>
<td>3</td>
<td>I think about my health at least once an hour</td>
</tr>
<tr>
<td>4</td>
<td>I think about my health continuously, or almost continuously. I can only think about other things for a few seconds or minutes.</td>
</tr>
</tbody>
</table>

When you are thinking about your health, how long does it last?

(Please circle a number)

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No thoughts about my health</td>
</tr>
<tr>
<td>1</td>
<td>Thoughts last for a very short time, no more than a minute</td>
</tr>
<tr>
<td>2</td>
<td>Thoughts last for several minutes</td>
</tr>
<tr>
<td>3</td>
<td>Thoughts last for at least one hour</td>
</tr>
<tr>
<td>4</td>
<td>Thoughts usually last for hours at a time</td>
</tr>
</tbody>
</table>

Over the last week, how much of the time have you spent focusing on your body? (Please Circle)

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I’ve focused on what’s going on around me and never thought about my body</td>
</tr>
<tr>
<td>1</td>
<td>I’ve focused on my body a small amount of the time</td>
</tr>
<tr>
<td>2</td>
<td>I’ve focused on my body half of the time</td>
</tr>
<tr>
<td>3</td>
<td>I’ve focused on my body most of the time and find it difficult not to</td>
</tr>
<tr>
<td>4</td>
<td>I’ve focused on my body nearly all of the time</td>
</tr>
</tbody>
</table>

Do your concerns and thoughts about your health cause you distress?

How much of the time do they cause you distress? (Please circle a number)

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I never have any health concerns that distress me</td>
</tr>
<tr>
<td>1</td>
<td>Health concerns cause distress, but not often</td>
</tr>
<tr>
<td>2</td>
<td>Health concerns cause distress about half of the time</td>
</tr>
<tr>
<td>3</td>
<td>Health concerns cause distress most of the time</td>
</tr>
<tr>
<td>4</td>
<td>Health concerns always cause distress</td>
</tr>
</tbody>
</table>

When your health distresses you, how severe does this feel? (Please circle)

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No distress</td>
</tr>
<tr>
<td>1</td>
<td>Health causes slight distress</td>
</tr>
<tr>
<td>2</td>
<td>Health causes moderate distress</td>
</tr>
<tr>
<td>3</td>
<td>Health causes a lot of distress</td>
</tr>
<tr>
<td>4</td>
<td>Health causes extreme distress; I can’t imagine it being worse</td>
</tr>
</tbody>
</table>

**END OF QUESTIONNAIRE THANK YOU FOR YOUR TIME.**
The Physical Health Questionnaire 15, Metacognitions Questionnaire 30, Health Anxiety Inventory and Cognitions and Beliefs about Health Questionnaire are not included in the electronic submission of this thesis due to potential copyright infringement, although are available for viewing in the soft bound thesis.
Appendix I: Electronic Copy of the Research contract
This contract is explicitly to formalise the use of and sharing of questionnaires measures in the allied studies conducted by Anna Chapman, PhD student and Philip Miner, DCLinPsy student in the Division of Clinical Psychology, University of Manchester.

Anna Chapman’s planned study is called ‘Symptom Reporting: A prospective cohort study of symptom reporting, body focused attention and somatic perception’ and Philip Miner’s study is called ‘A study to develop and evaluate a novel questionnaire measure of metacognitive beliefs around physical health concerns in a primary care setting’.

The measures will be shared between the two aforementioned parties and payments for these measures outlined below:

- At Anna Chapman will be responsible for the distribution and completion of these measures on the study day, to compensate for her time Philip Miner has agreed to the entry of the data calculated from the questionnaire measures into an SPSS database.
- The novel measure of metacognitions related to physical health concerns which is being tested and evaluated by Philip Miner will be available for Anna Chapman in her studies if she so wishes to use it.
- At Anna Chapman’s request a change in one of the measures has been made with the Hamilton Anxiety and Depression Scale substituted for the Brief Symptom’s Inventory.
- Philip Miner and Anna Chapman have agreed to share responsibility for the recruitment of subjects to their respective research studies.
- Philip Miner’s study will evaluate the validity and utility of the novel measure and will be delivered at the same time point as the measures used in Anna Chapman’s study. Both parties have agreed to share the data resulting from the novel questionnaire measures.

The measures to be shared will be:

1. Patient Health Questionnaire - Somatic Symptom Severity Scale (P-HQSS)
2. State-Trait Anxiety Inventory (STAI)
3. Health Anxiety Inventory (HAI)
4. Brief Symptom Inventory (BSI)
5. Cognitions and Beliefs About Health Questionnaire
6. Metacognition Questionnaire-10 (MCQ-10)
7. Novel measure of metacognitions relating to physical health concerns
F. The measures and scales for the questionnaire measures are as follows:

The following questionnaires are free or Philip Miller and Anna Chapman shared software or Richard Brown holds a license for:

1. PHQ-15
2. Health Anxiety Inventory – Short Version
3. Cognitions and Debias Aided Health
4. Meta-cognitions Questionnaire 30
5. Novel measure of meta-cognition relating to physical health concerns
6. State-Trait Anxiety Inventory

Philip Miller has been given permission to use the Meta-cognitions Questionnaire 30 by its author Professor Adrian Wells.

The cost of 360 Brief Symptom Inventories is £5750.00, which includes the price of a starter kit, including one manual, 50 profile forms, and 5 sets of 20 profile forms. This cost will be shared equally, amounting to £5860 at current prices.

The remainder of Philip Miller's budget after paying for other costs will be £311.70 which divided amongst the role for 150 participants giving a payment of £2.11 each for the completion of the novel measure.

I hereby agree to abide by the terms stated within this contract.

Signed: [Name]

Anna Chapman

Signed: [Name]

Philip Miller
Appendix J: Study approval letter
Mr Philip Milner
15 Pat Street
Stockport
Cheshire SK3 9EE

15th November 2010

Dear Philip,

Re: Feedback from Research Sub-committee 15th November 2010

Thank you for your revised research proposal which was considered by the Research Sub-Committee Meeting on 15th November 2010. The committee were satisfied that the revisions made were appropriate and in accordance with the feedback from the meeting of 18th October 2010 and you may now proceed with your research work.

For the purposes of ethical scrutiny by relevant NHS and/or University bodies, this letter may be taken as confirmation that your research proposal has been independently reviewed and that it is considered to meet necessary scientific and methodological standards.

On behalf of the Research Sub-committee, we wish you good luck with your research work.

Yours sincerely,

[Signature]

Dr Douglas Hare
Research Director
Panel Chair, Research Sub-Committee

cc: Dr Richard Brown
Professor Carolyn Chiew-Grant
Dr James McMinn
Appendix K: Electronic version of letter highlighting requested changes to the Research Ethics Committee
Dear Mr Chan,

Study title: Understanding Physical Symptoms Study – A prospective cohort study of cognitive and metacognitive predictors of symptom reporting in primary care.

REC reference: 11/NW0377
I am most grateful for the committee members’ helpful and constructive feedback on our application. Both Anna Chapman and I reflected on how helpful the Research Ethics Committee had been in reviewing the application. I am pleased that you deem the study to not present any major ethical issues and I write below how to outline the changes and clarifications to our proposal requested in your letter of the 27th June 2011, in order for our application to receive a favourable opinion. The changes made in the specified documents are highlighted.

Changes outlined in the Discussion
The approach to participants has been clarified in section A27-1 of the REC Application form, as has the nature of the screening process, as well as outlining that although some questionnaires would be completed before consent is given, these questionnaires would not be requested until consent is given, and if consent is not given then these would be destroyed. Further clarification is given in sections A27-2 and A27-3 around potentially identifiable information and guarding against breaches of confidentiality.

Standard Condition
Management approval from each host organisation will be obtained prior to the start of the study at the sites outlined in the application via the appropriate NHS R & D office.

Additional Conditions
1. Receptionists at the participating practice will be asked to give out a slip to patients to say that a research study is being carried to warn patients that they may be approached about the study. A copy of the slip is provided in Appendix A.
2. The poster to be placed in GPs practices advertising the study will now include a landline number to contact researchers on. The highlighted changes to the poster can be seen in Appendix 5 version 2.
3. The appointment letter for patients has been amended in paragraph 2 to include the word ‘completed’ before the word ‘questionnaires’. The highlighted changes to this letter can be seen in Appendix 12 version 2.
4. Each of the four requested changes to the information sheet for patients has been made and can be seen in Appendix 4 version 2.
   a) As requested in the section titled ‘Confirming your participation in part 1’ participants are asked to bring completed questionnaires with them
   b) and are informed that it will take 20 minutes to complete these questionnaires.
   c) In the section titled ‘What will happen to the results of the study’ added after the phrase ‘this research’ the phrase ‘in medical journals’ has been added.
   d) In the section titled ‘What will happen if I don’t wish to carry on with the study’ it is explained what will happen to study data if a participant is withdrawn or withdraws from the study in line with the answer in Section 13 of the REC Application.
5. On the **consent form for patients**, as it is not necessary to include the NHS Research Ethics Committee name and address, this has been removed. This can be seen in Appendix 6 version 2.

6. On the **information sheet for GP Practices** a contact detail has been included for the University Research Governance Office to be used in case of any complaints. This can be seen in Appendix 1 version 2.

7. The **follow up email** for GP Practices now includes an email address for the researcher as well as a work telephone number. This can be seen in Appendix 2 version 2.

I hope that the changes outlined above will be seen as sufficient to meet the conditions for ethical approval by the committee.

Best wishes,

Philip Milner
Appendix L: Hypothetical metacognitive model of functional somatic symptoms
Rough Metacognitive model of functional somatic symptoms

1. First double arrow at intrusions. The supervisory regulatory executive function (SREF) model contains monitoring as well as intrusions into awareness. The meta beliefs in the questionnaire will try to assess this, it will include things such as being ‘on guard’, monitoring body / health as well as what people do with the intrusions, i.e. pay close attention to them (cognitive self-consciousness), chose to think about them in detail, worry about them and trying not to think about them (thought suppression).

2. The second arrow predicts that positive meta-beliefs lead people into body / self focussed attention, analogous to Wells and Clarks (1995) social anxiety model which was also based on SREF theory. This circle contains worry, rumination and threat monitoring.

3. The perseverative appraisals are maintained and enhanced by positive and negative meta-beliefs around the value of looking for and paying attention to
threat, worry, rumination, and cognitive control strategies (attempts to control
cognitive events such as thoughts, feeling, emotions and images).

4. This perseverative appraisal (including worry about worry, rumination about
rumination) maintained by negative meta-beliefs leads to emotional distress
(anxiety, fear, anger, depression etc), noticing and focussing on ‘symptoms’,
maladaptive thought control strategies and rumination, and maladaptive
behaviours. Cognitive control strategies backfire, increased threat from
cognitions about health (need to control thoughts) and time spent focussing on
aversive cognitions (cognitive self consciousness).

5. As in the Wells and Sembi (2004) post traumatic stress model, psychosocial
stress contributes to intrusions, thought control strategies and maladapive
behaviour, enhancing and possibly initiating the vicious cycle. Iatrogenesis, i.e.
doctors offering ambiguous descriptions of difficulties (maintaining worry and
doubt), or sending for unnecessary diagnostic tests, may also contribute to
difficulties by reinforcing unhelpful behaviours / thinking strategies.

6. Behaviours such as resting or avoiding are likely to bring about reversible
physiological changes, for example, loss of muscle tone in people reporting
chronic back pain of people who avoid bending or rest more. Perseverative
appraisal (worry) is likely to bring about reversible increases in sympathetic
autonomic arousal i.e. back pain, gastrointestinal symptoms.

7. Behaviours, thought control strategies and emotions / symptoms cause more
intrusive thoughts to occur. Wells and Papageoriou showed that worry
increases intrusive thoughts.