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Investigating the Relationship Between Meta-Cognitive Beliefs, Thought Fusion Beliefs and Worry, in Relation to Obsessive - Compulsive Behaviours and Symptoms Within the General Population

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Abstract

Previous research and theory has suggested that in clinical samples, meta-cognitive beliefs and thought fusion beliefs (also referred to as magical thinking) as well as worry, contribute to the development of OCD behaviours and symptoms. However, worry, meta-cognitive and thought fusion beliefs are a cognitive phenomena, which are also found in the general population. The aim of the present study was to examine relationships between these variables and OCD in a non-clinical sample, since both worry and thought fusion beliefs have been under-researched in the literature.

A total of 301 participants, (144 males and 157 females, age range: 18-72 years, *M*_{age} = 32.6 years, *SD*=14.7), who had not been diagnosed with OCD, completed the Generalised anxiety disorder scale (GADS) which measures levels of worry, the meta-cognitions questionnaire (MCQ-30) which measures meta-cognitive factors which are suggested to relate to OCD behaviours and symptoms, the Thought Fusion Inventory (TFI), which assesses the beliefs held by individuals regarding the power of their thoughts and experiences, and the Obsessive-Compulsive Inventory (OCI) which measures OCD behaviours and symptoms.

As predicted, a multiple regression analysis showed that meta-cognitive beliefs and thought fusion beliefs predicted OCD behaviours and symptoms after controlling for worry. However, contrary to predictions, a moderated regression analysis revealed that worry did not moderate the relationship between meta-cognitive beliefs and OCD behaviours and symptoms. As predicted, an analysis demonstrated that worry significantly predicted meta-cognitive beliefs. Additionally, as predicted, a hierarchical multiple regression analysis demonstrated that worry significantly predicted OCD behaviour and symptoms whilst controlling for meta-cognitive beliefs. Finally, thought fusion beliefs predicted OCD behaviours and symptoms whilst controlling for worry. These results are discussed in relation to previous research and theory and suggestions for future directions are made.

Acknowledgments

I would like to convey my appreciation towards my research supervisors, Dr. Christopher Bale and Dr. Michael Lucock for their guidance, support and encouragement throughout. This project would have been extremely challenging without their endless, friendly and valuable support and supervision.

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1. Introduction and Literature Review

1.1. Definition of Obsessive-Compulsive Disorder

The diagnostic and statistical manual of mental disorders published by the American Psychiatric Association (APA, 2000), propose that obsessive-compulsive disorder (OCD) is the fourth most common psychiatric diagnosis. The DSM is the manual that is used by clinicians and researchers in order to diagnose and classify mental disorders. In accordance with the (APA, 2000), the essential features of the disorder are recurrent obsessions and compulsions, which are suggested to be severely time consuming. This is as they take up more than an hour a day for most individuals, causing distress and significant impairment. The disorder results in persistent fears, ideas and intrusive thoughts. Symptoms of the disorder can include excessive hoarding, consistently washing and cleaning, repetitive checking and many more. These particular ritual habits are aimed at the reduction of the fears and anxiety that are caused by the disorder (O'Dwyer & Marks, 2000).

The word 'obsession' is derived from the Latin, 'obsessus' or 'besieged'. The root meaning to the terminology, suggests that when an individual is obsessed, the state of mind is overwhelmed with uncontrollable thoughts, intrusions and images (Weisman et al., 1994, p.6).

According to the American and World Health criteria for diagnoses, obsessions are unwanted, repeated and persistent thoughts, images or impulses (APA, 1994). An obsession is intrusive because it is not voluntarily produced and is perceived as irrational. Additionally, the individual affected identifies that the thoughts are their own and are not controlled by environmental factors, outer force or introduced by another individual (Salkovskis, Richards & Forrester, 1995).

Often individuals take active measures in the attempt to curb their OCD. On occasion, this is done by resisting and/or avoiding the thoughts that lead to OCD behaviour. However, the thoughts may become naturally difficult to suppress and the obsession will intrude within the consciousness, which therefore interrupts the individuals' original thinking and behaviour (Freeston & Ladouceur, 2003).

Various common examples of obsessions include, fear of dirt and germs (contamination obsessions), fear of causing harm to oneself or others (aggressive obsessions), obsessing about lucky or unlucky numbers (magical obsessions) and hoarding obsessions. These include worrying about throwing items and belongings; however, obsessions can be focused in many other ways.

Although obsessions are defined as recurring thoughts, compulsions are seen as recurrent actions. In most cases, the compulsions are a way for individuals to attempt to relieve themselves from their obsessive thoughts. Compulsions are defined as deliberate actions and behaviours, which an individual feels the need to carry out repetitively in order to prevent harm occurring to them self or others. The behaviours are mainly performed in a stereotypical fashion, as the individual believes that by doing so they are avoiding any negative and detrimental outcomes (Salkovskis et al., 1995).

The compulsions are regarded as excessive and sometimes inappropriate. Although individuals with the disorder have the desire to reduce their behaviour, to a more realistic and moderate level, they fail to do so, as the urge to persistently carry the action is overwhelming. This leads to a sense of relief for a short period of time (Marcks & Woods, 2005). Compulsions can be both overt (for example, cleaning and washing) or covert such as believing that thinking a 'good' thought will replace a 'bad' thought with the aim of preventing feared events and reducing distress (Salkovskis et al., 1995, p.285).

Various common examples of compulsions include, excessive hand washing, repetitively checking items such as electrical equipment, locks on doors etc. Repeatedly saying phrases or counting them in the mind, arranging and ordering items in a specific way and many more.

In the past, OCD was seen as a rare illness. However, recent statistics have shown that OCD is the fourth most common mental health condition in various Western countries (Karno, Golding, Sorenson & Burman, 1988). The disorder is known to affect men and women, as well as children despite of their nationality, race or religion. However, research on OCD has shown that the disorder affects a slightly higher proportion of women (1.5%) than men (1.0%) (Foe et al., 1995)

Within the United Kingdom, it was estimated that a prevalence of 1.2% of the population at any one time will have this condition, which equates to around 12 out of 1000 individuals with an approximate lifetime prevalence rate of 2.5% (Kessler, Chiu, Demler & Walters, 2005). However, OCD is regarded as a 'hidden' disorder and the actual prevalence may be higher than indicated by these studies. Therefore, the figures suggested by the DSM-

IV are argued to underestimate the true prevalence of the condition (Somers, Goldner, Waraich & Hsu, 2006).

1.2. History of (OCD)

Within Ancient Egyptian documents, mental disorders such as OCD were explained in terms of states of concentration, attention and emotional distress in reference to the heart or the mind. Many of the interpretations of mental disorders within the documents were termed as hysterical and abnormal behaviour (Reynolds & Kinnier, 2011).

In the Egyptian and Mesopotamian era, treatments for mental disorders included reciting magical spells while applying bodily fluids on the patients, as this was seen as a purifying process (Flaskerud, 2000). Additionally, as a healing method, psychoactive drugs were given in order to make subjective changes to individuals' perceptions, thoughts, emotions and consciousness (Franz & Selesnick, 1966).

Ancient Hindu and Punjabi scriptures known as the Ramayana and Mahabharata, portrayed depression and anxiety which related the mental states, as the reflection of supernatural causes and of witchcraft. The mental disorders were also seen as an imbalance of bodily fluid or forces known as Dosha, which led individuals to believe they were of ill health, unhealthy and unfit to do anything or be part of society itself (Lauber & Rossler, 2007). Worries and difficulties relating to mental disorders were investigated and were described as being caused by an inappropriate diet, disrespect towards Gods, parents, teachers or other individuals, as well as damaged bodily activity. In Ancient Indian times, ointments and herbs were used to treat patients, alongside, prayers, charms and shocking the patients (Ciarrocchi, 1995).

From the 14th to the 16th century in Europe it was believed that individuals who experienced mental illnesses, which included experiences of sexual desires, blasphemous or any obsessive thoughts, were possessed by the Devil. The disorders were seen as unnatural elements of the individual which were caused by Demons, supernatural forces, or the Devil itself (Aardema & O'Connor, 2007).

In 1691, John Moore, Bishop of Norwich, England argued that individuals obsessed by intrusive and improper thoughts, which start in their minds, were to be exercised in the worship of God. Based on this, individuals with the disorder were involved in treatment which consisted of exorcism in order to banish the 'evil' from the 'possessed' (Berrios, 1989, p.88).

In the early centuries, OCD sufferers consistently pursued help from the clergy, defined as formal leaders within specific religions. Their role consisted of providing rituals and teachings of their religious knowledge, experience and practices (Steketee, 1991).

According to the clergy books, anxiety and fears underlie obsessions and compulsions and trying to suppress distressing thoughts made them worse. Modern conceptions would correlate also agreeing that the grounds of OCD lay in disorders of emotions such as anxiety, worry, stress, depression and fear (AuBuchon & Malatesta, 1995).

Roman Catholic writers suggested that OCD behaviours and symptoms were related to the individual's obedience towards their spiritual advisor. Thus, suggesting that it was believed that an individuals' behaviour would lead to spiritual repercussions and exaggerated obsessive and compulsive behaviours (Steketee, 1991).

Bloodletting, also known as phlebotomy was used in order to treat individuals' intrusive thoughts. This technique involved draining blood from the individuals' body to adjust the bodily systems (Franz & Selesnick, 1966). Other physicians used individual zodiac signs, and the positioning of symbols of the sun, moon and planets in order to attempt to cure compulsions within individuals. Additionally, laxatives and enemas was used as a form of treatment and claimed to be a success, in terms of curing distressing thoughts (Jenike, Baer & Minichiello, 1986).

In the eighteen and nineteenth centuries there was a growth in the number of individuals admitted, as it became more common to institutionalise the mentally ill. The mentally ill were perceived as wild animals with an insensitive nature. Harsh treatment was involved through the use of restraining the patients with chains in order to suppress their animalistic nature (Elkes & Thorpe, 1967). Treatment in various asylums was referred to as barbaric as whips were used for therapeutic treatment. Additionally in Bedlam Royal Hospital located in London, spectators would donate a penny in order to watch the patients as an entertainment (Jonathan, 2004).

In the early 1910s an alternative perspective was formed when Sigmund Freud related OCD to unconscious conflicts and behavioural psychology related OCD to fear, avoidance and conditioned responses. These treated phobias and anxiety disorders through systematic desensitization also known as graduated exposure therapy (Jenike et al., 1986). Both Freudian and behavioural psychology became the dominant models in terms of understanding OCD and the treatments based on these, were shown to be effective in treating the condition (Compas & Gotlib, 2002).

In the twentieth and twenty-first centuries, there was a major development of Psychoanalysis and mental disorders became widely accepted. (Leichsenring, 2005). There was a development in all areas, to understand and gain knowledge on the disorders starting from clinical, behavioural, and biological perspectives (Compas & Gotlib, 2002). It can be suggested that most of the obsessions and compulsions seen within individuals, in the 1600s up till today are similarly experienced, whether it is compulsively hand washing, doubting, or hoarding, as well as the various intrusive thoughts, images and impulses experienced. However, as discussed above, historic theories believed that mental illnesses were seen as abnormal behaviour, which was associated to the Devil. However, modern conceptions of mental illnesses have shifted from the religious to a more scientific analysis, in which psychiatry is strongly influenced by intellectual streams through chemistry, philosophy, physiology and other biological sciences (AuBuchon & Malatesta, 1995).

1.3. Aetiology of OCD

1.3.1 Psychodynamic approaches

Prior to the 1960s treatment of OCD was mainly based within the Psychodynamic approach, and this was originated from Psychoanalytic ideas regarding unconscious motivation (Salzman & Thaler, 1981).

Freud suggested that OCD is based on defensive mechanisms, which he labelled “isolation affect” and “undoing”. The defence mechanisms allow individuals with OCD to manage anxiety-provoking thoughts, images and impulses. Through the use of isolation of affect, individuals observe the thoughts as intrusive disturbances as they are recognised as being unconnected to their feelings (Freud, 1926). Additionally, the undoing is associated with the compulsion of OCD as the individuals use ‘magical’ treatment to avoid and get rid of the intrusive thoughts (Freud, 1926, p.98).

Psychoanalysts suggest that OCD is most likely to develop in individuals who have characteristics of an anal personality. These include, being excessively tidy, orderly and punctual, as the disorder occurs at a unconscious level, where the sufferers are concerned about being clean and tidy and creates an area which they can control (Rosen & Tallis, 1995).

The Psychoanalytic theory further suggests OCD is due to the individuals’ development from the defensive regression to the anal-sadistic stage. Freud proposed that individuals who are unable to master the oedipal conflict, which involves emotions and ideas

that are stored in the unconscious, would regress to the anal sadistic stage in order to avoid anxiety. This process stimulates aggressive impulses in which magical thinking beliefs act as a defence mechanism (Freud, 1924). The aim of Psychodynamic interventions is to aid individuals with OCD in understanding the core causes of their symptoms, which involve developing alternative solutions to emotional conflicts and increasing self-acceptance.

Psychodynamic interventions are suggested to decrease stress within individuals and thus, they will avoid the need to use defence mechanisms. These are suggested to create anxiety and produce magical thinking beliefs (Hansell & Damour, 2008). However, there is no convincing evidence for the effectiveness of psychodynamic psychotherapy as a treatment for OCD and as a consequence it does not feature in treatment within the National Institute of Health and Clinical Excellence guidelines (NICE, 2005).

1.3.2 Biological approaches

Neurobiological theories of OCD state that the root causes of the disorder are due to abnormal serotonin functioning (Gross, Sasson, Chopra & Zohar, 1998). Serotonin is a neurotransmitter and adequate levels of serotonin are required for efficient communication between brain cells and neurons. However, an insufficient level of serotonin prevents this process from occurring, which causes high levels of stress, and mood fluctuations (Bloch et al., 2008).

Individuals with OCD have been found to have limited serotonin production and thus, the serotonin receptors are under stimulated (Ozaki et al., 2003). Due to this, there is a decrease in serotonin receptors, which can lead to an increase in receptors for neurotransmitters related to stress such as norepinephrine and cortisol, and this, can cause OCD related compulsions (Ozaki et al., 2003). The usual treatment in this case consists of using selective serotonin reuptake inhibitors (SSRIs) which are also used as anti-depressant medicines. The treatment aims to reduce the symptoms and distress of OCD, through the use of anti-depressants to influence levels of serotonin. The various antidepressants used include sertraline, citalopram, fluoxetine and others (Ozaki et al., 2003).

Neuro biologists also hypothesise that OCD is due to ‘abnormal metabolic activity’ within the anterior cingulate, orbitofrontal cortex and the caudate nucleus (Saxena, Brody, Schwartz & Baxter, 1998, p.27). The communication between these different parts is particularly important since they make up a neural system which is linked to the initiation of

various behavioural responses which involve the acquisition of habits. This is suggested to be connected to OCD behaviours and also magical thinking beliefs, whereby individuals maintain and establish certain obsessional beliefs and ritual habits, and will perform them continuously (Saxena et al., 1998).

Additionally, the anterior cingulate and orbitofrontal cortex are proposed to have a very strong connection between one another. Thus, the interaction of the two cortices' are argued to produce OCD type behaviours, which produce ritual magical thinking beliefs. This is as; they are suggested to influence the emotional value which an individual places on a stimulus, alongside the response and action of the individuals' behaviour (Whiteside, Port & Abramowitz, 2004).

Many theorists however, also believe that the basal ganglia are involved in the development of OCD (Middleton & Strinck, 1994). It has been proposed that the basal ganglia are connected to the neocortex through 'parallel loops' of the cortico-ganglia. The loops are suggested to be interlinked to one another and link the neocortex to the basal ganglia then to the thalamus which in turn, goes back to the neocortex. Many theorists believe that if there is a problem in terms of the function within the loops then it causes individuals to repeatedly act out obsessions and compulsions. It has been argued, that the loops have been found to be involved in the setting of mental habits, as well as physical habits which individuals carry out (Middleton & Strinck, 1994).

1.3.3 Genetics approaches

There is now an increasing amount of acceptance within the literature that various psychiatric disorders are strongly related to genetic factors (Bellodi, Sciuto, Diaferia, Ronchi & Smeraldi, 1992). The first source of evidence that OCD is highly heritable was provided by an International research group. It was proposed that there are certain genetic compositions which can lead to OCD behaviours, additionally, it was found that OCD heritability appears to be concentrated in particular chromosomes, mainly chromosome 15 (Pauls, 2008).

Researchers have further proposed a relationship between OCD and the glutamate gene (Stepherd, 2004). Glutamate acts as a typical neurotransmitter in which the gene encodes a protein named EEACI. The role of the EEACI is to control the flow of the glutamate substance within the brain cells. Thus, high levels of glutamate could result in the increase of anxiety levels and cause alterations in the substance flow, putting individuals at

higher risk to creating severe obsessions and compulsions relating to OCD behaviours (Arnold, Sicard, Burroughs, Richter & Kennedy, 2006).

1.3.4 Evolutionary approaches

During the 1980's and 1990's the increasing recognition of evolutionary psychology has guided various applications of the adaptationist view of mental disorders, particularly OCD (Moskowitz, 2004). Gilbert, (1998) claims that the symptoms relating to OCD are all linked to the avoidance of threats. Thus, OCD is thought to result from dysfunction within systems built to identify threats and avoid harm. Additionally, Abed and DePauw, (1998) proposed that individuals developed an information processing stream within the brain as a result of natural selection. This causes individuals to develop magical thinking beliefs and intrusive thoughts relating to harmful circumstances and how to avoid particular events. In these circumstances, individuals envision solutions to various problems which may arise in the future. Thus, the malfunction of this system is thought to be the root to the development and flow of obsessions which result in OCD (Abed & de Pauw, 1998).

The specific symptoms of OCD are suggested to represent survival concerns which may have originated as group-selected traits in early human society. Compulsions, such as cleanliness, hoarding, counting and checking were beneficial behaviours, which strengthened hunting abilities and social ties within both human beings and mammals (Polimeni, Reiss & Sareen, 2005). In reference to this, it was also proposed that consistently checking and repetitive behaviours, which are now associated with OCD, was in the past used as a defence of territory. This was considered essential in order to survive, and may have been actively selected through mammalian evolution (Joiner & Sachs-Ericsson, 2001). Although individuals are less likely to use these survival skills to the same extent which they were used in the past, it is suggested that due to their mammalian evolutionary past, humans still possess certain relevant structures. For example, the neocortex involved in higher mental functions and amygdala involved in emotional responses and damage to the specific structures could cause OCD behaviours and symptoms (Stevens & Price, 1996).

In order to support the evolutionary perspectives in terms of OCD, various theorists have referred to the identification of fixed patterns in animals. These are behaviours which are encoded in the brain as affective and cognitive programs. These were considered essential for survival and are now suggested to be activated by various environmental events,

since they represent specific response tendencies which were selected through evolution (Lorenz, 1966). The fixed patterns include; grooming, hoarding, washing and ensuring safety, and are suggested to serve adaptive functions. An example of this is repetitive grooming and washing, as it is proposed to consist of an obvious adaptive value in terms of avoiding infections and diseases (Shuster & Dodman, 1998).

1.3.5 Conditioning models

In the 1970's and early 1980's, among clinical researchers conditioning models were suggested to be central to the development of OCD and its symptoms (APA, 2000). One of the earliest explanations of OCD was Mowrer's two stage theory (Mowrer, 1947). Mowrer, (1947) proposed that obsessional fears were acquired by classical conditioning and maintained by operant conditioning (Rachman & Hodgson, 1980).

In regards to the philosophy of classical conditioning, it was believed that phobias and fears associated with OCD symptoms develop, due to a paired association between a neutral stimulus and a feared stimulus (Lissek, 2006). For example, if an individual has previously experienced a panic attack in a grocery store, then the neutral stimulus (grocery store) will be associated with an anxiety response, potentially leading to a feared response to the store and further acts associated with OCD (Meyer, 1966).

The explanation of individuals' compulsive avoidance of anxiety provoking stimuli in Mowrer's second stage theory model, originated from Skinner's theory of operant conditioning. Mowrer (1956) suggested that individuals avoided and tried to escape from the anxiety provoking stimuli, which leads to the removal of unpleasant and unwanted emotions. Additionally, it is proposed that responses which aim to reduce the discomfort are developed such as, magical thinking beliefs and OCD behaviours, which aim to avoid specific aversive events and actions occurring (Mowrer, 1956).

1.3.6 Cognitive approaches

In the past 30 years, the evidence for the efficacy of cognitive behavioural therapy (CBT) has increased; this has been shown by the National Institute for Health and Clinical Excellence (NICE, 2005). Guidance which advises on the identification, treatment and management of OCD and body dysmorphic disorder (BDD) has been developed based on

cognitive models of these. Both disorders are included in these guidelines, since they have common characteristics and have similarities in terms of the treatments used.

The guidelines are intended to be helpful to clinicians, in order to organise high quality care for those suffering from OCD, and emphasise the importance of the patient's treatment and their experience of this. Thus, in recent years, research and evidence has consistently emphasised the importance of CBT treatment for OCD, and this is reflected within the NICE guidelines.

Over the years, CBT has been developed and used as a form of therapy, for a range of emotional disorders, and cognitive-behavioural models. They are based on the understanding that individuals misinterpret and react to various events, due to their central beliefs and attitudes. Formulations based on the cognitive model include an understanding of how cognitions, emotions and behaviours are linked in order to maintain the disorder, as well as educating patients on the intrusive thoughts (Rachman, 1998).

The first step within CBT after the assessment of the disorder is to develop a formulation, which provides an explanation for the patients' symptoms, and also a formulation of the maintenance of the disorder. A cognitive model of OCD is discussed, and examples of patients' symptoms are identified, which are suggested to maintain the obsessions (see Figures 1.1 and 1.2).

In this model (Figure 1.1) experiences in the individual's lives will create beliefs, which will then be interpreted in specific ways, this conditions them to believe that doing something, or not doing something, will have negative repercussions. This is as it may have happened in their past experience. The individual often experience high levels of distress/ and /or anxiety due to this, and in an attempt to neutralise this behaviour, they engage in repetitive or ritualised behaviours and compulsions.

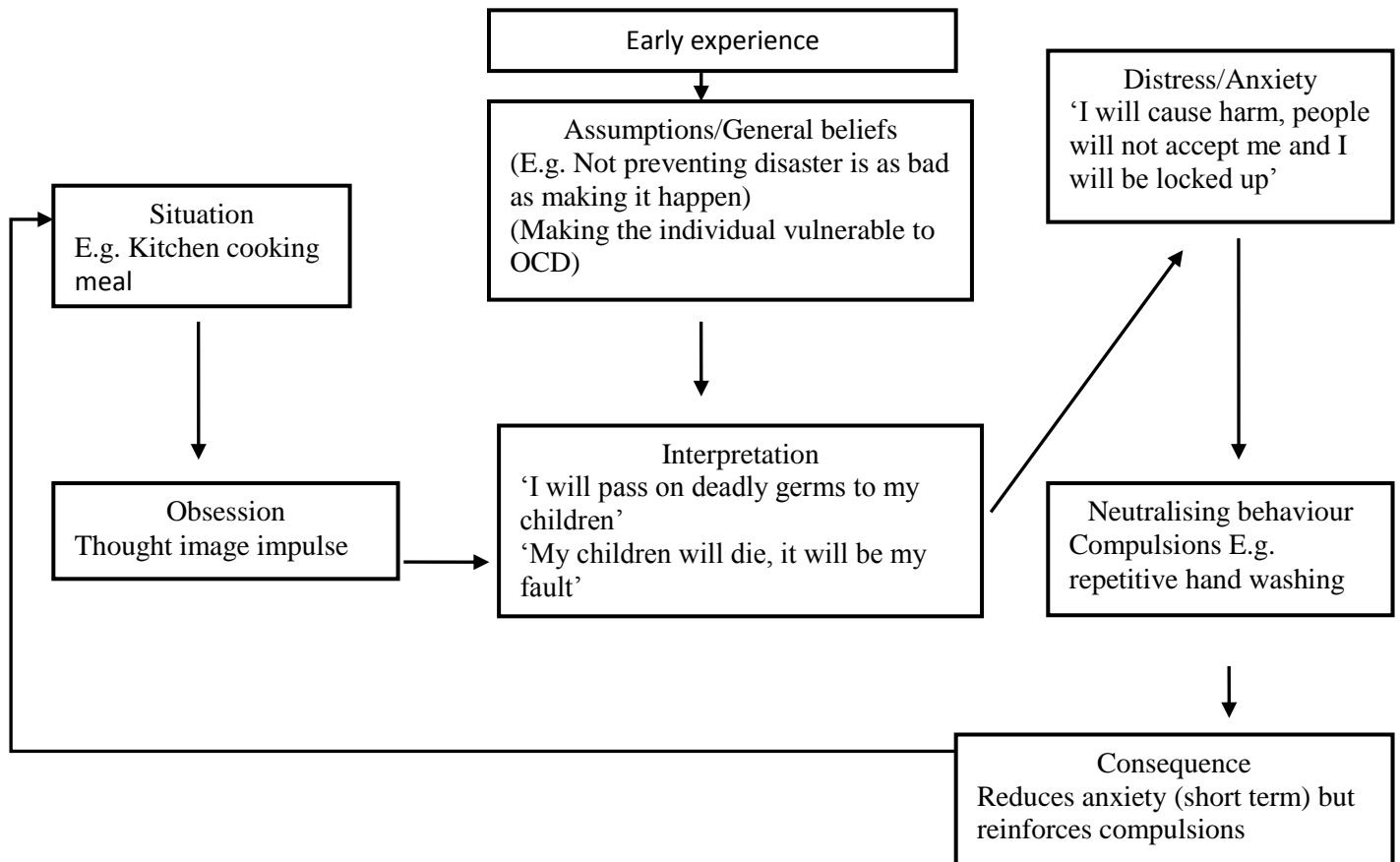


Figure 1.1: The Postulated Sequence of Descriptions, Interpretations and Actions. Adapted from, Frost, R. O, & Hartl, T. L. (1996) A cognitive-behavioural model of compulsive hoarding. *Behaviour Research and Therapy*, 34, 341–50.

1.4. Metacognition and OCD

In recent years, meta-cognitions have been incorporated into CBT based theories of OCD, in order to understand the origin and maintenance of psychological difficulties such as, anxiety and depression (Freeston, Leger & Ladouceur, 2001). Meta-cognition is described as beliefs about beliefs. As a result of individuals' experiences in life, beliefs are formed and certain beliefs can make an individual prone to developing OCD. Thus, when certain critical incidents appear in an individuals' life such as stress, anxiety, or depression, then these beliefs can lead the person to interpret intrusive thoughts and images in a way that can lead to the development of OCD (Freeston et al., 2001). Neutralising and responding to the ruminations leads to an immediate decrease in anxiety which reinforces the compulsive behaviour. Furthermore, the individual can get caught up in an OCD pattern which becomes

self-perpetuating with all the maintaining factors, thus they are seen to be the central cause of OCD (see Figure 1.2 for an illustration of this).

Magical thinking is also a term used parallel to thought fusion beliefs and is an example of an unrealistic thought pattern. This is due to an underlying belief that thinking about a bad action is equivalent to carrying it out. It is one of the aspects that have been associated with a vulnerability to develop OCD and one of the maintaining factors (Abramowitz, Whiteside & Deacon, 2005) (see Figure 1.2).

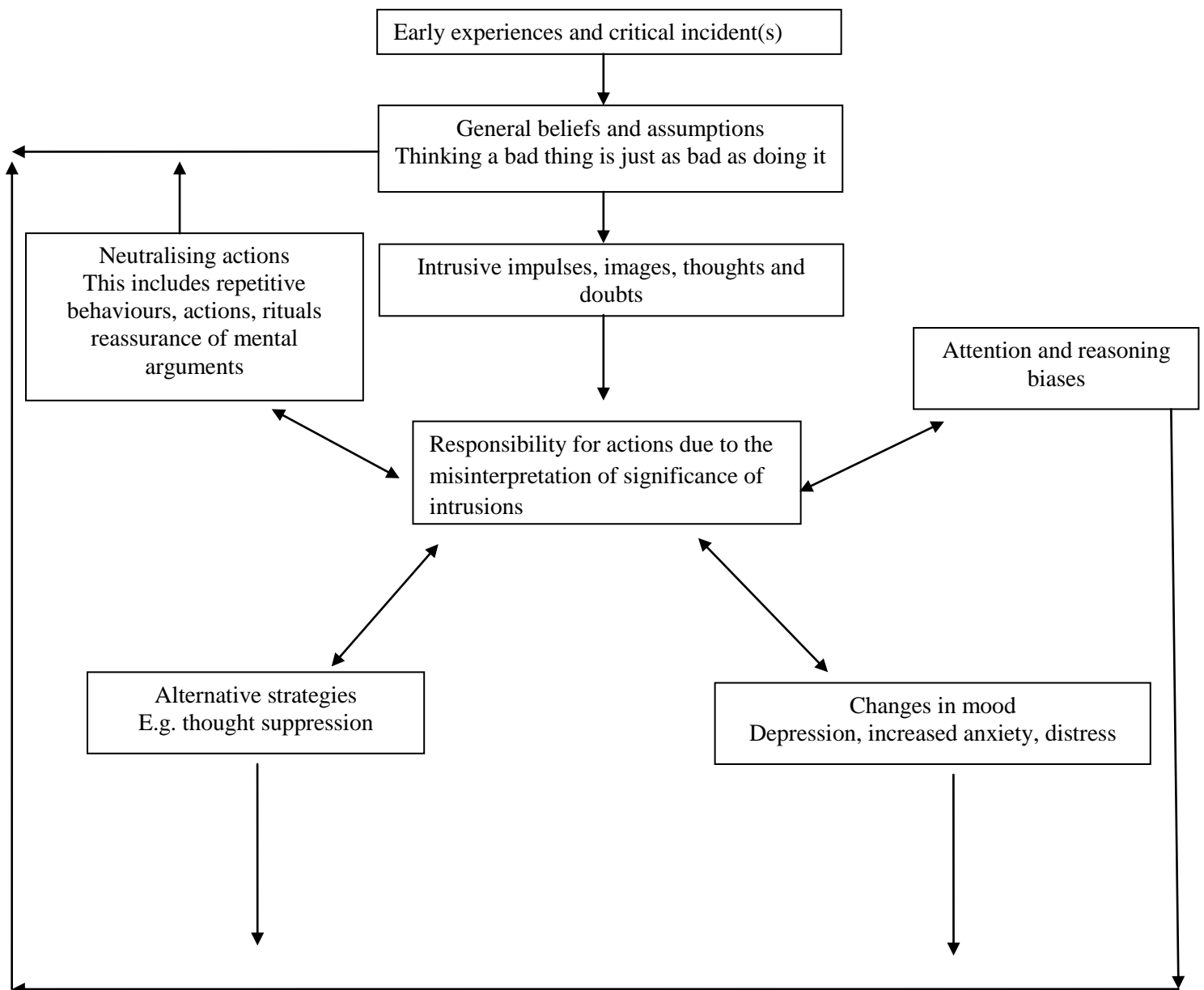


Figure 1.2: Psychological Factors Maintaining Threat Beliefs in OCD. Adapted from, Frost, R. O, & Hartl, T. L. (1996) A cognitive-behavioural model of compulsive hoarding. *Behaviour Research and Therapy*, 34, 341–50.

It has been proposed that in order to recognise and treat the disorder, it is essential to reveal the central processes which are linked to the development of OCD (Rachman, 1997). The NICE (2005) guidelines on OCD include the role of individuals' beliefs in terms of developing OCD. Meta-cognition is argued to be successful in terms of detailing the meaning and importance of intrusive thoughts, as it refers to various aspects such as, psychological structures, events, processes and knowledge that are suggested to be involved in terms of the modification, regulation and interpretation of an individuals' thinking (Wells & Cartwright-Hatton, 2004).

The beliefs are suggested to influence the interpretation of thoughts and lead an individual to react to them; thus, beliefs are argued to play a deciding role in terms of the development of psychological disorders such as OCD (Wells, 2000). In accordance with the self-regulatory-executive function (S-REF;) Wells and Matthews (1994) model, it was found that meta-cognitive beliefs encourage individuals to develop specific response patterns to their thoughts, or particular events. This is due to increased self-focused attention, initiation of dysfunctional beliefs and the practice of self-regulation strategies, which fail to reconstruct false beliefs (Wells & Cater, 2001). In addition to this, individuals are suggested to hold both positive and negative beliefs, which are described as two components within meta-cognitive beliefs, and are proposed to be important to the development of OCD behaviours and symptoms (Myers, Fisher & Wells, 2008).

Research has proposed that individually, negative and positive beliefs relate to specific OCD behaviours and symptoms including, hoarding, doubting and washing. These beliefs can lead a person to feel that if their actions and thoughts are not executed, then it will have catastrophic outcomes (negative). Alternatively, individuals may believe that their thoughts and actions can prevent these from happening (positive) (Wells, 1995). However, although it has been suggested that meta-cognitive beliefs predict OCD behaviours and symptoms, there is limited research on this (Myers et al., 2008). Thus, the construct of meta-cognitive beliefs needs to be investigated. This will enable further understanding to whether meta-cognitive beliefs as a whole predict OCD behaviours and symptoms, rather than specific positive and negative beliefs.

1.5. Thought Action Fusion and OCD

Magical thinking can be defined as a thought process in which real life events are linked together within an individuals' state of mind, but in reality they are unconnected to one another (Rachman, 1993). Examples of magical thinking discussed below, which is also referred to as thought fusion beliefs, include linking unrelated actions and events. This linking can lead individuals to live by specific rules. For example, individuals may be preoccupied with lucky or unlucky numbers, certain colours, words, sayings, actions or superstitions and link them to catastrophic things which they perceive could occur (Aarnio & Lindeman, 2005).

These thought fusion spheres include thought-action fusion (TAF), which is the belief that cognitive intrusions have the power to cause individuals to carry out actions. Similarly, thought-event fusion (TEF) is the certainty that a thought can cause an event to occur, and thought-object fusion (TOF) is the belief that thoughts can be transferred to objects (Fisher & Wells, 2005). Also, misperceptions of personal agency comprise beliefs are linked to an inflated sense of responsibility, since individuals may believe that choosing not to act can increase the chances of negative consequences. Therefore, they feel compelled to take the OCD actions within their mind to ensure that their perceived responsibilities are fulfilled. In addition, it is believed inaction will cause distress as they will feel they have failed at their responsibilities (Fisher & Wells, 2005).

Various studies have found a significant relationship between these fusion spheres and OCD symptoms. It was found that thought fusion beliefs play a major role in terms of the cognitive processes in OCD, as the thoughts or images become fused with reality (Rachman, 1993). Individuals in these circumstances find it difficult to distinguish between the thoughts in their mind and the physical reality. The thoughts can be so intruding, that they feel a physical and psychological danger (Rachman, 1993).

Thought fusion beliefs are suggested to underlie various magical thinking aspects linked to OCD such as; the obsessive worry for a loved one's safety with the compulsive need to carry out various rituals (Rachman, 1993). In addition thought fusion beliefs are also associated with guilt; for if an individual fails to carry out the ritual and harm is inflicted upon others, then the individual believes the cause of harm is the consequence of their failure to prevent it. Thus, individuals form conclusions based on the perception of the causal

relationships between their own intrusive thoughts, and real world events (Evans & Seaman, 2000).

Research into OCD and thought fusion beliefs has identified two types of TAF that are suggested to be related to OCD, and may be involved in the development of the condition (Rassin, Diepstraten, Merckelback & Muris, 2001). Firstly, moral TAF (TAFM), which is the belief that the reoccurrence of unacceptable thoughts, impulses or images are as damaging as carrying out the actions which they represent. Thus, the individual experiences a sense of heightened responsibility due to the occurrence of the thought, as the individual views the presence of the thought as morally deviant (Rassin et al., 2001). Secondly, likelihood TAF (TAF_L) is the belief that the reoccurrence of thoughts will increase the likelihood of the objects of the thoughts occurring in reality.

Previous research within clinical participants found that TAF-likelihood-for-others, which is the belief that a disturbing thought about others may hurt them, was endorsed to the same extent as TAF-likelihood-for-self which is the belief that thinking a bad thought about the self may make the thoughts come true (Rassin et al., 2001). However, non-clinical participants showed higher levels of TAF-likelihood-for-self than TAF-likelihood-for-others. This suggests that individuals with OCD are prone to believe that they are not in control of their beliefs, and that their thoughts will have damaging consequences, both for themselves and others (Einstein & Menzies, 2004).

Nevertheless, although it was reported that the non-clinical participants acknowledged the difference between the two beliefs, it was argued that the non-clinical population originally still reported both the TAF beliefs. Therefore, suggesting that there is an existence of these beliefs in both clinical and non-clinical population (Einstein & Menzies, 2004).

Research on thought fusion beliefs, has consistently linked the beliefs surrounding responsibility to OCD, as Salkovskis (1985), suggested thought fusion beliefs regarding excessive responsibility for harm to be the primary cause of obsessional problems. The continuous sense of responsibility produces automatic negative thoughts, thus OCD behaviours are produced in order for the individuals to believe they are avoiding harm to themselves or others (Salkovskis et al., 1995).

In addition to this, Rassin, Merckelbach, Muris and Spaan, (1999) conducted an experiment on thought fusion beliefs and the impact the thoughts have on individuals. Participants were told that having the thought 'apple' would result in a mild electric shock being inflicted on another individual. Participants were told they could avoid the electric shock being given by pressing a button when the thought arose. Within the control group,

participants were told that their thoughts would be monitored through with special equipments. The results indicated that the participants within the experimental group experienced high levels of discomfort, increased intrusions and more resistance to the word 'apple'. This suggests that individuals consciously try and control their thoughts if they believe that having them will have a real world detrimental consequence, which they will be responsible for. However, in OCD it is suggested that through the control of these thoughts the normal intrusions can change into obsessions (Rassin et al., 1999).

1.6. Worry and OCD

Worrying has been defined as a chain of negative loaded thoughts, images and emotions which are somewhat uncontrollable. Additionally, worry has been described as a cognitive process which involves repetitive, ritual and verbal thoughts aimed to avoid anticipated threats (Vasey & Daleiden, 1994). Both worry and anxiety are described as negative emotions and the terms are often used interchangeably. Worry is conceptualised as the mental component of anxiety and more extensive forms of worry can lead to anxiety. Nevertheless, according to Barlow (2000), worry may be independent and distinct from anxiety; general anxiety is usually prompted by fear and stress whereas worry occurs when individuals experience disturbances in their personal circumstances relating to their work, education, or family life, for example. This distinction has led researchers to suggest that worry may act as an independent factor in relation to various anxiety related disorders such as OCD (Barlow, 2002).

Previous studies have consistently reported a positive association between worry and OCD behaviours and symptoms (Heimberg, Turk & Mennin, 2004). Additionally, studies have shown that significant levels of worry were reported and associated with OCD behaviours and symptoms in more than 40% of the clinical population and around 30-35% of the general population. These statistics show that there is a direct correlation between levels of worry and OCD within both the clinical and non-clinical population (Brown, Dowdall, Cote & Barlow, 1994).

There is extensive experimental evidence, which shows, that obsessions and compulsions displayed through the individuals' physiological worry (Hogson & Rachman, 1972). Provocation of the intrusive thought, impulse or image will result in the increase of

worry and thus the individual engaging in an obsessive and compulsive ritual (Hogson & Rachman, 1972).

Worry is a trait which has been defined to lie within every individual, however the severity of worrying has been identified as a factor which distinguishes clinical patients with OCD from non-clinical patients (Brown et al., 1994). Various studies found that most obsessions and compulsions were related to intolerance of uncertainty which has significantly been associated with worry (Heimberg et al., 2004). Thus, individuals who may come across situations or events of uncertainty, will experience increased levels of worry which may lead to OCD related symptoms and behaviours (Heimberg et al., 2004).

There have been recent developments in regards to understanding worry in the adult population, as it is suggested that individual's hold positive beliefs about the benefits of worry (e.g. 'Worrying helps me avoid problems in the future') and negative beliefs in terms of the danger and uncontrollability of worry (e.g. 'My worrying is dangerous for me') (Wells & King, 2006, p.209). Furthermore, research suggests that the modification of these beliefs about worry can enhance treatment outcomes in individuals with anxiety related disorders, (including OCD) (Wells & King, 2006).

In the meta-cognitive model of generalised anxiety disorder (GAD), Wells, (1995) describes worry as a process maintained through meta-cognitive beliefs, and worry is hypothesised to be a coping response to an intrusive thought or image. Positive metacognitive beliefs are then encountered such as 'Worrying keeps me safe', are then generated which can lead individuals to continue this worry sequence, which aims to address danger related cognitions, and various strategies to resolve threatening scenarios are generated. This is classified as type 1 worry and this continue until the process identifies a personally suitable coping response. Furthermore, Wells, (1995) states that these positive beliefs represent a coping strategy which is observed within both the clinical and non-clinical population and is classified as 'normal'. However, it is the increased level of worry within clinical samples which distinguishes between the two populations (Wells, 1995, p.310). Thus, normal worry may influence both meta-cognitive beliefs and OCD behaviours and symptoms (Borkovec, Robinson, Pruzinsky & DePree, 1983). Butler, Wells and Dewick, (1995), additionally proposed that individuals who are likely to have high levels of worry, are likely to engage in activity which increases the frequency of intrusive thoughts and thus, engage in various meta-cognitive beliefs in order to cope with this.

The cognitive theory suggests that one variable has an effect on the other and is linked to one another, such as worry would mediate the relationship between meta-cognitive beliefs

and OCD behaviours and symptoms. Also, meta-cognitive beliefs would mediate the relationship between worry and OCD behaviours and symptoms (Borkovec et al., 1983). Nevertheless, previous studies have shown that when various variables were controlled for such as worry and responsibility then meta-cognitive beliefs still had an effect on OCD behaviours and symptoms. This was also the case when meta-cognitive beliefs were controlled. Therefore, suggesting that worry and meta-cognitive beliefs may be independent predictors of OCD (Purdon & Clark, 1999).

Although research has suggested that there is a causal relationship between meta-cognitive beliefs and worry, and also that both might be an independent predictor of OCD (Borkovec et al., 1983, Purdon & Clark, 1999). Another possibility would be that the two variables in conjunction work together and that worry will have an influence on the relationship between meta-cognitive beliefs, and OCD behaviours and symptoms (Butler et al., 1995). This analysis would suggest that meta-cognitive beliefs and worry might interact, such that worry at least partially significantly moderates the relationship between meta-cognitive beliefs and OCD behaviours and symptoms.

Borkovec and Roemer, (1995), suggested that individuals who display symptoms relating to GAD, report more positive reasons for worrying, involving superstitions and problem solving than non-anxious subjects. Wells, (1995), however, suggests that positive beliefs about the usefulness of worry are the central cause of problematic worrying, since individuals who hold these beliefs may not attempt to control their thoughts, or alternatively apply strict limits to them. This can lead to the development of specific magical thinking type beliefs which can produce OCD related ritual behaviours. Individuals may also try suppressing their thoughts, however Clark and Watson, (1991) argues that thought suppression can increase the number of intrusions which are experienced, leading to worry and anxiety and thus, may carry out OCD behaviours as a way of coping and relieving the anxiety for a short period of time.

Einstein and Menzies, (2004) further found that general beliefs in relation to magical causation were also linked to worry. Negative thoughts increase anxiety and that OCD behaviours constitute individuals' attempts to relieve the anxiety.

It has been indicated that the uncontrollability and harm associated with worry can explain washing compulsions, as these may serve as acts to control thoughts and reduce any dangers (Clark, 2004). Also Clark and Purdon, (1993) supported that worrying may similarly be associated with checking compulsions as these may be techniques used to avoid future threats and catastrophes. Worrying does not necessarily always constitute a negative

influence; but, develops into a dysfunctional element when it is used as a fixed coping procedure (Wells, 2005). Individuals believe that their worrying is uncontrollable and may be potentially dangerous and harmful, thus leading them to use unhelpful control strategies (Wells, 2005)

Some individuals encompassed in emotional suffering due to type 2 worry, this is the term used for 'worrying about worry' which concerns negative appraisals on the uncontrollability of worry e.g. 'I could go crazy with worry' and also, the dangerous consequences it may lead to on psychological, physical and social aspects e.g. 'worrying can damage my body' (Wells, 2005, p.311). Therefore, once an individual is confronted with an anxiety-provoking or/stressful event, their levels of anxiety can escalate making it difficult for the individual to recognise that it is safe for them to stop worrying, thus, reinforcing negative worry and the need to continue worrying as a safety shield (Wells, 2005). Furthermore, due to the high levels of worry, the individuals may experience problematic meta-cognitive beliefs and OCD behaviours and symptoms (Butler et al., 1995).

It has been proposed that around 80% of the general population experience various unpleasant, unwanted, intrusive thoughts similar to those seen within OCD patients; however, this is experienced as less distressing and to a less frequent degree than for OCD patients (Salkovskis & Harrison, 1984). Additionally, Einstein and Menzies, (2004) reported that more than half of the population may engage in various ritualised behaviours; however the obsessions and compulsions are reported to be less severe and distressing within the non-clinical samples.

Although worry has been shown to be related to OCD, the exact nature of this relationship is unclear, such as, does worry directly and independently predict OCD, or is it a moderator or mediator of other relationships? Several studies have looked into the relationship between meta-cognitions and obsessive-compulsive symptoms within both clinical and non-clinical samples and have found significant results even when controlling for different variables such as worry and responsibility (Sica & Ghisi, 2007). It was also found that meta-cognitions within the non-clinical sample act as an independent predictor of obsessive-compulsive symptoms, suggesting that meta-cognitions are experienced and lie within the general population as well as within patients with OCD (Myers & Wells, 2005).

Additionally, Julien, O'Connor and Aardema, (2009) study indicated that between 79-99% of the general population reported repetitive and intrusive thoughts which corresponded with the thoughts similarly experienced by OCD patients. However, within this study and Freeston, Ladouceur, Thibodeau and Gagnon, (1991) study, these non-clinical participants

did not experience any worry associated with these thoughts. Nevertheless, there have been studies which argue that worry and obsessional symptoms and behaviours are systematically associated (Borkovec, Shadick & Hopkins, 1991). This questions the role of worry and whether it is an independent predictor of OCD or whether it is influenced through variables such as meta-cognitive and thought fusion beliefs? This is an aspect which is explored within the study.

Although the general population are suggested to experience these meta-cognitions, only a minority go on to develop the disorder, and this is likely to be due to how individuals interpret these beliefs. Some individuals may simply dismiss these thoughts and beliefs, but, others may be unable to avoid the thoughts until they take some form of action (Zucker, Craske, Barrios & Holguin, 2002). However, if unwanted and disturbing intrusive thoughts are in fact part of the normal stream of consciousness, then the question arises as to why some individuals are so particularly disturbed by these mental intrusions? One of many answers could lie with investigation of worry. It has been found that generalised anxiety, which incorporates worry, and OCD are closely related in terms of their symptoms (Barlow, 2000). Hence, measuring levels of worry and OCD symptoms in the non-clinical samples could provide a sufficient analogue research in relation to OCD. In summary if we were to measure worry and OCD symptoms, we could see if there is a correlation between the two and if by affecting one it has an impact on the other. This will allow us to identify individuals who may be more susceptible to developing OCD. It can also potentially, open up suggestions, as to how patients with OCD could potentially be treated by identifying and eliminating the causes of their worry (Burns et al., 1995).

Research has primarily focused on clinical patients, rather than the non-clinical population, a research focusing on the non-clinical population could possibly be compared to the findings to the clinical population to see if there are any correlations or trends which can be established (Freeston et al., 1991). There is evidence to suggest that meta-cognitions, thought fusion beliefs and worry not only correlate to OCD, but are linked to one another and exist within the general population (Barkovec et al., 1994; Hazlett-Stevens, Zucker & Craske, 2002). Therefore it is essential that this research be conducted to analyse this. However, despite this, there is much debate within the literature about the exact nature of the casual relationship between thought fusion beliefs, meta-cognitive beliefs and worry.

To further this point, Borkovec et al., (1994) argued that thought fusion beliefs are closely related to worry, which is designated as a key aspect of trait anxiety. Evidence was found to suggest that worry comprises various cognitions, which are similar to thought fusion

beliefs. For example, individuals may hold beliefs that worrying could prevent potential calamities, or have an influential effect on outside events (Barkovec, 1994). Also, it has been proposed that, it is the high levels of worry exhibited by the individuals that cause thought fusion beliefs to relate to OCD behaviours and symptoms (Zucker et al., 2002).

Alternatively, some researchers have proposed that thought fusion beliefs form a component of meta-cognitive beliefs (Wells & Matthews, 1994). Hazlett-Stevens et al., (2002) further found results which are consistent with the assumption that thought fusion beliefs and meta-cognitive beliefs, and the likelihood of bad events observed within pathological worry, are similar and reflected similar cognitions. Whereas, it has also been argued that the three concepts are related but distinct phenomena (Amir et al., 2001). Other researchers have proposed that thought fusion beliefs are not a component of meta-cognitive beliefs or worry; rather they are construed as an independent factor (Rassin, 2001).

On this view, thought fusion beliefs would be proposed to have an influence on OCD behaviours and symptoms, whilst controlling for worry (Rassin, 2001). However, previous research also suggests that thought fusion beliefs do not independently predict OCD behaviours and symptoms and it is the various factors such as meta-cognitive beliefs and worry influencing thought fusion beliefs (Matthews, Reynolds & Derisley, 2007). However, Holmbeck, (1997) argued that if thought fusion beliefs are associated with the anxiety disorders, then it is an individual cognitive bias rather than one which is specific to worry and meta-cognitive beliefs. Thus, Rassin, Muris, Schmidt and Merckelbach, (2000) suggested that due to thought fusion beliefs being associated with anxiety disorders, then it could be assumed that individuals with thought action fusion beliefs may be pre-disposed to experiencing OCD behaviours and symptoms.

Considering the evidence stating the relevance of thought fusion beliefs within treatment, and theoretical issues surrounding the understanding of anxiety related disorders, the role of thought fusion beliefs in terms of OCD, deserves more of an in-depth investigation (Hazlett-Stevens et al., 2002). This is an aspect which is limited within previous research as, although the role of worry and meta-cognitions have been investigated, previous research fails to look into the specific role of thought fusion beliefs thoroughly in relation to worry, meta-cognitions and OCD. This is something which the present study aimed to overcome as all these constructs are considered together.

1.7. Rationale

Although previous research has addressed clinical samples (Myers & Wells, 2005; Sica et al., 2007) research has typically used small sample sizes of around, 50-75 participants to study relationships between magical thinking and OCD behaviours and symptoms. Furthermore, studies based on non-clinical samples have typically consisted of sample sizes varying between 100-150 participants (Rachman & de Silva, 1978; Rassin et al., 2000). Consequently, suggested that a larger sample size is needed in order to establish robust and generalisable results (Fowkes & Fulton, 1991). In order to overcome this limitation the current study recruited approximately 300 participants.

Research has frequently proposed that the same mechanisms exist within the general population which are found within individuals diagnosed with OCD (Salkovskis & Harrison, 1984). It is assumed that it is simply the case that the general population do not experience the beliefs as severely as those diagnosed with the disorder (Salkovskis & Harrison, 1984). However, there has been limited research principally focusing on the general population alone, hence the current study aimed to examine this assumption. In addition, the present study sought to address the debate within the literature regarding the nature of the connection between worry and OCD symptoms (Julien et al., 2009; Freeston et al., 1991).

Wells and Carter, (2001) further found that thought fusion beliefs are implicated in psychological problems such as obsessions, worry and anxiety. However, Clark, (2004) argues that although it is suggested that worry, thought fusion and meta-cognitive beliefs play a role in the development of OCD; there is limited research on this. In addition to this, it is currently unclear if worry itself is linked to OCD, as well as established variables such as thought fusion and meta-cognitive beliefs. Therefore, Lobban, Haddock, Hinderman and Wells, (2002) argue that in regards to examining the role of meta-cognitive and thought fusion beliefs and the development of OCD, the level of worry should be controlled and this has not been the case in previous studies on relationships between these variables. Therefore the present study looked into trait worry, to see whether worry moderates the relationship between meta-cognition, thought fusion beliefs and OCD behaviours and symptoms. This was done through the use of the GADS 5 (Wells, 1997) questionnaire. This specific measure was used instead of the more recent GADS-7 since the latter is frequently used for screening and assessing the severity of anxiety. As the present study aimed to look into worry, it was

found that the GADS-5 would be more of a suitable measure to use as the questionnaires' main focus is around the factor of worry.

Research has also found that thought fusion beliefs are closely associated with anxiety disorders such as OCD (Amir, Freshman, Ramsey, Neary & Brigidi, 2001). It could further be proposed that thought fusion beliefs alone predict OCD, if they are not conceived as a component of meta-cognitive beliefs or worry. However, this area of research is relatively limited as although worry and meta-cognitive beliefs have been investigated, previous research fails to look thoroughly into the role of thought fusion beliefs (Hazlett-Stevens et al., 2002). This is an aspect which the current study aims to expand on and address the limitations in the literature to a large sample of non-clinical participants. It aimed to do this by administering measure of the generalised anxiety scale GAD-5 which specifically aimed to measure levels of worry rather than anxiety which is a predominantly used by the newer version (GADS-7).

Secondly the MCQ-30 measures meta-cognitive beliefs, this measure was chosen due to the measurement assessing various factors including positive and negative beliefs about worry, cognitive confidence, cognitive self consciousness and the need to control thoughts. All these aspects are suggested to make up meta-cognitive beliefs and are also related to OCD behaviours and symptoms (Gwilliam, Wells & Cartwright-Hatton, 2004). Thus, this measure will allow meta-cognitions to be tested as a whole construct and to observe how this affects different factors such as worry, thought fusion beliefs as well OCD behaviours and symptoms.

Thirdly, the thought fusion inventory will be used as the present study will be measuring all the components, such as thought action fusion, thought event fusion and thought object fusion. However, the present study will focus on the thought fusion beliefs as a whole construct. Thus, this particular term is going to be used throughout.

Lastly, the obsessive compulsive inventory OCI is a forty two item scale, designed to measure all the OCD behaviours and symptoms which an individual may experience.

Based on previous research and theory it was predicted that:

- 1) Meta-cognition and magical thinking (also known as thought fusion beliefs) will significantly predict OCD behaviours after controlling for worry
- 2) The relationship meta-cognitive beliefs and OCD behaviours and symptoms will be significantly moderated by worry.
- 3) Worry will significantly predict meta-cognitive beliefs
- 4) Worry will significantly predict OCD behaviours when controlling for meta-cognitive beliefs
- 5) Thought fusion beliefs will significantly predict OCD whilst controlling for worry

2. Method

2.1. Design

The current research study comprised of a cross-sectional survey which examined relationships between worry, meta-cognitive beliefs, thought fusion beliefs and OCD behaviours and symptoms.

2.2. Participants

There were 301 participants, (144 males and 157 females, age range: 18-72 years, $M = 32.6$, $SD=14.7$). An opportunistic sample was used in which the participants were recruited through an online participant procedure e.g. SONA system and social network sites as well as personal acquaintances.

Participants were also encouraged to forward the study onto any individuals who they knew who may be willing or interested to take part in the study. This ensured that a broad sample consisting of individuals of all ages, cultures and both sexes was recruited.

2.3. Materials

Generalised anxiety disorder scale (GADS) – Well's, (1997) generalised anxiety scale was used to measure worry in the present study. The questionnaire consists of five questions which relate to various aspects of worry such as the need to control worry, cope with worry, avoid worry and prevent worry. The scale is widely used within the clinical practice in order to assess anxiety in accordance with the diagnostic and statistical manual of mental health disorders (DSM-IV) symptom criteria for GAD. The first four questions are responded to on an 8 point likert scale (0=not at all, 4=moderately, 8=extremely) the last question however concerns participants' beliefs and is scored from 0-100 (0=do not believe the thought, 100=completely convinced the thought is true).

The mean scores for questions 1-4 were totalled to form the measure of worry used in subsequent analyses. However since the last question on the GADS is designed to measure meta-cognitive beliefs and due to the meta-cognitive beliefs, which were measured in the present study using the meta-cognitions questionnaire described below, this item was not included in the analyses below (though descriptive statistics are reported). Example: "in the

past week how much effort have you put into trying to control your worries” “I could go crazy with worry”

GADS has been used previously to assess the severity of the symptoms of worry and anxiety within both males and females across a range of within various age groups from adolescents to the elderly.

Previous research has demonstrated high levels of internal consistency for the measure (Cronbach's $\alpha = 0.89$, Swinson, 2006) and this was also established in the present study $\alpha = .91$. The GADS was also compared to an alternative questionnaire (Rosenberg self-esteem scale) and portrayed a moderate correlation indicating ($r = -0.43$, $P < 0.001$). The scores from the GADS have also shown to predict that both clinical and non-clinical patients indicated good internal consistency (Swinson, 2006), ranging from Cronbach's $\alpha = 0.86-0.93$ within patients with anxiety disorders and Cronbach's $\alpha = 0.91-0.95$ in non-clinical samples.

These considerations suggest that the GADS is an adequate measure for investigating relationships between worry and the other variables investigated in this study.

Meta-cognitions Questionnaire-30 (MCQ-30)-The meta-cognitions questionnaire (Wells and Cartwright-Hatton, 2004) assesses a variety of meta-cognitive beliefs alongside, monitoring tendencies and judgments which are indicated to play an important role within the meta-cognitive theory of OCD (Wells, 2000).

The MCQ-30 includes thirty questions encompassing five factors which are suggested to relate to OCD behaviours and symptoms; negative and positive beliefs about worry, cognitive confidence, cognitive self-consciousness and the need to control thoughts.

Participants are required to indicate their answers on a four point scale, (1=Do not agree to 4=Agree very much). Scores are obtained for the following scales; 1) positive beliefs about worry (e.g. “I need to worry in order to remain organised”) 2) negative beliefs about the uncontrollability of thoughts (e.g. “I could make myself sick with worrying”) 3) cognitive confidence, (e.g. “I have a poor memory”) 4) negative beliefs about thoughts in general (e.g. “not controlling my thoughts are a sign of weakness”) 5) and cognitive self consciousness, (e.g. “I think a lot about my thoughts”).

Scores for sub-scale items are summed and these are then summed to provide an overall MCQ-30 total score. Previous research using the MCQ-30 has indicated the acceptable internal consistency of the overall measure ($\alpha = 0.80$) and of each constituent subscale ($\alpha = 0.78, 0.75, 0.83, 0.63$ and 0.53) respectively (Spada, Mohiyeddini & Wells, 2008) and $\alpha = .93$ for the total scale in the present study. Furthermore, Spada et al., (2008) reported that the MCQ-30 demonstrates high test-retest reliability and reported positive relationships between

the instruments and measures of obsessive compulsive symptoms, intrusive thoughts, worry and beliefs suggesting high construct validity of the measure.

The Thought-Fusion-Instrument (TFI)-The Thought Fusion Instrument (TFI) was originally developed by Wells, Gwilliam and Cartwright-Hatton, (2009) in order to assess beliefs about thoughts across 'fusion' spheres and beliefs held by individuals regarding the power of their thoughts and experiences, referred to as magical thinking. These factors are considered relevant in terms of the meta-cognitive formulation and treatment of OCD.

Three fusion areas are measured within the 14 item single scale; Thought Event Fusion, (TEF: e.g. "My thoughts can influence an event to occur") Thought Action Fusion (TAF: e.g. "Thinking a bad thing is just as bad as acting it out") and Thought Object Fusion (TOF: e.g. "My thoughts can be passed onto objects"). The fourteen questions are responded to on a 0-100 scale (0=I do not believe this at all, 100=I am completely convinced this is true).

Gwilliam et al., (2004) and Myers and Wells, (2005) reported that Cronbach's alpha for the TFI questionnaire was 0.89 and for the present study $\alpha = .94$. Additionally, previous research using the TFI found that Cronbach's alpha for the total TFI scale was (0.87) and for each of the subscale; 0.72, 0.77, 0.75 were perceived acceptable (Mohammadkhani, 2013).

Furthermore, thought fusion beliefs are considered important in regards to the meta-cognitive formulation as well as the treatment of OCD. Positive correlations have been found between the TFI, meta-cognitive beliefs and measures of obsessive-compulsive symptoms, thus, reflecting adequate validity (Myers & Wells, 2005).

Obsessive-compulsive inventory (OCI) -The obsessive compulsive inventory (OCI) (Foa et al., 1998) has consistently been used in previous research to measure OCD behaviours.

The self-report scale consists of forty-two questions which aim to measure the major symptoms of OCD on seven dimensions; washing (8 items) e.g. "I wash and clean obsessively", checking (9 items), e.g. "I check things more often than necessary" doubting (3 items), e.g. "after doing something carefully, I still have the impression I haven't finished it" ordering (5 items), e.g. "I need things to be arranged in a particular order" obsessing (8 items), e.g. "I am obsessively concerned about cleanliness" hoarding (3 items), e.g. "I avoid throwing things away because I am afraid I might need them later" and mental neutralising (6 items) e.g. "I have to do things over and over again until it feels right".

Each of the 42 items are scored for frequency on a five point scale, ranging from 0-4 (0= not at all and 4= extremely). Mean scores for each of the sub-scales are calculated and an

overall mean 'distress' score is calculated from these. For example: "I feel compelled to counting whilst doing things" "I have to do things over and over again until it feels right".

Although this is not a diagnostic instrument, total scale scores greater than 42, or any mean sub-scale scores of greater than 2.5 are considered to indicate the presence of OCD.

Foe et al., (1998) found that in a sample of OCD patients, non-patient controls and generalised social phobia patients, internal consistency for the sub-scales ranged from $\alpha = 0.72-0.96$ for the frequency ratings and $\alpha = 0.68-0.94$ for distress ratings. In the present study $\alpha = .95$ for the overall measure.

It was additionally found by Foa et al., (1998) that the OCI total scores had high-retest reliability within an OCD patient samples ($r = 0.84$ total frequency and $r = 0.87$ total distress) also, in non-patient ($r = 0.90$ and 0.89). This was also the case in terms of the sub scale scores in both clinical and non-clinical samples, thus, again demonstrating high test-retest.

Results from previous studies indicated that the instrument is a psychometrically valid measure of OCD as well as the various symptom presentations (Abramowitz & Deacon, 2006). Five out of the six subscale items were found to correspond closely to identifying OCD symptom dimensions as well as differentiating OCD from other anxiety disorders. Thus, the instrument is recommended as a validated measure which can be used in both clinical setting and research on OCD (Abramowitz & Deacon, 2006).

2.4. Procedure

Participants were recruited online using a University participation system, and were also invited to participate through email, Facebook and personal acquaintances of the researcher. Participants were also asked to forward details of the study to any other individuals they knew who might be willing to take part.

The individuals were approached with an invitation to participate sheet; which had both electronic versions for online and paper versions for face to face recruitment (see appendix 1 and 2). The invitation sheet and email acknowledges all the information which may be questioned by the participant such as the definition of OCD meta-cognition and magical thinking (see appendix 1 and 2).

The invitation sheet and email gave participants full details of the study, and indicated examples of the types of questions they will be required to answer (see appendix 1 and 2). Participants were advised not to take part if they have been diagnosed with OCD, and assured that their answers would remain anonymous.

Participants were also informed on their rights to withdraw, the confidentiality their data, and participant safety considerations such as the time and place the study will be held. Having read this information, participants indicated their consent (see appendix 3 and 4). Participants then completed the study measures in the order presented above. Having completed the measures, participants were debriefed, thanked for their time and contribution, and further contact information was given for the researcher and services available to them if they felt that they had been psychologically affected by the study or required further support.

The present study was approved by the University of Huddersfield (Human and Health Sciences), School Research Ethics Panel (see appendix 5).

3. Results

Table one below shows descriptive statistics for the scores of each measure; GADS (worry) MCQ (meta-cognitive beliefs) TFI (thought fusion beliefs) and OCI (OCD behaviours and symptoms).

Table 3.1: *Descriptive statistics for all study variables*

	N=301	Range	Minimum	Maximum	M	SD
GADS		6.38	.00	6.38	3.31	1.48
MCQ		2.97	1.00	3.97	2.07	.52
TFI		75.7	.00	75.7	26.5	19.8
OCI		3.57	.00	3.57	1.03	.62

Note: Possible ranges; Generalised anxiety (5) scale (GADS): 0-8, Meta-cognitions questionnaire 30 (MCQ):1- 4, Thought-fusion inventory (TFI):0-100, Obsessive-compulsive inventory (OCI):0-4

Pearson's correlations were calculated between all scales in the study and are displayed in table 2, below. The correlations show significant positive relationships between all predictor variables and OCD behaviours and symptoms.

Table 3.2: *inter-correlations between all study variables*

N=301	Gads score	MCQ	TFI	OCI
GADS		.291**	.313**	.37**
		.000	.000	.000
MCQ			.534**	.590**
			.000	.000
TFI				.611**
				.000
OCI				

*Note: ** Correlation is significant at the 0.01 level (2-tailed.) Generalised anxiety disorder (5) scale (GADS), Meta-cognitions questionnaire 30(MCQ), Thought-fusion inventory (TFI), Obsessive-compulsive inventory (OCI)*

All correlations were moderate, ranging between $r = .48$, and $r = 0.69$, thus indicating that multicollinearity was unlikely to be a problem due to the coefficients being less than .9 (Yong & Pearce, 2013).

In order to examine hypothesis one, which predicted that meta-cognitive beliefs measured by the participants scores on the MCQ and thought fusion beliefs measured by the scores on the TFI questionnaire would significantly predict OCD behaviours and symptoms after controlling for worry, a hierarchical multiple regression analysis was conducted in which OCI scores were entered as the criterion. The scores on the GADS were entered in step one and scores on the TFI and MCQ in step two.

Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity and homoscedasticity. Table 3 below shows the results of this analysis. The hierarchical multiple regression revealed that at stage one worry scores significantly and positively predicted OCD behaviours and symptoms, ($F(1, 299) = 35.78$, $p < .001$) and accounted for 10% of the variance. In step two all three of the predictors significantly and positively predicted OCI scores ($F, (3,297) = 91.10$, $p < .001$) and explained 47% of the

variance in OCD behaviours and symptoms. The ΔR^2 value indicated that 37% of variance was accounted for by TFI and MCQ scores, and these explained a significant amount of additional variance after controlling for worry ($F, (2, 297) = 106.2, p < .001$). This supports hypothesis one by demonstrating that after controlling for worry, meta-cognitive beliefs and thought fusion beliefs both significantly and positively predicted OCD behaviour and symptoms.

Table 3.3: *Hypothesis 1, Effects of meta-cognitive beliefs and thought fusion beliefs on OCD behaviours and symptoms whilst controlling for worry*

Predictor	Model	β	B	SE	CI
GADS*	Step 1	.33*	.14	.02	.10/.18
(R ² = .10, p < .001)					
MCQ*	Step 2	.35*	.41	.06	.03/.53
TFI*	($\Delta R^2 = .37, p < .001$)	.39*	.01	.00	.01/.02
GADS*		.33*	.14	.02	.09/.18

Note: * $p < .001$, Generalised anxiety disorder (5) scale (GADS) Meta-cognitions questionnaire 30 (MCQ), thought-fusion inventory (TFI)

Hypothesis two predicted that worry as measured by the scores on the GADS would moderate the relationship between meta-cognitive scores on MCQ and OCD scores on OCI. In order to test this, a hierarchical regression analysis with a continuous moderator was used.

Worry was examined as a moderator of the relation between meta-cognitive beliefs (MCQ) and OCD behaviours and symptoms (OCI). Firstly, the both predictor and moderator were standardized. In order to run the moderated regression analysis, the Z score of the MCQ and GADS was entered in block one and the interaction terms for these (MCQ x GADS) was entered in block two. Table 4 below shows the results of the moderated regression analysis.

The moderated regression analysis revealed that at stage one worry and meta-cognitive beliefs significantly and positively predicted OCD behaviours and symptoms ($F, (2, 298) = 89.04, p < .001$) and accounted for 37% of the variance. In step two the interaction

term between GADS and MCQ was entered, however it did not significantly predict any additional variance in OCD behaviours $\Delta R^2 = .003$, (F , (1, 297) = 1.286, $p = .26$). Therefore, worry did not moderate the relationship between meta-cognitive beliefs and OCD behaviours and symptoms in the present sample and thus hypothesis two was rejected.

Table 3.4: *Hypothesis 2, Moderation effect of worry on meta-cognitive beliefs and OCD behaviours and symptoms.*

Predictor	Model	β	B	SE	CI
ZGADS*	Step 1	.17*	.17	.05	.92/.12
ZMCQ*	($R^2 = .37$, $p < .001$)	.54*	.54	.05	.92/.12
ZMCQ*	Step 2	.55*	.55	.05	.90/1.10
ZGADS*	($\Delta R^2 = .003$, $p = .26$)	.18*	.18	.05	.85/1.20
ZMCQ x ZGADS		.06	.05	.05	.90/1.10

*Note: * $p < .001$, Standardised Generalised anxiety disorder (5) scale (ZGADS), Meta- cognitions questionnaire (30) (ZMCQ)*

Hypothesis three predicted that the participants' scores on GADS worry would significantly predict meta-cognitive beliefs measured by the MCQ. A regression analysis revealed that worry significantly and positively predicted meta-cognitive beliefs, (F , (1, 299) = 27.60, $p < .001$, $\beta = .291$ 95% CI = .064/ .142 $p < .001$) and accounted for 9% of the variance. This supports hypothesis three as the results demonstrated that worry did significantly predict meta-cognitive beliefs in the present sample.

Hypothesis four proposed that the participants' scores for GADS would significantly predict OCD behaviours and symptoms after controlling for meta-cognitive beliefs (MCQ). In order to test this, a hierarchical multiple regression analysis was conducted. The scores on the MCQ were entered in step one and GADS scores in step two with OCI as the criterion. Additionally, preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity and homoscedasticity. Table 5 shows the results for this regression analysis.

The hierarchical multiple regression revealed that at stage one meta-cognitive beliefs significantly and positively predicted OCD behaviours and symptoms, ($F, (1, 299) = 159.3, p < .001$) and accounted for 37% of the variance in OCD behaviours and symptoms. The R^2 change value between steps showed that a significant ($F, (1, 298) = 127.2, p < .001$) additional amount (27%) of the variance in OCI scores was accounted for by worry. This supports hypothesis four by demonstrating that after controlling for meta-cognitive beliefs, worry significantly and positively predicted OCD behaviour and symptoms in the present sample.

Table 3.5: *Hypothesis 4, Effects of worry on OCD behaviours and symptoms whilst controlling for meta-cognitive beliefs.*

Predictor	Model	β	B	SE	CI
MCQ*	Step 1	.59*	.70	.06	.59/.81
	$(R^2 = .11, p < .001)$				
GADS*	Step 2	.17*	.07	.02	.03/.11
MCQ*	$(\Delta R^2 = .27, p < .001)$.54*	.64	.06	.53/.75

Note: * $p < .001$, Meta-cognitions questionnaire (30) (MCQ), Generalised anxiety disorder (5) scale (GADS)

Hypothesis five predicted that thought fusion beliefs, as measured by the participants' scores on the TFI, would significantly predict OCD behaviour and symptoms whilst controlling for GADS. A hierarchical multiple regression analysis was conducted in order to examine the hypothesis. Scores on the GADS were entered into step one and the TFI into step two. Furthermore, preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity and homoscedasticity. Table 5 below shows the results of the relationship between thought action fusion beliefs and OCD whilst controlling for worry.

The hierarchical multiple regression revealed that in stage one, worry, measured by the GADS scores, significantly and positively predicted OCD behaviours and symptoms, ($F, (1, 299) = 35.78, p < .001$) and accounted for 11% of the variance. In step two worry and TFI also significantly and positively predicted the OCD behaviours and symptoms accounting for 39% of the variance in OCD behaviour and symptoms ($F, (2, 298) = 96.65, p < .001$). The R^2

change value shows that 29% of variance was accounted for by TAF, ($F, (1, 298) = 140.8, p < .001$) which accounted for a significant amount of additional variance in OCD behaviours and symptoms ($F, (1, 298) = 140.8, p < .001$). This supports hypothesis five through demonstrating that after controlling worry, thought fusion beliefs significantly and positively predicted OCD behaviour and symptoms in the present sample.

Table 3.6: *Hypothesis 5, Effects of thought fusion beliefs on OCD behaviours and symptoms whilst controlling for worry.*

Predictor	Model	β	B	SE	CI
GADS*	Step 1	.33*	.14	.02	.09/.18
	(R ² = .11, p < .001)				
TFI*	Step 2	.56*	.02	.00	.02/.02
GADS	($\Delta R^2 = .29, p < .001$)	.15	.06	.02	.02/.10

Note: * $p < .001$, Generalised anxiety disorder (5) scale, Thought-fusion inventory (TFI)

4. Discussion

Overall the present results support previous research and theory in the area of clinical psychology by showing that worry, meta-cognitions and thought fusion beliefs, also known as magical thinking, all predict OCD behaviours and symptoms.

Hypothesis one predicted that meta-cognitive beliefs and thought fusion beliefs would significantly predict OCD behaviours and symptoms after controlling for worry. The results from the hierarchical multiple regression analysis revealed that worry significantly and positively predicted OCD behaviours and symptoms. Additionally, after controlling for worry, thought fusion and meta-cognitive beliefs also, significantly and positively predicted OCD behaviours and symptoms, thus supporting the hypothesis.

Worry is a trait which has been suggested to be common to all individuals, and it has been shown to be linked to various OCD behaviours and symptoms (Brown et al., 1994). Generalised anxiety disorder has received increasing research attention, however general worry and its contribution to OCD has only received limited attention within previous research (Borkovec & Roemer, 1995). In order to better understand the specificity of this construct and to examine its relationship to OCD behaviours and symptoms, the present study assessed general worry in the non-clinical population.

Extensive experimental research suggests that individuals' may experience obsessions and compulsions, at least partly as a result of physiological worry (Borkovec & Roemer, 1995). It is proposed that higher levels of worry increase the likelihood of demonstrating OCD behaviours and symptoms (Butler et al., 1995).

The findings from the present study support this contention by demonstrating that worry significantly predicted OCD behaviours and symptoms. Turner, Beidel and Stanley, (1992) however, argued that worry and obsessions are often used interchangeably. It is argued that the obsessions within OCD and worry are both referred to as ruminations or intrusive thoughts (Turner et al., 1992). Brown et al., (1994) further argues that at the diagnostic level, OCD and worry share the same underlying cognitive processes and this may be the case within the general population, suggesting that OCD and worry cannot be distinguished as separate constructs (Brown et al., 1994). However, studies have started looking at the role of worry in more depth and have found that the two cognitive symptoms of worry and obsessions can be distinguished. This is as worry has been found to be more actively controlled than obsessions (Borkovec et al., 1983).

The present findings supported both Brown et al's., (1994); Turner et al's., (1992) ideas, by showing that worry and obsessions in OCD are correlated and significantly predict each other. Therefore, suggesting that both worry and obsessions are important. However, the results from the current study are not able to distinguish between these two components.

Nevertheless, further research could be conducted which looks into particular negative patterns, as negative patterns within individuals could further determine whether the negative thought is worry or an obsession (Ishiyama, 1986). A possible intervention could be the Morita therapy, which focuses on the obsession of the negative appraisals in terms of an individuals' worrying sequence to be the main etiological factor in various anxiety disorders e.g. OCD. Morita therapy is designed to not stop the individual from worrying, but to stop them from appraising their worries. The therapy further aids individuals to overcome negative thoughts by changing their attitudes to be more positive (Ishiyama, 1986). Thus, the results could present special challenges to the clinicians and the intervention would be beneficial to individuals experiencing high levels of worry.

Alternatively worry has also been associated with meta-cognitive and thought fusion beliefs as theory suggests that meta-cognitions form a component of worry (Heimberg et al., 2004). Also, high levels of worry could increase the probability of experiencing thought fusion beliefs, since they both feature similar beliefs e.g. the belief that their thought can influence outside events, which may lead to OCD behaviours and symptoms (Borkovec et al., 1991).

The results from the present study revealed that when worry was controlled for meta-cognitions and thought fusion beliefs independently predicted OCD behaviours and symptoms and accounted for a higher proportion of the variance than did worry. As discussed below, anxiety levels have been shown to be higher in clinical patients than in non-clinical samples, (Heimberg et al., 2004). This may also be the case for meta-cognitive beliefs and thought fusion beliefs. Given that various psychological disorders including OCD are often described as extreme expressions of traits, which vary within the general population (Salzman and Thaler, 1981). Thus, the findings from the present study can be proposed to have an implication in the prevention and treatment of OCD.

Through the use of cognitive behavioural therapy (CBT) these specific beliefs, (MCQ and TAF) could be challenged and modified (Salkovskis, 1998). Identifying these specific beliefs could inform theories regarding meta-cognition and thought fusion beliefs, and their

role in OCD. It could further attempt to aid individuals to modify these beliefs, and prevent the development and maintenance of the condition.

Despite limited research into thought fusion beliefs and OCD, there are studies which have suggested that thought fusion beliefs and meta-cognitions, both relate to OCD and have obtained empirical evidence to support this (Wells & King, 2006). However, it has been proposed that thought fusion beliefs may just be one of many different types of meta-cognitive beliefs (Wells & Matthews, 1994). Alternatively, it may be that the two concepts are related but more of a distinct phenomenon than suggested and that thought fusion beliefs are not types of meta-cognitive beliefs (Myers & Wells, 2005). However, the findings from the present study established that thought fusion beliefs and meta-cognitive beliefs both independently predict OCD behaviours and symptoms. Thus, it is recommended that both thought fusion and meta-cognitive beliefs should be routinely assessed in individuals with OCD in clinical settings. Furthermore, the results from the present study accorded with the results of previous research, as it was shown that there were significant and positive correlations between both thought fusion beliefs and meta-cognitive beliefs, and obsessive-compulsive symptoms.

These findings were also consistent with Gwilliam et al., (2004); Sica et al., (2007), who found that positive relationships between meta-cognitive beliefs and OCD within both clinical and non-clinical samples were significant even after controlling for variables such as worry and responsibility. Thus the present data is consistent with recent formulations of generalised anxiety disorder and OCD including cognitive and meta-cognitive models of the latter construct (Purdon & Clark, 1999; Wells, 2000).

Hypothesis two predicted that worry would moderate the relationship between meta-cognitive beliefs and OCD behaviours and symptoms. The moderated regression analysis revealed that worry and meta-cognitive beliefs significantly and positively predicted OCD behaviours and symptoms. However, the interaction term did not significantly predict any additional variance in OCD behaviours and symptoms, suggesting that worry did not moderate the relationship between meta-cognitive beliefs and OCD in the current sample, and so hypothesis two was rejected.

As discussed above both worry and anxiety may be two separate components which independently contribute to the development of various disorders such as OCD (see Barlow, 2000). However, Wells, (1999) suggests that worry may lead to increases in anxiety which can lead individuals to catastrophise by envisaging potential disastrous outcomes. This in turn could lead individuals to experience various intrusive thoughts and meta-cognitive beliefs

leading to obsessive-compulsive behaviours and symptoms. Wells & Papageorgiou, (1998) presented a gruesome film of a workshop incident to three separate groups of individuals. Two of the groups were told to worry and the other group was told to relax. The results indicated that the two groups told to worry experienced more intrusive thoughts about the film in comparison to the relaxation group. Furthermore, Butler et al., (1995) proposed that individuals who are likely to, or have high levels of worry, are expected to engage in activities which increases the frequency of intrusive thoughts. Additionally individuals also utilise various meta-cognitive beliefs to aid their coping strategies. Butler et al's., (1995) theory was based on a mediation effect, stating that worry causes meta-cognitive beliefs which cause OCD. However, the results from the present study suggest that both worry and meta-cognitive beliefs independently predicts OCD, as there was no evidence of it acting as a moderator.

This lack of moderation could be specific to non-clinical populations, where levels of worry and meta-cognitive beliefs are likely to be lower than in clinical samples. In the present sample, mean scores on the worry measure were considerably lower ($M = 3.31$) than those reported in studies of clinical patients (which typically range between 14.1 and 15.1; Heimberg et al., 2004). The lack of a moderation effect in the present sample could be due to the majority of participants not experiencing high enough levels of worry to exert any possible moderation effect on the relationship between meta-cognitive beliefs and OCD.

In order to examine this possibility, the present study could be replicated with a non-clinical sample and include a manipulation designed to temporarily increase levels of anxiety in participants prior to completing the measures. For example the exposure and response prevention (ERP) paradigm, which involves exposing the individual to an anxiety provoking stimulus and asking them to refrain from carrying out their compulsions, could be employed as a manipulation (Kozak, Foa & Steketee, 1988).

Specific suggestions for further studies based on this are made below. It may be the case that an interaction effect could have been obtained using a larger sample. However, the standardised coefficient of the interaction term was extremely close to zero, suggesting that any interaction effect would be very small, even if significant, in a larger sample.

Hypothesis three predicted that worry would significantly predict meta-cognitive beliefs. The regression analysis demonstrated that worry significantly and positively predicted meta-cognitive beliefs, thus, supporting this hypothesis.

Although the present results show that worry significantly predicts meta-cognitive beliefs, worry may be differently related to positive and negative beliefs (Wells & King, 2006). In the

meta-cognitive model of generalised anxiety disorder (GAD) both positive and negative meta-cognitive beliefs can assist individuals' to continue with their worry sequence. This continuous structure aims to resolve danger related questions and thus, various strategies to resolve threatening scenarios are generated. This is classified as type 1 worry, and this will continue until the process distinguishes a personally suitable coping response. Furthermore, Wells, (1995) states that these positive and negative beliefs represent a coping strategy which is observed within both the clinical and non-clinical populations and is classified as 'normal'

Both positive and negative beliefs are suggested to be interlinked with worry and meta-cognitive beliefs (Wells, 1995). The distinction between the two however, is that positive beliefs are based on thoughts, actions and impulses which individuals believe will have a positive impact, "worrying helps me cope". Alternatively, negative beliefs are based on the thoughts, actions and impulses, that are thought to have a negative impact, "I will be punished for not controlling my thoughts" (Wells & King, 2006, p.310).

Although positive and negative beliefs have been consistently reported to be associated with OCD, most research has primarily linked the different types of beliefs to specific OCD behaviours (e.g. checking, hoarding, and doubting; Wells & Papageorgiou, 1998). The present study did not aim to investigate specific behaviours and symptoms within OCD; rather the aim was to look at meta-cognitive beliefs as a whole construct and whether this relates to OCD. Thus, negative and positive beliefs were not individually examined. If this aspect were to be investigated, it may give a broader understanding of the role of both positive and negative beliefs in relation to worry, meta-cognitive and thought fusion beliefs, and OCD.

It may be that both positive beliefs concern the advantages of worrying and engaging in ritualised and compulsive behaviour, whereas negative beliefs could be concerned with the negative consequences of not worrying and carrying out various obsessive compulsions. Also, both positive and negative beliefs about worry may correlate with meta-cognitive and thought fusion beliefs as well as OCD. If this were the case, individuals could be possibly treated using meta-cognitive therapy, which would tackle and challenge these positive or negative beliefs, in order to reduce various meta-cognitive and thought fusion beliefs as well as their obsessions and compulsions.

Hypothesis four proposed that worry would significantly predict OCD behaviours and symptoms, even after controlling for meta-cognitive beliefs. The results showed that meta-cognitive beliefs at stage one significantly and positively predicted OCD behaviours and symptoms. Furthermore, in stage two both worry and meta-cognitive beliefs significantly and

positively predicted OCD. The results suggested that worry alone accounted for 27% of the variance in OCD symptoms and behaviours which it significantly predicted after controlling for meta-cognitive beliefs, supporting the hypothesis.

Previous research has proposed that both worry and meta-cognitive beliefs share the same underlying characteristics and are often linked (Wells, 1995). Additionally it has been suggested that worry mediates the relationship between meta-cognitive beliefs and OCD (Wells, 1995). However, the present results indicated that after controlling for other variables, worry still independently predicts OCD behaviours and symptoms. In hypothesis one the emphasis on meta-cognitive beliefs shows that it is not to do with individuals just worrying.

In addition, the results regarding hypothesis four show the converse of this; worry predicts OCD showing that taken together with hypothesis one and two, both worry and meta-cognitive beliefs are independently influencing OCD. Again a possible intervention could be the use of CBT which could separately target and assess both worry and meta-cognitive beliefs. In addition to this, ERP could be used in order to diminish the effects of worry on OCD, as the treatment aids individuals to gradually face the situation which they fear or are worried about but encourages them to avoid carrying out any compulsive rituals (Kozak et al., 1988).

Lastly hypothesis five predicted that thought fusion beliefs would significantly predict OCD behaviour and symptoms whilst controlling for worry. The results revealed that worry significantly predicted OCD in step one of the analysis. Additionally in step two worry and thought action fusion both significantly and positively predicted OCD. The results suggested that 29% of the variance in OCD behaviours and symptoms was accounted for by thought action fusion beliefs, which significantly predicted OCD behaviours and symptoms after controlling for worry, supporting the hypothesis.

There is a debate in previous research and literature over the role of thought fusion beliefs and meta-cognitive beliefs, as it was suggested by Matthews et al., (2007), that thought fusion beliefs do not directly and independently predict OCD behaviours and symptoms. Furthermore, Rassin, (2001) reported that thought fusion beliefs did not predict OCD symptoms whilst controlling for worry. On the other hand however, Purdon and Clark, (1999), proposed that thought fusion beliefs may just be one of many meta-cognitive beliefs. However, other researchers have proposed that thought fusion beliefs alone predict OCD and that they are not a component of meta-cognitive beliefs but in fact an independent factor (Amir et al., 2001).

The present results support this suggestion, by showing that thought fusion beliefs are an independent predictor of OCD behaviours and symptoms. The results also suggest that thought fusion beliefs may play a key role in OCD and that future research, should further explore this relationship. Research on thought fusion beliefs has generally focused on beliefs concerning probability of harm and responsibility (Zucker et al., 2002). However given that the present findings show that overall thought fusion beliefs predict OCD behaviours and symptoms, it would be sensible to also include the complete TFI in further research on both clinical and non-clinical samples. Doing so will provide a more complete understanding of the phenomenology of the disorder. Additionally, findings from the present study support approaches designed to provide education about, and challenge these beliefs, for example, through the use of CBT and MCT (meta-cognitive theory).

Previous research and theory, suggests that meta-cognitive beliefs, thought fusion beliefs and worry all occur within clinically diagnosed patients of OCD, as well as individuals in the general population (Fisher & Wells, 2005). It has been proposed that the three variables are independent from one another and independently predict OCD behaviours and symptoms (Rosen & Tallis, 1995). However, alternative suggestions have been made, in which the three variables are suggested to be linked to one another (Wells, 1995). Thought fusion beliefs have often been suggested to be a component of meta-cognitive beliefs (Purdon & Clark, 1999). Also, high levels of worry have been proposed to cause thought fusion beliefs which influence OCD behaviours and symptoms (Borkovec et al., 1983).

The findings from the present study however, have shown that thought action fusion beliefs independently predict OCD behaviours and symptoms; when both meta-cognitive beliefs and worry were controlled for, thought fusion beliefs still predicted OCD scores. This suggests that thought fusion beliefs are not merely a component of meta-cognitive beliefs and do not only influence OCD when individuals are experiencing high levels of worry. In addition to this, worry has been proposed to influence meta-cognitive beliefs which influence OCD behaviours and symptoms (Butler et al., 1995).

Alternatively, meta-cognitive beliefs have been proposed to influence worry which influences OCD behaviours and symptoms, suggesting these variables causally interact and that they are not independently influencing OCD (Wells & Papageorgiou, 1998). However although the results from the present study showed that worry correlates with meta-cognitive beliefs, it was further shown that when controlling for the other, each variable independently predicted OCD symptoms and behaviours, suggesting against a simple mediational causal relationship. Moreover, the results from the present study indicated that approximately 50%

of the variance in OCD symptoms and behaviours was accounted for by meta-cognitive and thought fusion beliefs, and worry.

Whilst this suggests that these variables may be important in the understanding of OCD, it is important to consider the remainder of the variance in the latter construct, and whether this can be explained by variables such as stress and depression, and this is discussed below.

4.1. Future directions

The results obtained in relation to hypothesis one suggest that worry explains 10% of the variance in OCD symptoms and behaviours, but this is less than that accounted for by meta-cognitive and thought fusion beliefs (which explained 37% of the variance). All three predictors combined account for 50% of the variance in OCD, and this raises the issue of how the remainder of the variance can be explained. Clearly, some of this will be the result of measurement error. However, there are other potential variables which could be implicated in OCD behaviours and symptoms, and these could include depression and stress.

Previous research has revealed a close association between obsessions, compulsions and depression (Billett, Richter & Kennedy, 1998). Furthermore, correlational evidence suggests that obsessions can increase during occurrences of depression. Additionally, constant obsessional symptoms can contribute to the development of depression (Billett et al., 1998), suggesting that OCD and depression are interlinked. The two disorders have also been suggested to share the same underlying symptoms, including worry, doubt, indecisiveness, guilt, loss of control and isolation (Billett et al., 1998), and these also feature in descriptions of worry and various meta-cognitive and thought fusion beliefs. Therefore, it could be proposed that worry, meta-cognitive and thought fusion beliefs may contribute to depression, as well as obsessions and compulsions (Dupuy & Ladouceur, 2008).

Alternatively, it could be that depression exerts a causal influence not only on OCD symptoms and behaviours, but also on these belief domains (Clark, 2002). Thus, further research should examine relationships between depression, OCD behaviours and symptoms, and relevant beliefs. In addition to this, cognitive models have proposed that increased levels of stress may cause increases in intrusive thoughts, which may in turn, increase the risk of obsessions developing (Davidson, Hughes, Blazer & George, 1991). Although it is suggested that stress does not cause OCD, a stressful event may trigger the onset of obsessive and

compulsive behaviours, which may contribute to the development of the condition (de Silva & Marks, 1999).

Furthermore, recent studies have shown a relationship between experiencing periods of stressful events, with the likelihood of carrying out ritualised behaviours (de Silva & Marks, 1999). Thus, future studies of OCD, similar to the present one, could include measures of both stress and depression in order to examine the extent to which they predict OCD behaviours and symptoms.

Various studies have used cross-sectional designs to investigate the relationship between OCD, meta-cognitive and thought fusion beliefs (Yorulmaz, Gençöz & Yorulmaz, 2004). Cross-sectional survey designs have the strength of allowing for a wide range of individuals from different groups to be studied, allowing samples to reflect the wider population (Fowkes & Fulton, 1991). The present study not only represented undergraduate students, but also used snowball sampling to obtain data from their contacts, such as family members, friends and relatives. This produced a sample which included individuals who varied considerably in relation to their backgrounds and demographic characteristics, increasing the generalisability of the results to wider populations (Einstein & Menzies, 2004).

To date, research on OCD and belief domains has relied mostly on retrospective self-report questionnaires as well as cross sectional studies, similar to the present one. However, these cannot address the causal direction of the relationship between OCD and the various belief domains (Clark, 2002). An alternative approach would be to examine these variables in longitudinal studies, which could require participants to respond on a weekly basis. This would allow for an examination of causal relationships between worry, meta-cognitions and TAF, and OCD behaviours and symptoms, together with the impact of depression and stressful life events on the course and development of the condition. This would help to elucidate the aetiology of OCD and give a clear idea of which factors truly have a causal influence on it (Emmelkamp, 2002).

In addition, qualitative methods could be utilised to gain an in-depth analysis of specific individuals' experiences of OCD (Bryman & Cramer, 1990). Such future studies would provide in-depth information on the factors which influence OCD behaviours and symptoms and a greater understanding of this could help in interventions and possible treatments for those who may be suffering from, or vulnerable to the disorder.

As previously discussed, it is difficult to directly compare studies on clinical and non-clinical samples due to differences in typical levels of worry. However, the possible influence

of worry on OCD could be further investigated by conducting experimental studies in which different interventions were set up within a clinical sample.

One intervention would be designed to minimise worry and examine whether any decreases in worry diminished meta-cognitive and thought action fusion beliefs and OCD behaviours and symptoms. If this were found to be the case, it would suggest that worry exerts a causal influence on these variables, and that relevant beliefs may act as a mediator in the relationship between worry and OCD. However, if worry solely influenced OCD behaviours and symptoms, then it would suggest that worry exerts an independent effect on the condition. Similarly, another intervention could aim at tackling relevant beliefs to distinguish whether addressing these would decrease worry and OCD. Again, if such a manipulation affected OCD symptoms and behaviours, but not worry, this might indicate independent influences of worry and belief on the development and maintenance of OCD.

In addition to investigating the effects of interventions on clinical samples experimental manipulation studies could be conducted on non-clinical samples to further investigate causal relationships. For example, manipulations designed to induce increased levels of worry could be administered to non-clinical participants, in order to assess whether this would influence OCD behaviours and symptoms. The difficulty with this would be that any short term manipulations might not be expected to influence OCD, which is conceptualised as a trait (rather than state) and measured accordingly.

Whilst manipulations designed to induce longer term changes in worry would address this, these would clearly bring with them attendant ethical concerns. Accordingly, it might be more profitable to examine the effects of short term manipulations of worry, using the ERP paradigm (Kozak et al., 1988), on the prevalence of intrusive thoughts. Since Freeston et al., (1994) have suggested that various OCD behaviours and symptoms may be in part caused by the loss of control over intrusive, distressing and unwanted thoughts. Therefore, the links between intrusive thoughts and worry and how these influence OCD behaviours and symptoms could be investigated through the experimental manipulation of worry in non-clinical individuals.

Additionally, Freeston et al., (1994) proposed that the impact of loss of control of intrusive thoughts should be further investigated, since both worry and OCD behaviours and symptoms may be strategies used by individuals to manage their feeling of believing that they are out of control in terms of their intrusive thoughts. Thus future studies could look into control strategies used by individuals and how they may affect worry and OCD behaviours and symptoms. These could inform possible treatment programs; for example CBT

interventions which aim to address coping strategies and challenge and re-script the intrusive thoughts which allow individuals to experience decreased levels of worry and greater control over obsessive and compulsive tendencies.

4.2. Conclusion

The findings from the present study support previous research and theory by demonstrating that individuals within the general population experience specific meta-cognitive and thought fusion beliefs, which are found to be an important aspect in the development of OCD behaviours and symptoms within the clinical population. Additionally, worry was found to predict OCD behaviours and symptoms. This represents a novel contribution to the literature, since most previous studies have looked into anxiety rather than general worry, and thus the results may help aid future treatment for those who may be vulnerable to developing OCD behaviours and symptoms.

Meta-cognitive beliefs have consistently been associated with thought fusion beliefs and have been suggested to constitute a single construct; however, researchers have also suggested that they may be two different phenomena.

The present study suggests that thought fusion and meta-cognitive beliefs are two separate independent factors which predict OCD; thus future research and treatment should focus on the two factors separately, rather than considering them as a single construct. For example it may be profitable to develop different treatments designed to targeting the two separate factors.

Similarly, worry and meta-cognitive beliefs have been suggested to share the same underlying cognitive processes, including those concerning positive and negative beliefs about worry. Nevertheless, the present results indicate that meta-cognitive beliefs and worry are separate factors which independently predict OCD.

The results of the present study accord with those from previous research on both clinical and non-clinical samples. However, by including a wide range of measures, including of worry and thought fusion beliefs, which have previously been under-researched, the present study consolidates and extends on previous findings. However, due to the limitations of cross-sectional studies such as this one, longitudinal, idiographic and laboratory studies of OCD are needed, to further our understanding of OCD phenomena and treatment related

change. Insights from the present study, together with future research in this area will be invaluable in contributing to advances in the treatment and management of OCD.

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Invitation to participate

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Supervisor: Chris Bale (01484-473477)

Dear participant,

I am a research Masters Student at the University of Huddersfield, investigating the relationship between meta-cognitive beliefs, magical thinking and obsessive-compulsive behaviours. Obsessive-compulsive disorder (OCD) has been defined as an anxiety disorder linked to intrusive thoughts and fears which lead individuals to carry out repetitive and ritual behaviours in order to decrease the level of anxiety caused by the disorder. Additionally magical thinking is defined as an individual's attitude and beliefs about the cognitions which relate to the various intrusive thoughts which lead to OCD compulsions.

The current study involves answering questions surrounding worry and magical thinking beliefs as well as meta-cognitive beliefs which involve intrusive thoughts and images as well as the sense of responsibility and how this relates to OCD behaviours. The research is a short study which will take 25-30 minutes of your time as it is a matter of filling out questionnaires in relation to the topics stated above.

If you are interested, please read the enclosed information sheet, consent form and debrief letter and return the form, or contact myself or the supervisor. Additionally, if you require any further information please do not hesitate to contact me or my supervisor on the contact details stated above. Your participation will be highly appreciated.

Thank you for your time

Yours sincerely

Priyanka Bose

Appendix 2

Email to be sent to participants

Dear participant,

I am a research masters student at the University of Huddersfield, investigating the relationship between magical thinking and obsessive-compulsive behaviours.

The current study involves answering various questions in relation to magical thinking type beliefs which mainly look into various intrusive thoughts and images as well as the sense of responsibility which we may consist of, thus, having an effect on the outcomes such as different OCD behaviours. The research is a short study which will take only 5-10 minutes of your time as it is a matter of filling out questionnaires in relation to the topics stated above.

If you are interested, please follow the link below. Additionally, if you know anyone who may be interested in this study please forward this email. If you require any further information please do not hesitate to contact me or my supervisor on U1052215@unimail.hud.ac.uk or c.bale@hud.ac.uk

Thanks

Priyanka Bose

Obsessive compulsive disorder (OCD) is defined as an anxiety disorder characterised through intrusive thoughts and fears which leads individuals to carry out repetitive behaviours (compulsions) in order to reduce the anxiety caused by the disorder. Additionally 'magical thinking' has consistently been linked to OCD and is defined as an individual's attitude and beliefs about the cognitions which relate to the different intrusive thoughts.

Please note that this study involves answering questions on various intrusive thoughts, beliefs, OCD behaviours and worry related questions such as "I feel compelled to counting whilst doing things" "My thoughts become reality, if I think something it will come true". Therefore, individuals should not take part if you are likely to be distressed about answering questions in regards to these specific thoughts and beliefs. Additionally individuals should not take part if they have been diagnosed with OCD.

This study is aimed to investigate how many individuals within the general population have specific magical thinking type beliefs which are suggested to be linked to OCD behaviours. This will be investigated through the use of four questionnaires; 1) which is the generalised anxiety scale questionnaire which will consist of five questions relating to worry, and will consist of questions such as; "how distressing has your worries been in the last week". 2) Questionnaire on meta-cognitive beliefs which look into various factors in relation to the beliefs which are related to OCD such as "I constantly examine my thoughts". 3) Thought-fusion instrument questionnaire involves answering questions on different thoughts one might have and the belief which they hold in terms of that thought such as, "Having a bad thought means I will do something bad". 4) Lastly a questionnaire measuring the OCD behaviours composes questions relating to various subscales such as obsessional thoughts, hoarding, washing, checking etc. "I have to do things over and over again until it feels right".

Taking part in this research is voluntary, thus, it is completely your decision whether to take part or not. Once the information sheet is read, you are entitled to ask any questions and I will provide you with as much information as possible.

If you agree to take part in this research a consent form will need to be signed in order to declare that you have agreed to take part. If you wish to withdraw from the research you are free to do so at any time before the start of the study. If you wish to withdraw from the online process, there will be a tick box in order to state that you want to withdraw, thus it will take you to the debrief letter rather than closing the website tab. Also, you should not answer any questions which you are not comfortable with.

What will I be asked to do?

You will be asked to take part in a research study which will consist of filling out four questionnaires in order to explore the different beliefs and OCD behaviours within variables such as anxiety, magical thinking and OCD. The questionnaires will be to judge your views on how much they relate to you as the participant.

What will you do with the findings?

The data from the questionnaires will be analysed in order to investigate the relationship between magical thinking, OCD and anxiety. However, no names will be mentioned when writing up the results as only group data will be analysed and not the results of individual participants.

Will I be personally identified in the research?

All the participants' data and responses will be completely anonymous when conducting the research and you will not be asked for any personally identifying information and there will be no names attached to any data within the study.

Will the information I provide be confidential?

The ethical and legal practice will be followed and all the information about you will be handled in confidence. Additionally, the information which is provided for the data will remain confidential.

Will my safety be taken into consideration?

The safety of yourself (Participant) and myself (Researcher) will be taken into consideration at all times. Thus, the research will take place in a safe surrounding and the supervisor will be informed at all times where we are. Furthermore, the experiment will be conducted in a lab in normal working hours.

If you have any questions when conducting the research, I will be happy to answer them before and after the completion of the research.

Further information and contact details:

Priyanka Bose

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Chris Bale (Supervisor)

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CONSENT FORM

Title of research: investigation of the relationship between magical thinking beliefs and OCD behaviours within the general population, and whether this is moderated by anxiety.

In order to participate in this research it is important that you fully understand and give consent to the following information. Your contribution to this research is completely voluntary and you are not obligated in any way to participate. Please read the following information and tick the box at the end in order to give your consent in terms of the participation of the research.

1. I have been fully informed of the nature and aims of this research. I have had the opportunity to consider the information, ask questions and have had these answered sufficiently.
2. I understand that my participation in this research is voluntary and that I have a right to withdraw at any time until the end of the experiment without giving any reason.
3. I give consent for the investigator to use the data and responses that I have provided in the experiment.
4. I understand that the information collected will be kept in secure conditions for a period of five years at the University of Huddersfield.
5. I understand that no individual other than the researcher/s and facilitator/s will have access to the information given.
6. I understand that my personal details and information will remain anonymous.
7. I understand that my identity will be protected therefore no information which will reveal my identification will be included in any publication, resulting from this research.
8. I give my consent to taking part in this research.

Please tick the box if you are satisfied with the information provided and are happy to take part in this research:

☐

Debrief letter

Priyanka Bose
Human and Health Sciences
Queensgate
Huddersfield
HD1 3DH
Chris Bale: 01484-473477
U1052215@unimail.hud.ac.uk

Dear Participant,

I would like to thank you for your participation in the research, your contribution was highly appreciated. The aim of the study was to explore the commonality of the beliefs within individuals which are suggested to be prone to OCD and further exploring any gender differences.

The research has received an ethics approval and is carried out by the Human and Health sciences department at the University of Huddersfield. If any questions arise regarding this research please do not hesitate to contact me, Priyanka: (U1052215@unimail.hud.ac.uk) or my supervisor: Chris Bale: c.bale@hud.ac.uk

Questionnaire responses in terms of the research will be entirely confidential and the privacy of your personal identity will be taken into account at all times, thus, no names or personal details will be mentioned in the research analysis. It will be appreciated if you do not discuss details in terms of the research with other participants in order to prevent the data being biased, as many other individuals may know about the research before they participate.

If you feel psychologically distressed by the research please contact the University of Huddersfield Counselling service on 01484-472675 or email: internalcounsel@hud.ac.uk. Please note that only University of Huddersfield students and staff can use the Counselling service provided. Participants who are not at this University can access the following services; Support 2 Recovery: 01484-53953, Samaritans: 08457 90 90 90 and rethink mental illness on: 0300 5000 927

Your participation and time is greatly appreciated

Yours sincerely

Generalised anxiety scale

1. How distressing/disabling have your worries been in the past week?

0 1 2 3 4 5 6 7 8
Not at all Moderately Extremely

2. In the past week how much effort have you put into trying to control your worries?

0 1 2 3 4 5 6 7 8
Not at all Moderately Extremely

3. Place a number from the scale below next to each item to show how often in the past week you have done the following in order to cope with your worry

0 1 2 3 4 5 6 7 8
Not at all Half of the time All of the time

- a) Tried to distract myself _____
- b) Tried to control my thinking _____
- c) Tried to reason things out _____
- d) Asked for reassurance _____
- e) Talked to myself _____
- f) Tried not to think about things _____
- g) Looked for evidence _____
- h) Acted cautiously _____
- i) Planned how to cope if my worries were true _____

4. How often in the past week have you avoided the following in order to prevent worrying?
Place a number from the scale below next to each item.

0 1 2 3 4 5 6 7 8
Not at all Half of the time All of the time

- a) News items _____
- b) Social situations _____
- c) Uncertainty _____
- d) Thoughts of illness _____
- e) Thoughts of accidents/loss _____

5. Below are a number of thoughts that people have about their worries. Indicate how much you believe each one by placing a number from the scale below next to each one.

0	10	20	30	40	50	60	70	80	90	100
Do not believe the thought								completely convinced the thought is true		

- | | |
|---|-------|
| 1) I could go crazy with worry | _____ |
| 2) Worrying could harm me | _____ |
| 3) Worrying puts my body under stress | _____ |
| 4) If I don't control my worry it will control me | _____ |
| 5) My worrying is uncontrollable | _____ |
| 6) If I worry too much I could lose control | _____ |
| 7) Worrying helps me cope | _____ |
| 8) If I worry I'll be prepared | _____ |
| 9) Worrying keeps me safe | _____ |
| 10) Worrying helps me get things done | _____ |
| 11) Something bad would happen if I didn't worry | _____ |
| 12) Worrying helps me solve problems | _____ |

META-COGNITIONS QUESTIONNAIRE 30

MCQ-30

Adrian Wells & Samantha Cartwright-Hatton (2004)

This questionnaire is concerned with beliefs people have about their thinking. Listed below are a number of beliefs that people have expressed. Please read each item and say how much you generally agree with it by circling the appropriate number. Please respond to all the items, there are no right or wrong answers.

Gender:.....

Age:.....

		Do not agree	Agree slightly	Agree moderately	Agree very much
1.	Worrying helps me to avoid problems in the future	1	2	3	4
2.	My worrying is dangerous for me	1	2	3	4
3.	I think a lot about my thoughts	1	2	3	4
4.	I could make myself sick with worrying	1	2	3	4
5.	I am aware of the way my mind works when I am thinking through a problem	1	2	3	4
6.	If I did not control a worrying thought, and then it happened, it would be my fault	1	2	3	4
7.	I need to worry in order to remain organised	1	2	3	4
8.	I have little confidence in my memory for words and names	1	2	3	4
9.	My worrying thoughts persist, no matter how I try to stop them	1	2	3	4
10	Worrying helps me to get things sorted out in my mind	1	2	3	4
11.	I cannot ignore my worrying thoughts	1	2	3	4
12.	I monitor my thoughts	1	2	3	4
13.	I should be in control of my thoughts all of the time	1	2	3	4

		Do not agree	Agree slightly	Agree moderately	Agree very much
14.	My memory can mislead me at times	1	2	3	4
15.	My worrying could make me go mad	1	2	3	4
16.	I am constantly aware of my thinking	1	2	3	4
17.	I have a poor memory	1	2	3	4
18.	I pay close attention to the way my mind works	1	2	3	4
19.	Worrying helps me cope	1	2	3	4
20.	Not being able to control my thoughts is a sign of weakness	1	2	3	4
21.	When I start worrying, I cannot stop	1	2	3	4
22.	I will be punished for not controlling certain thoughts	1	2	3	4
23.	Worrying help me to solve problems	1	2	3	4
24.	I have little confidence in my memory for places	1	2	3	4
25.	It is bad to think certain thoughts	1	2	3	4
26.	I do not trust my memory	1	2	3	4
27.	If I could not control my thoughts, I would not be able to function	1	2	3	4
28.	I need to worry, in order to work well	1	2	3	4
29.	I have little confidence in my memory for actions	1	2	3	4
30.	I constantly examine my thoughts	1	2	3	4

Please ensure that you have responded to all of the items - Thank You.

THOUGHT-FUSION INSTRUMENT (TFI)

People have different beliefs about the power of their thoughts and experiences. Listed below are a number of these beliefs. Please read each one and indicate how much you believe it by circling a number on the right hand scale. There are no right or wrong answers. Do not think too much about each one, indicate how much you generally believe it.

	I do not believe this at all									I am		completely convinced this is true
1. If I think about an unpleasant event it will make it more likely to happen	0	10	20	30	40	50	60	70	80	90	100	
2. If I have thoughts about harming myself I will end up doing it	0	10	20	30	40	50	60	70	80	90	100	
3. If I think I'm in danger it must mean I am in danger.	0	10	20	30	40	50	60	70	80	90	100	
4. Having bad thoughts means I will do something bad.	0	10	20	30	40	50	60	70	80	90	100	
5. If I think about an unpleasant event it means it must have happened	0	10	20	30	40	50	60	70	80	90	100	
6. If I have thoughts about harming someone I will act on them.	0	10	20	30	40	50	60	70	80	90	100	
7. If I think things are contaminated by other people's experiences it means they are contaminated	0	10	20	30	40	50	60	70	80	90	100	
8. My thoughts alone have the power to change the course of events.	0	10	20	30	40	50	60	70	80	90	100	
9. Some objects give off bad vibes.	0	10	20	30	40	50	60	70	80	90	100	
10. When I have bad thoughts it must mean I want to have them.	0	10	20	30	40	50	60	70	80	90	100	
11. My feelings can be transferred into objects.	0	10	20	30	40	50	60	70	80	90	100	
12. If I think of harming someone it will harm them.	0	10	20	30	40	50	60	70	80	90	100	
13. My thoughts become reality. If I think something it will come true.	0	10	20	30	40	50	60	70	80	90	100	
14. My memories / thoughts can be passed into objects.	0	10	20	30	40	50	60	70	80	90	100	

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From Wells, A (2009) Metacognitive Therapy for Anxiety and Depression. New York: Guilford Press

Obsessive-Compulsive Inventory (OCI)

Please read each statement and select a number 0, 1, 2, 3 or 4 that best describes how much that experience has **distressed or bothered you during the past month**. There are no right or wrong answers. Do not spend too much time on any one statement. This assessment is not intended to be a diagnosis. If you are concerned about your results in any way, please speak with a health professional.

0 = Not at all 1 = A little 2 = Moderately 3 = A lot 4 = Extremely

1. Unpleasant thoughts come into my mind against my will and I cannot get rid of them
2. I think contact with bodily secretions (sweat, saliva, blood, urine, etc.) may contaminate my clothes or somehow harm me
3. I ask people to repeat things to me several times, even though I understood them the first time
4. I wash and clean obsessively
5. I have to review mentally past events, conversations and actions to make sure that I didn't do something wrong
6. I have saved up so many things that they get in the way
7. I check things more often than necessary
8. I avoid using public toilets because I am afraid of disease or contamination
9. I repeatedly check doors, windows, drawers etc .
10. I repeatedly check gas / water taps / light switches after turning them off
11. I collect things I don't need
12. I have thoughts of having hurt someone without knowing it
13. I have thoughts that I might want to harm myself or others
14. I get upset if objects are not arranged properly
15. I feel obliged to follow a particular order in dressing, undressing and washing myself
16. I feel compelled to count while I'm doing things
17. I am afraid of impulsively doing embarrassing or harmful things
18. I need to pray to cancel bad thoughts or feelings

19. I keep on checking forms or other things I have written
20. I get upset at the sight of knives, scissors or other sharp objects in case I lose control with them
21. I am obsessively concerned about cleanliness
22. I find it difficult to touch an object when I know it has been touched by strangers or certain people
23. I need things to be arranged in a particular order
24. I get behind in my work because I repeat things over and over again
25. I feel I have to repeat certain numbers
26. After doing something carefully, I still have the impression I haven't finished it
27. I find it difficult to touch rubbish or dirty things
28. I find it difficult to control my thoughts
29. I have to do things over and over again until it feels right
30. I am upset by unpleasant thoughts that come into my mind against my will
31. Before going to sleep I have to do certain things in a certain way
32. I go back to places to make sure that I have not harmed anyone
33. I frequently get nasty thoughts and have difficulty getting rid of them
34. I avoid throwing things away because I am afraid I might need them later
35. I get upset if others have changed the way I have arranged my things
36. I feel that I must repeat certain words or phrases in my mind in order to wipe out bad thoughts, feelings or actions
37. After I have done things, I have persistent doubts about whether I really did them
38. I sometimes have to wash or clean myself simply because I feel contaminated
39. I feel that there are good and bad numbers
40. I repeatedly check anything that might cause a fire

41. Even when I do something very carefully I feel that it is not quite right

☐

42. I wash my hands more often, or for longer than necessary

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