

MAGICAL THINKING IN OBSESSIVE COMPULSIVE DISORDER

REBECCA PERCIVAL

DOCTORATE IN CLINICAL PSYCHOLOGY  
THE UNIVERSITY OF EDINBURGH  
1997



## DECLARATION

This thesis has been composed by myself and the work contained herein is my own

Rebecca Percival

## CONTENTS

<b>Abstract</b>	page 1
<b>Introduction</b>	page 2
General overview of OCD	page 5
Aetiology and treatment of OCD	page 8
The role of cognition in OCD	page 11
The phenomenology of obsessions	page 24
Magical thinking in non-OCD populations	page 25
Aim of present study	page 33
Hypotheses	page 35
<b>Method</b>	page 36
Experiment A	page 36
Subjects	page 36
Procedure	page 36
Measures	page 39
Table 1 (Items in MTQ)	page 40
Results	page 43
Table 2 (Scores on MTQ)	page 44
Table 3 (Psychometric data)	page 44
Discussion	page 44
Experiment B	page 45
Subjects	page 46
Design	page 47
Procedure	page 47
Measures	page 47
Table 4 (Items in the revised MTQ)	page 48
<b>Results</b>	page 49
Description of OCD subjects	page 49
Comparisons of demographic variables	page 49
Psychometric data	page 50
Magical Thinking Questionnaire	page 50
Table 5 (Psychometric data)	page 51
Table 6 (Mean difference and 95% confidence intervals)	page 51
Table 7 (Means and SD's on revised MTQ)	page 52
Figure 1(% of S's on MTQ)	page 53
Figure 2 (Distribution on MTQ)	page 53
Intercorrelations between research variables	page 55
Table 8 (Correlations in OCD group)	page 56
Table 9 (Correlations in Control group)	page 58
Table 10 (Correlations within MTQ)	page 58

## CONTENTS (cont)

Timed Task	page 60
Table 11 (Description of event)	page 61
Factor Analysis	page 62
<b>Discussion</b>	page 62
Introduction	page 62
Between group differences in magical thinking	page 64
The nature of magical thinking in OCD group	page 66
The nature of magical thinking in control subjects	page 73
Magical thinking in other disorders	page 75
The aetiology of magical thinking	page 76
Methodology of study	page 77
Implications for therapy	page 79
Summary	page 80
<b>References</b>	
Appendix 1 (Copy of research information sheet)	
Appendix 2 (Copy of letter sent to subjects)	
Appendix 3 (Magical Thinking Questionnaire)	
Appendix 4 (MOCI-R)	
Appendix 5 (TAF Scale)	
Appendix 6 (Revised Magical Thinking Questionnaire)	



## **ABSTRACT**

This study investigated the role of magical thinking in obsessive-compulsive disorder (OCD). Magical thinking was defined as the belief that having a thought may actually cause or increase the likelihood of an event happening to self or others. Cognitive and psychoanalytic models of OCD (Salkovskis, 1985; McFall and Wollersheim, 1979; Freud, 1909) have hypothesised that magical thinking or a sense of inflated personal influence may play a significant part in the phenomenology of OCD. Other authors such as Tallis (1995) have suggested how a sense of inflated personal influence might lead to the perception of excessive responsibility and guilt which also feature significantly in cognitive theories of OCD. Previous research findings from studies on the phenomenology of obsessions (Kulhara and Prasad Rao, 1985) and from the cognitive literature (Shafran, Thordarson and Rachman, 1996) have suggested that this belief may play an important role in OCD. A questionnaire tapping magical thinking was developed for use in this study adapting methods used in a previous study to assess magical thinking in children (Viken and Clausen, 1988). The questionnaire consisted of 32 items looking at various aspects of magical thinking. A pilot study was carried out to evaluate the feasibility of this questionnaire. In the main study an adapted version of this questionnaire with 16 items was used to assess magical thinking in a group of adults with a diagnosis of OCD and a control group of normal adults. There were 20 subjects in each group. The main hypothesis was that magical thinking would be higher in the obsessional sample than the control group. The results are presented and discussed in relation to previous research findings.

## INTRODUCTION

In the past two decades, there has been increased interest in developing a clearer understanding of the phenomenology of obsessive-compulsive disorder (OCD). Phenomenology has been defined as “the theory that our knowledge should be based on immediate, ongoing experience, that is the process of attending to phenomena as they are directly experienced...to get ‘inside the mind’ ” (Goldenson, 1984). Previously, the most common explanations for the aetiology of OCD were behavioural and biological, but in line with trends in psychology generally, a greater emphasis is being put on the role of cognitive factors and the content of obsessional thoughts in OCD. Tallis (1995) describes that the most meaningful way of studying the phenomenology of OCD is in a cognitive framework. Several cognitive models of OCD have been put forward (Carr, 1974; McFall and Wollersheim, 1979; Salkovskis, 1989). Cognitive functioning in OCD is addressed on several levels in these theories. These levels include cognitive events which are the person's obsessional or intrusive thoughts and cognitive structures which are deeply held beliefs or schema about the self and the world. These schemas influence day to day cognitive events. Cognitive processes which are the rules used to govern cognitive events have not been so specifically addressed in OCD although have been considered central in cognitive models of other disorders such as depression (Beck, 1969, 1976).

In the cognitive models of OCD, the beliefs people hold about their obsessive thoughts are hypothesised to be central (Salkovskis, 1985). Freeston, Ladouceur, Gagnon and Thibodeau (1993) reviewed several theoretical models of OCD (Carr, 1974; McFall and Wollersheim, 1979; Salkovskis, 1985; Niler and Beck, 1989; Rachman and Hodgson, 1980; Rosen, 1975). They identified nine themes as being relevant to cognitive functioning in OCD. These themes were (1) direct or indirect responsibility for harming, possibly harming or failing to prevent harm to the self or another person; (2) blame and blame avoidance; (3) control of thoughts and action and the possible consequences of not controlling such thoughts; (4) thoughts as causing or provoking harm (5) guilt as an appropriate response to thoughts; (6) the overestimation of negative outcomes (7) the reaction to danger; (8) the neutralisation rather than the confrontation of thoughts; (9) the intolerability of uncertainty. It can be seen from these nine themes that excessive responsibility, personal extended

influence and guilt all feature prominently in the cognitive theories of obsessive compulsive disorder.

The overestimation of personal influence is central in cognitive models of OCD. From the above list, beliefs (3) "control of thoughts and the possible consequences of not controlling such thoughts" and (4) "thoughts as causing and provoking harm" seem particularly related to the belief that one may have personal extended influence. The term, personal extended influence, means that an individual sees a causal relation between their thoughts and actions and events in the world. If one held the belief that one's thoughts could actually cause harm, it follows on logically that one would think the control of harmful thoughts was important in order to prevent these negative outcomes. The same overestimation of personal influence can be used to neutralise the initial thought.

The theme of extended personal influence (which has also been termed magical thinking) in OCD, particularly in relation to the belief that thoughts in themselves can affect actions or events, has been an area of empirical research. In the cognitive literature, a construct termed thought-action fusion has emerged as being potentially important in the analysis of personal responsibility and correlated with obsessive-compulsive symptoms (Shafran, Thordarson and Rachman, 1996). Thought-action fusion has two components: firstly, that having a bad thought is the moral equivalent of carrying out a bad act and secondly, that having a thought makes an event more likely to occur. The second part of this factor seems more relevant to the idea of a belief in extended personal influence or magical thinking.

Other types of research in OCD have also supported the idea that the concept of extended personal influence may be important. Firstly, studies investigating the phenomenology of obsessions have indicated that there is a type of obsession that has been termed "obsessive magical thinking". This type of obsession has been defined as an "idea which is based on a magical formula of thought equals an act i.e. a thought equals an act, harm or suffering to self or others" (Kulhara and Prasad Rao, 1985). This same type of obsession has also been called an "obsessive conviction" in the phenomenological literature (Goodwin and Guzes, 1989; Khanna and Channabasavanna, 1988).

Secondly, early psychoanalytic theory considered magical thinking to be important in OCD. Magical thinking was often thought to be related to the fear of causing harm to others. Psychoanalysts (Freud, 1909) hypothesised that the ritualistic behaviour is reinforced by its seeming effectiveness in preventing harm to oneself or others. This seemingly effective outcome strengthens the underlying magical or superstitious thinking. Tallis (1995) has noted that while the psychoanalytic model of OCD has not been generally accepted, some of its ideas such as the belief in the power of thoughts to cause harm are the focus of research in the newly developing cognitive literature.

Lastly, research has been conducted to see whether obsessive-compulsive symptoms can be understood as pathological extremes of normal developmental stages such as childhood rituals or of social behaviour (Leonard, Goldberger, Rapoport, Cheslow and Swedo, 1990). In their study of children with OCD, they retrospectively studied early childhood rituals and superstitions. No difference was found between the experimental and control group for superstitions, although there was a difference in number of early childhood rituals. In their discussion, the researchers suggested that magical thinking could potentially act as a psychological marker for obsessive-compulsive disorder. Magical thinking has been suggested by some authors to typify the cognitive style of pre-school children (Freud, 1950; Piaget, 1950; Wilder, 1975).

In summary, research from various fields of OCD, especially from recent cognitive research has pointed to the possible importance of magical thinking in OCD. The term magical thinking will be defined as the belief that thinking something may cause or increase the likelihood of harm happening to self or others. A source of confusion is the variety of names that have been given to this concept. It is noted that other terms such as obsessive convictions or extended personal influence have been used to signify a similar idea and that it is also one component of the construct termed thought-action fusion. This aim of this study is to investigate magical thinking in OCD. In this introduction, a general overview of OCD (including its clinical features, epidemiology, demography, biological theories and treatments, behavioural theories and treatments and psychoanalytic theories and treatments) will be given before going on to review the literature that is more directly relevant to magical thinking in OCD.

## **General overview of OCD**

### *Clinical features of obsessive-compulsive disorder*

Obsessions are persistent distressing thoughts, images or impulses that are unwanted and involuntary causing the person anxiety and distress. In an attempt to reduce or alleviate the anxiety or distress, the person carries out a compulsion; a repetitive, stereotyped act, which can be overt or covert. An overt compulsion is an observable behaviour such as handwashing or checking, whereas a covert compulsion is a mental act such as thinking a good thought to neutralise a bad thought. Carrying out a compulsion is often viewed as a voluntary act, even though the person often does not want to carry out the behaviour and attempts to resist the urge. Over time and with increasing chronicity of OCD, the need to resist may decrease. The voluntary nature of compulsions has been questioned (Tallis, 1995). Much compulsive behaviour is associated with reduced control and therefore researchers such as Rachman and Hodgson (1980) view the extent of voluntary control in compulsions as on a continuum rather than being either entirely voluntary or entirely involuntary.

Although generally compulsive behaviour has been considered to serve the function of reducing discomfort or anxiety, carrying out a compulsion does not always lead to a reduction in anxiety or discomfort. This seems to be especially true of checking behaviour. Sometimes repeated checking can lead to an increase in anxiety as the person never feels certain that they have checked correctly (Rachman and Hodgson, 1980). This means that the compulsive behaviour ends only when the individual is exhausted rather than because their anxiety has reduced to a reasonable level.

Washing and checking are the most common compulsions. Other compulsive symptoms include hoarding, counting and asking for reassurance. In counting rituals the person counts words or letters or performs arithmetic calculations. Particular numbers may have special meaning and the person has to repeat the behaviour a certain number of times according to this number. Obsessions can centre around contamination fears, pathological doubting, the need for symmetry, and unwanted aggressive or sexual thoughts. Goodwin (1989) described obsessions as "being characterised by ambivalence. The person believes and simultaneously does not

believe". This feature of believing and at the same time not believing has to be considered when trying to assess and treat obsessional beliefs and has implications for the development of cognitive therapy for OCD.

For obsessive-compulsive disorder to be diagnosed a person must have either obsessions or compulsions (DSM-IV, 1994). These must "cause marked distress, are time-consuming, or significantly interfere with the person's normal routine, occupational functioning or usual social activities or relationships". Obsessions are defined as being "recurrent and persistent thoughts, ideas or impulses that are experienced at least initially as intrusive and inappropriate". These are not simply excessive worries about real life problems. The person must attempt "to ignore or suppress such thoughts and impulses or to neutralise them with some other thought or action" and the person must recognise "that they are products of their own mind". Compulsions are defined as "repetitive behaviours or mental acts that the person feels driven to perform in response to an obsession". The compulsions must be "aimed at preventing or reducing distress or preventing some dreaded event or situation; however, these behaviours or mental acts are not connected in a realistic way with what they are designed to neutralise or prevent or are clearly excessive". The person must recognise at some time during the disorder "that the obsessions or compulsions are excessive or unreasonable".

### *Epidemiology and demography of OCD*

Obsessive-compulsive disorder is estimated to affect 2 to 3% of the population (Karno, Golding, Sorenson and Burnam, 1988) during their lifetime. The National Institute of Mental Health (NIMH) Catchment Survey showed that OCD had a six month point prevalence of 1.6% (Myers et al., 1984) and a lifetime prevalence of 2.5% (Robins et al., 1984). These results indicated that obsessive-compulsive disorder was 50 to 100 times more common than previously thought making it the fourth most frequently occurring psychiatric disorder behind phobias, substance abuse and major depression. Similar prevalence rates have been found in other countries such as Canada (Bland et al., 1988; Vaisaner, 1975). There may be up to one million people with OCD in the United Kingdom and up to five million with OCD in the United States (Rapoport, 1989a). Previously, it had been viewed as an uncommon disorder because of the relatively rare presentation of OCD in mental health services. Studies



using both outpatient and inpatient psychiatric populations had indicated that adults and children with OCD only made up 1% to 4% of patients (Rudin, 1953; Rasmussen and Tsuang, 1984). A person with OCD may take years to approach services and the triggers for seeking help often include depression, anxiety, worsening obsessions or affected social functioning (Goodwin and Guze, 1989). The average time between onset and seeking help is seven to eight years ( Yaryura-Tobias and Neziroglu, 1983).

There have been few prospective studies looking at how obsessive-compulsive symptoms might change over time (Jenike, 1992). Rapoport (1989a) looked at adolescents with obsessive-compulsive disorder and found that baseline measures were a poor predictor of the course of the disorder. It used to be thought there was a clear differences between washers and checkers (Rachman, 1976a). Differences that have been noted are in mode of onset, sex ratio, effect of rituals on anxiety, fluctuations in rituals and response to behaviour therapy (Baer and Minchellio, 1986), but more recent thinking suggests the picture is more complex than this (Tallis, 1995). People with OCD often have multiple obsessions and compulsions which can change over time for example from predominately checking to predominately washing compulsions or vice versa. The course of obsessive-compulsive disorder tends to be chronic with a waxing and waning of symptoms. Rasmussen and Tsuang (1984) found that 85% of patients fitted into this category.

Rasmussen and Eisen (1992) found that sixty-five per cent of their subjects developed obsessive-compulsive disorder before twenty-five years old. The mean age of onset was 20.9 years old for both sexes, but they found that men developed symptoms significantly earlier than women. There is some evidence for precipitating events in OCD. Between 56% to 90% of patients with OCD can remember a precipitating event in some studies (Rudin, 1953; Rasmussen and Eisen, 1992). However, other research has shown that a third to a half of patients with OCD cannot recall a precipitating event (Goodwin, Guze and Robins, 1969; Black, 1974). Precipitants can include emotional stress at work or home or there may be an increased level of life events in the six months before onset (Khanna et al., 1988).

OCD is equally common in males and females (Black 1974; Karno et al., 1988) although there can be differences within the subgroups of cleaning and checking. Women tend to experience more washing compulsions and contamination fears

whereas men tend to suffer from obsessional slowness more frequently (Marks, 1987). OCD is twice as common in boys in childhood and adolescence (Swedo and Rappoport, 1989). People with OCD are more likely to be single and up to 47% are celibate (Rudin, 1953). Marital conflict has also been associated with OCD (Rachman and Hodgson, 1980; Yaryura-Tobias and Neziroglu, 1983). Supporting evidence for this is that Karno et al. (1988) found a relationship between OCD and separation or divorce.

OCD also has a high rate of co-morbidity with other psychiatric disorders. Rasmussen and Eisen (1992) found that two-thirds of their OCD sample had a lifetime history of major depression. For the majority (85%), the depression was secondary to the OCD, but 15% experienced concurrent major depression. OCD also had a significant overlap with anxiety disorders such as panic disorder and agoraphobia.

### **Aetiology and treatment of obsessive-compulsive disorder**

#### *Biological theories and treatments*

The first group of theories have concentrated on attempting to find an underlying biological or physical cause for obsessive-compulsive disorder. Firstly, it has been suggested that obsessive-compulsive disorder is caused by a specific abnormality in the levels of the neurotransmitter serotonin in the brain. The main evidence for this theory is that people with obsessive-compulsive disorder respond well to a group of antidepressants termed the serotonin reuptake inhibitors (SRI) such as clomipramine that prevent the loss of serotonin. These drugs have been shown to have specific anti-obsessional effects and clomipramine has generally had the highest levels of success (Stein, Spadaccini and Hollander, 1995; Jenike, 1993). However, other research, for example looking at blood serotonin has proved inconclusive about whether patients with obsessive-compulsive disorder do have abnormal serotonin levels (Flament et al., 1987). A second area of interest has been in the possible brain structures implicated in obsessive-compulsive disorder. A series of neuroimaging studies have shown that particular areas of the brain in individuals with obsessive-compulsive disorder show increased metabolic activity levels compared to a control group (Baxter et al., 1988). PET scans have indicated that these areas are the orbital frontal cortex, cingulate cortex and head of the caudate. Work is continuing in this area. There has also been



research into the potential genetic factors involved in obsessive-compulsive disorder. The results of twin studies have shown a higher rate of OCD in monozygotic twins compared to dizygotic twins (Carey and Gottesman, 1981), but another study has shown that there is increasing monozygotic and dizygotic concordance as obsessional traits or other anxiety disorders are included (MacDonald and Murray, 1989). This gives more support for the inheritability of a predisposition to developing anxiety disorders generally rather than specifically OCD. Other studies have looked at the rate of OCD in the relatives of patients with OCD. The results of five out of six studies using DSM-III diagnostic criteria suggested that the incidence of OCD among relatives was less than 10% (Black et al., 1992). In parents, obsessional personality traits seem to be more common than obsessive compulsive symptoms (Honjo et al., 1989; Riddle et al., 1990).

### *Behavioural and psychoanalytic theories and interventions*

The most influential psychological theory has been learning theory which led to the development of behaviour therapy for obsessive-compulsive disorder. The principal theory used to explain obsessive-compulsive disorder is the two stage learning theory first proposed by Mowrer (1947), although there are variations on the original theory (Rachman and Hodgson, 1980). He hypothesised that an event becomes associated with anxiety through the mechanism of classical conditioning. In an attempt to reduce anxiety, a compulsive behaviour is carried out. If this behaviour is successful in decreasing the level of anxiety, the compulsive behaviour is reinforced and more likely to occur again if anxiety is experienced. This cycle means that the person never experiences the natural habituation of anxiety over time. Rachman and Hodgson (1980) updated this theory to include the idea that compulsions do not always have an anxiety reducing effect.

The main type of behaviour therapy used is response prevention where the person has to stop carrying out the compulsive behaviour long enough so they can see that the anxiety reduces eventually without carrying out an compulsion. This technique is coupled with encouraging the person to gradually stop avoiding situations they find anxiety provoking. Behaviour therapy has been shown to be effective in treating obsessive-compulsive disorder (Rachman and Hodgson, 1980). Generally, 60 to 70% of patients with compulsive rituals improved after completing treatment. However,

behaviour therapy does have a high drop out rate of 20% (Rachman and Hodgson, 1980).

Psychoanalysts have focused on finding an underlying psychological cause for obsessive-compulsive disorder. Freud (1909) proposed that obsessional symptoms were defensive reactions to unconscious impulses caused by a regression to an earlier childhood stage. He thought that obsessive-compulsive disorder is linked to the stage of development termed the 'anal-sadistic stage' in which toilet training is a major feature. During this stage, anger, aggression and the need for control can be predominant themes. Also from a psychodynamic standpoint, Beiser (1987) hypothesised that obsessive-compulsive attributes in children could be seen as part of normal development, as a defence mechanism against urges to untidy or destroy, as a way of mastering deficits or as a mixture of all three. She reviewed the obsessive compulsive behaviour that might occur during normal development. This behaviour includes childhood rituals such as bedtime stories, the emergence of superstitious behaviour such as avoiding stepping on cracks in the pavement and repetitive behaviour such as repeating the same game over and over again. These behaviours can serve various functions such as dealing with separation, assisting in the mastery of the environment and coping in social situations. Other authors have also hypothesised that obsessive or compulsive symptoms may be related to superstitious or magical thinking (Freud, 1963).

Tallis (1995) states that there is little evidence to support a theory in which infant sexuality and regression are important. He also notes that Freud was concerned with cognition in OCD and that some of his observations about OCD are the focus of current research. Tallis talks specifically about defensive reactions which occur to keep unacceptable thoughts out of consciousness. If a person experiences an obsessional thought about a harmful event happening to someone, they may carry out an overt or covert act to undo or neutralise the thought to prevent the outcome. As mentioned before, this behaviour is seemingly effective and this outcome reinforces the magical thinking and the compulsive behaviour. Freud proposed that magical and superstitious thinking and other symptoms were caused by a regression to an earlier developmental stage which is characterised by feelings of omnipotence. Tallis (1995) proposes that in early onset OCD which carries on into adulthood, magical thinking or overestimation of personal influence is better seen as a developmental delay.

Leonard et al. (1990) looked specifically at the theory that the symptoms of OCD could be viewed as extreme variants of superstitiousness or early developmental rituals. Ritualistic play, magical and childhood rituals and thinking, and superstitions have all been viewed as related to obsessive-compulsive disorder (Peller, 1954; Nemiah, 1985). Up to thirty per-cent of people with OCD develop the disorder before the age of fifteen and childhood OCD is similar in its presentation to adult OCD. A group of children with OCD and a control group were compared on measures of parental report of early developmental rituals and current superstitions. They found no difference between the groups on current superstitions and argue that most superstitions differ in content from the common obsessions and compulsions in childhood OCD. A difference was found in number of developmental rituals and it is suggested that a prospective study should be conducted to see whether this result is due to preclinical OCD or biased parental recall. They also thought that other psychological factors which could be on a developmental continuum, such as magical thinking, may show continuity with OCD. In terms of treatment, there is little evidence for the efficacy of psychoanalytical treatment of obsessive-compulsive disorder (Jenike, 1986).

### **The role of cognition in OCD**

Firstly, three cognitive models of OCD will now be discussed and evaluated. Secondly, the implications of these models for the role of cognitive therapy in OCD will be discussed.

#### *The model of Carr*

The earliest cognitive model was formulated by Carr (1974). He hypothesised that people with OCD tend to overestimate the possibly of negative outcomes in certain situations and tend to overestimate the negative consequences of this outcome occurring. These are known as distorted threat appraisals. Lazarus (1966) was the first to introduce the idea of "threat appraisals". These appraisals are defined as the evaluation of situations in terms of their harmful consequences. In OCD, if there is an overestimation of harmful outcomes and consequences, this evaluation may lead to increased anxiety levels. The anxiety triggers compulsive behaviour in an attempt to

reduce the probability of the harmful consequences. This model has been criticised for several reasons. Firstly, it is primarily descriptive of threat appraisals in OCD rather than explaining them. For example, why might individuals with OCD process situations in this way? Secondly, it has been criticised for not being specific enough to OCD. This model has been shown to apply to other forms of anxiety such as agoraphobia (Butler and Matthews, 1983, McNally and Foa, 1987) and also intrusive thoughts related to health (Freeston et al., 1994). However, this first model led to theoretical speculation about what were the specific cognitive underpinnings of OCD as compared to other anxiety disorders. The theory also gave an idea of how therapy might tackle these hypothesised overestimations of threat.

### *The model of McFall and Wollersheim*

The next main theory was by McFall and Wollersheim (1979) who proposed a model again developed within the structure of appraisal theory (Lazarus, 1966) and perception of threat. They hypothesised that there are two stages in appraisals of threat in OCD: a primary appraisal and a secondary appraisal. In obsessive-compulsive disorder certain beliefs guide these appraisals which mean that people with obsessive-compulsive disorder perceive themselves as unable to control threat and carry out compulsive behaviour in order to reduce the possibility of the unfavourable outcomes. The initial perception of threat is caused by the person evaluating the danger of an event compared to their ability to cope with it. This leads to an increase in anxiety levels which in turn leads to a secondary appraisal of the probable consequence of their attempt to cope with the situation. The secondary appraisal can trigger compulsive behaviour.

McFall and Wollersheim were the first to suggest specific beliefs that might underlie OCD behaviours. They proposed that the beliefs underlying primary appraisals are centred around the theme of the unacceptable nature of obsessional thoughts and an inflated sense of personal influence (Tallis, 1995). These include that "one is powerful enough to initiate or prevent the occurrence of disastrous outcomes" and that "certain thoughts and feelings are unacceptable and could lead to a catastrophe". The beliefs that might underlie secondary appraisals also reflect these themes. For example that "magical rituals or obsessive ruminating will circumvent feared outcomes", "it is easier and more effective to carry out a magical ritual or to obsess than to confront one's

feelings directly" and "feelings of uncertainty and loss of control are intolerable". Tallis (1995) notes the similarity between the types of themes and beliefs considered central in this model of OCD and the types of beliefs considered in psychoanalytic theory.

Salkovskis (1985) criticised this model for several reasons. Again, like the theory proposed by Carr (1974), he did not think it explained OCD specifically enough and could not differentiate between threat appraisals in OCD and other anxiety disorders. Secondly, he thought there was no serious attempt to delineate the processes in OCD and thirdly that there was too heavy an emphasis on preconscious and unconscious cognitions drawn from psychoanalytic theory.

### *The model of Salkovskis*

Salkovskis (1985, 1989) developed a fuller cognitive theory of OCD which in particular has stimulated much research testing out its predictions. He criticised McFall and Wollersheims' model as not being specific enough to obsessive-compulsive disorder and not differentiating between threat appraisals in obsessive-compulsive and other anxiety disorders. He also did not include some of the beliefs that McFall and Wollersheim viewed as important. However, there are many similarities between the two models.

His theory was based on similar principles to cognitive models of depression and anxiety developed by Beck (1967, 76). These types of models hypothesise that it is a person's interpretation of a situation that governs their emotional response. In depression and anxiety, negative automatic thoughts occur which are characterised by their involuntary nature and distressing content and can affect mood.

Salkovskis (1989) proposed that "clinical obsessions are intrusive cognitions, the occurrence and content of which patients interpret as an indication that they might be responsible for harm to themselves or others unless they take action to prevent it". Obsessive thoughts differ from automatic thoughts in that when negative automatic thoughts occur they are generally perceived as reasonable compared to obsessions which are generally perceived as senseless and intrusive. In obsessive-compulsive disorder, the obsessions in themselves trigger negative automatic thoughts that lead to



neutralising activity. He notes that intrusive thoughts are common in the general population (Rachman and de Silva, 1978) therefore it is not the intrusive thoughts per se which are related to OCD, but the person's reaction to these types of thoughts. These differ in occurrence from obsessional patients, but are similar in form and content (Rachman and de Silva, 1978). Obsessional thinking therefore has its foundation in normal intrusive cognitions.

Underlying beliefs or dysfunctional assumptions (Beck, 1967) are hypothesised to influence the person's reaction to intrusive thoughts. For example, if a person holds the dysfunctional assumption that "having a bad thought is like doing a bad action", they will react with distress if they experience a "bad" thought. When the person carries out a ritualistic behaviour in order to reduce the distress or to neutralise the thought, the behaviour is mediated by a cognitive factor. For example, "I acted on my belief and felt better, therefore the belief must have some basis in truth". Salkovskis notes that in the early stages of OCD, the effort required to carry out a compulsion is small compared to the possible awful consequences if the behaviour is not carried out. The underlying beliefs include "having a thought about an action is like causing the action" and "failing to prevent harm to self or others is the same as having caused the harm in the first place".

A further part of this model relates to excessive responsibility. Salkovskis suggests that in the normal population people hold themselves responsible for what they actually do whereas people with OCD also hold themselves responsible for what they fail to do. Therefore if a negative event is foreseen, however slim the probability of it actually happening, the person is responsible for doing something to prevent it. Responsibility has been recognised as potentially important in OCD before Salkovskis proposed his model. Rachman and Hodgson (1980) noted a difference in people with checking rituals at home and immediately after entering hospital. The checking rituals decreased significantly on their entry to hospital. They suggest this was due to reduced feelings of responsibility and therefore reduced anxiety levels in hospital. In hospital, over time, checking can increase as the person comes more to view it as a home. It has also been noted that anxiety reduces when a therapist is present as the responsibility is shared. Tallis (1995) notes that reassurance seeking can often take the form of seeming to share responsibility such as "You did see me switch the cooker off, didn't you?". Responsibility has been thought to be particularly related to

checking behaviour. Evidence supporting this hypothesis was from studies carried out comparing individuals with primarily checking behaviour with those with cleaning behaviour. A difference was found in that checkers reported less discomfort than cleaners after being provoked. The conclusion drawn was that the checkers experienced less discomfort because of the presence of the experimenter and it was hypothesised that the experimenter has an inhibiting effect on discomfort levels as the subject perceives that the experimenter shares responsibility. Secondly, checkers experienced greater discomfort and urge to check in their own homes where they feel most responsible (Rachman and Hodgson, 1980). These studies suggested that responsibility may be more related to checking rituals than washing rituals. As mentioned before, this situation is complicated by the fact that many people with OCD have both checking and washing rituals at various stages of the disorder.

Many researchers have been interested in the role of personal responsibility and in testing out the predictions of the model proposed by Salkovskis. A series of studies have recently been published exploring whether firstly there is a relationship between excessive responsibility and obsessive-compulsive symptoms and secondly attempting to clarify and measure this concept. Freeston, Ladouceur, Thibodeau and Gagnon (1992) tested the relationship between intrusive thoughts and measures of anxious, depressive and compulsive symptoms. Subjects were one hundred and twenty-five university students who completed a questionnaire describing and evaluating seven cognitive intrusions and scales of depressive, anxious and compulsive symptoms. Five factors that emerged from the cognitive intrusions questionnaire were general distress, evaluation, control, diversity and attention. Evaluation was the only factor found to be a significant predictor of Compulsive Activity Checklist scores. This factor was made up of perceived responsibility, disapproval and guilt ratings. This gave support to the idea that responsibility is related to compulsive behaviour although this study was carried out with a non-clinical student population. Patients with obsessive-compulsive disorder have also reported higher responsibility for outcomes related to their thoughts (Freeston, Ladouceur, Gagnon and Thibodeau, 1992) and also rated beliefs more strongly about responsibility (Freeston, Ladouceur, Gagnon and Thibodeau, 1993) as compared to matched controls.

Responsibility has been thought to be a more prevalent schema in those with checking type ritual as opposed to contamination fears and washing and cleaning rituals. Lopatkha and Rachman (1995) found that by reducing perceived responsibility using an experimental manipulation, OCD subjects experienced a significant decrease in levels of discomfort and urge to check, conversely when perceived responsibility was increased, there was an increase in level of discomfort and urge to check, although this increase was not statistically significant.

Further research looked at the link between increased responsibility and checking behaviour. Ladouceur et al. (1995) compared checking behaviour under conditions of high and low perceived responsibility using a sound recognition task in non-clinical subjects. The high responsibility group were told that the study was for an insurance company in order to improve security for blind people and elderly people while crossing roads. The low responsibility group were told that the study was about sound recognition. The results indicated that anxiety was the only variable to be found significantly higher in the high responsibility group. The other dependent variables (number of checks, number of errors made, and time taken to finish the task, need to check after the task, time believed to be needed to make an extra check after the task, subjective number of errors made, preoccupation with errors and discomfort experienced during the task) did not differ between the two groups. A manipulation check was also conducted looking at the perception of the probability and the severity of negative consequences, the influence of the subject over the consequences and the perceived responsibility. The authors suggested that this result might be due to task difficulty masking differences between groups or that the manipulation to increase responsibility may not have been powerful enough. In order to test out these explanations, a second study was carried out looking at checking behaviour, but using a different task, a manual classification task. This time, a significant difference was found between the groups with the high responsibility group more frequently hesitating, checking, and having more preoccupation with errors and anxiety during the task. The researchers discuss the relationship between perception of danger and perception of responsibility and suggest that the perception of danger may also play a role in causing checking.



The above study demonstrates the difficulty in defining, testing and manipulating the construct of responsibility. Rheaume, Ladoceur, Freeston and Letarte (1995) defined responsibility as the belief that "one possess pivotal power to provoke or prevent subjective negative outcomes". In their studies, they were looking at how subjects assess responsibility over ambiguous situations. These situations were based around subjects such as contamination, sexuality, verification, loss of control and magical thinking. Three hundred and ninety seven adults were given a situation and asked to describe a possible negative outcome which they had to rate according to probability, severity, influence and pivotal influence. Ratings of probability and severity aimed to measure the subject's threat appraisal whereas ratings of influence and pivotal influence were measuring the perceived power to provoke or prevent the outcomes. Subjects also rated perceived responsibility and personal relevance. Influence was defined as the degree of influence subjects believed they had over the outcome whereas pivotal influence was the part of the outcome the subjects believed to be completely under their control. For example, if it was an office worker's job to lock up the office at night, they may rate their level of pivotal influence as high over the outcome of leaving the office unlocked and the office being burgled. This is because whether or not the office is locked is completely under their control. However, if it was another persons responsibility to lock up the office in the evenings, the person might feel they still had some influence over the outcome, but they would probably rate the level of pivotal influence as lower. Influence and pivotal influence more strongly predicted responsibility ratings than severity and probability. Pivotal influence was the strongest predictor of responsibility in this study and in a second study controlling for the order of items. This means that if a subject believes they have more influence over the outcome, this is the best predictor of their responsibility ratings. These findings give support to the model of OCD by Salkovskis. However again this study was conducted using a non-clinical population and the authors conclude that further research needs to compare OCD, clinical controls and normal controls to see if a responsibility schema is important in OCD.

A general point to note about most of the research carried out in this area is that so far non-clinical subjects groups have been used. If subjects with obsessional problems are used, they are often chosen on the basis of a cut off point on a measure of obsessive-compulsive symptomatology rather than having a formal diagnosis. These shortcomings in the research means it is at times questionable how applicable these

results are to OCD. This situation may be due to the fact that it is often difficult to recruit subjects with OCD due to their relative rarity in mental health settings and their reluctance to disclose (Rapoport, 1989b; Rasmussen and Tsuang, 1984).

As mentioned, another difficulty has been the variety of definitions of responsibility and the lack of empirically tested measures of the concept. Work on developing a reliable scale free from OCD related items has been carried out by Rachman et al. (1995). They developed a questionnaire called the Responsibility Appraisal Questionnaire and tested two hundred and ninety one students. The results indicated there were four factors in the construct of responsibility. These were responsibility for harm, responsibility in social contexts, a positive outlook towards responsibility and thought-action fusion (TAF) which is the belief that thoughts can influence events or are almost equivalent to actions. A revised questionnaire was developed and tested on two hundred and thirty four students. Again, four factors were found but only the TAF subscale was found to correlate significantly with measures of obsessionality, guilt and depression. This correlation remained significant even when depression scores were controlled. This, they suggest, shows that the concept of responsibility is made up of several factors and is not a unitary concept. They also argue that evidence does not support the idea that people with obsessive-compulsive are generally over-responsible. Excessive responsibility seems to be specific to particular situations rather than across all situations.

In two studies investigating TAF further, Shafran et al. (1996) have shown that thought-action fusion is higher in an obsessional sample than a non obsessional sample, particularly the belief that thinking about something happening increases the risk of it happening. They suggest that thought-action fusion has two components (1) the belief that thinking about an unacceptable or disturbing event makes it more likely to happen (TAF-Likelihood) and (2) the belief that having an unacceptable thought is the moral equivalent of carrying out the unacceptable or disturbing action (TAF-Moral). The Likelihood factor is divided into two categories. Firstly, Likelihood for others measures TAF for events happening to a friend/ relative and secondly, Likelihood for self measures TAF for events happening to oneself. In the first study, an obsessional group numbering one hundred and forty seven was compared with a student control group of one hundred and ninety. The obsessional group was recruited through adverts and were included if they scored above a cut off

of eleven on the Maudsley Obsessional Compulsive Inventory. Two thirds of this group had received a formal diagnosis of obsessive-compulsive disorder although their scores on the Maudsley did not differ from those without a formal diagnosis. The other measures used were the Beck Depression Inventory and the Thought-Action Fusion Scale. The new scale was made up of thirty four items. Twelve items related to TAF-Moral, six to negative events happening to others, four items to positive events happening to others (TAF-Likelihood-for-others), six to negative events to self and four items relating to positive events happening to self (TAF Likelihood-for-self).

A factor analysis was conducted. A three factor solution was found to explain 61.6% of the variance of the student sample. These factors were TAF-Likelihood-for-self, TAF-Likelihood for-others and TAF-Moral. Moderate correlations ( ranging from .32 to .35) were found between these factors. In the obsessional sample, a two factor solution was found to better explain the variance. The factor TAF-Likelihood did not differentiate between self and other in the obsessional group. When comparing the groups, a significant difference was found between TAF-Moral and TAF-Likelihood-for-others, but not TAF-Likelihood for self. The authors noted that most of the obsessional group did not state they strongly believed many of the items, but tended to score highly on certain items. This may reflect the often idiosyncratic nature of obsessions. A weakness of this study is that it used a cut off score as criteria for inclusion rather than a formal diagnosis and also used an unmatched student control group.

A second study was carried out to investigate Thought Action Fusion further, using a revised 19 item Thought-Action Fusion Scale. The positive items were removed as they seemed least relevant to OCD and two ambiguous items were also removed. This study used an obsessional sample (according to the same criteria as Study 1) and two control groups: a community sample (made up of 122 community volunteers) and a student sample. This study found that the TAF scale correlates significantly with cleaning and checking subscales of the Maudsley Obsessional Compulsive Inventory (MOCI). TAF-Moral and TAF-Likelihood-for-others was associated with compulsive checking and cleaning in the obsessional and student groups, but not for the community group. However, once depression had been partialled out, only the correlation between TAF-Likelihood-for-others and the checking subscale of the

MOCI remained significant in the obsessional group. This correlation was reduced and this result suggests that depression may increase the likelihood of both TAF-Likelihood-for-others and checking. For example, if you are depressed, this may increase your vulnerability to TAF-Likelihood-for-others and this may in turn lead to increased checking to stop a harmful event from happening. Another explanation could be that depression affects checking and TAF-Likelihood for-others independently. Again, the obsessional group tended to believe in TAF-Likelihood-for-others to a similar extent as they believed in TAF-Likelihood-for-self whereas the control groups rated TAF-Likelihood-for-self more than TAF-Likelihood-for others. The authors suggest that a belief in TAF-Likelihood-for-self can be explained by "self-fulfilling prophecies". If a person has a positive or negative thought, this may affect their future behaviour and therefore influence future events. Therefore your own thoughts may have an influence over your own behaviour and future events. However, the influence of your own thoughts on events happening to another person cannot have the same effect. The obsessional sample did not distinguish between these two components, indicating that they believed their thoughts could have an equal effect on their own and others behaviour.

The factor, TAF-Likelihood-for-others, relates back to the idea of extended personal influence which has been a theme throughout the cognitive models. The researchers suggest that obsessional-compulsive symptoms with TAF are particularly likely to experience a sense of inflated responsibility. TAF is viewed as an internal trigger for responsibility as differentiated from the external triggers such as no-one else being there. They hypothesise that cultural factors such as religious beliefs may play a role in its development. One intriguing fact is that a person can believe that if they think about a car crash, this means it is more likely to happen, yet if they have a thought about someone falling ill, they do not believe that this makes it more likely to happen. This suggests that a person with OCD often does not hold the general belief that thoughts can influence events, but only in certain situations. For example, people with OCD do not differ from a control group in their rating of thought-action fusion for positive events such as winning the lottery. Therefore they do not believe that thinking about winning the lottery or other positive events make them more likely to happen (Shafran et al., 1996). This difference may be partially explained by the nature of beliefs in OCD as discussed by Goodwin (1989). He suggested that obsessive convictions and magical thinking were characterised by believing yet not believing.

Different hypotheses, such as the role of cultural factors, have been put forward to explain how thought-action fusion might develop. One suggestion has been the role of early or past experience. Tallis (1994) described two case studies where magical thinking or the fusion of thoughts and actions seemed important in the aetiology of obsessive compulsive disorder. The first case was a woman who experienced intrusive thoughts, repeated checking and repeated doubts about whether she had harmed someone. As a child, she had prayed that her grandfather would die and the next day he died. Also, as an adult she had a violent argument with her mother and two weeks later her mother was diagnosed with cancer. In the second case, a woman experienced intrusive thoughts, checking behaviour and number rituals. She found it difficult to distinguish thought from action and would worry that she had put poison into food. Again, as a teenager, she had wished that her father would be taken away and he died in an accident two weeks later. He related these cases to the cognitive theories of emotion which stress the importance of early experiences in the development of dysfunctional beliefs. In both these cases, an early learning experience appeared to lead to the formation of the belief that thinking about something bad will result in its actual occurrence.

In summary, much recent research has investigated the concept of personal responsibility and its relation to obsessive and compulsive symptoms in non-clinical and clinical populations. Positive results have been found suggesting there may be a link between inflated responsibility and obsessive and compulsive symptoms. Problems in this field have been the use of non-clinical samples and the obvious complexity of the construct of responsibility. Responsibility is not a unitary concept (Rachman et al., 1995) and different factors seem to be more related to obsessive and compulsive symptoms than others. One construct termed thought-action fusion developed from research looking at the construct of responsibility has been found to be related to measures of obsessional and compulsive symptoms in a clinical population.



*Cognitive therapy for OCD*

Cognitive therapy for OCD is still at its early stages of development and there have only been a few outcome studies. Van Oppen and Arntz (1994) have described some of the specific cognitive techniques drawn from cognitive therapy of anxiety and depression (Beck, 1976; Beck et al., 1985) which have been used in the treatment of obsessions and compulsions. The first group of interventions focus on changing estimations of catastrophe. There are two aspects to this: firstly, the overestimation of danger and secondly, the overestimation of the consequences of danger. The authors give an example of these overestimations as "If I don't extinguish my cigarette, the house will burn down". Strategies to address the overestimation of danger include working out the probability of the feared event occurring and comparing this to the person's perceived probability of the event occurring. A second strategy is to carry out behavioural experiments. They give the example of asking the client writing the wrong account number on the cheque and testing whether the feared consequences occur. The second area targeted for therapy is to change the overestimation of responsibility. They suggest that responsibility is made up of two factors: the overestimation of the amount of responsibility and secondly, the overestimation of the consequences of having been responsible. They suggest that the core assumptions of the person are linked to their perception of the consequences of responsibility. A specific technique for this is the pie-technique where the person lists all the possible contributing factors to a particular outcome and rates how important each one is. A second method is to ask the person how responsible they would think a friend or another person would be if a certain catastrophe happened to them. Lastly, behavioural experiments can also be used to challenge the belief in the consequences of responsibility. For particular dysfunctional assumptions, the downward arrow has been used. Instead of challenging the person's thoughts and beliefs, they are asked "Supposing that were true, what would that mean?"

The only well-controlled study looking at the effectiveness of cognitive therapy for OCD was carried out by Van Oppen et al. (1995). A cognitive therapy condition was compared to a behaviour therapy condition. Subjects were assessed on a variety of measures including the Padua Inventory-Revised, the Irrational Beliefs Inventory and the Anxiety Discomfort Scale. The results showed that both groups improved

significantly on most measures and that there were no significant differences between the groups. The effect sizes were slightly higher in the cognitive therapy group. Other studies have been carried out (Emmelkamp, van der Helm, van Zanten and Plochg, 1980; Emmelkamp and Beens, 1991) also giving some support for the effectiveness of these types of techniques.

Problems have been noted with cognitive therapy for OCD (Van Oppen and Arntz, 1994; Tallis, 1995). Firstly, some clients with OCD may not be able to report their thoughts and beliefs. Secondly, these types of techniques are often more successful with patients who are more intellectually able and have more abstract thinking skills. However, this problem has been noted in the application of cognitive therapy generally and techniques can be adapted and simplified. Thirdly, patients with ruminations can use the Socratic technique as a way of reassurance seeking. Lastly, behavioural experiments cannot be applied to all beliefs as sometimes the feared consequence is only expected to occur in the long term and is not amenable to short term behavioural experiments.

There have been other proposed developments in cognitive therapy looking more specifically at the psychological consequences of fusing thought and action or having a sense of inflated personal influence. Rachman (1993) proposes that one aim of therapy might be to help the person distinguish between obsessional thought and obsessional action. Tallis (1994) presents two cases where because of a specific learning experience, the person learnt that thoughts could affect events or other people. He hypothesises the role of specific learning experiences may contribute to the development of beliefs which may be related to certain obsessional symptoms such as thought-action fusion and suggests that if this belief has resulted from a congruent experience, the most appropriate treatment model might be similar to that used for the challenging of delusions. He compares the formation of these types of beliefs in OCD to the theories about the formation of delusions. For example, Maher (1988) has argued that delusions are rational responses to explain abnormal or anomalous experiences. Tallis cites the delusion modification model as suggested by Watts, Powell and Austin (1979) in which the person is encouraged to consider alternative explanations for the seeming link between thoughts and actions. This type of theory or application of cognitive therapy techniques to specific types of obsessional and compulsive symptoms is at an early stage.

### **Phenomenology of obsessions**

This section reviews research looking more specifically at the phenomenology of obsessions. Khanna and Channabasavanna (1988) reviewed the case notes of 412 patients with obsessive compulsive disorder seen between 1975 and 1984 in a Psychiatry Outpatient clinic in India. A psychiatrist had given each of these patients a diagnosis of obsessive compulsive disorder according to both ICD-9 and DSM-III criteria. One hundred and sixty patients had been seen subsequently and the diagnosis confirmed. From the files, 761 obsessions were recorded and classified according to form and content. The form of obsessions could be (1) obsessional thoughts-thoughts which repeatedly intrude into consciousness (2) obsessional doubts e.g. doubts about having completed daily activities (3) obsessional fears e.g. fear of getting dirty etc. (4) obsessional urges - these are powerful impulses to carry out certain acts (5) obsessional images and (6) obsessive convictions - these are often based on the magical formula of thought equalling an act. The content of obsessions was categorised as dirt/contamination, religion, sex, death, illness, aggression, harm, past, daily activity, inanimate-personal and others. In this sample, obsessive convictions made up 9.08% of all obsessions. They were most commonly recorded as about daily activities and inanimate-personal. Unfortunately, the authors did not define the inanimate-personal category. Khanna and Channabasavanna said that rituals are often associated with obsessive convictions. This study used a large sample, but a shortcoming is that it relied on a retrospective analysis of case notes rather than direct interviews with subjects. Case notes can often be unreliable and open to individual variance in the quality and type of information.

Another Indian study by Kulhara and Prasad Rao (1985) looked at the phenomenology of obsessions and compulsions. A similar design was employed to the study by Khanna and Channabasavanna in which the researchers reviewed the case notes of patients who met the Research Diagnostic Criteria for obsessive compulsive disorder. Seventy two cases were identified. Obsessions were categorised as obsessive doubts, obsessive thoughts, obsessive fears, obsessive impulses, obsessive images, miscellaneous and obsessive magical thinking. Obsessive magical thinking was defined almost exactly as obsessive convictions were defined in the previous study by Khanna and Channabasavanna (1988). Again, they defined obsessive



magical thinking as based on the magical formula of thought equalling an act, harm or suffering to others. The results showed that magical thinking accounted for 36.1% of all obsessions in this sample and occurred in 26 out of the 72 subjects. The authors state that they think magical thinking is a more suitable term for this concept than convictions and that it requires further investigation. These results suggest that not everyone with OCD has magical thinking, but a significant proportion do. Again these results are restricted by the fact the researchers relied on retrospective analysis of case notes. To overcome these weaknesses, the main aim of the present study was to investigate magical thinking through questionnaires and individual interviews with subjects. Magical thinking or the belief in extended personal influence is not a phenomenon restricted to OCD and has also been widely researched in other areas of psychology. The next part of the discussion will look at magical thinking or extended personal influence in normal adults, other psychiatric disorders and young children.

### **Magical thinking in non-OCD populations**

Magical thinking has been viewed as common in children (Piaget, 1929; Freud, 1950) and in traditional societies (Tylor, 1871/1974; Mauss, 1902/1972). Social anthropologists studying traditional cultures early in this century and late last century hypothesised that two laws could explain magical thinking and rituals. The law of contagion states that things that have been in contact with each other may influence each other after the cessation of actual contact. For example, a touch of a lucky charm could make someone lucky at gambling. The second law, the law of similarity states that things that resemble each other share fundamental properties. For example, that if you tear someone's photograph that this will harm them.

Research has also shown that these laws apply to American adults (Rozin et al., 1986, 1989) and that magical thinking or rituals are not uncommon in adults in Western societies. Gmelch and Felson (1980) found that approximately 70% of the adults in their study had carried out magical rituals or superstitions. These types of rituals seem to be particularly common in competitive sports and are thought to be related to anxiety and worries about performance. Certain factors seem to be associated with magical thinking such as lack of information and conditions of uncertainty. Jahoda (1969) suggested that superstitions are more likely to occur when people do not feel in control and engaging in superstitious behaviour creates the feeling of having some

control over events. Similarities can be seen between the functions of obsessions and compulsions and superstitions in gaining control over future events and reducing anxiety.

Superstitiousness and obsessive compulsive symptoms have been found to be common in normal populations (Rachman and Hodgson, 1980; Marmor, 1956). Frost et al. (1993) showed that superstitious beliefs and behaviours correlated with measures of compulsivity and obsessionality in a non-clinical population. The measures of superstitiousness used were the Lucky Beliefs Questionnaire (included items such as “some numbers are lucky” and “crossing your fingers brings good luck”) and the Lucky Behaviours Questionnaire which measured the frequency of superstitiousness behaviours such as “avoid doing things on Friday 13th”. The Maudsley Obsessional-Compulsive Inventory, the Compulsive Activity Checklist - Revised and the Obsessive Thoughts Questionnaire were used to measure obsessive and compulsive symptoms. Superstitiousness was related to compulsive checking, but not to compulsive washing. The authors discuss these results with relation to the concept of perceived control and also note that superstitiousness is related to checking, but not washing symptoms. However, Leonard, Goldberger, Rapoport, Cheslow and Swedo (1990) compared a group of children with OCD and a control group on measures of early developmental rituals and current superstitions. They found no difference between the groups on current superstitions and argue that most superstitions differ in intensity, context and role from the common obsessions and compulsions in childhood OCD. The only similarity the researchers note is that anxiety worsens both OCD rituals and superstitious behaviour. Superstitiousness has not been systematically studied in an adult population with OCD and this was one aim of the present study.

In other work looking at the relationship between stress and magical thinking, Keinan (1994) gave a very general definition of magical thinking; that any explanation of a behaviour or an experience that contradicts the laws of nature may be seen as reflecting magical thinking. This usually means that there is a lack of empirical scientific evidence for the explanation of the event or behaviour. More specifically Zusne and Jones (1989) defined magical thinking as a belief that either a transfer of energy or information between physical systems may take place solely because of their similarity or contiguity in time or place; or that one's thoughts, words or actions can achieve specific physical effects not governed by the principles of ordinary

transmission or energy. Both these definitions stress the fact that these are beliefs people have about the world which are not supported by hard, scientific evidence. The latter definition allows for the fact that people can hold these beliefs to varying degrees and that it is not a black or white concept. As mentioned, in obsessive-compulsive disorder specifically, magical thinking was defined as the belief that a "thought equals an act, harm or suffering to others" (Kulhara and Prasad-Rao, 1985). This seems to be more related to the second part of the definition by Zusne and Jones (1989); that one's thoughts can have specific physical effects.

Keinan's study (1994) explored the relationship between psychological stress and magical thinking and how this relationship might be affected by a person's ability to tolerate ambiguity. Questionnaires looking at magical thinking and tolerance of ambiguity were administered to 174 Israelis during the Gulf War. The group was divided into high stress (people living in areas exposed to missile attacks) or low stress (people who lived in areas not exposed to missile attacks). The results indicated that subjects in a high stress condition (living in areas exposed to missile attacks) showed a significantly higher frequency of magical thinking than subjects in a low stress condition (not exposed to missile attacks). In addition, high stress levels had a more pronounced effect on magical thinking in subjects with a low tolerance of ambiguity. The author explained this result in terms of the theory of personal control. When a person is in a situation where they feel helpless or out of control, efforts are often made to regain a sense of control. Magical thinking may emerge because it can help to explain phenomena which the person cannot explain and because through magical rituals, the person can gain a feeling of control. In this study, subjects with a low tolerance of ambiguity appeared more prone to magical thinking.

Keinan suggested that this may mean that people with a low tolerance of ambiguity may perceive any situation that cannot be adequately categorised as threatening. This may mean that they are more likely to experience stress and therefore have more magical thinking. She also concluded that magical thinking does occur in "normal" adults, but that they manage to suppress it in most normal circumstances. She also described how people who hold magical beliefs are often aware that these are irrational, but how they are still unable control them. She gave the example of soldiers or students before an exam, who know such rituals are irrational, but they perform them just in case. Some parallels can be seen with OCD. In OCD, people

can feel a reduced sense of control and will perform rituals just in case a negative outcome might occur. They also often view their obsessive thoughts and rituals as senseless and irrational.

### *Magical thinking and psychotic disorders*

There has been evidence for the role of magical thinking in psychotic disorders such as schizophrenia or schizotypal personality disorder. Magical thinking has been shown to be related to schizophrenia (George and Neufeld, 1987) and other measures of schizotypy (Tobacyk and Wilkinson, 1990). Meehl (1962) initially proposed that individuals who are prone to developing schizophrenia often show magical beliefs. Spitzer, Endicott and Gibbon (1979) in a review of case records found magical ideation to be a major symptom in people with borderline schizophrenia. It is also part of the diagnostic criteria for schizotypal personality disorder. A questionnaire termed the Magical Ideation Scale which looks at a general belief in magical phenomena was developed as part of a package of questionnaires used to assess proneness to developing schizophrenia. This questionnaire consists of thirty items including items such as " Horoscopes are right too often for it to be a coincidence", "At times, I perform certain little rituals to ward off negative influences" and "Some people can make me aware of them just by thinking about me". Subjects have to rate each of the items as either true or false. This questionnaire is generally administered along with the Physical Anhedonia Scale which assesses a deficit in the ability to experience physical pleasure and the Perceptual Aberration Scale which assesses distortion in body perception.

Eckblad and Chapman (1983) carried out a study testing this questionnaire. In all, 1,512 students completed the questionnaire. Eckblad defines magical ideation as a belief, quasi-belief or semi-serious entertainment of the possibility that events which according to the causal concepts of this culture cannot have a causal relation with each other might somehow nevertheless do. From this sample, twenty eight were selected who scored 1.91 standard deviations above the mean on the scale and compared with a control group using a psychiatric interview. It was found that those in the experimental group reported more psychotic or psychotic like symptoms, more schizotypal experiences and more evidence of magical thoughts. These questionnaires

have shown magical ideation to be correlated with measures of manic depression (Thalbourne and French, 1995) and other psychiatric disorders.

Interestingly, recent research has used the above measures of psychosis proneness and correlated them with measures of obsessive and compulsive symptoms. There has been debate about the relationship of obsessive compulsive disorder to anxiety disorders, mood disorders and schizophrenia. Norman, Davies, Malla, Cortes and Nicholson (1996) conducted a study looking at the relationship between measures of schizotypy (using the Magical Ideation Scale), anxiety, depression and obsessive compulsive symptoms. The measures used were the Maudsley Obsessional-Compulsive Inventory, the Padua Inventory, the Magical Ideation Scale, the Perceptual Aberration Scale, the Beck Anxiety Inventory, the Beck Depression Inventory and the Hamilton Rating Scales for depression and anxiety. The results indicated that obsessive and compulsive symptoms are more strongly correlated with measures of schizotypy than measures of anxiety and depression. The authors discuss the possible implications of these results for the categorisation of OCD as an anxiety disorder and suggest that OCD may be more closely linked to the schizophrenic spectrum of disorders. The measures used in this study explore magical thinking and beliefs in unusual methods of causation. The authors hypothesise that a tendency towards magical thinking may be an area of similarity between schizophrenia and obsessive-compulsive characteristics. Tallis (1995) also has commented on the similarities between some beliefs in OCD and delusions. A weakness of this study is that a clinical sample of 117 general psychiatric outpatients was used, mostly with diagnoses of anxiety and depression. Only four of the sample had a diagnosis of obsessive compulsive disorder therefore it is unclear how applicable the results of this study are to OCD. In the present study, a key aim is to study magical thinking in a group of adults with OCD.

### *Magical thinking in children*

Magical thinking and behaviour has often been theorised to be more prevalent in children. This idea has been important in the developmental theories of Piaget (1950) and also Freud (1950). Piaget proposed a stage from 2 to 6 years old where children actually believe they can cause an event merely by thinking about it. He believed that as a child gets older, 'rational' thought begins to increase and magical thinking



decreases. Freud also favoured the idea that during early development children go through a stage in which they are self centred and overestimate their ability to affect their environment. He thought that magical thinking was a logical outcome of these two factors. More recently, Rothbaum and Weisz (1988) suggested that children went through a magical stage from 2 to 6 years old where they believed that other people and events could be affected by thoughts and behaviour.

Little systematic research was conducted testing their ideas. More recent research has indicated that the picture may be more complicated than this and that these theories underestimate the cognitive abilities of young children. Harris (1994) states that recent research has indicated that children can and do interpret or understand many events and behaviours according to causal principles at a young age. For example, children can explain events rationally such as physical actions, psychological responses or biological changes.

Research has been conducted exploring young children's reactions to and explanations of breaches of these rules. Results have indicated that even babies as young as six months old show surprise by increased looking when circumstances occur which breach normal causal principles. Baillargeon (1986) showed that when an object such as a hand passes through a screen young infants showed surprise indicated by increased looking. They were also surprised when an object moved from one place to another without seeing the path the object takes. These findings showed that children do have an understanding of causal principles such as that an object cannot pass through another object or an object cannot move from one place to another without an obvious path and show surprise when these types of rules are broken. This is evidence against the idea that children's cognition is characterised by magical thinking and that rational thinking does not appear until later.

Research has also looked more specifically into children's beliefs about magic using older children who can give more insight into their understanding of situations. Rosengren, Kalish, Hickling and Gelman (1994) explored 4 and 5 year old children's explanations of possible and impossible animal transformations. A possible transformation was a small squirrel growing into a large squirrel. An impossible transformation was a large squirrel turning into a small squirrel. Children judged that the second type of explanation could not occur. Unlike adults, they also thought a

magician could cause either type of transformation. Later questioning suggested that children were unlikely to think of tricks or deceptions as an explanation for the impossible transformation. Johnston and Harris (1994) also conducted an experiment where different events were described to young children involving disappearance, action, creation or a shift of identity. Events were presented in pairs and for one of each pair, a causal principle was broken. Children judged that magic was responsible for the event which violated the causal principle. Chandler and Lalonde (1994) found that most pre-schoolers at first explained the apparent passage of a screen through a block as magic, but in later trials involving the same children, children became more suspicious and eventually explained it as deception or trickery. This is evidence against the idea that young children's cognition is dominated by magical thinking. Children do seem to understand causal principles and are able to explain events using these principles, but there is evidence for the idea that children do believe in magic in a particular class of events that violate normal causal rules.

A study was carried out by Viken and Clausen (1988) looking specifically at the idea that others or events could be controlled by wishing or by magical behaviour. The study was in two parts and tested ninety-six children, forty-eight four year olds and forty-eight six year olds. The first part looked at children's knowledge of realistic ways of influencing other people such as positive reinforcement. The second part looked at children's beliefs in being able to control or influence another person's thoughts, actions or behaviours by thinking or by magical behaviour. The children were shown two drawings; one was of a child in a nursery and the second was of another person (mother or peer) in a separate house. The subject was told that the child wants the person in the other drawing to do, think or feel something. When testing belief in control by thinking the subjects were asked "what do you think the mother will feel if the child wishes that the mother will feel happy?". This procedure was carried out in four categories: positive wishing, negative wishing, positive magical behaviour and negative magical behaviour. Answers indicating a belief in magical thinking were followed up by asking children to rate how effective this would be on a 5 point scale.

Results indicated that beliefs in the ability to influence others by thinking and by magical behaviour were present in 94% of children. As previous research would suggest, children also understood the effects of the realistic ways of influencing

others. There was no difference in the childrens' beliefs in the efficacy of wishing for positive outcomes as opposed to negative outcomes. Children believed that magical behaviour was more effective than wishing. The authors concluded that there was strong evidence of a belief in control by thinking in 4 and 6 year old children, but not for a specific magical developmental stage. They proposed that there are two parallel sorts of control beliefs in children. One is about controlling others by behaviour and another aimed at controlling by mental processes such as anticipating. They suggest that in the development of the second type of belief, young children will attribute unrealistic power to thinking and to other mental processes due to lack of experience. Problems in the development of beliefs about mental processes may play a role in schizophrenia. However, it may also be a factor in the development of obsessive-compulsive disorder as evidence has shown that some people with obsessive compulsive disorder do show magical thinking.

In summary, research from various areas suggests that magical thinking or the belief in personal extended influence may be an important concept in OCD as well as in other populations. Magical thinking and superstitious rituals have been shown to occur in non-clinical populations (Gmelch and Felson, 1980; Rozin et al., 1986, 1989) and have been associated with factors such as stress, low tolerance of ambiguity, lack of information and lack of perceived control (Keinan, 1994; Jahoda, 1969). Measures of obsessionality and compulsivity have been shown to correlate with measures of superstiousness in a non-clinical population (Frost et al., 1993). A self-report questionnaire termed the Magical Ideation Scale which taps magical thinking or the belief in unusual methods of causation has been used to measure proneness to developing schizophrenia. Measures of obsessions and compulsions have been found to correlate more highly with the Magical Ideation Scale and other measures of schizotypy than with measures of anxiety and depression in a psychiatric out-patient population (Normans et al., 1996). There is also evidence that young children hold the belief that other people can be influenced by thinking or by magical behaviour (Viken and Clausen, 1988).



### **Aim of the present study**

The aim of the present study is to investigate magical thinking in adults with obsessive-compulsive disorder. There has been empirical evidence from various types of research that indicates that magical thinking may be associated with obsessive and compulsive symptoms and may be present in a proportion of people with OCD (Khanna and Channabasavanna, 1988; Kulhara and Prasad Rao, 1985; Frost et al., 1993; Norman et al., 1996). However, most previous studies have either used non-clinical or general psychiatric samples or relied on the retrospective analysis of case notes. This limits the reliability and validity of the findings especially in relation to OCD. Some studies have looked at one aspect of magical thinking, the belief in the power of thoughts to affect events (Shafran et al., 1996), but this study will widen the definition to look at the belief that thinking can affect events and another person's thoughts, behaviour or feelings.

The study is looking specifically at the belief that thoughts on their own can have the power to influence other people or events. In the present study, measures used with children to assess beliefs in magical thinking (Viken and Clausen, 1988) have been adapted for use with an adult OCD sample and a control group. These types of measures involving scenarios about other people were chosen in order to try to tap a general belief in magical thinking without directly asking the person about their attitudes to their own thoughts. One aim of the study was to see whether people with OCD had a general belief in the power of thoughts to affect events rather than just the belief in the power of their own thoughts to affect events.

In the Viken and Clausen study, drawings were used to assess the child's belief in magical thinking. In this study, a questionnaire (called the Magical Thinking Questionnaire) was developed to test out the various aspects of the belief in magical thinking. Similar to the Viken and Clausen study, two people are described in the questionnaire. One person is the influencer who attempts to influence the other person's behaviour, thoughts, feeling or events. A series of situations were developed by the researcher where one person (the influencer) is thinking about something happening to the other person (the influencee). An example situation about influencing events is that the influencer is described as thinking that the influencee's house had been broken into. The subject has to rate the degree of influence thinking

about this outcome will have over the actual outcome i.e. how much will thinking about the house being burgled, affect whether the house is actually burgled.

The questionnaire includes magical thinking about influencing another's behaviour, thoughts or feelings and about events happening to another person. These aspects were further divided into thinking about positive/neutral outcomes or negative outcomes as in the Viken and Clausen study. Previous research has indicated that in OCD people are more concerned about influencing negative events rather than positive events (Shafran et al., 1996). An extra dimension was introduced into this study. In the Viken and Clausen study all the thinking is deliberate. The child is wishing intentionally for something to happen. In OCD, the person is generally not wishing for something good or bad to happen. Rather, they suddenly and frequently experience intrusive, distressing thoughts which they do not wish to have. They may then worry that having this thought has increased the likelihood of an event occurring or of harm happening to another person. Therefore in this study, both intentional or non-intentional thoughts were included to compare the differences in beliefs about these two types of thoughts.

Another aim of this study was to investigate the possible causes of these types of beliefs. Tallis (1994) suggested that these types of beliefs might be caused by specific learning experiences where a person has thought about something bad happening and then it coincidentally actually happened. He hypothesised that this early experience may lead to the development of dysfunctional assumptions which influence obsessive and/or compulsive behaviour. Therefore, in the present study in order to investigate the role of early experiences in the development of beliefs about personal extended influence, the subject will be asked if they remember an incident when they thought about something bad/good happening and then it actually happened. The response will be timed.

## Hypotheses

Following on from the aims of the study, the main hypothesis is that people with OCD will rate as higher the degree of influence thoughts have in affecting events, behaviour, thoughts or feelings than the control group. Secondly, it is hypothesised that subjects with OCD, but not control subjects will rate as higher the degree of influence non-intentional thoughts have compared to intentional thoughts. Thirdly, from descriptions of the clinical features of OCD, it seems that people with OCD are particularly worried about being responsible for causing harmful events or behaviours such as car accidents than about affecting another's thoughts and feelings which is often thought to be more a feature of psychotic illnesses such as schizophrenia (Eckblad and Chapman, 1983). Therefore, it is hypothesised that subjects with OCD will rate the degree of belief as higher about thoughts affecting events and behaviours than thoughts affecting thoughts and feelings. Fourthly, it is hypothesised that the OCD group will rate the degree of influence as significantly higher for negative outcomes compared to positive outcomes (Shafran et al., 1996). Fifthly, it is predicted that the Magical Thinking Questionnaire will correlate significantly with the Likelihood factor of the Thought Action Fusion Scale and the Maudsley Obsessional Compulsive Inventory -Revised, especially the checking subscale. The checking subscale of the MOCI has been found to correlate significantly with the TAF- Likelihood-for-others (Shafran et al., 1996) and measures of superstitiousness (Frost et al., 1993). Finally, it is hypothesised that people who remember an event where they thought about an incident and then it happened will score significantly higher on the Magical Thinking Questionnaire than those who do not remember such an event.

## **METHOD**

### **Ethical Approval**

This study was approved by Lothian Health Board and Highland Health Board Ethics Committees.

### **Experiment A**

The aim of the first experiment was a pilot study to test out the feasibility of the Magical Thinking Questionnaire as a measure for use with adults with OCD. This was because it was newly developed and specifically designed for this study.

### **Subjects**

Six subjects (2 males, 4 females) with a diagnosis of OCD were recruited from local Clinical Psychology and Psychiatry Departments. The mean age of the subjects was  $M = 31.83$  years ( $SD = 2.64$ ) and mean number of years in education was  $M = 12.667$  ( $SD = 2.422$ ). Three subjects were currently receiving psychological therapy for OCD and three subjects were currently receiving pharmacological help for OCD. All subjects had previously received (within last year) or were currently receiving either psychological or pharmacological treatment for OCD. Six normal control subjects (2 males, 4 females) were also recruited. The mean age of the control subjects was  $M = 34.17$  years ( $SD = 10.03$ ) and the mean number of years in education was  $M = 13.667$  ( $SD = 2.66$ ). In order to control for the presence of psychopathology in the control group, control subjects had to score below 33 on the Maudsley Obsessional Compulsive Inventory-Revised and /or below 10 on the Beck Depression Inventory to be included in the study.

### **Procedure**

Subjects were recruited in a variety of ways depending on whether they were currently being seen by mental health services. Letters giving information about the study were sent to local psychiatry and psychology departments, community mental health teams and a local department of psychotherapy. Psychologists, community psychiatric

nurses and psychiatrists were also contacted individually to ask for assistance in recruiting subjects. The researcher was not currently working in local psychology departments. If their therapist agreed to help, subjects with OCD who were currently attending either a psychologist, psychiatrist or CPN were introduced to the study by their principal therapist (not the researcher). They were given information about the research, given a research information sheet (see Appendix 1) and asked whether they would like to attend an introductory interview. If the subject agreed to be contacted, an introductory letter was sent inviting them to an interview (see Appendix 2) .

Interviews could take place at a hospital, G.P. surgery or home visit depending on the preference of the subject. A research information sheet, a consent form, confirmation slip and a stamped addressed envelope were also enclosed with the introductory letter. The research information sheet gave brief details about the aims of the study and the procedures involved. Subjects were asked to read the research information sheet, to send the confirmation slip back using the stamped addressed envelope either confirming the interview, declining the interview or requesting a different interview time. Subjects were also asked to bring the consent forms to the interview. Subjects who had previously been seen by psychiatry or psychology services ( in the previous year) were only contacted, after their previous therapist's or G.P.'s permission had been obtained. Again, an introductory letter with a consent form, research information slip, SAE and confirmation slip was sent. If the patient refused to participate or did not reply to this initial contact, they were not contacted again.

Subjects were also recruited through a local self-help group. In this case, the researcher met with the subjects at the group to give information about the study and arranged appointments with each subject individually. At the initial interview, further details were given about the study and the opportunity given for the subject to ask any questions they might have. Subjects were given time to think about their decision to take part and another appointment could be arranged if they could not decide during this interview. If subjects agreed to participate in the study, informed consent signatures were obtained. It was emphasised to the subject that they were free to stop at any point if they became uncomfortable. Subjects were also asked for permission to audiotape the interview. After informed consent was obtained, a short clinical interview was first carried out lasting approximately fifteen to thirty minutes. The first part of this interview covered demographic details including age, date of birth, occupation, years in education (as measured by number of years at school and in higher education), postcode and name and address of their General Practitioner. The

second part of the interview focused on the subject's obsessive and/or compulsive symptoms. Subjects were asked whether they were currently receiving or had previously received treatment for obsessive and/or compulsive problems. If the person said that they had, further details of the treatment were requested including type of treatment (e.g. behaviour therapy, cognitive therapy, medication), length of treatment, whether it was current or previous treatment, and if it had been previous, dates of treatment. Subjects were also asked more specifically if they were taking any medication currently for obsessive or compulsive problems. If the subject said they were taking medication, they were asked specifically about the type of medication and how long had they been taking it. After this, the Obsessive Compulsive Disorder section from the SCID-P (W/PSY SCREEN, Version 1.0), was conducted, in order to assess whether the subject met DSM-IV criteria. After the clinical interview and the timed task, the subjects were asked to complete the battery of self-report questionnaires as described in the measures section. The instructions of each questionnaire were explained to the subject. Depending on the preference of the subject, the researcher would read out the questionnaire items or the person completed them with no assistance. Other questionnaires were also given out, but these were part of another study. Subjects were given the choice of completing all the questionnaires in one interview, of taking the Beck Anxiety Inventory, Beck Depression Inventory and/or Maudsley Obsessional Compulsive Inventory-Revised home and sending them back or of arranging a second session to complete the questionnaires. The session lasted approximately 1 1/2 hours. At the end of the interview the person had the opportunity to ask any questions about the research and were given the choice of taking a short self-help leaflet about OCD. The control group were not interviewed directly. A set of questionnaires with a front sheet asking for basic demographic details (age, sex, years in school and higher education) so the groups could be matched were given out. Control subjects filled out the questionnaires independently and returned them by post to the researcher.



## Measures

### *Magical Thinking Questionnaire (MTQ)*

This measure was designed specifically for this study (see Appendix 3) to assess the subjects' magical thinking and was adapted from a study looking at magical thinking in children (Viken and Clausen, 1988). The questionnaire was developed by making up different scenarios looking at the various aspects of magical thinking (see Table 1). There were 32 items in the questionnaire. Sixteen looked at intentional thoughts and sixteen looked at non-intentional thoughts. Each of these sixteen broke down into eight positive outcomes and eight negative outcomes and then into four thoughts, four feelings, four events and four behaviours. Therefore, there were eight items in positive intentional magical thinking (two thoughts, two feelings, two events and two behaviours), eight items in positive non-intentional magical thinking (two thoughts, two feelings, two events and two behaviours), eight items in negative intentional magical thinking (two thoughts, two feelings, two events and two behaviours) and eight items in negative non-intentional magical thinking (two thoughts, two feelings, two events and two behaviours). For each item a short scenario involving the same two protagonists was made up. For example, the scenario for positive intentional magical thinking towards events was "Jane would like Laura to win some money in the lottery this week. She thinks about Laura choosing her numbers, paying for the ticket and taking the ticket home. She imagines Laura in front of the television watching for her numbers and realising she has won. She wishes that Laura will win some money". For this item, the question is asked "to what extent will Jane thinking in this way influence whether Laura wins any money? Rate the degree of influence". The subject rates the degree of influence on a 6 point scale from "Not at all" to "Very much". Similar types of scenario were made up for each aspect of magical thinking. The questionnaire was shown to two other clinicians for suggestions and slight revisions were made. There was a questionnaire for females naming female protagonists (Jane and Laura) and a questionnaire for males using male protagonists (Peter and Mark). This was to assist in the subjects' identification with the



protagonists. The male and female questionnaires differed slightly on two items which were changed slightly to make them gender appropriate.

Table 1. Items in Magical Thinking Questionnaire (MTQ)

Influence types	Target responses	Items
Positive/neutral intentional magical thinking	Feelings	Happy, excited
	Thoughts	Thinking confidently, having pleasant thoughts
	Events	Getting a promotion, winning the lottery
	Behaviour	Buying new clothes, moving car
Positive/neutral non-intentional magical thinking	Feelings	Enjoyment, surprise
	Thoughts	Thinking about a good holiday, remembering about date
	Events	Having safe flight, finding £10
	Behaviour	Going out, making phone call
Negative intentional magical thinking	Feelings	Angry, guilty
	Thoughts	Dislike friend, remembering owes money
	Events	Tiles blowing off, leak in bathroom
	Behaviour	Forget bus pass, stay late at work
Negative non-deliberate magical thinking	Feelings	Sad, depressed
	Thoughts	Remembering bad time, remembering skid
	Events	Car accident, house burgled
	Behaviour	Stub toe, get into argument

### *The Maudsley Obsessional Compulsive Inventory- Revised (MOCI-R)*

The original Maudsley Obsessional Compulsive Inventory was a 30 item true-false questionnaire (Hodgson and Rachman, 1978). This scale was developed to measure compulsive behaviours and there are only two items relating to obsessions. Some of the items have also been criticised for being unclear (Salkovskis, 1990) and it has also been criticised for fixed true/false responses which do not measure the severity of symptoms (Tallis, 1995). The revised Maudsley (see Appendix 4) has recently been developed to address these criticisms and this self-report measure consists of 62 items assessing obsessive and compulsive symptoms. The patient has to rate each statement on how much it is true of them on a six point scale ranging from "Not at all" to "Very

much". An example of a statement is " I am often upset by unwanted urges to harm myself". The questionnaire breaks down into six subscales. These subscales are contamination (11 items), checking (7 items), obsessions (13 items), hoarding (4 items), indecisiveness/perfection/concern over mistakes (8 items) and routine/counting/slow (9 items). There are also two additional subscales which are not included in the overall score: TAF-Moral (6 items) and TAF-Likelihood (4 items). The internal reliability has been shown to be good (Thordarson et al., 1997).

### *The Thought-Action Fusion Scale (TAF)*

This is a relatively recently developed scale for assessing a concept termed Thought-Action Fusion thought to be important in obsessive-compulsive disorder (see Appendix 5). This is the belief that thinking something is as bad as carrying it out or that by thinking about an event, the risk of the event happening can be increased. This measure consists of 19 items categorised into two main factors. Each item is a statement about which the subject rates their agreement or disagreement on a five point scale. Seven questions assess the Likelihood factor. This factor consists of negative events happening to a friend/relative (e.g. "If I think of a friend losing their job, this increases the risk that they will lose their job") and negative events happening to oneself (e.g. "If I think of myself being injured in a fall, this increases the risk that I will have a fall and be injured"). Twelve questions assess the second factor which is Thought-Action Fusion in terms of morality (e.g. "Thinking of making an extremely critical remark is almost as unacceptable to me as actually doing it"). Internal consistency of the Moral and Likelihood subscales has to be found to be good and these two factors accounted for a large proportion of the total variance (Shafran, Thordarson and Rachman, 1996).

### *The Beck Anxiety Inventory(BAI)*

This self-report questionnaire consists of 21 items designed to measure the severity of anxiety in psychiatric patients (Beck and Steer, 1990). The patient rates each item on a four point scale from "Not at all" to "Severely". The possible score can range from 0-63. The Beck Anxiety Inventory has been found to be correlated with other measures of anxiety and to have satisfactory levels of test-retest and internal reliability (Beck, Epstein, Brown and Steer, 1988a, Beck and Steer, 1991).

*The Beck Depression Inventory (BDI)*

This 21 item self-report scale has been very widely used to measure the severity of depression. For each item, the patient has to circle one of four statements which best describes the way they have been feeling during the last week. The Beck Depression Inventory has been shown to have good internal and test-retest reliability (split-half reliability of .93) and correlates well with other measures of depression (Beck, Steer and Garbin, 1988b).

*SCID-P (W/PSY SCREEN, Version 1.0)*

This instrument involved asking specifically about various symptoms of obsessive compulsive disorder. Questions are asked specifically about obsessions and the person's reactions to them and about compulsions and the person's reactions to them. Subjects have to experience either obsessions or compulsions. These obsessions and/or compulsions have to "cause marked distress, are time-consuming (take more than an hour a day) or significantly interfere with the person's normal routine, occupational functioning or usual social activities or relationships with others". The various criteria can be rated as absent or false, subthreshold or threshold or true. The interview is designed to assess DSM-III-R criteria for OCD. However, a comparison between DSM-III-R and DSM-IV criteria for OCD shows that the criteria are very similar except that in DSM-IV poor insight has to be noted. Particular types of obsessions were also assessed. These were categorised as contamination, repeated doubts, need to have things in a particular order, sexual imagery, aggressive or horrific impulses and other. Types of compulsions were evaluated. These were categorised as either overt compulsions (checking, washing/cleaning, repeating actions, requesting/demanding assurances and other) and /or covert compulsions (praying, counting, repeating words silently and other). The researcher rated whether any of these obsessions or compulsions was present or absent.

*Timed task*

At the end of the clinical interview, the subjects were asked two questions. The first question was "Can you remember an incident when you thought something bad would happen and then it actually happened?". The second question was "Can you remember an incident when you thought something good would happen and then it actually happened?". Their answer was noted and their speed of response measured.

**RESULTS**

The results will be presented descriptively as the numbers in each group are too small to analyse statistically. Out of the six subjects with OCD, all experienced obsessions (four experienced thoughts about contamination, two experienced repeated doubts, three experienced the need to keep things in a particular order, one subject experienced sexual imagery, two experienced aggressive or horrific impulses and one subject experienced other), all experienced overt compulsions (five carried out checking behaviour, three subjects carried out washing/cleaning and two repeated actions) and three experienced covert compulsions (two subjects counted silently and one subject experienced another type of covert compulsion).

The results of the Magical Thinking measure are shown in Table 2. Only one person in each group scored at all on the measure, and even these subjects were rating the degree of influence as a little. The means and standard deviations of the MOCI-R, BDI, BAI and TAF are presented in Table 3. No subject with OCD could remember an incident when they had thought about something bad/good and then it happened.

Table 2. Scores on the Magical Thinking Questionnaire

Variable	OCD group (n = 1)	Control Group (n = 1)
Overall score	4	10
Magical Thinking type		
Intentional	2	5
Non-intentional	2	5
Positive	3	6
Negative	1	4
Target response		
Thoughts	0	2
Events	1	2
Feelings	0	4
Behaviour	3	2

Table 3. Psychometric data

Variable	OCD group (n = 6)		Control group (n = 6)	
	M	SD	M	SD
MOCI-R	73.50	30.50	8.83	6.37
BDI	18.83	5.71	5.50	3.08
BAI	22.67	11.08	2.50	0.84
TAF	26.83	18.57	17.50	9.81

## DISCUSSION

These results show that either the Magical Thinking Questionnaire as it stands is failing to tap the belief in the power of thoughts to affect another person or events, or alternatively this belief is relatively rare in OCD. Results from previous studies (Shafran et al., 1996) have shown that the belief in the power of thoughts to affect events is generally higher in an OCD sample than a student and community group control samples. However, the authors also noted that the majority of the OCD group did not rate the belief in the power of thoughts over events highly. They also noted

that many in the OCD group rated only one item highly. For example, they may agree strongly with the statement "If I think of a relative/friend losing their job, this increases the risk that they will lose their job", but not the statement "If I think of a relative/friend being in a fall, this increases the risk that he/she will be in a fall". The OCD group in this pilot study are small in numbers and also do not appear to differ much from the control group on the TAF-Likelihood factor.

Another feature of these types of belief in OCD is that people often do not seem to really believe that thoughts can affect events, but are worried about it all the same just in case. As mentioned in the introduction, authors have noted that the person can believe yet simultaneously not believe (Goodwin, 1989). A diagnostic feature of OCD is that the person sees their thoughts as senseless and inappropriate at least initially.

Considering the above points, two main changes were made to the Magical Thinking measure. Firstly, instead of asking the subject to rate the degree of influence, the question was changed to ask how worried the person would be that having a certain type of thought might affect another person or another event. Rating the degree of worry may be a more sensitive measure than rating the degree of influence. Secondly, the questionnaire was shortened to include only negative outcomes as previous studies (Shafran et al., 1996) have shown that positive events are least relevant to OCD.

## **Experiment B**

The aim of this study was to assess magical thinking in subjects with OCD and a matched control group using the revised Magical Thinking Questionnaire. The hypotheses were as described in the introduction except for two changes. Firstly, because of the changes in the wording of the questions it was predicted that worry about thoughts affecting another person or events rather than degree of influence would be higher in the OCD group. Secondly, because positive items were removed, the hypothesis looking specifically at the difference between positive and negative items was no longer relevant and was therefore removed.



## Subjects

Two groups, an obsessional sample and a 'normal control' sample were used in this study.

### *(1) Obsessional sample*

Twenty subjects (13 males, 7 females) were recruited from the Clinical Psychology and Psychiatry departments at the local psychiatric hospitals and community facilities in Lothian and in Highland region. Again, current in-patients and out-patients, patients on waiting lists and patients who had previously been seen in the last year were included. Five of the twenty subjects were recruited from a self-help group. Three of the subjects were in-patients and twelve were currently or had been out-patients within the last year. Three of the twenty subjects had also participated in the pilot study. Out of fifty one potential subjects contacted, twenty eight refused to participate or did not reply to an introductory letter about the study. Subjects were included in this group if their primary clinician thought they had OCD and if they met DSM-IV criteria for OCD. A short clinical interview was conducted to determine whether subjects met DSM-IV criteria for Obsessive Compulsive disorder. This was done using the Obsessive Compulsive disorder section of a structured interview, the SCID-P (W/PSY SCREEN, Version 1.0), designed to assess psychiatric disorders. Out of twenty three subjects interviewed, twenty met the diagnostic criteria for obsessive-compulsive disorder. Of the subjects that were excluded from the study, one had a primary diagnosis of schizophrenia, one had in the past met the diagnostic criteria for OCD, but no longer did and one subject had a primary diagnosis of depression. The mean age of subjects was  $M = 37.35$  years ( $SD = 9.85$ ) and the mean years of education was 13.8 years ( $SD = 3.22$ ). Seventeen subjects were currently receiving either psychological and/or pharmacological treatment for OCD. Fourteen OCD subjects were currently receiving the following medications for OCD: fluoxetine ( $n = 5$ ), clomipramine ( $n = 7$ ) and seroxat ( $n = 2$ ). Nine subjects were currently receiving cognitive-behavioural therapy for OCD. All the OCD subjects were currently receiving or had previously received psychological and/or medical treatment for OCD.

## *(2)Control group*

Twenty adults (11 males, 9 females) were recruited as a normal control group out of a pool of thirty five control subjects who completed questionnaires. These subjects were recruited from a staff group through a local healthcare facility. The mean age was  $M = 36.65$  years ( $SD = 10.68$ ) and the mean number of years in education was  $M = 15.8$  years ( $SD = 2.46$ ). The obsessional group and control group were matched for sex, age (within 10 years) and, where possible, for years in education which was measured by years at school and years in full time higher education. For education, subjects were matched for Higher Education and/or having three years or less difference in years in education. As in Experiment A, to screen for possible psychopathology within the control group, subjects were excluded from the control group if they had a MOCI-R score of 33 or over and/or a BDI score of 10 or over.

## **Design**

A 2 (Group: OCD, Control) x 4 (Target Response: Thoughts, Feelings, Behaviour, Events) x 2 (Type of Magical Thinking: Intentional, Non-intentional) factorial design was employed. The first factor was measured between subjects whereas the last two factors were measured within subjects.

## **Procedure**

The procedure was exactly the same as Experiment A except a revised Magical Thinking Questionnaire was used.

## **Measures**

### *Magical Thinking Questionnaire (Revised)*

The results of the pilot study led to several changes to the Magical Thinking Questionnaire (see Appendix 6). The scenarios remained unchanged, but the wording of the question was changed. An example of the original wording was "To what extent will Peter thinking in this way influence whether Mark's house was broken into? Rate the degree of influence (on a 6 point scale from Not at all to very much)".

This was changed to "Either now or in the past, how worried would you be that having this thought might affect whether the house was broken into? (on a 6 point scale from Not worried to Very worried)". This change was made as the researcher thought that this may be a more sensitive measure of magical thinking. The positive items were also removed as these were not compatible with the new type of question and therefore the new questionnaire contained 16 items. A recent study has also found that positive items are least relevant to OCD (Shafran et al., 1996). The reliability of the questionnaire will be discussed in the Results section.

Table 4. Items in the revised Magical Thinking Questionnaire

Influence types	Target responses	Items
Negative intentional magical thinking	Feelings	Angry, guilty
	Thoughts	Dislike friend, remembering owes money
	Events	Tiles blowing off, leak in bathroom
	Behaviour	Forget bus pass, stay late at work
Negative non-intentional magical thinking	Feelings	Sad, depressed
	Thoughts	Remembering bad time, remembering skid
	Events	Car accident, house burgled
	Behaviour	Stub toe, get into argument

*Maudsley Obsessional Compulsive Inventory- Revised (MOCI-R; Thordarson and Rachman, 1997)*. See Experiment A

*Thought Action Fusion Scale- Revised (TAF; Shafran, Thordarson and Rachman, 1996)*. See Experiment A.

*Beck Depression Inventory (BDI; Beck, 1961)*. See Experiment A.

*Beck Anxiety Inventory (BAI; Beck and Steer, 1990)*. See Experiment A.

*SCID-P (W/PSY SCREEN, Version 1.0)*. See Experiment A

*Timed task*. See Experiment A.

## RESULTS

### Description of OCD subjects

Out of the twenty subjects with OCD, all experienced obsessions. Each OCD subject reported the following number of obsessions out of six possible categories (contamination, repeated doubts, need to have things in a particular order, sexual imagery, aggressive impulses, other): one ( $n = 4$ ), two ( $n = 8$ ), three ( $n = 6$ ), four ( $n = 1$ ) and five ( $n = 1$ ). All subjects also experienced compulsions and each OCD subject reported the following number of compulsions out of nine possible categories: one ( $n = 2$ ), two ( $n = 3$ ), three ( $n = 4$ ), four ( $n = 7$ ), five ( $n = 2$ ) and seven ( $n = 2$ ). The compulsions were divided into overt compulsions (washing/cleaning, checking, requesting reassurance, repeating actions, other) and covert compulsions (praying, repeating words silently, counting, other). Five subjects reported only overt compulsions, one reported only covert compulsions and fourteen subjects reported overt and covert compulsions. The following obsessions were reported by OCD subjects in order from the most frequently reported to the least frequently reported: repeated doubts ( $n = 17$ ), need to have things in a particular order ( $n = 9$ ), contamination ( $n = 8$ ), aggressive impulses ( $n = 6$ ), sexual imagery ( $n = 5$ ) and other ( $n = 2$ ). OCD subjects also described the following compulsions: checking ( $n = 15$ ), requesting reassurance ( $n = 13$ ), repeating actions ( $n = 11$ ), counting ( $n = 8$ ), washing/cleaning ( $n = 7$ ), repeating words silently ( $n = 7$ ), praying ( $n = 6$ ) and other ( $n = 5$ ).

### Comparisons of demographic variables between groups

In order to assess the effectiveness of the matching of the groups, the differences between the control group and the experimental group were compared for sex, age and years in education. No significant differences were found for age ( $t = .22$ , 38df,  $p = .831$ ) and sex (chi square = .519, 1df, ns). However, the control group had significantly more years in education than the OCD group ( $t = -2.21$ , 38df,  $p < .05$ ). To ensure that education did not account for any results, a correlation was conducted looking at the relationship

between the main measure, the Magical Thinking Questionnaire and years in education. This correlation was not significant ( $r = -.0579$ ,  $p = .723$ ).

### **Psychometric data**

Means and standard deviations for OCD and control subjects on the MOCI-R, MOCI-R subscales and BDI, and for OCD subjects only on the BAI and TAF are presented in Table 5. Before addressing the main hypotheses of the present study, the differences between groups on the measures of obsessionality and compulsivity and on the depression scale are presented. The standard deviations differed significantly between the OCD group and the control group on the MOCI-R, the MOCI-R subscales and the BDI (all  $F$ 's greater than 11.25,  $p < .01$ ), therefore independent sample two-tailed  $t$ -tests adjusted for unequal variance were conducted looking at the differences between the OCD group and the control group on these measures. OCD subjects scored significantly higher than controls on the MOCI-R, all MOCI-R subscales and the BDI (see Table 5). The mean difference between the groups and the 95% confidence interval of the difference between the means are presented in Table 6.

### **Magical Thinking Questionnaire**

The internal reliability coefficient (Cronbach's alpha) of the whole questionnaire for the OCD group was .92. For intentional items, the reliability coefficient was .88 and for non-intentional items, .91. The reliability coefficient of the whole questionnaire for both groups was .95. Means and standard deviations for the OCD subjects and controls on the Magical Thinking Questionnaire (total score), on types of magical thinking (intentional and non-intentional) and on different target responses (thoughts, events, feelings and behaviour) are included in Table 7. Generally, the OCD group scored higher than the control group on the Magical Thinking Questionnaire, on both types of magical thinking and on all different target responses. The mean and standard deviation on the Magical Thinking Questionnaire for the OCD group was 15.10 ( $SD = 13.4$ ) and the mean and standard deviation for the control group was 2.9 ( $SD = 8.03$ ) (see Table 7). The lower

Table 5. Psychometric data

Variable	OCD group (n =20)		Control group (n =20)		t
	M	SD	M	SD	
MOCI-R	81.45	32.60	9.20	7.47	9.66*
MOCI-R Contamination	9.40	9.49	1.25	2.07	3.75*
MOCI-R Checking	16.55	9.44	0.70	1.13	7.46*
MOCI-R Obsessions	16.50	11.40	1.00	1.26	6.04*
MOCI-R Hoarding	5.10	5.24	1.45	1.99	2.91*
MOCI-R Indecisiveness	18.05	9.14	3.40	2.52	6.91*
MOCI-R Routine	15.95	9.93	1.25	1.89	6.50*
MOCI-R TAF-Moral	8.20	6.25	2.45	3.15	3.68*
MOCI-R TAF-Likelihood	3.25	4.05	0.30	0.66	3.21*
BDI	20.40	11.21	2.35	2.23	7.06*
BAI	21.65	13.96	-	-	-
TAF Total	28.55	17.73	-	-	-
TAF-Moral	20.85	12.33	-	-	-
TAF-Likelihood	7.70	8.28	-	-	-

\* p &lt; 0.01

Table 6. Mean difference and 95% confidence interval of difference

Variable	Mean difference	95% confidence interval of diff
MOCI-R	72.25	56.69, 87.70
MOCI-R Contamination	8.15	3.63, 12.67
MOCI-R Checking	15.85	11.41, 20.29
MOCI-R Obsessions	15.50	10.14, 20.86
MOCI-R Hoarding	3.65	1.07, 6.23
MOCI-R Indecisiveness	14.65	10.25, 19.05
MOCI-R Routine	14.70	9.99, 19.41
MOCI-R TAF-Moral	5.75	2.55, 8.95
MOCI-R TAF-Likelihood	2.95	1.04, 4.86
BDI	18.05	12.73, 23.37





Table 7. Mean scores and standard deviations for Magical Thinking Questionnaire

Variable	OCD group (n=20)		Control group (n=20)	
	M	SD	M	SD
MTQ Total	15.10	13.40	2.90	8.03
Magical Thinking type				
Intentional	5.65	5.69	1.05	3.63
Non-intentional	9.45	9.20	1.95	4.51
Target response				
Thoughts	3.50	3.86	0.95	3.03
Events	4.90	4.25	1.10	1.71
Feelings	3.55	4.21	0.55	1.88
Behaviour	3.20	3.11	0.45	1.61

Key: MTQ = Magical Thinking Questionnaire

and upper 95 % confidence intervals for the mean score on the Magical Thinking Questionnaire for the OCD group were 8.83 to 21.37. The lower and upper 95% confidence intervals for the control group were 0.86 to 6.66. The standard deviations of the data were high for both groups reflecting the wide variability in scores on this questionnaire. The range of scores for the OCD group was from 0 to 36 and the range of scores for the control group was 0 to 34.

Figure 1 presents the percentage of subjects who scored one or above on the Magical Thinking Questionnaire by group, influence type (intentional/non-intentional) and target response. The results show that a greater percentage of subjects in the OCD than the control group scored one or above on the Magical Thinking Questionnaire. Out of the twenty subjects with OCD, fifteen scored one or more on the Magical Thinking Questionnaire and five scored zero suggesting that not all people with OCD are worried about their thoughts affecting other people or events. Out of the control group, ten scored zero on the Magical Thinking Questionnaire and ten scored one or above. When looking at type of magical thinking, a greater percentage of both groups are worried

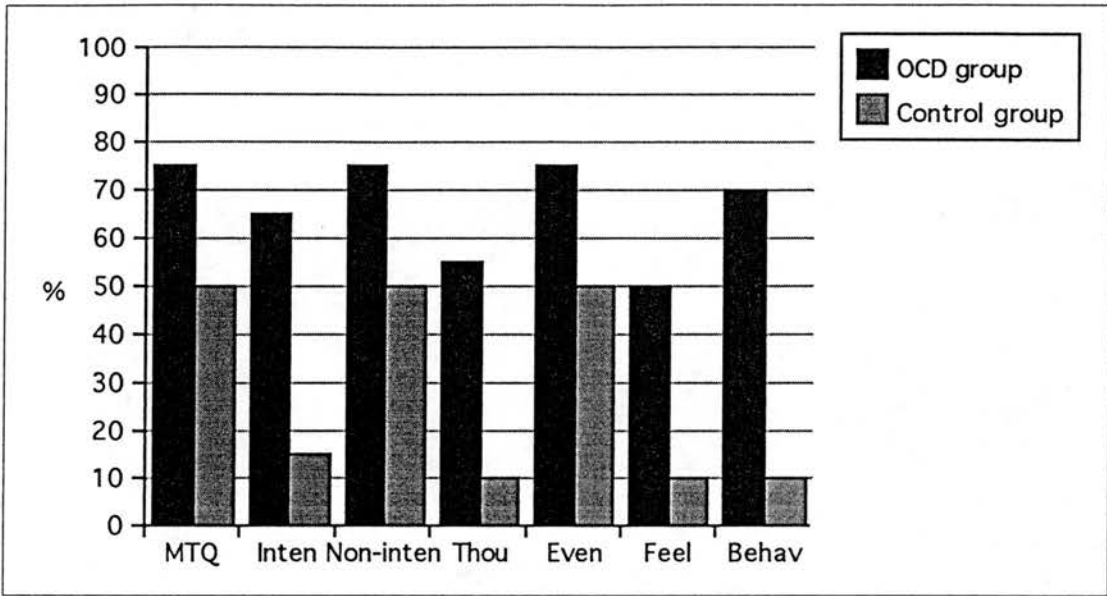


Figure 1. Percentages of subjects scoring one or above on Magical Thinking Questionnaire (MTQ) by group, magical thinking type (intentional/non-intentional) and by target response (Thoughts, Events, Feeling, Behaviour)

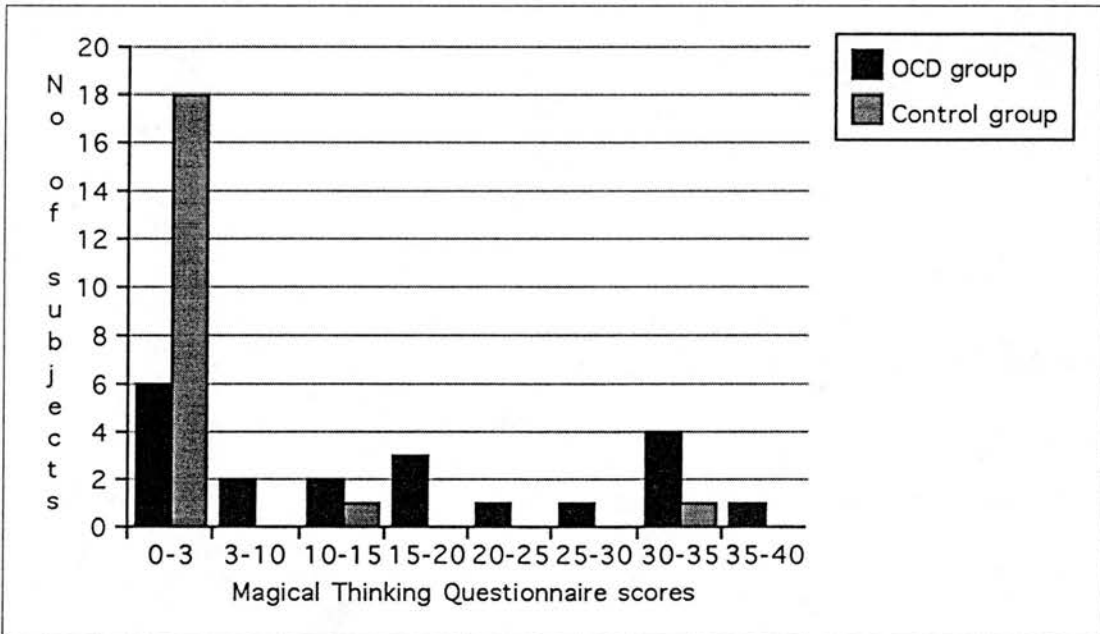


Figure 2. Distribution of scores on Magical Thinking Questionnaire by group

about the effect of non-intentional thoughts as compared to intentional thoughts, although again a higher percentage of OCD subjects are worried about both types of thought. Looking at target response, a greater percentage of both groups are worried about thoughts influencing events as compared to thoughts influencing thoughts, behaviours or feelings. Figure 2 presents the distribution of scores on the Magical Thinking Questionnaire by group. This shows the majority of control subjects scored between 0 and 3 with only two control subjects scoring much higher. A significant minority of OCD subjects also scored between 0 and 3, but the distribution of scores for the OCD group seems to be more varied.

To investigate the main hypothesis that scores on the Magical Thinking Questionnaire would be higher in the OCD group than the control group, a Mann-Whitney Test (two-tailed) was conducted to investigate whether the total score on the Magical Thinking Questionnaire differed between the groups. In all analyses involving the control group, non-parametric tests were chosen because in the control group, a large number of subjects scored zero and therefore the data were significantly skewed. A significant difference was found between the groups, with the OCD group scoring significantly higher on worry about magical thinking than the control group ( $U = 91.5, p < .01$ ). The mean rank for the OCD group was 25.92 and the mean rank for the control group was 15.07.

The next hypothesis was that worry would be higher about non-intentional thoughts compared to intentional thoughts in the OCD group, but not the control group. Initially, it was envisaged a 2 (group: OCD, control) x 2 (Magical Thinking type: intentional, non-intentional) analysis of variance (ANOVA) would be conducted with repeated measures on the second factor, but because of the need for non-parametric tests with the control group, analyses were conducted separately within groups. In order to test out the second hypothesis, a t-test for paired samples (two-tailed) was conducted comparing scores on intentional versus non-intentional items on the Magical Thinking Questionnaire within the OCD group. This analysis showed that OCD subjects worried significantly more about the effect of non-intentional than intentional thoughts ( $t = -2.30, 19df, p < .05$ ). The mean difference between the conditions and the 95% confidence interval of the mean difference was 3.8 (.34, 7.26). An equivalent non-parametric test was also carried out

within the OCD group and again revealed that OCD subjects scored significantly higher on non-intentional compared to intentional items. To test whether worry would be higher for non-intentional items within the control group, a Wilcoxon Matched-Pairs Signed-Ranks test was conducted. As predicted, no significant difference was found between worry about intentional compared to non-intentional thoughts ( $Z = -.9297, p = .3525$ ).

Thirdly, it was hypothesised that worry would be higher depending upon the target responses. Specifically, it was hypothesised that worry about thoughts affecting events and behaviour would be higher than worry about thoughts affecting other's thoughts and feelings. In order to test this hypothesis, a repeated measures ANOVA was conducted within the OCD group. No significant difference was found for type of target response within the OCD group ( $F = 2.23, p = .094$ ). There were also no significant differences within the OCD group using an equivalent non-parametric test. To investigate this hypothesis in the control group, a Friedman Analysis of Variance by ranks was conducted, which again showed no significant difference for target response (chi square = 5.295, 3df, ns). When inspecting the means for each target response, the trend for both groups was that subjects scored higher on items looking at worry about events (see Table 7).

### **Intercorrelations between research variables**

The fourth hypothesis predicted that scores on the Magical Thinking Questionnaire would correlate significantly with the Likelihood factor of the Thought Action Fusion Scale and the MOCI-R. When looking at the OCD group only, Pearson's correlation coefficients (two tailed) were calculated and when looking at the control group, Spearman's correlation coefficients (two tailed) were calculated.

#### *Correlations between MTQ and MOCI-R*

There was no significant correlation between the total score of the MOCI-R and total score of the Magical Thinking Questionnaire in the OCD group (see Table 8). When looking at specific subscales, the only MOCI-R subscale which correlated with the total

Table 8. Correlations between the MOCI-R, MOCI-R subscales, the Magical Thinking Questionnaire (MTQ), BDI and TAF in OCD group

	MTQ	Inten	Non-inten	Thoughts	Feelings	Events	Behav	TAF-Moral	TAF	TAF-Likelihood	BDI	BAI
MOCI-R	0.23	0.23	0.2	0.28	0.45*	-0.05	0.11	0.39	0.33	0.13	0.25	0.11
MOCI-R Contamination	0.31	0.03	0.44	0.11	0.27	0.44*	0.28	-0.18	-0.07	0.13	-0.08	-0.03
MOCI-R Checking	-0.04	0.04	-0.08	0.02	0.18	-0.3	-0.06	0.04	-0.07	-0.22	-0.01	-0.24
MOCI-R Obsessions	0.48*	0.46*	0.41	0.49*	0.57*	0.18	0.42	0.55*	0.67*	0.61*	0.24	0.34
MOCI-R Hoarding	0.2	0.24	0.15	0.3	0.37	0.02	-0.02	0.36	0.3	0.11	0.11	0.12
MOCI-R Indecisiveness	0.01	0.05	-0.03	0.16	0.17	-0.17	-0.22	0.3	0.16	-0.09	0.33	0.1
MOCI-R Routine	-0.17	-0.02	-0.23	-0.08	0.02	-0.36	-0.15	0.31	0.13	-0.18	0.26	0.07
BAI	0.2	0.24	0.13	0.42	0.22	0.08	-0.11	0.37	0.45*	0.4	0.79*	-
BDI	0.16	0.22	0.09	0.41	0.17	0.04	-0.15	0.46*	0.43	0.23	-	-
TAF-Likelihood	0.76*	0.57*	0.76*	0.73*	0.68*	0.58*	0.66*	0.46*	-	-	-	-
TAF	0.58*	0.61*	0.47*	0.76*	0.61*	0.27	0.34	-	-	-	-	-
TAF-Moral	0.32	0.5*	0.15	0.6*	0.42	0.01	0.05	-	-	-	-	-

\* p &lt; .05

score on the Magical Thinking Questionnaire was the Obsessions subscale ( $r = .4765$ ,  $p < .05$ ). All other subscales, including the Checking subscale, correlated non-significantly with the Magical Thinking Questionnaire. In the OCD group, the BDI and the BAI did not correlate significantly with the Magical Thinking Questionnaire therefore depression was not partialled out in the correlations.

In the control group, the total score on the MOCI-R also did not correlate significantly with the total score on the Magical Thinking Questionnaire (see Table 9). When looking at specific subscales the Magical Thinking Questionnaire correlated significantly with the Contamination subscale and the TAF-Likelihood and the TAF-Moral additional subscales of the MOCI-R. The BDI did not correlate significantly with the Magical Thinking Questionnaire in the control group.

When looking at correlations between subsections of the Magical Thinking Questionnaire and the overall MOCI-R score within the OCD group (see Table 8), only the items involving the target response Feelings correlated significantly with the MOCI-R ( $r = .449$ ,  $p < .05$ ). Other subsections of the Magical Thinking Questionnaire correlated significantly with subscales of the MOCI-R. For example, the Feelings items and Thoughts items correlated significantly with the Obsessions subscale and the Events items correlated with the Contamination subscale. The Magical Thinking Questionnaire intentional items correlated significantly with the Obsessions subscale.

When looking at individual sections of the Magical Thinking Questionnaire in the control group, the Thoughts items and the Feelings items both correlated significantly with the overall score on the MOCI-R in the control group (see Table 9). The intentional items, but not the non-intentional items also correlated significantly with the MOCI-R. Other subscales of the MOCI-R also correlated significantly with subsections of the Magical Thinking Questionnaire. For example, the Feelings, Behaviour and Thoughts items correlated significantly with the Hoarding, Obsessions and Routine subscales as well as with both additional subscales of the MOCI-R. The non-intentional items did not correlate significantly with any of the main MOCI-R subscales.



Table 9. Correlations between the MOCI-R, MOCI-R subscales, the Magical Thinking Questionnaire and BDI in control group

	MTQ	Inten	Non-inte	Thought	Feeling	Event	Behav	BDI
MOCI-R	0.15	0.55*	0.04	0.51*	0.51*	0.03	0.51*	0.21
MOCI-R Contamination	0.44*	0.38	0.22	0.2	0.2	0.33	0.2	0.29
MOCI-R Checking	0.14	0.46*	0.09	0.4	0.4	0.06	0.4	0.2
MOCI-R Obsessions	0.37	0.46*	0.22	0.46*	0.46*	0.25	0.46*	0.01
MOCI-R Hoarding	0.01	0.5*	-0.04	0.55*	0.55*	-0.1	0.55*	-0.16
MOCI-R Indecisiveness	0.03	0.43	0.07	0.4	0.4	0.05	0.4	0.39
MOCI-R Routine	0.28	0.47*	0.22	0.47*	0.47*	0.17	0.47*	0.02
MOCI-R TAF Moral	0.5*	0.55*	0.35	0.5*	0.5*	0.35	0.5*	0.13
MOCI-R TAF Likelihood	0.51*	0.86*	0.68*	0.66*	0.66*	0.72*	0.66*	0.27
BDI	0.12	0.08	0.22	0.12	0.12	0.32	-0.12	-

\*  $p < .05$

Table 10. Correlations between target responses and correlations between non-intentional and intentional items on the Magical Thinking Questionnaire in the OCD group

	MTQ Target reponses				Magical Thinking type	
	Thought	Feelings	Events	Behaviour	Non-intentional	Intentional
Behaviour	0.57*	0.72*	0.68*	-	-	-
Events	0.62*	0.56*	-	0.68*	-	-
Feelings	0.87*	-	0.56*	0.72*	-	-
Thoughts	-	0.87*	0.62*	0.57*	-	-
Non-intentional	-	-	-	-	-	0.59*

\*  $p < .05$

### *Correlations between MTQ and TAF*

As hypothesised, the total score on the Magical Thinking Questionnaire correlated significantly with the overall score on the TAF Scale and the Likelihood factor of the TAF scale within the OCD group. The Likelihood factor can be broken down into items looking at self and others. Both these groups of items correlated significantly with the Magical Thinking Questionnaire. Correlations were relatively high between the Magical Thinking Questionnaire and the Thought Action Fusion measures, especially the Likelihood factor.

### *Correlations between TAF and MOCI-R*

When investigating the association between the TAF and the MOCI-R within the OCD group (see Table 8), the TAF, like the Magical Thinking Questionnaire, did not correlate significantly with the MOCI-R. Again, like the Magical Thinking Questionnaire, the only MOCI-R subscale the TAF correlated significantly with was the Obsessions subscale. When looking at the individual subscales in TAF (TAF-Likelihood, TAF-Moral), the correlations with the MOCI-R were also non-significant, but these subscales also correlated significantly with the Obsessions subscale. The BAI, but not the BDI correlated significantly with the TAF. The TAF-Likelihood factor and the TAF-Moral factor correlated significantly.

### *Correlations within Magical Thinking Questionnaire*

Looking at the Magical Thinking Questionnaire (see Table 10), correlations among different types of magical thinking (intentional and non-intentional) and types of target response were moderate. The intentional and non-intentional items correlated significantly. All combinations of target responses correlated significantly.

**Timed task**

The results of this task will be presented descriptively as the majority of subjects with OCD ( $n = 13$ ) did not remember thinking about a good or bad event which then actually happened and therefore the numbers are too small for statistical analysis. Seven subjects remembered either a good or bad event. Out of subjects who did remember such an event, two subjects remembered only a bad event they thought about which then actually happened, three subjects remembered only a good event they thought about which actually happened and two remembered both a good and a bad event. The types of event remembered by each subject and their Magical Thinking Questionnaire and TAF-Likelihood score are presented in Table 11.

The mean and standard deviation on the Magical Thinking Questionnaire for subjects who remembered an event was 21 (8.33) compared to 11.92 (14.77) for subjects who did not remember an event. The range of scores for subjects who remembered an event was 13 to 34 compared to a range of 0 to 36 for subjects who did not remember an event. The same pattern was found for mean scores on the TAF-Likelihood items. The mean and standard deviations for subjects who remembered an event scored 12.14 (10.04) compared to a mean score of 5.31 (6.36) for subjects who did not remember an event. The range of scores on TAF-Likelihood for subjects who remembered an event was 2 to 27 compared to 0-16 for subjects who did not remember an event.

Table 11. Description of event, latency of recall, Magical Thinking Score and TAF-Likelihood score by subject

Subject	Description of good event (latency in secs)	Description of bad event (Latency in secs)	MTQ score	TAF-Likelihood
1	At work, had thought about task which came true (1 sec)	None remembered	31	26
2	Thought about relative waking up from coma which then happened (4 secs)	Thought about someone being hurt then dad hurt himself 2 days later ( 1 sec)	13	9
3	Thought that one newborn twin would live which happened (15 secs)	Thought about someone saying 'ouch' which then happened (9 secs)	18	2
4	Father was smoking. Thought about him stopping which he then did (5 secs)	None remembered	34	27
5	None remembered	Thought about friend coming round to ask about house next day and they did (12 secs)	21	11
6	Thinking that football team might win and they did (5 secs)	None remembered	14	7
7	None remembered	Thought about boat being wrecked which then happened (9 secs)	16	7

The mean and range on the Magical Thinking Questionnaire for those who remembered a bad event was 17 (13-21) and for subjects who did not remember such an event was 14.63 (0-36). For subjects who recalled a good event, the mean and range on the Magical Thinking Questionnaire was 22 (13-34) and for subjects who did not remember such an event, the mean score was 12.80 (0-36). A similar pattern was found for scoring on the TAF-Likelihood of the TAF. For subjects who remembered a bad event, the mean and range was 6.25 (2-9) and for those who did not, the mean score was slightly higher at 8.06 (0-27). For subjects who remembered a good event, the mean on the TAF-Likelihood was 14.2 (2-27) and for those who did not, the mean was lower at 5.53 (0-16). The mean response time and standard deviation for recall of bad events was 7.75 (4.72) and the mean response for recall of good events was slightly lower at 6.00 (5.29).

## **Factor Analysis**

While it was accepted that the number of subjects was low to carry out a factor analysis, a recent study by Guadagnoli and Velicer (1988) suggested that components with four or more loadings above .60 in absolute value are reliable regardless of sample size.

Therefore a principal components analysis with a Varimax rotation was performed on the Magical Thinking Questionnaire, each of the MOCI-R subscales, the BAI and the BDI. Four factors emerged accounting for 78.8% of the variance. The first factor included the variables Obsessions, TAF-Moral, TAF-Likelihood and the Magical Thinking Questionnaire which all had loadings over .60 suggesting this is a reliable finding. The second factor had three variables which loaded over .80 (Indecisiveness, Routine, Checking) again suggesting this is reliable. The third and fourth factors each only had two factors over .60 making the reliability of these components questionable.

## **DISCUSSION**

### **Introduction**

The results indicated that the Magical Thinking Questionnaire is a reliable measure in an OCD and adult control group. There was good internal consistency within the measure with relatively high reliability coefficients of the whole questionnaire, intentional items and non-intentional items. The validity of the measure was investigated by looking at the relationship between the Magical Thinking Questionnaire and the TAF scale. The Magical Thinking Questionnaire correlated highly with the TAF Scale and the TAF Likelihood subscale indicating concurrent validity with this measure. TAF has been shown to be a very reliable construct in obsessional, adult and student groups (Shafran et al., 1996). Within the questionnaire, individual sections correlated moderately with each other. This might suggest that all items are tapping one underlying factor. Subject numbers were not large enough to conduct a factor analysis of the questionnaire items.

The purpose of the present study was to determine whether magical thinking (as measured by level of worry about thoughts affecting other people or events) was more prevalent in a group of subjects with OCD compared to a normal control group. The results of the study indicated that the level of worry was significantly higher in the subjects with OCD thus confirming the main hypothesis. However in Experiment A, a pilot study of twelve subjects (six OCD subjects, six control subjects) which asked subjects to rate the degree of influence actually thinking about something would have, most subjects did not score at all. The difference between the two measures and the possible reasons for it will be discussed in more detail in a later section.

The other hypotheses of the study were focused on which particular types of magical thinking might be more frequent in the OCD group. The second hypothesis was that the OCD subjects would rate their worry as higher about non-intentional thoughts as opposed to intentional thoughts. Intentional thoughts are when a person is deliberately wishing for something to happen, whereas non-intentional thoughts are thoughts that "pop" into the mind involuntarily. When looking at the OCD group, subjects scored significantly higher on the items tapping non-intentional magical thinking than items tapping intentional magical thinking. When looking at the control group, no significant difference was found between their scores on non-intentional items than intentional items. These results indicate that OCD subjects do worry more about the effect of their non-intentional thoughts on others than the effect of their intentional thoughts, whereas the control subjects do not seem to worry more about the effects of their non-intentional thoughts than their intentional thoughts.

The third hypothesis was that OCD subjects would rate their worry as higher on items looking at the effect of their thoughts on events or others behaviour as compared to others' thoughts or feelings. This hypothesis was not confirmed. No significant differences were found between scoring on groups of items looking at thoughts, feelings, events or behaviour. When looking at the means, both groups scored more highly on items relating to events. This result might have been significant if there had been more subjects in each group and the power of the study had been higher. The issue of power will be discussed in a later section.



The fourth hypothesis predicted that the Magical Thinking Questionnaire would correlate significantly with the MOCI-R, especially the Checking subscale. This hypothesis was not confirmed. The Magical Thinking Questionnaire did not correlate significantly with the MOCI-R or the Checking subscale. The final hypothesis was that subjects who remembered an event which they had thought about and then actually happened would score more highly on the Magical Thinking Questionnaire. Seven subjects did remember such an event, and these seven subjects did tend to score more highly than the thirteen subjects who did not, but a statistical comparison was not possible due to small group sizes. The next part of the discussion will cover between group differences and the nature of magical thinking in the OCD and control groups. The aetiology of magical thinking, the methodology of the study and finally, implications for therapy will then be discussed.

### **Between group differences in magical thinking**

The implications of the confirmation of the first hypothesis, that the OCD group scored higher on the Magical Thinking Questionnaire, will be firstly be discussed. Initially, it is important to note that worry about overextended personal influence is not universal among subjects with OCD. While overall there were significant group differences on the revised Magical Thinking Questionnaire, not all subjects in the OCD group actually did worry about their thoughts affecting another person. In Experiment B five subjects (25%) of the OCD group did not score on the revised Magical Thinking Questionnaire and there was a wide variety in the range of scores within the OCD sample. This result, together with the results of the pilot study, shows that the belief or worry about the influence of thoughts is not present in all subjects with OCD and is present to a much greater degree in some subjects, but that worry about thoughts affecting events or others is generally more prevalent in an OCD group compared to a normal control group. This finding fits in with results from previous research which has also suggested that this belief is only present in a subsection of people with OCD (Kulhara and Prasad Rao, 1985; Khanna and Channabasavanna, 1988; Shafran et al., 1996).

The results also indicated that the OCD group rated their worry as higher about non-intentional thoughts than intentional thoughts whereas no difference was found between ratings of worry about non-intentional thoughts compared to intentional

thoughts in the control group. One explanation for these findings is that the control group may not have scored high enough on the questionnaire to reliably test out the difference between these types of magical thinking. Evidence supporting this explanation is that in the control group the mean of non-intentional items was higher than the mean on intentional items. In addition, fifty percent of subjects scored one or over on non-intentional items whereas only fifteen percent scored one or over on non-intentional items. In order to test out this possibility, a larger control group would have to be used. An alternative interpretation is that the results demonstrate a genuine difference in magical thinking between the two groups. This difference could be explained by differences in beliefs about thoughts between the OCD and control group. Studies (Rachman and de Silva, 1978) have shown that most people occasionally experience intrusive thoughts similar in content to people with OCD. Intrusive thoughts can be likened to the non-intentional thoughts as described in the questionnaire and are a main characteristic of OCD. They appear out of the blue and are experienced as senseless and unwanted. Magical thinking has been hypothesised to be strengthened by a person carrying out a ritual in response to a distressing thought (Freud, 1909) because this is apparently effective in preventing the harmful outcome. Over time, the belief may become more strongly held and therefore the person experiences increased worry and the increased urge to carry out a ritual every time another intrusive thought is experienced. If subjects were deliberately wishing for something to happen, this would be unlikely to make them worried. They would not carry out a ritual and therefore beliefs about the possible influence of intentional thoughts are not increased. This may explain the difference in the levels of worry about the possible influence of intentional and non-intentional thoughts in the OCD group. However against this hypothesis, in the present study, some subjects with OCD were also worried about the possible influence of intentional thoughts and non-intentional and intentional items were moderately correlated. The nature of beliefs in OCD will be discussed further in a later section.

The third hypothesis about the Magical Thinking Questionnaire was that worry would be higher about thoughts affecting events or behaviours than thoughts or feelings in both the OCD and the normal control group. This hypothesis was not confirmed as there was no statistically significant differences between the four target responses in either group. When inspecting the means of each target response in both groups, the mean for events items were higher than the means for items related to thoughts,

feelings or behaviours. When looking at percentage of subjects who scored on each set of items in the control group, fifty percent scored at least once on an event item while only ten percent scored on any of the other items. This difference was not so apparent in the OCD group. Seventy-five percent of subjects scored on items relating to the target response events, fifty-five percent on the thoughts items, fifty percent on the feeling items and seventy percent on the behaviour items. This suggests that in the OCD group as well as scoring higher in the questionnaire generally, the OCD group rate worry about their thoughts affecting a wider range of target responses. Previously, it has been thought that OCD subjects worry about their thoughts increasing the risk of negative events happening to other people. The present study suggests that they also worry about their thoughts affecting another person's thoughts, feelings and behaviour as well as negative events happening to another person. The nature of magical thinking in the OCD group will be discussed further in the next section. This includes the measurement of magical thinking, the heterogeneity of OCD, the relationship of magical thinking to specific OCD symptoms and the relationship of a belief or worry about magical thinking to other belief domains in OCD.

### **The nature of magical thinking in OCD group**

#### *Measuring worry versus belief*

In exploring the nature of magical thinking in OCD, a relevant area to consider is why there were very low scores on the first questionnaire used in the pilot study compared to higher scores on the second revised Magical Thinking Questionnaire. Several possible explanations could account for the difference in the results on the two measures. Firstly, the differences in scoring between the original questionnaire and the new questionnaire may be accounted for by the different samples used in each experiment. In Experiment A, only six subjects with OCD were used. If more subjects had been recruited to complete this questionnaire, it may have been the case that some subjects scored on it. Even in Experiment B, five subjects with OCD did not score at all on the Magical Thinking Questionnaire. Against this explanation, there were three subjects who completed both questionnaires and when comparing their results on the two questionnaires, this showed that subjects with OCD did tend to score more highly on the second questionnaire tapping worry as opposed to belief.

One subject scored zero on the original questionnaire and four on the new questionnaire, another scored four on the old questionnaire and seventeen on the new questionnaire. The third subject scored zero on both.

A second explanation is that the revised questionnaire asked people specifically about how much the subject would worry about the effect of their own thoughts rather than only asking about the effect of another person's thoughts. The difference in scoring on the two questionnaires may suggest that people do not have a general belief in magical thinking for other people, but do hold that belief about their own thoughts. This argument may be backed up by clinical descriptions. It is rare for someone with OCD to be worried about another person influencing them by their thoughts. This is a more common feature of psychotic disorders, such as schizophrenia.

A third interpretation of the difference between the two questionnaires may be that measuring worry about the overimportance of thoughts is a more sensitive measure than measuring the actual belief in extended personal influence. This finding may be explained by the nature of beliefs in OCD. People often know their behaviour or thoughts are senseless or irrational and OCD is mainly characterised from psychotic disorders by the weaker strength in beliefs and the realisation at least initially that it is probably untrue. The fact that worry seemed to be a more sensitive measure than measuring the degree of influence suggests that the beliefs in personal extended influence are not necessarily strongly held. This ties in with low tolerance of ambiguity as the person may find it difficult to tolerate the vague possibility that their thoughts increase the risk of harm occurring to another person. In response, they attempt to control the effect of their thoughts, for example, by carrying out a covert or overt action to reduce the vague risk that something might happen. Generally, nothing bad does happen and this may increase the probability that the next time a person experiences an intrusive thought about harm happening to another person, that they experience anxiety and carry out an action. This also means that the belief in personal extended influence is never disconfirmed because the person attributes the fact that nothing bad did happen to the preventative action they took. This also may explain the difference between the levels of responsibility and level of overextended personal influence often expressed for bad, but not for good events in individuals with OCD. If the person does not really believe that thoughts affect another person or events, but cannot cope with the vague possibility this leads to worry and the urge to

neutralise and carry out some compulsive behaviour. Logically, the subject would not worry about the vague possibility of being responsible for something good therefore does not have the urge to carry out an action to reduce the risk of a good event happening. This means the above cycle is not started and the belief about thoughts affecting the outcome of positive events is not reinforced and strengthened.

The Magical Thinking Questionnaire and the TAF scale measures differ in that the TAF Likelihood-for-others factor scale measures belief in thoughts affecting events rather than worry about thoughts affecting events. On the TAF Scale, subjects have to rate their level of agreement (agree strongly, agree, neither agree or disagree, disagree or disagree strongly) with a statement such as "If I think of a relative/friend being in a car accident, this increases the risk that they will be in a car accident." The two scales do correlate highly, but when investigating how people score on the TAF-Likelihood-for-others items compared to the Magical Thinking Questionnaire, differences in results can be seen between the two measures for some subjects. For example, five subjects did not agree with any items on TAF-Likelihood-for-others yet on the Magical Thinking Questionnaire rated on some items that they would be quite worried, worried or very worried about thoughts affecting another person or events. (One of these subjects disagreed strongly with all items on the TAF-Likelihood-for-others, two subjects disagreed with all the statements and one neither agreed or disagreed with the statements). Seven subjects did not agree with any statement on the TAF Likelihood-for-others items (most subjects disagreed or disagreed strongly with all statements) yet rated they would be very slightly worried or slightly worried about some items on the Magical Thinking Questionnaire. Two subjects agreed strongly with statements on the TAF and also scored highly on worry on the Magical Thinking Questionnaire. One subject agreed with two items on the TAF-Likelihood items and rated their worry as only very slight on items on the Magical Thinking Questionnaire. Five subjects scored zero on both questionnaires. Comparing the two questionnaires shows that some subjects show no evidence of a belief in thoughts affecting events on the TAF Scale yet rate on another questionnaire that they would be worried (even if only slightly in some cases) about thoughts affecting another person or events.

In summary, differences in results between Experiment A and B and comparisons of the TAF and the MTQ indicates that worry may be a more sensitive measure of



magical thinking than measuring the degree of belief in some subjects. Low tolerance of ambiguity could be one explanation of why people worry about their thoughts causing harm to another person. Priming has also been suggested to be important when assessing appraisals, e.g. "When you feel anxious, what types of thoughts do you have..?". People with anxiety disorders have been shown to have threat related beliefs which are only accessed in situations they perceive as dangerous (Beck and Emery, 1985). The same may be true of people with OCD. Thoughts about personal extended influence may be only accessed in relevant situations when the person feels anxious. In the present questionnaire another way of tapping magical thinking could have been to word the questions as "When you are worried, how much do you believe that your thoughts could affect....?"

### *Individual variations in magical thinking*

As well as the finding that there was great variation on scores on the Magical Thinking Questionnaire within the OCD group, there also seemed to be individual variations in beliefs about personal extended influence which this questionnaire did not tap although subjects reported them qualitatively. One subject did not score on the questionnaire. She described that she did not believe that thoughts could affect events or another person, but she also described that if she said a thought out loud, she would worry that saying out loud would increase the risk of it happening. Another subject who had a relatively low score on the questionnaire believed that thoughts or mental events could affect real life events, but he did not believe that thinking about a car crash could affect whether a car crash occurred. Instead, he believed that the completion of a counting sequence could increase the probability of a negative event occurring. When the sequence got to a certain number, he had an intense visual image of something harmful happening to a relative or friend. However, he believed it was the counting sequence and reaching a certain number which influenced whether a negative event happened. This may reflect the often idiosyncratic nature of beliefs in OCD and gives support for the need for a more individually based approach to the measurement of beliefs in OCD as advocated by Rheaume, Ladoceur, Freeston and Letarte (1995). Safran et al. (1990) also commented that as the nature of these beliefs become clearer and more detailed research into the cognitive features of a disorder is conducted, it can be useful to take a more individually focused approach which can make specific predictions about an individual's schemas and the associated processing



biases. They emphasised the importance of having specific hypotheses about the cognitive events, processes and structures which are present in particular disorders. It could be hypothesised that worry would be rated as even higher in the present study if scenarios relevant to an individual person were chosen as demonstrated in the study by Rachman, Shafran, Trant and Teachman (1997) using a non-clinical population.

These findings fit in with the heterogeneity of the presentation of OCD which has been noted by many authors (Tallis, 1995; Steketee, 1993). For example, Shafran et al. (1996) found that many subjects with OCD only rated one item strongly out of all the TAF-Likelihood-for-others items. Therefore a subject may be very worried about the effect of thinking about their friend/relative being in a car crash, but not at all worried about thinking about them falling ill. In the present study, subjects showed this same variability in their worry and the particular scenarios that they were most worried about seemed to vary between subjects. When looking at the mean scores for each item, the highest rated items were worrying about thoughts influencing whether someone would be in car crash, whether someone's house would be burgled, whether someone would remember cruel remarks and whether someone would feel sad. These were all non-intentional items and included three target responses of thoughts, feelings and events. The lowest rated items were worrying about thoughts influencing whether someone had a leak in their bathroom and whether someone forgot their bus pass. These are both intentional items and include the target responses of events and behaviour.

One way of addressing the problem of heterogeneity has been to attempt to develop reliable measures of the different types of beliefs in OCD (Obsessive Compulsive Cognitions Working Group, 1997) and to try to link particular beliefs and particular OCD symptoms. Tallis (1994) also described how certain types of beliefs may be associated with certain kinds of symptoms of OCD, but commented that research investigating these types of potential relationships was at an early stage. This raises the question of what particular symptoms or characteristics of OCD may be associated with different types of belief and whether in fact different beliefs can be reliably linked to specific OCD symptoms.

*Relationship between MTQ and OCD symptoms*

The relationship between beliefs and particular OCD symptoms has been addressed empirically. For example, excessive responsibility has been linked to compulsive checking behaviour (Rheaume et al., 1995a; Lopatka and Rachman, 1995) although other research investigating therapy for OCD indicated that increased responsibility was not evident in two subjects with checking behaviour (Ladouceur, Leger and Rheaume, 1994). The belief in overextended personal influence has also been linked to checking behaviour. For example, research has shown that checking behaviour may be associated with TAF- Likelihood factor which postulates that thinking about a negative event increases the risk of it occurring (Shafran et al., 1996). Checking behaviour has also been found to correlate with measures of superstitious beliefs and behaviour in a student group (Frost et al., 1993). In the present study, no significant correlation was found between either the overall score of the MOCI-R or the Checking subscale of the MOCI-R and the Magical Thinking Questionnaire or the Thought Action Fusion Scale in the obsessional sample. This was not as predicted. The only subscale of the MOCI-R that did correlate significantly with either of these measures was the Obsessions subscale. This relationship between the Obsessions subscale and the Magical Thinking Questionnaire was not specifically hypothesised and would have to be replicated in another study to ensure it was a reliable result.

There are several reasons why the overall score of the MOCI-R might not correlate significantly with the Magical Thinking Questionnaire. Firstly, this study and others (Khanna and Chabbasavanna, 1988; Shafran et al., 1996) indicate that magical thinking or a belief in extended personal influence is not a universal belief in OCD and is present strongly in only a subsection of those with OCD. Therefore many people with high scores on the MOCI-R may score nothing on the Magical Thinking Questionnaire. It seems more likely that certain types of symptoms or characteristics of OCD are associated with a belief in extended personal influence (Tallis, 1994). In the present study, there does seem to be a significant correlation in the OCD group between the Magical Thinking Questionnaire and the Obsessions subscale of the MOCI-R. A second explanation for the lack of a relationship between the total score on the MOCI-R and the Magical Thinking Questionnaire is that if a subject has only

one strong obsession and/or compulsion, they may not score that highly on the overall score of the MOCI-R, but score highly on one or two subscales.

*The relationship of magical thinking to other beliefs associated with OCD*

While different beliefs may be associated with particular characteristics of OCD, it is likely that different beliefs may be associated with one another. Excessive responsibility has been viewed as the main cognitive belief which may be associated with OCD (Obsessive Compulsive Cognitions Working Group, 1997) and one question is how might a belief or worry about magical thinking be associated with excessive responsibility. The TAF scale emerged from work looking at the construct of responsibility. Shafran et al. (1996) discussed how a belief in TAF might be viewed as increasing thoughts of responsibility and trigger anxiety or discomfort. If one worries that one's thoughts may cause harm to others then one is going to feel very responsible for trying to control these thoughts or to neutralise the effect of them by carrying out particular overt or covert rituals. A belief in personal extended influence and thoughts of responsibility are likely to be closely linked.

Other types of beliefs have been investigated in OCD. Beliefs that are held about your own thoughts have been termed metacognitions and have been investigated by several researchers (Freeston et al. 1992; Shafran et al., 1996; Clark and Purdon, 1993 ). These include beliefs about the over importance of thoughts and the importance of controlling one's thoughts. Clark and Purdon (1993) found that perceived control over thoughts was most strongly predicted by the belief in that the thought might come true or be acted upon. This finding indicates that beliefs about controlling thoughts may to some extent be accounted for by beliefs about the possible consequences of thoughts. This indicates a possible association between a belief or worry about magical thinking and beliefs in the importance of controlling thoughts. For example, if one had a belief or worry about thoughts possibly causing harm to someone, this may increase the belief in the need to control over your thoughts, in order to prevent the harm from occurring.

Another area that may be relevant is work investigating low tolerance of ambiguity. Rather than really believing that thoughts may affect other people or events, it may be the belief in the very small possibility that thoughts may increase the risk of harm and

the inability to tolerate this uncertainty which triggers anxiety. Tolerance of ambiguity has been addressed previously in OCD. Rasmussen and Eisen (1990) viewed a need for certainty as an important feature of OCD and measures such as the Inventory of Beliefs as related to Obsessions includes items looking at this construct. For example, subjects checking light switches again and again have been noted to think it is very unlikely they left the lights on, but want to check again just in case. Tallis (1995) also notes that like in other areas of OCD, poor tolerance of uncertainty can be held only in particular situations. He gives the example of a man who read his insurance policies over and over again, never feeling certain that he had understood the text properly. Poor tolerance of uncertainty has also been noted in other disorders such as anxiety and depression and it is unclear how specific this belief may be to OCD.

In summary, the possible relationship of different types of belief to each other is still an empirical question. Currently, work is focusing on developing reliable, valid measures for specific beliefs (Obsessive Compulsive Cognitions Working group, 1997). Once these measures are fully developed, more research may be carried out how these beliefs are associated.

### **The nature of magical thinking in control subjects**

Results from the normal control group indicated that worry about thoughts does exist at a low level in a significant number of the group. While half of the normal sample scored zero on the questionnaire, half the normal sample did score, one or two quite highly. This may show that worry about thoughts affecting events or other people are present in the normal population even though are at a very low level. Other research has shown that these types of belief and worries are present in the normal population. Rachman, Shafran, Mitchell, Trant and Teachman (1997) looked at students who had scored highly on the TAF-Likelihood factor. They were asked to write down the phrase "I hope (friend's name inserted) is in a car accident". This increased anxiety and the urge to neutralise. The fact that these types of thoughts and worries are present in the normal population fits in with the cognitive model of OCD which proposes that it is the meaning (and the beliefs underlying this process) that a person ascribes to their thoughts which is important in governing their reaction. If a person experiences a thought like "my friend will be in a car crash" (which are common in the normal population), they often feel very slightly worried. The person usually does

nothing in response to this worry. Nothing happens and the belief is therefore not reinforced. Whereas as described above, if the person does react to this worry, the belief can be reinforced and anxiety is increased the next time that thought is experienced.

Magical thinking has also been found to be related to low tolerance of ambiguity in a normal population (Keinan, 1994). She found that low tolerance of ambiguity was a strong predictor of magical thinking. High stress levels also had a greater effect on magical thinking in individuals with a low tolerance of ambiguity. She suggested that people with low tolerance are more likely to experience stress and a perception of loss of control which may lead them to carry out certain behaviours to regain a sense of control. Sometimes, even though the person may know the behaviours are irrational, the rituals may be performed to be on the safe side. The person feels unable to stop carrying them out. Keinan suggests that under normal circumstances these types of beliefs are suppressed in normal adults, but that in times of stress and personal threat, they are more likely to occur. There are clear parallels between this description of normal adults under stress and subjects with OCD. Firstly, magical thinking is more likely to occur if the person has a low tolerance of ambiguity which has been related to OCD. Magical thinking seems particularly likely when low tolerance of ambiguity interacts with high stress levels which also seems to be the case in some people with OCD. Secondly, the way people with OCD cope with the feelings of losing control is by carrying out some sort of ritual. The differences between superstitions in the normal population and OCD have been noted (Leonard et al., 1993), but some of the mechanisms such as low tolerance of ambiguity, stress levels and perception of control underlying magical thinking and rituals in the normal population may be relevant to a greater understanding of why belief in or worry about overextended personal influence are more common in an OCD group.

The role of perception of control in OCD is unclear as little research has been conducted using a clinical OCD population. Schoor and Rodin (1984) compared the motivation to control the environment in subjects with obsessive-compulsive, depressive and normal personality traits. They did not find any overall difference in motivation for subjects with obsessive-compulsive personality traits, but did find that there was an increased motivation for control in specific situations. Further research



would be needed to look at what particular circumstances may increase the motivation to control in a OCD group.

### **Magical Thinking in other disorders**

The relationship between magical thinking and stress suggests that magical thinking may be higher in a population of subjects with clinical anxiety or other anxiety disorders. Distinguishing the types of beliefs and schema in OCD and different anxiety disorders such as panic disorder has been a focus of theoretical debate and research (Salkovskis, 1985). Some studies have found that there have been no significant differences on measures thought to be OCD-specific when comparing an anxiety control group and an OCD group (Frost and Steketee, 1997). In the present study, a normal control group was chosen because one aim of the study was to investigate the presence of these types of beliefs in a normal population. An important next step for this questionnaire and others such as the TAF would be to use an anxious control group to investigate whether these types of beliefs were specific to OCD or as a function of general anxiety. This present study indicates that worry about personal extended influence is higher in a OCD group than a normal control group, but this does not mean that worry about magical thinking does not occur in other psychiatric groups. It also may be interesting to compare these types of beliefs in OCD with group of people with schizophrenia to see in which way the beliefs differ. For example, beliefs might differ in terms of how strongly they are believed to be true.

Depression is often associated with OCD and therefore it is important to control for the effect of depression to ensure that the variables specific to OCD account for group differences in magical thinking rather than the depression. As would be expected, the OCD group scored significantly higher than the control group on the BDI. When looking at the OCD group and control groups, there is no significant correlation between the BDI and the Magical Thinking Questionnaire or the BDI and the MOCI-R suggesting that depression does not play a significant role in the results. Shafran et al. (1996) found that the BDI significantly correlated with all factors of the TAF in their obsessional sample. In the present study, only TAF-Moral correlated significantly with the BDI, whereas TAF-Likelihood did not correlate significantly. This difference in results may be due to the larger group size in the Shafran et al.



study. Shafran et al. (1996) discussed the relative influence of thoughts and emotions in OCD. They hypothesised that depression and anxiety may increase the frequency and intensity of intrusive thoughts and inversely intrusive thoughts may also promote depression, anxiety, guilt and other reactions.

### **The aetiology of magical thinking**

The aetiology of beliefs in personal extended influence were also investigated in this study. Tallis (1994) had suggested that specific experiences where a person had thought something bad then it actually happened may contribute to the development of beliefs in personal extended influence and thought action fusion. A significant proportion (seven out of twenty) did remember such an event. Only two subjects remembered a bad event, three remembered a good event and two subjects remembered both a good and bad event. No statistical analysis could be carried out because of the small numbers, so this discussion can only be speculative. Looking at the descriptive data, the means of the Magical Thinking Questionnaire and the TAF-Likelihood factor tended to be higher for subjects who remembered an event compared to those who did not remember such an event. This gives some evidence for the role of experience in the development of beliefs or worry about personal extended influence. When looking at subjects who remembered a good event, the means on the Magical Thinking Questionnaire seemed to be much higher than those who did not remember a good event. However, there was no such difference for subjects who remembered a bad event. The mean scores were similar for subjects who remembered a bad event compared to those who did not remember such an event.

Although no hypothesis was made specifically looking at good compared to bad events, this finding is at odds with what might be expected. It has been noted by several authors (Tallis, 1995; Shafran et al., 1996) that subjects with OCD worry about influencing the occurrence of negative events as opposed to positive events. Therefore it would be expected the occurrence of a negative event rather than a positive event would contribute to the development of belief in overextended personal influence. In addition, some people who scored very highly on both the TAF and the Magical Thinking Questionnaire did not remember any specific learning event. This may have been because no such event had occurred and would suggest that an early unusual experience was not necessary for the development of these types of beliefs.

Another explanation is that such an event had occurred, but the person had forgotten about it. A study by Wilhelm, McNally, Baer and Florin (1996) suggested that in fact OCD subjects tend to remember negative words more than they remembered positive or neutral words. This difference was not found in a normal control group. A third possibility is that subjects were reluctant to disclose such an experience where they had thought about harming someone and then it happened. In the two case studies Tallis (1994) presented, both individuals had never previously told health professionals about their experiences. The question also may have been asked in such a way that it was not clear to the person what was meant and therefore did not elicit relevant responses. A longer clinical interview asking subjects about the development of their OCD in greater detail and asking about any early unusual experiences might have given more information. Further research is needed to look more closely at the relationship between early experiences, the development of beliefs and certain characteristics of OCD. An empirical question is whether bad events are more easily accessed than good events as might be suggested by the Wilhelm et al. (1996) study. They found that subjects with OCD encoded negative words, despite being instructed to forget them, thus meaning the OCD subjects were more likely to remember this material. Comparing the frequency of recall of these types of experiences in a normal control group and other psychiatric populations to an OCD group would also be interesting.

### **Methodology of study**

There were several weaknesses in this study that have not been previously discussed. Firstly, the study would be improved if there were greater numbers in each group. Difficulties were experienced in the recruitment of subjects. Out of fifty one potential subjects contacted, less than half actually took part. This difficulty has previously been noted by other researchers and clinicians. Subjects with OCD are relatively rare in mental health settings although epidemiological studies have shown that it is the fourth most common psychiatric disorder (Robins et al., 1984). An average of eight years lapses between the onset of the disorder and the person seeking help (Yaryura Tobias and Neziroglu, 1983). A strength of the present study was that a clinical sample was used and that subjects were diagnosed as having OCD. Many other studies to overcome the above difficulty have looked at associations between

measures of obsessionality and compulsivity with other measures in non-clinical or general psychiatric samples which can make it unclear how their results are applicable to OCD. The relatively small numbers in each group meant that the power of the study was fairly low and low power may have explained the failure to find significant results on some of the hypotheses. In order to overcome this difficulty and to increase the power of the experiment to pick up significant results, more subjects would have to be recruited into each group.

A second issue in the present study concerns the diagnosis of OCD and the presence of other psychiatric morbidity. The researchers were not specifically trained in diagnosis, therefore this may have affected the reliability of the diagnosis of OCD, although the majority of subjects were recruited from mental health services where they were currently being seen for OCD and the majority of subjects were currently receiving either psychological and/or pharmacological help for OCD. Also, only the OCD section of the SCID-P was used so additional diagnoses were not carried out, although to screen for other psychiatric morbidity, subjects had to view OCD was their main difficulty and were asked during the clinical interview whether they had any other mental health problems. In addition, to control for the possible influence of depression, severity of depression was measured by the BDI and was partialled out where appropriate when using correlational analyses.

Thirdly, there may have other factors which accounted for differences in scores on the Magical Thinking Questionnaire. The scenarios were not specifically matched for the severity of the outcome. Therefore rather than intentionality and non-intentionality accounting for the differences between the items, it may have been that the severity of the outcome accounted for the differences. For example, a subject might be much more worried about the possibility of being in a car crash than the possibility of a house being burgled. This could be addressed by presenting the scenarios to groups of subjects and asking them to rate how bad that outcome would be for them and controlling for severity of outcome in a later study. Lastly, the two groups did differ on educational levels and it was a possibility that a lower level of education might be associated with a higher level of magical thinking thus accounting for the group differences. As a supplementary check on the validity of the results, correlations indicated that years in education showed very little relationship with scores on the Magical Thinking Questionnaire.

## **Implications for therapy**

Research into OCD is working towards developing an empirically validated theory about OCD in order to advance effective therapeutic techniques. While behavioural therapy has helped many people with OCD, there is still a significant proportion of individuals who do not respond to or drop out of this type of treatment. Medication also is not effective for many subjects with OCD (Steketee, 1993). Therefore it is important to develop alternative treatments such as cognitive therapy which may prove more effective for those people or which have reduced drop out rates.

In terms of therapy, it would seem important to carefully and accurately assess beliefs and attitudes, and the strength of particular beliefs during assessment. Measures such as the TAF scale could be used to facilitate this process and help in assessing the belief in personal extended influence. Therapists should also be aware that clients with OCD may be reluctant to discuss previous experiences where they thought about harm happening to someone which then actually happened and beliefs relating to this. It is important to build up a trusting relationship where the person feels able to discuss these types of belief as this may have implications for the way therapy proceeds. Rachman (1993) thought that one aim of therapy could be to help the person to differentiate between thoughts and actions. This could be done by employing cognitive methods already used in OCD such as behavioural experiments or challenging of thoughts. Tallis (1994) has pointed out that where people hold these beliefs strongly and especially where they have developed because of an early learning experience, cognitive therapy more in line with work looking at modifying delusions may be more appropriate than the standard cognitive therapy for OCD. This takes a more indirect approach where clients are encouraged to explore the alternative evidence for a belief in the association between thoughts and events without being urged to change their belief. The client is also likely to have a variety of beliefs which may be interconnected and the clinician has to decide which beliefs are most prominent and the best way to address these in therapy. For example, a belief in overextended personal influence may be linked to excessive responsibility and beliefs about controlling thoughts. The evaluation of the effectiveness of cognitive therapy for OCD is still at a relatively early stage, but studies so far have indicated that it can be at least as effective as behavioural therapy (Van Oppen et al., 1995).

## Summary

In summary, the study indicated that worry about the power of thoughts to influence events and other people was higher in an OCD group than a normal control group. OCD subjects seemed to be more worried about the influence of non-intentional thoughts as compared to intentional thoughts. No difference in worry was found between thoughts affecting events, behaviour, feelings or thoughts. The belief in personal overextended influence appeared not to be present in all subjects with OCD and probably causes significant distress to only a proportion of people with OCD. This study found that there was no clear relationship between this belief and particular compulsions and that the strength of this belief is likely to vary between individuals. Some people hold the belief very strongly and others do not really believe that thoughts can affect others or events, but worry about it, possibly because of a low tolerance of ambiguity or a belief in excessive responsibility.

Research in this area contributes towards a clearer understanding of the cognitive underpinnings specific to certain obsessional and compulsive behaviour and how these might differ from the cognitive features of other disorders such as generalised anxiety or psychotic disorders. The increasing development of reliable and valid measures which tap the individual beliefs and cognitions underlying obsessive and compulsive behaviours will hopefully help clinicians to better understand the nature of beliefs in OCD and lead to the development of more effective, individually tailored therapy for people with OCD, especially those who at present are not helped by the existing treatments on offer.

## REFERENCES

- American Psychiatric Association (1994). *Diagnostic and Statistical Manual of Mental Disorder*, 4th ed. Washington, DC: APA.
- Baer, L. and Minichiello, W.E. (1986). Behaviour Therapy for Obsessive-Compulsive Disorder. In M.A. Jenike, L. Baer and W.E. Minichiello (Eds), *Obsessive Compulsive Disorders: Theory and Management*. Littleton, MA: PSG Publishing Company Inc.
- Baillargeon, R. (1986). Representing the existence and location of hidden objects: Object permanence in 6 and 8 month old infants. *Cognition*, 23, 21-41.
- Baxter, L.R., Schwartz, J.M., Mazziotta, J.C. et al. (1988). Cerebral glucose metabolic rates in non-depressed obsessive-compulsives. *American Journal of Psychiatry*, 145, 1560-1563.
- Beck, A.T. (1967). *Depression: Clinical, Experimental and Theoretical Aspects*. Philadelphia: University of Pennsylvania Press.
- Beck, A.T. (1976). *Cognitive therapy and the emotional disorders*. New York: International Universities Press.
- Beck, A.T., Emery, G. and Greenberg. (1985). *Anxiety disorders and phobias: A cognitive perspective*. New York: Basic Books.
- Beck, A.T., Epstein, N., Brown, G. and Steer, R.A. (1988a). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology*, 56, 893-897.
- Beck, A.T., Steer, R.A. and Garbin, M.G. (1988b). Psychometric properties of the Beck Depression Inventory. Twenty five years of evaluation. *Clinical Psychology Review*, 8, 77-100.
- Beck, A.T. and Steer, R.A. (1990). *Manual for the Revised Beck Anxiety Inventory*. San Antonio, Tx: Psychological Corporation.
- Beck, A.T. and Steer, R.A. (1991). Relationship between the Beck Anxiety Inventory and the Hamilton Anxiety Rating Scale with anxious out-patients. *Journal of Anxiety Disorders*, 5, 213-223.
- Beck, A.T. Ward, C.H., Mendelson, M., Mock, J. And Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry*, 4, 561-571.



- Beiser, H. (1987). Obsessive-compulsive disorder in children. *Psychiatric Journal of University of Ottawa*, 12: 231-233.
- Black, A. (1974). The natural history of obsessional neurosis. In H.Beech (Ed), *Obsessional States*. London: Methuen & Co Ltd.
- Black, D.W., Noyes, R., Goldstein, R.B. and Blurn, N. (1992). A family study of obsessive-compulsive disorder. *Archives of General Psychiatry*, 49, 362-368.
- Bland, R.C., Newman, S.C., Orn, H. et al. (1988). Lifetime prevalence of psychiatric disorders in Edmonton. *Acta Psychaitrica Scandinavacia*, 77 (suppl. 338), 24-32.
- Butler, G. and Matthews, A. (1983). Cognitive processes in anxiety. *Advances in Behavior Research and Therapy*, 5, 51-62.
- Carey, G. and Gottesman, I.I. (1981). Twin and family studies of anxiety, phobic and obsessive disorders. In D.F. Klein and J. Rabkin (Eds), *Anxiety: New Research and Changing concepts*. New York: Raven Press.
- Carr, A.T. (1974). Compulsive neurosis: a review of the literature. *Psychological Bulletin*, 81, 311-318.
- Chandler, M.J. and Lalonde, C.E. (1994). Surprising, magical and miraculous turns of events: Children's reactions to violations of their early theories of mind and matter. *British Journal of Developmental Psychology*, 12, 83-95.
- Chapman L.J. and Chapman, J.P. (1985). Psychosis proneness. In M. Alpert (ed), *Controversies in Schizophrenia: Changes and Constancy's*. New York: Guildford Press.
- Clark, D.A. and Purdon, C. (1993). New Perspectives for a cognitive theory of obsessions. *Australian Psychologist*, 28, 161-167.
- de Silva, P. And Rachman, S. (1992). *Obsessive compulsive disorder: The Facts*. New York: Oxford University Press.
- Dowson, J.H. (1977). The phenomenology of Severe Obsessive-Compulsive Neurosis. *British Journal of Psychiatry*, 131, 75-8.
- Eckblad, M. and Chapman, L.J. (1983). Magical Ideation as an Indicator of Schizotypy. *Journal of Consulting and Clinical Psychology*, 51, 215-225.

- Emmelkamp, P.M.G. and Beens, H. (1991). Cognitive therapy with obsessive-compulsive disorder: a comparative evaluation. *Behaviour Research and Therapy*, 29, 293-300.
- Emmelkamp, P.M.G., van der Helm, M., van Zanten, B.L. and Plochg, I. (1980). Contributions of self-instructional training to the effectiveness of exposure in vivo: A comparison with obsessive compulsive patients. *Behaviour Research and Therapy*, 18, 61-66.
- Flament, M.F., Rapoport, J.L., Murphy, D.L., Berg, C.J. and Lake, R. (1987). Biochemical changes during clomipramine treatment of childhood obsessive compulsive disorder. *Archives of General Psychiatry*, 44, 219-255.
- Freeston, M.H., Ladouceur, R., Gagnon, F. and Thibodeau, N. (1992, June). Intrusive thoughts, worry and obsessions: empirical and theoretical distinctions. In P.Salkovskis (Chair), Clinical and non-clinical intrusive thoughts. Symposium conducted at the World Congress of Cognitive Therapy, Toronto, Canada.
- Freeston, M.H., Ladouceur, R., Gagnon, F. and Thibodeau, N. (1993). Beliefs about Obsessional Thoughts. *Journal of Psychopathology and Behavioural Assessment*, 15, 1-21.
- Freeston, M.H., Ladouceur, R., Thibodeau, N. and Gagnon, F. (1992). Cognitive intrusions in a non clinical population II. Associations with depressive, anxious and compulsive symptoms. *Behaviour Research and Therapy*, 30, 263-271.
- Freeston, M.H., Ladouceur, R., Thibodeau, N., Letarte, H. and Rheaume, J. (1994). Health-related intrusive thoughts. *Journal of Psychosomatic Research*, 38, 203-215.
- Freud, S. Notes upon a case of obsessional neurosis ( the 'rat man'). In A. Richards (Ed), *The Penguin Freud Library: Case Histories II*. Harmondsworth: Penguin.
- Freud, S. (1950). *Totem and taboo*. London: Routledge and Kegan Paul.
- Freud, S. (1963). Obsessive acts and religious practices. In P.Rieff (Ed), *Character and Culture*. New York: Collier. (Original work published in 1907).
- Frost, R.O., Krause, M.S., McMahon, M.J., Peppe, J., Evans, M., McPhee, A.M. and Holden, M. (1993). Compulsivity and superstitiousness. *Behaviour Research and Therapy*, 31, 423-445.
- Frost, R.O. and Steketee, G. (1997). Perfectionism in obsessive compulsive disorder patients. *Behaviour Research and Therapy*, 35, 291-296.

- George, L. and Neufield, R.W.J. (1987). Magical ideation and schizophrenia. *Journal of Consulting and Clinical Psychology*, 55, 778-779.
- Gmelch, G. and Felson, R. (1980, Dec). Can a lucky charm get you through organic chemistry? *Psychology Today*, 75-78.
- Goldenson, R.M. (1984). *Longman Dictionary of Psychology and Psychiatry*. NY: Longman, Inc.
- Goodwin, D.W. and Guzes, S.B. (1989). *Psychiatric Diagnosis*, 4th edition. New York: Oxford University Press.
- Goodwin, D.W. Guzes, S.B. and Robins, E. (1969). Follow up studies in obsessional neurosis. *Archives of General Psychiatry*, 20, 182-187.
- Guadagnolia, E. and Velicer, W. (1988). Relationship of sample size to the stability of component patterns. *Psychological Bulletin*, 103, 265-275.
- Harris, P.L. (1994). Unexpected, impossible and magical events: Children's reactions to causal violations. *British Journal of Developmental Psychology*, 12, 1-7.
- Hodgson, R.J. and Rachman, S. (1977). Obsessive-Compulsive Complaints. *Behaviour Research and Therapy*, 15, 389-395.
- Honjo, S., Hirano, C., Murase, S., Kaneko, T., Sugiyama, T., Ohtaka, K., Aoyama, T., Takel, Y., Inoko, K. and Wakabayashi, S. (1989). Obsessive-compulsive symptoms in childhood and adolescence. *Acta Psychiatrica Scandinavica*, 80, 83-91.
- Jahoda, G. (1969). *The psychology of superstition*. New York: Penguin Books.
- Jenike, M.A. (1992, Dec) *The Psychiatric Clinics Of North America :Obsessional Disorders*. Philadelphia: W.B.Saunders Company.
- Jenike, M.A. (1993). Obsessive-compulsive disorder: Efficacy of specific treatments as assessed by controlled trials. *Psychopharmacology Bulletin*, 29, 487-499.
- Jenike, M.A., Baer, L., Minichiello, W.E. (1986). *Obsessive compulsive disorder: Theory and Management*. Littleton, Massachusetts: PSG Publishing Company INC.
- Johnston, C.N. and Harris, P.L. (1994). Magic: special, but not excluded. *British Journal of Developmental Psychology*, 12, 35-52.
- Karno, M., Golding, J.M., Sorenson, S.B. and Burnam, A. (1988). The Epidemiology of Obsessive-Compulsive Disorder in Five US Communities. *Archives of General Psychiatry*, 45, 1094-1099.

Keinan, G. (1994). Effects of stress and tolerance of ambiguity on magical thinking. *Journal of Personality and Social Psychology*, 67, 48-55.

Khanna, S. and Channabasavanna, S.M. (1988). Phenomenology of Obsessions in Obsessive-compulsive Neurosis. *Psychopathology*, 21, 12-18.

Khanna, S., Rajendra, P.N., Channabasavanna, S.M. et al. (1988). Life events and onset of obsessive compulsive disorder. *International Journal of Social Psychology*, 34, 305-309.

Khanna, S. and Srinath, S. (1988). Childhood Obsessive-Compulsive Disorder 1. *Psychopathology*, 21, 254-258.

Kulhara, P. and Prasad Rao, G. (1985). Obsessive Compulsive Neurosis in North West India. A phenomenological study. *Indian Journal of Psychiatry*, 27, 243-248.

Ladoceur, R., Rheaume, K., Freeston, M.H., Aublet, F., Jean, K., Lachance, S., Langlois, F. and De Pokomandy-Morin, K. (1995). Experimental Manipulations of Responsibility: An analogue test for models of obsessive-compulsive disorder. *Behaviour Research and Therapy*, 33, 937-946.

Lazarus, R.S. (1966). *Psychological stress and the coping process*. New York: McGraw Hill.

Leonard, H.L., Goldberger, E.L., Rapoport, J.L., Cheslow, D.L. and Swedo, S.E. (1989). Childhood Rituals: Normal development or Obsessive-Compulsive symptoms? *Journal of the American Academy of Child and Adolescent Psychiatry*, 29, 17-23.

Lopatka, C. and Rachman, S. (1995). Perceived responsibility and compulsive checking: an experimental analysis. *Behaviour Research and Therapy*, 33, 673-684.

MacDonald, A.M. and Murray, R.M. (1989). A twin study of obsessive compulsive neurosis. Presented at the 6th International Congress on Twin Studies, Rome, 28-31 August.

Maher, B. (1988). Anomalous experience and delusional thinking: The logic of explanations. In T.F. Oltmanns and B.A. Maher (Eds), *Delusional beliefs*. New York; Wiley.

Marks, I. (1987). *Fears, Phobias and Rituals: Panic, Anxiety and their Disorders*. Oxford: Oxford University Press.

Marmor, J. (1956). Some observations on superstition in contemporary life. *American Journal of Orthopsychiatry*, 13, 119-130.

Mauss, M. (1972). *A general theory of magic*. New York: Norton (Original work published in 1902).

McFall, M.E. and Wollersheim, J.P. (1979). Obsessive-compulsive neurosis: a cognitive-behavioural formulation and approach to treatment. *Cognitive Therapy and Research*, 3, 333-348.

McNally, R.J. and Foa, E.B. (1987). Cognition and agoraphobia: bias in interpretation of threat. *Cognitive Therapy and Research*, 11, 567-581.

Meehl, P.E. (1962). Schizotaxia, schizotypy, schizophrenia. *American Psychologist*, 17, 827-838.

Mowrer, O.H. (1947). On the dual nature of learning- a reinterpretation of 'conditioning' and 'problem solving'. *Harvard Educational Review*, 17, 102-148.

Myers, J.K., Weissman, M.M., Tischler, G.L., Holzer, C.E., Leaf, P.J., Orvaschel, H., Anthony, J.C., Boyd, J.H., Burke, J.D. Jr, Kramer, M. and Stoltzman, R. (1984). Six month prevalence of psychiatric disorders in three communities. *Archives of General Psychiatry*, 41, 959-967.

Nemiah, J. (1985). Obsessive compulsive disorder. In H. Kaplan and B. Sadock (Eds), *Comprehensive Textbook of Psychiatry*. Baltimore: Williams and Wilkins.

Niler, E.R. and Beck, S.J. (1989). The relationship among guilt, dysphoria, anxiety and obsessions in a normal population. *Behaviour Research and Therapy*, 27, 213-220.

Norman, R.M.G., Davies, F., Malla, A.K., Cortese, L. and Nicholson, I.R. (1996). Relationship of obsessive-compulsive symptomatology to anxiety, depression and schizotypy in a clinical population. *British Journal of Clinical Psychology*, 35, 553-566.

Obsessive Compulsive Cognitions Working Group. Co-chairs: R.Frost and G. Steketee. (1997). Cognitive Assessment of Obsessive-Compulsive Disorder. *Behaviour Research and Therapy*, 35, 667-681.

Peller, L. (1954). Libidinal phases, ego development and play. *Psychoanalytic study of the Child*, 10, 178-199.

Piaget, J. (1929). *The Child's Conception of the World*. London:Kegan Paul, Trench, Trubner and Co Ltd.

Piaget, J. (1950). *The psychology of intelligence*. New York: Harcourt, Brace.

Rachman, S. (1976a). Obsessive-compulsive checking. *Behaviour Research and Therapy*, 14, 269-277.

Rachman, S. (1993). Obsessions, Responsibility and Guilt. *Behaviour Research and Therapy*, 31, 149-154.

Rachman, S. and de Silva, P. (1978). Abnormal and normal obsessions. *Behaviour Research and Therapy*, 16, 233-248.

Rachman, S. and Hodgson, R.J. (1980). *Obsessions and compulsions*. Englewood, NJ: Prentice-Hall.

Rachman, S., Shafran, R., Mitchell, D., Trant, J. and Teachman, B. (1997). How to remain neutral: an experimental analysis of neutralisation. *Behaviour Research and Therapy*, 34, 889 - 898.

Rachman, S., Thordarson, D.S., Shafran, R. and Woody, S.R. (1995). Perceived Responsibility: Structure and Significance. *Behaviour Research and Therapy*, 33, 779-784.

Rapoport, J.L. (1989a). *Obsessive-compulsive disorder in childhood and adolescence*. Washington Dc: American Psychiatric Press.

Rapoport, J.L. (1989b). *The Boy Who Couldn't Stop Washing: The Experience and Treatment of Obsessive-compulsive disorder*. New York: E.P. Dutton.

Rasmussen, S.A. and Eisen, J. (1992). The epidemiology and clinical features of obsessive compulsive disorder. *The Psychiatric Clinics of North America*, 15, 743-758.

Rasmussen, S.A. and Tsuang, M.T. (1984) Epidemiology of obsessive compulsive disorder: A review. *Journal of Clinical Psychiatry*, 45, 450-457.

Rheaume, J., Ladoceur, R., Freeston, M.H. and Letarte, H. (1995). Inflated responsibility in obsessive compulsive disorder: validation of an operational definition. *Behaviour Research and Therapy*, 33, 159-169.

Riddle, M.A., Scahill, L., King, R., Hardin, M.T., Towbin, K.E., Ort, S.I., Leckman, J.F. and Cohen, D.J. (1990). Obsessive compulsive disorder in children and adolescents. Phenomenology and family history. *Journal of the American Academy of Child and adolescent Psychiatry*, 29, 766-772.



Robins, L.N., Helzer, J.E., Weissman, M.M., Orvaschel, H., Gruenberg, E., Burke, J.D.Jr and Regier, D.A. (1984). Lifetime prevalence of specific psychiatric disorders in three sites. *Archives of General Psychiatry*, 41, 949-958.

Rosen, M. (1975). A dual model of obsessional neurosis. (1975). *Journal of Consulting and Clinical Psychology*, 43, 453-59.

Rosengren, K.S., Kalish, C.W., Hickling, A.K. and Gelman, S.A. (1994). Exploring the relation between preschool children's magical beliefs and causal thinking. *British Journal of Developmental Psychology*, 12, 69-82.

Rothbaum, F. and Weisz, J.R. (1988). *Child psychopathology and the quest for control*. New York: Sage.

Rozin, P., Millman, L. and Nemeroff, C. (1986). Operation of sympathetic magic in digest and other domains. *Journal of Personality and Social Psychology*, 50, 703-721.

Rozin, P., Nemeroff, C., Wane, M. and Sherrod, A. (1989). Operation of the sympathetic magical law of contagion in interpersonal attitudes among Americans. *Bulletin of Psychonomic Society*, 27, 367-370.

Rudin, E. (1953). Bietroy zur frage der zwangs krankheit unsbesondere ihrere hereditaren beziehungen. *Arch. Psychiatr. Nervenkr*, 191, 14-54.

Safran, J.D., Segal, Z.V., Hill, C. and Whiffen, V. (1990). Refining strategies for research on self-presentations in emotional disorders. *Cognitive Therapy and Research*, 14, 143-160.

Salkovskis, P.M. (1985). Obsessional-Compulsive Problems: A Cognitive-Behavioural Analysis. *Behaviour Research and Therapy*, 23, 571-583.

Salkovskis, P.M. (1989). Cognitive-behavioural factors and the persistence of intrusive thoughts in obsessional problems. *Behaviour Research and Therapy*, 27, 677-682.

Salkovskis, P.M. (1990). Obsessions, Compulsions and Intrusive Cognitions. In D.F. Peck and C.M. Shapiro (Eds), *Measuring Human Problems*. Chichester: Wiley.

Salkovskis, P.M., Richards, H.C. and Forrester, E. (1995). The Relationship between Obsessional Thoughts and Intrusive Thoughts. *Behavioural and Cognitive Psychotherapy*, 23, 281-299.

Schoor, D. and Rodin, J. (1984). Motivation to control one's environment in individuals with obsessive-compulsive, depressive and normal personality traits. *Journal of Personality and Social Psychology*, 46, 1148-1161.

Shafran, R., Thordarson, D.S. and Rachman, S. (1996). Thought-Action Fusion in Obsessive Compulsive Disorder. *Journal of Anxiety Disorders*, 10, 379-391.

Spitzer, R.L., Endicott, J. and Gibbon, M. (1979). Crossing the border into borderline personality and borderline schizophrenia. *Archives of General Psychiatry*, 36, 17-24.

Spitzer, R.L., Williams, J.B.W., Gibbon, M. and First, N.B. (1989). *Instruction manual for structured clinical interview for DSM-III-R*. NY: Biometrics Research.

Stein, D.J., Spadaccini, E. and Hollander, E. (1995). Meta-analysis of pharmacotherapy trials for obsessive-compulsive disorder. *International Clinical Psychopharmacology*, 10, 11-18.

Steketee, G.S. (1993). *Treatment of Obsessive Compulsive Disorder*. New York: Guilford Press.

Swedo, S.E. and Rapoport, J.I. (1989). Phenomenology and differential diagnosis of obsessive-compulsive disorder in children and adolescents. In J.L. Rapoport (Ed), *Obsessive Compulsive Disorder in Children and Adolescents*. Washington DC: American Psychiatric Press.

Tallis, F. (1994). Obsessions, responsibility and guilt: two case reports suggesting a common and specific aetiology. *Behaviour Research and Therapy*, 32, 143-145.

Tallis, F. (1995). *Obsessive Compulsive Disorder. A Cognitive and Neuropsychological Perspective*. Chichester: John Wiley and Sons Ltd.

Thalbourne, M.A. and French, C.C. (1995). Paranormal belief and magical ideation: A replication. *Personality and Individual Differences*, 18, 291-292.

Thordarson, D.S, Radomsky, A.R. and Rachman, S. (1997). Norms and reliability for MOCI-R. Unpublished data.

Tobacyk, J.J. and Wilkinson, L.V. (1990). Magical thinking and paranormal beliefs. *Journal of Social Behaviour and Personality*, 5, 255-264.

Tylor, E.B. (1974). *Primitive culture: researches into the origins of mythology, philosophy, religions, art and custom*. New York Press. (Original work published 1871).

Vaisaner, E. (1975). Psychiatric disorders in Finland. *Acta Psychiatrica Scandinavica*, 62 (suppl. 263), 27.

Van Oppen, P. and Arntz, A. (1994). Cognitive Therapy for Obsessive-Compulsive Disorder. *Behaviour Research and Therapy*, 22, 79-84.

Van Oppen, P., Haan, E. de, Balkan, A.J.L.M. van, Spinhoven, Ph., Hoogduin, C.A.L. and Dyck, R. (1995). Cognitive therapy and exposure in vivo in the treatment of obsessive-compulsive disorder. *Behaviour Research and Therapy*, 33, 379-390.

Viken, A. and Clausen, S.E. (1988). Freud, Piaget or neither? Beliefs in Controlling Others by Wishful Thinking and Magical Behaviour in Young Children. *Journal of Genetic Psychology*, 154, 297-314.

Watts, F. Powell, G. and Austin, S. (1973). The modification of abnormal beliefs. *British Journal of Medical Psychology*, 46, 359- 363.

Wilder, J. (1975). The lure of magical thinking. *American Journal of Psychotherapy*, 29, 37-55.

Wilhelm, S., McNally, R.J., Baer, L. and Florin, I. (1996). Directed Forgetting in Obsessive-Compulsive Disorder. *Behaviour Research and Therapy*, 34, 633-641.

Wilhelm, S., McNally, R.J., Baer, L. and Florin, I. (1997). Autobiographical memory in obsessive-compulsive disorder. *British Journal of Clinical Psychology*, 36, 21-23.

Yaryura-Tobias, J. and Neziroglu, F. (1983). *Obsessive-Compulsive Disorders: Pathogenesis-Diagnosis-Treatment*. New York: Marcel Dekker Inc.

Zusne, L. and Jones, W.H. (1989). *Anomalistic psychology/magical thinking (2nd ed)*. Hillsdale, NJ: Erlbaum.

## **RESEARCH INFORMATION SHEET**

Some people experience distressing intrusive thoughts. These thoughts can often lead them to carry out an action which may make them feel less worried in the short term. The purpose of the study is to find out how people's beliefs and attitudes might be influencing these 'obsessions' and 'compulsions'. Our aim is to increase understanding of obsessional problems so that better ways of helping other people who have these difficulties can be developed.

If you are interested in helping in the study, you can arrange an appointment with a member of the research team. At this appointment you will be given more information about the study and the researcher will answer any questions you might have. You will have time to think about your decision to take part. If you are still unsure at this time, another appointment can be arranged for you.

If you consent to take part, the researchers will first ask you some questions about your difficulties. If you agree we would like to tape record this discussion. The tape will be kept entirely confidential and will be erased once the information has been taken from it. If you would prefer not to be recorded that would be fine.

After asking about your difficulties, you will then be given some questionnaires to complete. Some of the questionnaires will ask you about the distressing thoughts and obsessional problems and anxiety. Other questionnaires ask about general beliefs you may have about yourself and others. The questionnaires will take approximately 1- 1 1/2 hours to complete. All questionnaires can be completed at the first appointment, or if you prefer you can arrange a further appointment to complete the questionnaires. At the end of the appointment, there will be time for you to ask any questions you may have as a result of taking part. A brief factsheet on obsessional problems with useful addresses will be given out.

Your participation is entirely voluntary and should you decide not to take part, this will have no effect on your future care. If you decide to participate, you are free to stop at any time if you feel uncomfortable. We are required to tell you G.P. you are taking part in the study and to let them know what it involves. We will do this by letter after the appointment.

Any information you give us will be treated as completely confidential and nothing that could identify you will be published in any form. Questionnaires will be kept only for the period of the research (approx 5 months) and will then be destroyed. Only members of the research team have access to them. Once the research is completed, we can let you know how to obtain the results if you wish.

If you have any queries you can contact a member of the research team or our independent advisor.

For more information please contact

or for independent advice

## Appendix 2

Dear

I am writing to give you some information about a research project that is being carried out in . I understand that your therapist has already spoken to you about this. Thank you for agreeing to be contacted. I would like to invite you to an interview so that you can find out more about the research and decide if you would be interested in taking part.

The research is linked to the Clinical Psychology Training Course which is run by the University of Edinburgh and Edinburgh Healthcare NHS Trust. The researchers are qualified Clinical Psychologists or Clinical Psychologists in Training.

The study is related to people who experience intrusive and distressing thoughts which in some cases can lead them to carry out an action as a way to reduce the discomfort caused. The information sheet enclosed gives more details about the study and I would be grateful if you could read through this. I have also enclosed a consent form which you should read if you are interested in the research. At this stage you should not sign the consent form, but you will be asked to bring this along to the appointment which will be arranged if you are interested in helping with the research.

When you have read through the information sheet and the consent form, please could you complete the confirmation slip enclosed. This will show us whether or not you wish to attend for an introductory interview. If you are interested in attending, the time and place I would like to suggest are as follows:-

Date

Time

Place

Yours sincerely

Research Team Member

### Appendix 3

Peter is Mark's cousin who lives across the street from him. Sometimes, he experiences thoughts and worries that they might influence Mark's thoughts, feelings or behaviours. Have you ever thought you could influence or affect people in these ways?

1. Peter is walking to work and a thought pops into his mind. Peter experiences the thought that Mark will stub his toe on the stairs this morning. Peter tries to ignore the thought and concentrate on all the work he has to do today.

To what extent will Peter thinking in this way influence whether Mark will stub his toe?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

2. Peter is at home watching the television. Mark is away on holiday in Spain. Suddenly, he has the thought that Mark will be really enjoying his holiday.

To what extent will Peter thinking in this way influence the amount of enjoyment Mark feels?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

3. Peter is sitting at home eating his tea. The thought suddenly enters his mind that Mark will phone him tonight.

To what extent will Peter thinking in this way influence whether Mark will phone tonight?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

4. Peter arranged to go for a drink tonight with Mark after work a few days ago, but they haven't spoken since. All at once the thought comes into his mind that Mark will remember about tonight.

To what extent will Peter thinking in this way influence the way Mark might think?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much



5. Peter is in the house on his own and is watching his favourite television programme. Mark is driving back from a weekend away. Suddenly, out of the blue, Peter has the thought that Mark will be involved in a car accident.

To what extent will Peter thinking in this way influence whether Mark is involved in an accident?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

6. Peter is looking after Mark's house while he is away on holiday. The thought flits across Peter's mind that Mark's house will be broken into while he is away and that all his things will be stolen. Peter tries to ignore the thought, but it keeps popping into his mind and he cannot get it to go away.

To what extent will Peter thinking in this way influence whether Mark's house is broken into?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

7. Peter is listening to the radio, having his breakfast. A announcement comes up that Peter's and Mark's favourite film star has just won an award. A thought suddenly comes into his mind that Mark will also be pleasantly surprised by this.

To what extent will Peter thinking in this way influence the amount of surprise Mark feels?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

8. Peter is reading the newspaper at home and something reminds him of a time when Mark's boss at work was making cruel remarks to him. Briefly, Peter thinks about Mark remembering these sorts of comments.

To what extent will Peter thinking in this way influence the way Mark might think about his boss?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

9. Peter is sitting in a boring meeting at work. An image of the wonderful holiday he and Mark went on last year passes through his mind and he wonders whether that the thoughts of this holiday will come into Mark's mind as well that day.

To what extent will Peter thinking in this way influence the way Mark might think?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

10. Mark is going on holiday next week and has to go on quite a long flight. Peter drops him off at the airport. On his way home, the thought that Peter will have a safe flight briefly enters his mind.

To what extent will Peter thinking in this way influence whether Mark has a safe flight

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

11. Peter is sitting in his living room watching the news on the television. A report comes up about a bad car crash which happened yesterday. Suddenly, Peter experiences the thought that Mark will feel really sad about this car crash. Peter thinks about this happening and about the types of sad feelings Mark might have.

To what extent will Peter thinking in this way influence the amount of sadness Mark feels?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

12. Peter briefly has the thought that Mark will have a huge argument with his wife tonight and that they will really fall out.

To what extent will Peter thinking in this way influence whether Mark has an argument with his wife?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

13. Peter is sitting at his desk at work. Suddenly the thought passes through his mind that Mark will be having a bad day and will be feeling really down and depressed.

To what extent will Peter thinking in this way influence the amount of sadness Mark feels?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

14. Peter is eating his breakfast. All at once, the thought enters his mind that Mark will go out and enjoy himself tonight.

To what extent will Peter thinking in this way influence whether Mark goes out tonight?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

15. Peter suddenly skids on some black ice. He feels frightened and pulls over to calm down. Briefly, the thought enters his mind about a time when Mark was driving and skidded off the road and wonders whether Mark might remember this time.

To what extent will Peter thinking in this way influence the way Mark might think?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

16. Peter is meeting Mark for lunch this week. Briefly, he imagines that Mark will see a ten pound note on the street this week. He pictures Mark walking down the street and noticing some money on the ground.

To what extent will Peter thinking in this way influence whether Mark finds a ten pound note?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

Sometimes Peter wants Mark to either do, feel or think something. Therefore he tries different ways to try to influence Peter's thoughts, feelings or behaviour.

1. Peter is annoyed with Mark so he wishes that Mark will forget something important. Mark works in an office and travels to work by bus. Peter thinks about Mark leaving work in a hurry and wills him to leave his bus pass in a desk drawer.

To what extent will Peter thinking in this way influence whether Mark forgets his buspass?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

2. Peter wants Mark to feel happy because Mark has been moaning a bit recently. Peter thinks hard about the type of happy feelings and thoughts he would like Mark to experience. Peter wishes that Mark will cheer up a bit.

To what extent will Peter thinking in this way influence the amount of happiness Mark might feel?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

3. Peter wants Mark to move his car so he can park outside his house. Peter thinks about Mark getting up, walking out of his house, down the street and to his car. He imagines Mark driving his car away.

To what extent will Peter thinking in this way influence whether Mark will move his car?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

4. Peter wants Mark to feel confident for a job interview. Mark has been thinking that he has too little experience to stand a chance and is generally putting himself down. He concentrates on the types of thoughts such as 'I am as good as anyone else' that he wants Mark to experience.

To what extent will Peter thinking in this way influence the way Mark might think?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

5. Peter is at home and it is a very stormy night. Peter can hear that tiles are blowing off his roof and that his TV aerial is broken. Peter hopes that he is not the only one this has happened to and secretly wishes that Mark's TV aerial will blow off as well. He thinks about the wind catching Mark's aerial and blowing off the roof.

To what extent will Peter thinking in this way influence whether Mark's TV aerial blows off?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

6. It has been raining a lot recently. Mark has just been boasting about his new bathroom and how nice it is. Peter feels a bit jealous and decides that he wants Mark to get a leak in his bathroom. He thinks about this happening and wishes it will happen.

To what extent will Peter thinking in this way influence whether Mark does get a leak in his bathroom?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

7. Peter wants Mark to feel enthusiastic about a Christmas party he is having which Peter has invited Mark to. He hopes that Mark will feel keen to go and be really looking forward to it. He concentrates on the type of feelings that Mark might experience.

To what extent will Peter thinking in this way influence the amount of excitement Mark might feel?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

8. Mark owes Peter £40, but seems to have forgotten all about it. Peter feels embarrassed to ask him for it back. Peter wants Mark to remember about the money he owes so that he will pay it back soon. He concentrates on the types of thoughts he would like Mark to experience.

To what extent will Peter thinking in this way influence the way Mark might think?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

9. Peter wants Mark to think nice and pleasant thoughts about him as he is worried Mark might not like him anymore. He concentrates on the types of thoughts that Mark might have such as that he likes Peter. He wants that Mark to have these kinds of thoughts.

To what extent will Peter thinking in this way influence the way Mark might think?  
Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

10. Mark has the possibility of a promotion at work. Peter hopes that Mark will get this promotion. Mark works in an office and Peter imagines Mark's boss telling him that He has got the promotion. Peter wishes very hard that Mark will get this promotion.

To what extent will Peter thinking in this way influence whether Mark gets his promotion?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

11. Peter wants Mark to feel angry about a noisy neighbour near them who plays loud music constantly. Peter concentrates on the types of angry feelings he would like Mark to experience. He wishes that Mark will feel a strong feeling of anger.

To what extent will Peter thinking in this way influence the amount of anger Mark feels?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

12. Peter is going round to Peter's house to use his computer. Peter hopes that Mark will stay late at work tonight so Peter can use the computer at Mark's house without being disturbed.

To what extent will Peter thinking in this way influence whether Mark stays late?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much



13. Peter wants Mark to feel guilty about leaving rubbish in the street for Peter to clear up. Peter concentrates on the sorts of guilty feelings he would like Mark to experience. Peter wishes that Mark will feel a very strong feeling of remorse.

To what extent will Peter thinking in this way influence the amount of guilt Mark feels?  
Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

14. Peter wants Mark to buy himself some new clothes to wear at Mark's party next week. Peter imagines Mark going to the shops and looking at some clothes. He thinks about Mark finding something smart and new and deciding to buy it.

To what extent will Peter thinking in this way influence whether Mark buys some new clothes?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

15. Peter has fallen out with a mutual friend of Mark's. Peter wishes that Mark will dislike this friend as well and will experience negative thoughts about him.

To what extent will Peter thinking in this way influence the way Mark might think?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

16. Peter would like Mark to win some money in the lottery this week. He thinks about Mark choosing his numbers, paying for the ticket and taking the ticket home. He imagines Mark in front of the television watching for his numbers and realising he has won. He wishes that Mark will win some money.

To what extent will Peter thinking in this way influence whether Mark wins any money?

Rate the degree of influence

0----- 1 ----- 2 ----- 3 ----- 4 ----- 5

Not at all- Very little- Little - Moderately- Much- Very much

Appendix 4

MOCI-R

Please rate each statement by putting a circle around the number that best describes how much you agree with the statement, or how much it is true of you. Please answer every item, without spending too much time on any particular item.

How much is each of the following statements true of you?	Not at all	A little	Some	Much	Very Much
1. I find it very difficult to make even trivial decisions.	0	1	2	3	4
2. Touching the bottom of my shoes makes me very anxious.	0	1	2	3	4
3. For me, thinking about making an obscene gesture feels as bad as actually doing it.	0	1	2	3	4
4. I feel compelled to check letters over and over before mailing them.	0	1	2	3	4
5. I am often upset by unwanted urges to harm myself.	0	1	2	3	4
6. I feel compelled to follow a very strict routine when doing ordinary things.	0	1	2	3	4
7. If I think of a relative/friend being in a car accident, this increases the risk that he/she will actually have a car accident.	0	1	2	3	4
8. My living space is unacceptably full of clutter because I have great trouble throwing things away.	0	1	2	3	4
9. I feel extremely contaminated if I touch an animal.	0	1	2	3	4
10. I worry far too much that I might upset other people.	0	1	2	3	4
11. I repeatedly experience the same unwanted thought or image about an accident.	0	1	2	3	4
12. One of my major problems is that I collect excessive amounts of useless things.	0	1	2	3	4
13. I repeatedly experience upsetting and unacceptable thoughts of a religious nature.	0	1	2	3	4
14. I tend to get behind in my work because I repeat things over and over again.	0	1	2	3	4
15. I excessively check and recheck things like taps and switches after turning them off.	0	1	2	3	4
16. I spend far too much time washing my hands.	0	1	2	3	4

How much is each of the following statements true of you?	Not at all	A little	Some	Much	Very Much
17. I try to put off making decisions because I'm so frightened of making a mistake.	0	1	2	3	4
18. I am often upset by my unwanted thoughts of using a sharp weapon.	0	1	2	3	4
19. I almost always count when doing a routine task.	0	1	2	3	4
20. If I think of a relative/friend falling ill this increases the risk that he/she will actually fall ill.	0	1	2	3	4
21. I am afraid to use even well-kept public toilets.	0	1	2	3	4
22. I repeatedly experience the same upsetting thought or image about death.	0	1	2	3	4
23. I feel upset if my furniture, ornaments, or other objects are not always in exactly the same position.	0	1	2	3	4
24. Having violent thoughts feels as unacceptable to me as violent acts.	0	1	2	3	4
25. I find that almost every day I am upset by unpleasant thoughts that come into my mind against my will.	0	1	2	3	4
26. I take an excessively long time to dress in the morning.	0	1	2	3	4
27. I am often upset by unwanted thoughts or images of sexual acts.	0	1	2	3	4
28. I often have trouble getting things done because I try to do everything exactly right.	0	1	2	3	4
29. I am frightened of having any contact with bodily secretions (blood, urine, sweat, etc.).	0	1	2	3	4
30. I often experience upsetting and unwanted thoughts about illness.	0	1	2	3	4
31. I feel strongly compelled to keep things like lots of empty boxes and newspapers just in case I need them later on.	0	1	2	3	4
32. I often feel compelled to memorize trivial things (e.g., licence plate numbers, instructions on labels).	0	1	2	3	4
33. My mean thoughts wishing a person harm can increase the chance that something harmful will actually happen to him or her.	0	1	2	3	4

How much is each of the following statements true of you?	Not at all	A little	Some	Much	Very Much
34. I often feel strong unwanted urges to drive or run into oncoming traffic.	0	1	2	3	4
35. I repeatedly check that my stove is turned off, even though I resist the urge to do so.	0	1	2	3	4
36. Having a blasphemous thought feels as sinful to me as a sacrilegious act.	0	1	2	3	4
37. I feel very dirty after touching money.	0	1	2	3	4
38. After I have decided something, I usually worry about my decision for a long time.	0	1	2	3	4
39. I often experience upsetting and unwanted thoughts about losing control.	0	1	2	3	4
40. I am often very late because I can't get through ordinary tasks on time.	0	1	2	3	4
41. I find it very difficult to touch garbage or garbage bins.	0	1	2	3	4
42. I spend a lot of time every day checking things over and over again.	0	1	2	3	4
43. I avoid using public telephones because of possible contamination.	0	1	2	3	4
44. I feel compelled to be absolutely perfect.	0	1	2	3	4
45. Having bad thoughts makes me feel like a terrible person.	0	1	2	3	4
46. One of my major problems is repeated checking.	0	1	2	3	4
47. I repeatedly experience upsetting and unwanted immoral thoughts.	0	1	2	3	4
48. I find it almost impossible to decide what to keep and what to throw away.	0	1	2	3	4
49. I am excessively concerned about germs and disease.	0	1	2	3	4
50. I am strongly compelled to count things.	0	1	2	3	4
51. I become very anxious when I have to make even a minor decision.	0	1	2	3	4

How much is each of the following statements true of you?	Not at all	A little	Some	Much	Very Much
52. For me, thinking bad things feels as bad as actually doing bad things.	0	1	2	3	4
53. I frequently have to check things (e.g., gas or water taps, doors, etc.) several times.	0	1	2	3	4
54. One of my major problems is that I am excessively concerned about cleanliness.	0	1	2	3	4
55. I am often very upset by my unwanted impulses to harm other people.	0	1	2	3	4
56. I spend far too long getting ready to leave home each day.	0	1	2	3	4
57. I repeatedly check that my doors or windows are locked, even though I resist the urge to do so.	0	1	2	3	4
58. If I have a thought or image of a bad thing happening to people I care about, it makes me feel that I have put them at risk.	0	1	2	3	4
59. One of my major problems is that I pay far too much attention to detail.	0	1	2	3	4
60. For me, thinking unkindly about a friend feels as disloyal as doing an unkind act.	0	1	2	3	4
61. I am often upset by unwanted thoughts or images of blurting out obscenities or insults in public.	0	1	2	3	4
62. Touching the floor frightens me.	0	1	2	3	4

Appendix 5

TAF SCALE

Please indicate using the key below how much you agree or disagree with the following statements. Place the number which corresponds with your answer in the brackets.

disagree strongly	= 0
disagree	= 1
neither agree nor disagree	= 2
agree	= 3
agree strongly	= 4

1. Thinking of making an extremely critical remark to a friend is almost as unacceptable to me as actually saying it. ( )
2. Having a blasphemous thought is almost as sinful to me as a blasphemous action. ( )
3. Thinking about swearing at someone else is almost as unacceptable to me as actually swearing. ( )
4. When I have a nasty thought about someone else, it is almost as bad as carrying out a nasty action. ( )
5. Having violent thoughts is almost as unacceptable to me as violent acts. ( )
6. When I think about making an obscene remark or gesture in church, is almost as sinful as actually doing it. ( )
7. If I wish harm on someone, it is almost as bad as doing harm. ( )
8. If I think about making an obscene gesture to someone else, it is almost as bad as doing it. ( )
9. When I think unkindly about a friend, it is almost as disloyal as doing an unkind act. ( )
10. If I have a jealous thought, it is almost the same as making a jealous remark. ( )
11. Thinking of cheating in a personal relationship is almost as immoral to me as actually cheating. ( )
12. Having obscene thoughts in a church is unacceptable to me. ( )
13. If I think of a relative/friend losing their job, this increases the risk that they will lose their job. ( )
14. If I think of a relative/friend being in a car accident, this increases the risk that he/she will have a car accident. ( )
15. If I think of a friend/relative being injured in a fall, this increases the risk that he/she will have a fall and be injured. ( )
16. If I think of a relative/friend falling ill this increases the risk that he/she will fall ill. ( )
17. If I think of myself being injured in a fall, this increases the risk that I will have a fall and be injured. ( )
18. If I think of myself being in a car accident, this increases the risk that I will have a car accident. ( )
19. If I think of myself falling ill, this increases the risk that I will fall ill. ( )



## Appendix 6

Jane is Laura's cousin who lives across the street from her. Sometimes, Jane experiences thoughts and worries that they might affect Laura's thoughts, feelings or behaviours. Even though you may not believe logically that thought can affect another's behaviour, have you ever worried that your thoughts might affect an event or another person?

1. Jane is in the house on her own and is watching her favourite television programme. Laura is driving back from a weekend away. Suddenly, out of the blue, Jane experiences the thought that Laura will be involved in a car accident.

Either now or in the past, how worried would you be that having this thought might affect whether the accident happened?

0----- 1 ----- 2 ----- 3 ----- 4 -----5  
Not Very slightly Slightly Quite Worried Very  
worried worried worried worried worried worried

2. Jane is looking after Laura's house while she is away on holiday. The thought flits across Jane's mind that Laura's house will be broken into while she is away and all her things will be stolen. Jane tries to ignore the thought, but it keeps popping into her mind and she cannot get it to go away.

Either now or in the past, how worried would you be that having this thought might affect whether the house was broken into?

0----- 1 ----- 2 ----- 3 ----- 4 -----5  
Not Very slightly Slightly Quite Worried Very  
worried worried worried worried worried worried

3. Jane is reading the newspaper at home and something reminds her of a time when Laura's boss at work was making cruel remarks to her. Briefly, Jane thinks about Laura remembering these types of comments.

Either now or in the past, how worried would you be that having this thought might affect whether a person remembered a past event?

0----- 1 ----- 2 ----- 3 ----- 4 -----5  
Not Very slightly Slightly Quite Worried Very  
worried worried worried worried worried worried

4. Jane is walking to work and a thought pops into her mind. Jane experiences the thought that Laura will stub her toe on the stairs this morning. Jane tries to ignore the thought and concentrate on all the work she has to do today.

Either now or in the past, how worried would you be that having this thought might affect whether someone hurt themselves?

0----- 1 ----- 2 ----- 3 ----- 4 -----5  
Not Very slightly Slightly Quite Worried Very  
worried worried worried worried worried worried

5. Jane is sitting in her living room watching the news on television. A report comes up about a bad car crash which happened yesterday. Suddenly, Jane experiences the thought that Laura will feel really sad about this.

Either now or in the past, how worried would you be that having this thought might affect whether someone felt sad?

0----- 1 ----- 2 ----- 3 ----- 4 -----5  
Not Very slightly Slightly Quite Worried Very  
worried worried worried worried worried

6. Jane briefly has the thought that Laura will have a huge argument with her husband. Either now or in the past, how worried would you be that having this thought might affect whether someone got into an argument?

0----- 1 ----- 2 ----- 3 ----- 4 -----5  
Not Very slightly Slightly Quite Worried Very  
worried worried worried worried worried

7. Jane is sitting at her desk at work. Suddenly the thought passes through her mind that Laura will be having a really bad day and will be feeling really down and depressed. Either now or in the past, how worried would you be that having this thought might affect whether someone felt depressed?

0----- 1 ----- 2 ----- 3 ----- 4 -----5  
Not Very slightly Slightly Quite Worried Very  
worried worried worried worried worried

8. Jane suddenly skids on some black ice. She feels frightened and pulls over to calm down. Briefly the thought enters her mind about a time when Laura was driving and skidded off the road and wonders whether Laura might remember this time. Either now or in the past, how worried would you be that having this thought might affect whether the a person remembered a past event?

0----- 1 ----- 2 ----- 3 ----- 4 -----5  
Not Very slightly Slightly Quite Worried Very  
worried worried worried worried worried

9. Jane is annoyed with Laura so she wishes that Laura will forget something important. Laura works in an office and travels to work by bus. Jane thinks about Laura leaving work in a hurry and leaving her bus pass in a drawer. Either now or in the past, how worried would you be that having this thought might affect whether someone forgot something?

0----- 1 ----- 2 ----- 3 ----- 4 -----5  
Not Very slightly Slightly Quite Worried Very  
worried worried worried worried worried

10. Jane is at home and it is a very stormy night. Jane can hear that tiles are blowing off her roof and that her TV aerial is broken. Jane hopes that she is not the only one this has happened to and secretly wishes that Laura's TV aerial will blow off as well.

Either now or in the past, how worried would you be that having this thought might affect whether this happened?

0----- 1 ----- 2 ----- 3 ----- 4 -----5  
Not Very slightly Slightly Quite Worried Very  
worried worried worried worried worried worried

11. It has been raining a lot recently. Laura has been boasting about her new bathroom and how nice it is. Jane feels a bit jealous and hopes that Laura will get a leak in her bathroom.

Either now or in the past, how worried would you be that having this thought might affect whether this happened?

0----- 1 ----- 2 ----- 3 ----- 4 -----5  
Not Very slightly Slightly Quite Worried Very  
worried worried worried worried worried worried

12. Jane wants Laura to feel angry about a noisy neighbour near them who plays loud music constantly. Jane wishes that Laura will feel a strong feeling of anger.

Either now or in the past, how worried would you be that having this thought might affect whether someone felt angry?

0----- 1 ----- 2 ----- 3 ----- 4 -----5  
Not Very slightly Slightly Quite Worried Very  
worried worried worried worried worried worried

13. Jane wants Laura to feel guilty about leaving rubbish in the street for Jane to clear up. Jane wishes that Laura will feel a strong feeling of remorse.

Either now or in the past, how worried would you be that having this thought might affect whether someone felt guilty?

0----- 1 ----- 2 ----- 3 ----- 4 -----5  
Not Very slightly Slightly Quite Worried Very  
worried worried worried worried worried worried

14. Jane has fallen out with a mutual friend of Laura's. Jane wishes that Laura will dislike this friend as well.

Either now or in the past, how worried would you be that having this thought might affect whether someone disliked someone?

0----- 1 ----- 2 ----- 3 ----- 4 -----5  
Not Very slightly Slightly Quite Worried Very  
worried worried worried worried worried worried

15. Laura owes Jane £40, but seems to have forgotten all about it. Jane feels embarrassed to ask for it back. Jane wants Laura to remember about the money she owes so she will pay it back soon and concentrates on the types of thoughts she would like Laura to experience. Either now or in the past, how worried would you be that having this thought might affect whether someone remembered about the money?

0----- 1 ----- 2 ----- 3 ----- 4 -----5  
Not Very slightly Slightly Quite Worried Very  
worried worried worried worried worried

16. Jane is going round to Laura's house to use the computer. Jane hopes that Laura will have to stay late at work so Jane can use the computer without being disturbed. Either now or in the past, how worried would you be that having this thought might affect whether someone stayed late?

0----- 1 ----- 2 ----- 3 ----- 4 -----5  
Not Very slightly Slightly Quite Worried Very  
worried worried worried worried worried