APPRAISALS OF INTRUSIVE THOUGHTS;
AN EXAMINATION OF THE COGNITIVE THEORY OF OBSESSIONS

by

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Abstract

Obsessive-compulsive disorder (OCD) is characterized by recurrent unwanted intrusive thoughts that evoke enormous distress and contribute to functional impairment. Cognitive theories of OCD posit that appraisals about the significance of thoughts are critical in the development and persistence of obsessions. In his theory, Rachman (1997) suggests that appraisals of unwanted thoughts distinguish clinical obsessions from normal intrusive thoughts; thoughts appraised as important and personally significant will be upsetting and recur. Moreover, cognitive theories propose that appraisals motivate thought suppression, which results in a paradoxical increase in the frequency of thoughts.

This dissertation project was designed to examine several key tenets of Rachman’s (1997) cognitive theory of obsessions. First, if appraisals of unwanted intrusive thoughts are relevant to OCD, a positive relationship should exist between appraisals and OCD symptomatology. To explore this hypothesis, nonclinical participants in Studies 1 and 2 read four vignettes, each portraying a prototypical obsession of aggressive, sexual, blasphemous, and racist themes, and indicated their appraisals about the personal significance of the intrusive thoughts. Questionnaires assessing obsessive-compulsive (OC) symptoms, OC beliefs, and depression were also administered. Results revealed that appraisals of the intrusive thoughts were related to subclinical OC symptoms and OC beliefs. Moreover, there was evidence that appraisals varied according to thought content and thought frequency.

Second, the cognitive theory of obsessions implicates thought suppression in the development and persistence of obsessions. The purpose of Study 3 was to investigate whether the effects of thought suppression would differ depending on the personal meaning of the target thought. Sixty high religious and 60 low religious participants were randomly
assigned to suppress or not suppress a blasphemous target thought. Number of thought recurrences, thought control effort, anxiety, and mood were assessed. Results revealed that appraisals of personal meaning, when combined with thought control effort, were associated with negative mood and increased anxiety. There was also partial support that thought suppression had differential effects on target thought frequency according to the personal meaning of the target thought. The implications of this research are discussed with a focus on the proposed role of appraisals in the development of intrusive thoughts.
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CHAPTER 1: INTRODUCTION

"The greatest discovery of my generation is that human beings can alter their lives by altering their attitudes of mind." – William James

Obsessive-compulsive disorder (OCD), which affects approximately 2 – 3% of adults (Karno, Golding, Sorenson, & Burnam, 1988), is an anxiety disorder characterized by frequent and disturbing obsessions and ritualistic compulsions. The obsessions, which consist of unwanted, intrusive thoughts, images, or impulses (American Psychiatric Association, 1994), are highly distressing and tend to provoke active resistance of the thought in the form of suppression and neutralization. While full blown obsessions are a unique characteristic of OCD, it has been well-established that most people experience unwanted intrusive thoughts (Rachman & de Silva, 1978; Salkovskis & Harrison, 1984). Whereas most people are not troubled by these thoughts and experience them only infrequently, patients with OCD report recurrent, disturbing obsessions that interfere with their functioning and quality of life (Antony, Roth, Swinson, Huta, & Devins, 1998; Khanna, Rajendra, & Channabasavanna, 1988; Koran, Thienemann, & Davenport, 1996). Recently proposed cognitive theories of OCD posit that dysfunctional appraisals about the significance of intrusive thoughts are critical in transforming “normal” unwanted intrusive thoughts into clinical obsessions (Rachman, 1997, 1998; Salkovskis, 1985; Salkovskis, Forrester, & Richards, 1998).

In his cognitive theory of obsessions, Rachman (1997; 1998) argues that obsessions develop when individuals “catastrophically misinterpret” the meaning and personal
significance of unwanted intrusive thoughts. These *dysfunctional appraisals* produce anxiety and distress and motivate active resistance of such thoughts. Cognitive theories of OCD further suggest that trying to control the thoughts is an ineffective strategy that contributes to a paradoxical *increase* in the occurrence of such thoughts (Wegner, Schneider, Carter, & White, 1987). Thus, Rachman proposes a model whereby intrusive thoughts become increasingly frequent over time when they are appraised as personally significant and actively resisted. The purpose of this dissertation project is to test several hypotheses from Rachman's cognitive theory of obsessions with a focus on appraisals. The first goal is to clarify whether dysfunctional appraisals of socially unacceptable intrusive thoughts are related to subclinical obsessive-compulsive symptoms. The second goal is to investigate the interaction of appraisals and suppression of obsession-like thoughts.

**Behavioural Theories of OCD**

Until fairly recently, behavioural models of OCD were predominant in the literature. The behavioural account asserts that OCD is maintained via an anxiety reduction circuit (Rachman & Hodgson, 1980), whereby compulsions are performed in an effort to reduce the anxiety produced by obsessions. For example, a person may become highly anxious after having an intrusive thought about getting contaminated from touching a dirty faucet. In response to this upsetting thought, the person may feel the urge to wash in order to reduce anxiety. These escape and avoidance strategies (i.e., compulsions and neutralization strategies) are negatively reinforced because they reduce anxiety associated with the intrusive thoughts (i.e., obsessions). These strategies are also believed to maintain anxiety by preventing the individual from learning that anxiety would diminish naturally and that the feared consequences are unlikely to happen. Thus, behavioural models of OCD propose that
obsessions provoke anxiety and that compulsions become highly rewarding because they
serve to decrease anxiety. While the behavioural model has received empirical support for
the connection between compulsions and anxiety reduction (Hodgson & Rachman, 1972;
Rachman, De Silva, & Roper, 1976; Roper, Rachman, & Hodgson, 1973), it is less
successful at explaining the origins of obsessions (Taylor, 2002).

Exposure and response prevention (EX/RP; Meyer, 1966) was developed as a
treatment for OCD based on the behavioural model of OCD. In EX/RP, patients with OCD
are exposed to their feared stimuli (for example, a dirty bathroom for a patient with
contamination obsessions) and prevented from performing compulsions. Through repeated,
prolonged exposure, the anxiety response is diminished and patients learn that their feared
outcomes do not occur. Behavioral treatments such as EX/RP have been very successful in
the treatment of OCD. In a recent review of outcome studies, Foa and Kozak (1996) reported
a response rate of 83% among more than 300 clients involved in the various studies of
exposure and response prevention. Furthermore, they reported that 76% of patients remained
responders at follow-up (mean length of follow-up was 2.4 years). However, when treatment
refusers and treatment dropouts were considered, treatment efficacy of EX/RP was closer to
50%. Moreover, EX/RP has been found to be less effective for patients who experience
obsessions without overt compulsions (Salkovskis & Westbrook, 1989).

**Cognitive Theories of OCD**

Cognitive theories of OCD have recently been proposed in an effort to redress some
of the limitations of prior models (Purdon & Clark, 1999; Rachman, 1997, 1998; Salkovskis,
1985). These theories differ from past conceptualizations of OCD in their emphasis on
metacognitive processes, or the way that people interpret and give meaning to their thoughts
Cognitive models of OCD focus on the role of appraisals, beliefs, and assumptions in the maintenance of obsessions and compulsions. Specifically, these theories posit that appraisals of unwanted intrusive thoughts mediate the relationship between the occurrence of intrusive thoughts and anxiety; only when individuals attach undue significance to their unwanted intrusive thought will they experience increased anxiety and the desire to resist or control their unwanted thoughts.

Salkovskis's Cognitive Theory of OCD

Salkovskis's (1985) cognitive analysis of OCD was the first major attempt to view OCD from a cognitive perspective, although earlier cognitive theories of OCD were proposed (Beck, 1976; Carr, 1974; McFall & Wollersheim, 1979). In his theory, Salkovskis (1985) argued that obsessions develop when intrusive thoughts interact with an individual’s belief system in such a way as to give rise to negative appraisals about the occurrence of the intrusive thoughts. Salkovskis believed that when intrusive thoughts are appraised as meaningful or important, anxiety and discomfort will be produced. In response to the increase in anxiety, individuals engage in compulsive rituals or acts of neutralization in order to decrease anxiety and negative affect. In contrast, when unwanted intrusive thoughts are appraised as unimportant, no anxiety will result.

In his model, Salkovskis (1985) proposed that dysfunctional appraisals related to responsibility predominate in OCD and suggested that individuals with OCD tend to believe that they will be responsible for harm coming to themselves or others if they fail to act in response to harm-related obsessions. Salkovskis defined responsibility appraisals as the “belief that one has power which is pivotal to bring about or prevent subjectively crucial negative outcomes” (Salkovskis, Rachman, Ladouceur, & Freeston, as cited in Salkovskis &
Kirk, 1997). For example, if in response to the intrusive thought, “I may have left the stove on,” individuals make the attribution that they would be personally responsible for their house burning down, they are more likely to feel increased anxiety and the desire to check the stove. Salkovskis suggested that other faulty appraisals commonly found in OCD include the idea that thoughts are equivalent to actions, that failing to prevent harm is as bad as causing harm, that failing to neutralize after an intrusion is the same as wishing that the intrusion were true, and that it is important to have control over one’s thoughts.

Salkovskis's model (1985) also placed an important role on the effects of neutralization in maintaining the obsessive-compulsive cycle. Neutralizing, which can be either overt (i.e., compulsions) or covert (i.e., mental rituals) is an attempt to undo, cancel out, or compensate for the effects of intrusive thoughts (Rachman, Shafran, Mitchell, Trant, & Teachman, 1996). Salkovskis asserted that there are several consequences of neutralization. First, he suggested that neutralization results in an immediate decrease in distress, which is highly rewarding and is likely to lead to increased use of neutralization in the future. Second, because the feared events are unlikely (or impossible), neutralization has the appearance of being effective for preventing harm. This effect, combined with the reduction in anxiety that accompanies neutralization, serves to strengthen the individual’s beliefs. Finally, Salkovskis suggested that the neutralizing behavior itself will become a triggering stimulus for future obsessions.

**Rachman’s Cognitive Theory of Obsessions**

Rachman (1997; 1998) proposed a more comprehensive cognitive theory of obsessions that builds upon the theory of Salkovskis (1985). Rather than focusing exclusively on appraisals of responsibility, Rachman outlined a theory suggesting that
appraisals about the *personal significance* of intrusive thoughts cause unwanted intrusive thoughts to develop into clinical obsessions. In his theory, Rachman (1997) argues that when unwanted intrusive thoughts are given undue importance or "exaggerated significance" (p. 794), they will become problematic and upsetting. Specifically, he states that "obsessions are caused by catastrophic misinterpretations of the significance of one’s thoughts (images, impulses). By deduction: (a) the obsessions will persist for as long as these misinterpretations continue; and (b) the obsessions will diminish or disappear as a function of the weakening/elimination of these misinterpretations" (Rachman, 1997, p. 793).

In this model, Rachman (1997) proposes that individuals first make judgments about the *meaning* of their unwanted intrusive thoughts, for example, “this thought is immoral” or, “this thought is disgusting.” Next, he suggests that individuals make appraisals about the *significance* or *personal meaning* of the intrusive thoughts. For example, individuals may interpret their unwanted intrusive thoughts to signify something important or revealing about their innermost character, such as, “these obsessions mean that deep down I am an evil person, I am dangerous, I am unreliable, I may become totally uncontrollable..., I am weird, I am going insane (and will lose control), I am a sinful person, I am fundamentally immoral” (Rachman, 1997, p. 794). Rachman argues that the most common types of problematic appraisals fall into one of three main categories: “these horrible thoughts mean I am mad, bad, or dangerous – or all three” (Rachman, 2003, p. 6).

This is a critical stage in the model; Rachman believes that while it is normal for people to find the content of their thoughts disturbing, it is considerably less common for people to appraise their thoughts as having exaggerated significance. Rachman further argues that appraisals about the significance of intrusive thoughts will result in mood
disturbance and anxiety, whereas unwanted intrusive thoughts that are interpreted as simply "mental flotsam" will be dismissed as unimportant and insignificant and will not lead to changes in mood or anxiety. The resulting negative mood only serves to increase the negative interpretations about the significance of the thoughts and may also increase the frequency of intrusive thoughts. Finally, as a result of appraisals of exaggerated significance and the subsequent anxiety and mood disturbance, Rachman posits that individuals will attempt to resist, suppress, or neutralize the obsessions in order to "put matters right" (Rachman, 1997, p. 795). In the short term, thought control strategies such as neutralization and suppression are believed to reduce distress and discomfort, making them highly rewarding. However, over time thought control strategies strengthen obsessions because they interfere with the natural reduction of anxiety, and they preserve the belief that the feared consequence would have occurred if not for the neutralization. Rachman also implicates thought suppression in the maintenance of obsessions, suggesting that thought suppression directly increases the frequency of obsessions due to the paradoxical effects of suppression.

Further contributing to the negative cycle, the increased frequency that can result from thought suppression and other thought control strategies in turn makes the unwanted thoughts seem even more important and personally meaningful. For example, it is not uncommon for patients to use the following logic in the interpretation of their thoughts: "The very fact that I am experiencing these thoughts so frequently suggests that they must be meaningful." In this way, a vicious cycle of dysfunctional appraisals, thought control strategies, and increased frequency of thoughts is established. In summary, Rachman proposes a model whereby the "catastrophic misinterpretation" of the significance of
thoughts is critical in the development or maintenance of obsessions. As he states, the “misinterpretation of the intrusive thoughts as being very important, personally significant, revealing and threatening or even catastrophic, has the effect of transforming a commonplace nuisance into a torment” (Rachman, 1997, p. 794).

There are a number of predictions that follow from Rachman’s cognitive theory of obsessions. First, the theory is based on the assumption that unwanted intrusive thoughts are similar in content to clinical obsessions and that appraisals of personal meaning distinguish normal unwanted intrusive thoughts from clinical obsessions. Based on this assumption, the theory predicts that appraisals of personal significance should be related to obsessive-compulsive symptoms. That is, “people who experience recurrent obsessions [should be] more likely than people who do not experience them, to attach important, personal significance to their intrusive thoughts” (Rachman, 1997, p. 793). Second, the theory predicts that the content of intrusive thoughts should influence dysfunctional appraisals depending on the individual’s background and personal values. For example, for highly religious individuals, unwanted intrusive thoughts of a blasphemous nature would be particularly upsetting and most likely to lead to negative interpretations, but nonreligious persons would not be expected to appraise such thoughts as personally relevant or significant even if they did occur. Third, thought control strategies should contribute to increased frequency of intrusive thoughts. Finally, the theory would predict that dysfunctional appraisals combined with thought control strategies such as thought suppression should result in increased anxiety, mood disturbance, and increased frequency of intrusive thoughts.

The following literature review will focus on research that is pertinent to Rachman’s theory of obsessions. Specifically, the relevant literature on unwanted intrusive thoughts,
dysfunctional appraisals of unwanted intrusive thoughts, and thought control strategies will be reviewed.

**Unwanted Intrusive Thoughts**

Once believed to be qualitatively distinct, there is now considerable evidence that clinical obsessions and "normal" unwanted intrusive thoughts are more alike than they are different. In their seminal series of studies, Rachman and de Silva (1978) found that nonclinical individuals experience unwanted intrusive thoughts of similar content to clinical obsessions. In their first study, 80% of nonclinical participants reported that they experienced intrusive thoughts or images. In their second study, Rachman and de Silva (1978) collected examples of intrusive thoughts from clinical (OCD) and nonclinical participants using a structured interview. A panel of six judges (5 psychologists and 1 psychiatrist) categorized the thoughts as nonclinical or clinical, but they were unable to make reliable distinctions between clinical obsessions and normal unwanted intrusive thoughts based on content alone. The investigators interpreted this result as suggesting that "clinical obsessions are not as readily discernible – even to experienced clinicians – as might be expected" (Rachman & de Silva, 1978, p.239).

Rachman and de Silva (1978) also examined the similarities and differences between obsessions reported by the clinical sample and unwanted intrusive thoughts reported by the non-clinical sample. In addition to the content similarities, unwanted intrusive thoughts were similar to clinical obsessions in form; both occurred as thoughts or impulses. However, clinical obsessions differed from unwanted intrusive thoughts in a number of important ways. Specifically, clinical obsessions were reported to occur more frequently, be more intense, be more ego-dystonic, produce more discomfort, and lead to greater urges to neutralize.
Many studies have since examined unwanted intrusive thoughts in normal populations, and these studies have confirmed that unwanted intrusive thoughts are a near-universal experience (e.g., Freeston, Ladouceur, Thibodeau, & Gagnon, 1991; Niler & Beck, 1989; Purdon & Clark, 1993; Salkovskis & Harrison, 1984). Studies also provide evidence that the unwanted intrusive thoughts reported by normal samples are on a continuum of severity with clinical obsessions. For example, Purdon and Clark (1993) reported a significant correlation between a measure of intrusions and a measure of obsessive-compulsive symptoms in a normal sample, suggesting that obsessions may be simply a more intense and distressing variant of an otherwise normal cognitive process. The results of these studies suggest that the unwanted intrusive thoughts of normal individuals can be studied as an analogue of clinical obsessions.

**Appraisals of Unwanted Intrusive Thoughts**

The key tenet of Rachman's cognitive theory of obsessions (1997) is that dysfunctional appraisals of unwanted intrusive thoughts contribute to an escalating cycle of increased anxiety, negative self-evaluation, urges to neutralize or suppress, and increased frequency of intrusive thoughts. According to Lazarus (1991), appraisals refer to the "evaluation of the significance of knowledge about what is happening for our personal well-being" (p. 354). Similarly, the Obsessive Compulsive Cognitions Working Group (OCCWG; 1997) defines appraisals as the "ways in which meaning is given to a specific event such as the occurrence of an intrusion" (p. 670). The OCCWG contrasts appraisals with assumptions, which they define as enduring, trait-like beliefs. Appraisals of personal significance take on different forms, such as appraisals about the importance of an intrusion (i.e., "because I've had this thought, it must be important"), appraisals about the probability
of the intrusion actually occurring (i.e., “because I’ve had this thought, the negative event is more likely to happen” or “having a bad thought is equivalent to committing the bad deed”), and appraisals related to responsibility (i.e., “because I’ve had this bad thought, I must act to prevent the event from occurring”).

Consistent with Rachman’s theory, people with OCD appraise their intrusive thoughts as more personally significant than do individuals without OCD (OCCWG, 2001, 2003, 2005). In a series of studies conducted by the OCCWG, OCD patients, anxiety controls, and nonclinical control participants completed the Interpretation of Intrusions Inventory (III-31), a well-validated instrument designed to measure dysfunctional appraisals of idiosyncratic intrusive thoughts. Across all three studies, OCD patients scored higher on the III-31 than did the nonclinical and anxiety disorder controls, demonstrating that they endorsed faulty appraisals of their obsessional thoughts to a greater extent than did the other groups. However, OCD patients did not score higher on the importance of thoughts subscale than did the anxiety disorder control patients (OCCWG, 2003), suggesting that appraisals about the importance of thoughts may not be unique to OCD or that the III-31 does not adequately articulate the aspects of importance of thoughts that are unique to OCD.

Endorsement of appraisals of intrusive thoughts has also been found to correlate with obsessive-compulsive symptoms. In the OCCWG (2001; 2003; 2005) studies described above, a significant relationship was found between OCD patients’ scores on the III-31 and their scores on well-validated measures of OCD symptomatology, including the Yale-Brown Obsessive Compulsive Scale (Goodman et al., 1989) and the Padua Inventory (Sanavio, 1988). This relationship was also found within nonclinical control groups. In a study of normal undergraduates, Purdon and Clark (1994a) reported that perceived uncontrollability
of unwanted thoughts was related to the belief that the thought could come true in real life. High scorers on a measure of obsessive-compulsive symptoms were more likely to believe the thought could come true in real life, and they endorsed stronger feelings of guilt in response to the thought. Other appraisal domains that correlate with OCD symptoms include appraisals that one could act on the intrusive thought (Purdon & Clark, 1994a, 1994b), appraisals about control (Purdon & Clark, 1994a), appraisals of responsibility (Freeston, Ladouceur, Thibodeau, & Gagnon, 1992), and appraisals about the significance of the thought for one’s personality (Clark & Claybourn, 1997).

Neutralization and Thought Suppression

In the cognitive theory of obsessions, Rachman argues that people engage in thought control strategies such as neutralization and thought suppression in an effort to reduce the discomfort produced by unwanted intrusive thoughts. These thought control strategies, in turn, are believed to contribute to anxiety, negative mood, and the persistence of obsessions because perfect thought control is impossible.

Typical thought control strategies fall into three main categories: escape and avoidance strategies, thinking attentively strategies, and no effortful response (Freeston et al., 1991). Furthermore, people tend to engage in many different strategies in response to their intrusive thoughts (Freeston, Ladouceur, Provencher, & Blais, 1995), including distraction, seeking reassurance, physical action, replacing the intrusive thought with another thought, analyzing the thought, talking about the thought, thought stopping, trying to convince oneself that the thought is unimportant, and doing nothing (Freeston et al., 1995; 1994a). These strategies are very similar to those used by OCD patients (Freeston & Ladouceur, 1997), although OCD patients tend to engage in a greater number of response strategies, spend
longer attempting to control their thoughts, and engage in more repetitions than do individuals without OCD (Ladouceur et al., 2000).

**Thought Suppression**

Thought suppression is a commonly used thought control strategy that is believed to directly contribute to an increase in the frequency of thoughts and ultimately to the development and maintenance of OCD. Thought suppression is the attempt to block, stop, or otherwise rid the mind of the intrusive thought, which can include strategies such as thought-stopping or concentrating on a different topic (Rachman et al., 1996). In his writings, Wegner defines thought suppression as the “conscientious avoidance of a thought” (Wegner et al., 1987, p. 6). Rachman argues that when individuals make “catastrophic” appraisals of the significance of a thought, they are motivated to actively resist these thoughts, often employing thought suppression strategies. Considerable evidence suggests that suppression strategies may paradoxically increase the frequency of thoughts.

The ironic effects of thought suppression were first investigated by Wegner and colleagues (1987). In this classic study, participants who were instructed to suppress thoughts of a white bear experienced a greater frequency of target thoughts than did participants instructed to express the thoughts from the outset. This higher frequency of target thoughts was found when participants were attempting to actively suppress the thoughts (the “immediate enhancement” effect) as well as when suppression instructions were later removed and participants were told to freely express the thoughts (the “rebound” effect).

Since the publication of this first thought suppression study, a considerable body of literature has emerged replicating the ironic effects of thought suppression (Clark, Ball, &
Pape, 1991; Clark, Winton, & Thynn, 1993; Harvey & Bryant, 1998; McNally & Ricciardi, 1996; Wegner & Gold, 1995), with most studies finding evidence of thought rebound following a period of suppression. However, the thought suppression literature has been mixed, with some studies finding no evidence of a paradoxical effect of suppression (see Abramowitz, Tolin, & Street, 2001; Purdon & Clark, 2000; Wenzlaff & Wegner, 2000, for thorough reviews of this literature). In a recent meta-analysis, Abramowitz and colleagues (2001) examined 44 thought suppression studies and found a small to moderate effect size for the rebound effect (Cohen’s $d = 0.30$) but no evidence for an initial enhancement effect (Cohen’s $d = -0.35$). In other words, the results of the meta-analysis suggest that individuals are relatively successful at suppressing a thought when initially instructed to do so. However, once suppression instructions are removed, individuals who initially suppressed thoughts tend to experience a higher frequency of target thoughts relative to those who did not engage in suppression.

**Thought Suppression of Personally Relevant Thoughts**

Researchers interested in OCD have attempted to study thought suppression as a potential factor in OCD by extending the thought suppression paradigm to thoughts that are of greater relevance to OCD (i.e., suppression of personally relevant thoughts), thoughts that are more similar in nature to obsessions, and by directly studying thought suppression in OCD patients. In contrast to obsessions, which are personally relevant and upsetting, the early thought suppression studies examined suppression of novel, neutral targets such as “white bears” (Wegner et al., 1987) and “green rabbits” (Clark et al., 1993). Within the past decade, research has emerged demonstrating that the paradoxical effects of suppression may
extend to thoughts with obsessional or personally relevant content (McNally & Ricciardi, 1996; Salkovskis & Campbell, 1994; Trinder & Salkovskis, 1994).

Salkovskis and colleagues conducted two well-designed, ecologically valid studies investigating suppression of personally relevant intrusive thoughts. In the Salkovskis and Campbell (1994) study, nonclinical participants reporting at least three intrusive thoughts in the past month identified an upsetting intrusive thought and were assigned to one of four suppression conditions (regular suppression, suppression with general instructions to distract, suppression with a specific distraction technique, and suppression with instructions to not use distraction) or a mention control condition (think about anything, including the target thought). Compared to the mention control condition, suppression of personally relevant negative thoughts resulted in a greater frequency of target thoughts during the suppression interval and after the suppression instructions were lifted. In addition, almost all suppression conditions resulted in a higher frequency of target thoughts than the control condition, with the exception of participants instructed to use a specific distraction technique. In an extension of this study, Trinder and Salkovskis (1994) examined the long-term consequences of suppression of personally relevant intrusive thoughts. In this study, participants were assigned to suppress, monitor, or actively think about a personally relevant intrusive thought over a four-day period. Relative to the other two groups, participants who actively suppressed thoughts reported more frequent intrusions and increased distress across all four days. In a study comparing suppression of neutral thoughts to personally relevant intrusive thoughts, McNally and Ricciardi (1996) found a rebound effect for negative personally relevant thoughts but not for neutral thoughts.
In contrast, several studies examining suppression of personally relevant thoughts failed to replicate the paradoxical effect of suppression. Kelly and Kahn (1994) examined the suppression of negative personally relevant thoughts compared to neutral “white bear” thoughts. For participants in the neutral thought condition, but not the personally relevant thought condition, initial suppression was associated with a rebound in thought frequency during the second interval. Rutledge (1998) also failed to find evidence of a rebound effect for personally relevant thoughts. In this study, all participants completed three thought monitoring intervals; an initial active expression interval which served as a baseline interval, a suppression interval, and a final expression interval. Compared to the baseline expression interval, no paradoxical effect of suppression was found. However, the results of this study are difficult to interpret without a control group. Similarly, Smari, Birgisdottir, and Brynjolfsdottir (1995) found no evidence of a rebound effect, though they reported that participants high in obsessionality had more thoughts during suppression than their low obsessionality counterparts.

Methodological differences likely contribute to the contradictory results across studies and make comparisons difficult. Thought suppression studies have employed different research designs, participants, control conditions (expression, mention-control, do not suppress), target thoughts, recording methods, and length of thought monitoring intervals. On the basis of qualitative and quantitative reviews, Abramowitz and colleagues (2001) and Purdon and Clark (2000) proposed methodological recommendations to maximize effect sizes and relevance to OCD, such as inclusion of ecologically valid control conditions, thoughts with obsessional content, and methods of recording thoughts that are less sensitive to response bias.
Studies conducted with the inclusion of these methodological recommendations suggest that even when suppression does not lead to an increase in personally relevant thoughts, it may interfere with the natural decrease of such thoughts. In one such study, Purdon and Clark (2001) compared the effects of suppressing positive personally relevant, negative personally relevant, and neutral thoughts. Specific “do not suppress” instructions were used in an attempt to discourage participants in the control condition from engaging in natural suppression attempts. While there was no evidence of enhancement or rebound for any of the target thoughts, the researchers noted that suppression eliminated the natural decay in frequency observed among participants under nonsuppression instructions. Similarly, Belloch and colleagues (2004) reported that participants in control conditions showed a decline in target thought frequency across three periods. In contrast, participants in the suppression conditions reported similarly high levels of target thoughts across all intervals, suggesting that thought suppression may interfere with the normal decline in the frequency of personally relevant thoughts.

Thought Suppression in OCD

Some experimental thought suppression studies have been conducted with OCD patients. Janeck and Calamari (1999) explored the effect of suppressing personally relevant intrusive thoughts in 32 OCD patients and 33 normal controls. Contrary to the hypothesis, OCD patients did not show a stronger paradoxical effect of thought suppression than normal controls. However, OCD patients were more likely than normal controls to experience a rebound of their thoughts. Purdon, Rowa, and Antony (2005) reported similar findings. Fifty individuals with OCD were primed with their most upsetting obsessional thought and were instructed to suppress or not suppress the thought. No effect of suppression was found.
In contrast, Tolin, Abramowitz, Przeworski, and Foa (2002) compared OCD, anxiety controls, and normal controls on the suppression of neutral “white bear” thoughts and observed a rebound effect only for the OCD participants. In a second study, OCD participants instructed to suppress showed a faster response time to “white bear” targets in a lexical decision task than to distracter words or nonwords.

While more studies are needed with clinical samples, the results of the current studies of OCD patients show some evidence of a paradoxical effect for neutral thoughts (Tolin et al., 2002), but less evidence of rebound for personally relevant thoughts (Janeck & Calamari, 1999; Purdon et al., 2005). At first blush, these results suggest that thought suppression may not be an important mechanism in the persistence of obsessions. However, Tolin et al. (2002) argue that OCD patients develop comprehensive strategies to resist their obsessions, which may allow them to more effectively control their obsessions within a short-term laboratory setting. Another possibility is that OCD patients may actively resist their own obsessions in the context of a thought suppression study even when instructed to not suppress their thoughts. Therefore, it is possible that personally relevant obsessions are less likely to demonstrate the ironic effects of suppression in laboratory studies.

Thought Suppression, Appraisals, and Negative Affect

Rachman (1997, 1998) posits that negative affect (dysphoria and anxiety) are consequences of this cycle of appraisals of personal significance, thought suppression, recurrences of the target thought, and strengthening of the original appraisals. A similar view was proposed by Purdon and Clark (1993; 1999; 2001), who suggest that appraisals about failures of thought control will contribute to negative mood and distress. To test this idea, Purdon (2001) examined whether appraisals of the importance of controlling thoughts,
thought-action fusion, and ego-dystonicity would predict anxiety, mood, and thought frequency in a thought suppression task. Eighty-four students were randomly assigned to suppress or not suppress their most upsetting intrusive thought. After finishing the task, participants completed a questionnaire measuring appraisals of target thought recurrences during the thought suppression task. Although no paradoxical effect of thought suppression was evident for target thought frequency, negative appraisals of target thought recurrences during the suppression task predicted negative affect following the task. Specifically, anxiety and dysphoria were predicted by appraisals about the likelihood of the thought coming true and appraisals about the extent to which thought recurrences indicated something negative about the self.

Using this same questionnaire in a study with OCD patients, Purdon and colleagues (2005) found that appraisals about thought recurrences predicted anxiety and discomfort ratings following thought suppression. Specifically, appraisals about the thought coming true in real life or indicating negative features of one's personality were associated with greater discomfort, and appraisals about the need to control thoughts were related to negative mood. In a different study, the total frequency of thoughts reported during a suppression task was associated with negative appraisals of being out of control and dislike of the thought (Kelly & Kahn, 1994).

Summary of Thought Suppression Studies

While there has been considerable interest in examining whether the ironic effects of suppression can be studied as a causal factor involved in OCD, research has shown mixed support for a relationship between suppression and increased frequency of personally relevant thoughts. Although a number of studies have replicated the paradoxical effects of
suppression with personally relevant thoughts (McNally & Ricciardi, 1996; Salkovskis & Campbell, 1994; Trinder & Salkovskis, 1994), some have found that suppression interferes with the natural decrease in thought frequency (Belloch et al., 2004; Purdon & Clark, 2001), and others have found no negative effects of suppression for personally relevant thoughts (Kelly & Kahn, 1994; Rutledge, 1998). Also pertinent to cognitive theories of obsessions, however, is the important finding that perfect thought suppression is impossible. No study has reported complete elimination of target thoughts through suppression, meaning that thought suppression efforts inevitably fail. There is a growing body of literature examining the relationship between (failed) attempts to suppress personally relevant thoughts and subsequent negative affect.

**The Present Study**

The purpose of this dissertation project is to test several hypotheses from Rachman’s (1997, 1998) cognitive theory of obsessions as they relate to a nonclinical population. Specifically, this project was designed to examine Rachman’s assertion that appraisals of personal significance of intrusive thoughts are important in the persistence of obsessions. The goals of this project were two-fold. First, if appraisals of unwanted intrusive thoughts are relevant to OCD, a positive relationship should exist between appraisals of socially unacceptable thoughts (similar to obsessions) and OCD symptomatology. Thus, the aim of the first two studies was to determine whether appraisals of prototypical obsessive thoughts were related to obsessive compulsive symptoms in a nonclinical sample. Whereas previous studies established a relationship between appraisals and obsessive compulsive symptoms, no studies to date have examined how nonclinical participants appraise intrusive thoughts more typical of obsessions. Studies 1 and 2 also examined whether appraisals of intrusive thoughts
would vary as a function of two theoretically important variables, thought content and thought frequency.

Second, Rachman’s cognitive theory of obsessions posits that appraisals of personal significance motivate thought control efforts, which together result in negative affect and recurrence of the unwanted thoughts. In contrast, when intrusive thoughts are appraised as unimportant, the cognitive theory predicts that individuals should be less motivated to control their thoughts, experience less anxiety and negative mood, and be less likely to experience thought recurrences. In order to examine these hypotheses, the third study was designed to investigate the interaction of appraisals and thought suppression on obsession-like thoughts. Specifically, the third study examined whether thought suppression would have differential effects depending on the personal meaning of the target thought.
CHAPTER 2: STUDIES 1 AND 2

The purpose of Studies 1 and 2 was to examine whether the previously established relationship between appraisals and OCD symptoms would remain even when intrusive thoughts more typical of OCD were employed. Previous studies have provided evidence of a relationship between dysfunctional appraisals of personally relevant intrusive thoughts and OC symptoms (Clark & Claybourn, 1997; Freeston et al., 1992; OCCWG, 2001, 2003, 2005; Purdon & Clark, 1994a, 1994b). However, one potential confound of previous studies is that the content and severity of the thoughts reported by OCD patients may differ from that reported by normal controls, which may artificially increase the correlation between appraisals and OCD symptoms.

Although it has been well-established that the vast majority of people experience unwanted intrusive thoughts of similar content to those reported by individuals with OCD (Rachman & de Silva, 1978; Salkovskis & Harrison, 1984), the typical intrusive thoughts reported by nonclinical participants tend to be less abhorrent and less socially unacceptable than the types of thoughts most commonly reported by patients with OCD. For example, in studies conducted with nonclinical samples, the most commonly reported intrusive thoughts include: “running the car off the road,” “leaving the heat or stove on thereby causing an accident” (Purdon & Clark, 1994a), “leaving the house without doing something important to prevent burglary or accident”, “when using a sharp object that I will slit my wrist or throat or otherwise harm myself” or “saying something rude or insulting to others” (Clark, Purdon, & Byers, 2000). In contrast, typical obsessions reported by OCD patients include examples such as: “I will push an elderly man under the oncoming train,” “I will stab my mother,” “I will sexually molest a young child,” and “I will shout foul, obscene language in church”
(examples from Rachman, 2003, pp. 5 - 6). Therefore, it could be argued that nonclinical individuals endorse fewer dysfunctional appraisals of their own intrusive thoughts simply because the thought content is less socially unacceptable than that reported by OCD patients. This problem was highlighted by the OCCWG (2001), who noted that nonclinical participants had more difficulty identifying personal examples of intrusive thoughts, and therefore endorsed fewer dysfunctional appraisals of these thoughts, artificially inflating the correlation between appraisals and OC symptoms. In order to address this potential confound in the literature, Studies 1 and 2 were designed to examine how nonclinical individuals appraise thoughts more typical of OCD.

In addition, few studies have examined whether the content of intrusive thoughts is related to appraisals of personal significance despite the fact that the content of obsessions is known to vary considerably across the disorder. The most common themes found in obsessions are those of aggression, blasphemy, and unacceptable sexual thoughts (Rachman, 1998; Rachman & Hodgson, 1980) Given the heterogeneity of the content of obsessions, Clark and colleagues (2000) argued that obsessional content should be more closely considered in appraisal studies to determine whether thematic content will influence appraisals. In one of the few studies to do so, Clark and colleagues (2000) found that the content of intrusive thoughts differentially influenced appraisals. Specifically, differences emerged between appraisals of unacceptable sexual and non-sexual intrusive thoughts and the controllability of such thoughts. The results of the Clark et al. study provide preliminary evidence that the thematic content of intrusive thoughts may influence resulting appraisals and suggest that content is an important variable to consider in future studies.
Another variable that is likely to influence appraisals of intrusive thoughts is thought frequency. The clinical obsessions of patients with OCD are significantly more frequent than the intrusive thoughts of nonclinical participants (Rachman & de Silva, 1978). In their seminal study, Rachman and de Silva (1978) reported that patients with OCD experienced obsessive thoughts on average 10 times per day, compared to the nonclinical frequency of less than once per day, or even less than once per week. This considerable difference in frequency between clinical obsessions and nonclinical intrusive thoughts may be at least partially responsible for the differences in appraisals between nonclinical individuals and patients with OCD.

The purpose of Studies 1 and 2 was to investigate whether the relationship between appraisals of personal significance and OCD symptoms would remain when nonclinical individuals were asked to evaluate intrusive thoughts more typical of OCD. Moreover, these studies were designed to determine whether differences would emerge in appraisals of personal significance depending upon thematic content and frequency of the intrusive thoughts. In both studies, participants read vignettes portraying prototypical obsessive thoughts covering themes of aggression, blasphemy, racism, and sex. Vignettes are frequently used in the study of OCD as they provide a means for assessing how nonclinical individuals interpret situations that feature in obsessions (e.g., Riskind, Abreu, Strauss, & Holt, 1997). In Study 1, participants indicated their appraisals of each vignette, and analyses explored the relationship between appraisals and OCD symptomatology. Moreover, the appraisal ratings for each vignette were compared to examine whether appraisals varied as a function of thematic content. The aim of Study 2 was to replicate the results of Study 1 and to explore the impact of thought frequency on appraisals of obsessive thoughts.


**Study 1**

The goals of Study 1 were to investigate how nonclinical participants appraise prototypical obsessions, to explore the relationship between appraisals and obsessive compulsive symptoms, and to examine whether appraisals of personal significance would vary according to the thematic content of the obsessions. To explore these questions, nonclinical participants read four vignettes depicting prototypical obsessions covering aggressive, blasphemous, racist, and unacceptable sexual themes, and they completed appraisal ratings for each obsessive thought. The inclusion of four different themes allowed for a direct examination of whether appraisals would vary according to the content of the intrusive thoughts.

Two versions of the vignettes were used in the study; a "Self" version, in which participants imagined that they experienced the unwanted thoughts, and an "Other" version, in which participants imagined that a close friend experienced the thoughts. This manipulation was included based on previous evidence that people tend to view the potential consequences of an intrusive thought more negatively if they feel they are responsible rather than if someone else is responsible (Menzies, Harris, Cumming, & Einstein, 2000). In addition, examining how normal individuals are likely to respond to prototypical obsessions is of clinical utility. Patients with OCD tend to conceal their obsessions, often out of the concern that they will be judged negatively (Newth & Rachman, 2001). In cognitive treatments of OCD, patients are encouraged to discuss the content of their obsessions with trusted friends and family members in order to help normalize the experience and to confirm that others will not judge them negatively. Yet no research to date has investigated how
nonclinical individuals are likely to appraise prototypical obsessions. Thus, the inclusion of an “Other” version of the vignettes allowed for the empirical investigation of this question.

Three primary research questions guided this study. First, are appraisals of the obsession-like unwanted thoughts correlated with obsessive-compulsive symptoms among normal individuals? Based on the results of previous studies, participants’ appraisals of the obsessive thoughts portrayed in the vignettes were expected to be associated with obsessive-compulsive symptoms, and participants with a high level of obsessive-compulsive symptoms were expected to endorse more dysfunctional appraisals of the vignettes than were participants with few obsessive-compulsive symptoms. Second, among normal individuals, do appraisals vary depending on the thematic content of unwanted thoughts? Third, will identity (self or other) influence appraisals of the unwanted thoughts? Participants who read the “Other” vignettes were expected to endorse fewer OC appraisals of the vignettes than those who read the “Self” vignettes.

Method

Participants

Participants were 122 members of the university community. Participants were recruited from the Department of Psychology participant pool and from posters placed around the university campus. Participants received bonus course credit or $10 remuneration for participation in the study. The mean age of the participants was 21.4 years (SD = 5.53), and 63.9% of the participants were women. Of participants who reported their ethnic or racial group, 43.8% identified themselves as Caucasian, 47.1% identified as Asian, and 9.0% identified other racial or ethnic backgrounds.
Measures

**Vignette Appraisal Ratings.** Four vignettes were created for the purpose of this study. Each vignette portrayed an example of a prototypical obsession, covering unwanted aggressive ("impulse to stab your niece with a sharp kitchen knife"), blasphemous ("image of urinating on the Bible"), racist ("the thought 'Nigger!' intrudes into your mind"), and unacceptable sexual ("thought about having sex with your brother") themes. Participants were randomly assigned to receive one of two nearly identical versions of the vignettes; half received a "Self" version in which they were asked to imagine that they experienced the unwanted intrusive thoughts, and the other half received an "Other" version in which they were instructed to imagine that a close friend experienced the unwanted intrusive thoughts.

Participants completed sixteen questions assessing dysfunctional appraisals of each intrusive thought. For these questions, participants rated the degree to which they agreed with each statement, on a scale from 0 ("not at all") to 8 ("totally/definitely"). These questions assessed appraisal domains related to personal significance, including personal meaning (e.g., "To what extent does this thought reveal something important about you?"); thought-action fusion (e.g., "To what extent is having this thought just as bad as acting on it?"); disapproval (e.g., "To what extent do you find this thought disturbing?"); uncontrollability (e.g., "To what extent does this thought mean that you might lose control and do something awful?"); threat (e.g., "To what extent does this thought mean that you are a dangerous person?"); and negative self-evaluation (e.g., "To what extent does this thought mean that you are a bad, wicked person?"). Ten of the 16 questions were drawn from the Personal Significance Scale (PSS; Rachman, 2003). The remaining questions were developed for the purpose of this study and were based on questionnaires commonly used to
assess obsessive-compulsive appraisals, including the Distressing Thoughts Questionnaire (DTQ; Clark & de Silva, 1985), the Thought Action Fusion scale (TAF; Shafran, Thordarson, & Rachman, 1996), and the Responsibility Interpretations Questionnaire (RIQ; Salkovskis et al., 2000). An additional question measuring thought acceptability, “How bad or evil do you think this thought is?” was rated on a 0 – 100 scale.

In addition to the vignette appraisal ratings, participants completed three measures of obsessive-compulsive metacognition, one measure of obsessive-compulsive symptoms, and one measure of depression.

**Interpretation of Intrusions Inventory.** The Interpretation of Intrusions Inventory (III-31; OCCWG, 2001) was included to measure participants’ appraisals of their personal unwanted intrusive thoughts. The III-31 consists of 31 questions designed to measure the meaning and significance people assign to their unwanted intrusive thoughts. The III-31 provides a thorough definition of unwanted intrusive thoughts and instructs participants to list two personal examples. After identifying unwanted intrusive thoughts, participants rate how recently they experienced the intrusive thoughts, how frequently they experience the intrusive thoughts, and the level of distress caused by such thoughts. Finally, they rate the degree to which they believe each of 31 statements relating to their intrusive thoughts on a scale from 0 (“I did not believe this idea at all”) to 100 (“I was completely convinced this idea was true”). Examples of appraisal statements included on the III-31 are: “Having this intrusive thought means that I could lose control of my mind;” “Having this intrusive thought means I am a terrible person;” and “The more I think about these things, the greater the risk they will come true.”
The III-31 was designed to measure three theoretically derived subscales: appraisals of responsibility, over-importance of thoughts, and control of intrusions. However, the subscales are highly intercorrelated and the OCCWG recommends using only the total score (OCCWG, 2005). The III-31 has demonstrated good to excellent internal consistency, ranging from $\alpha = .79$ to $\alpha = .93$ (OCCWG, 2003). It has shown good test-retest reliability, with reliability coefficients ranging from $r = .64$ to $r = .68$ (OCCWG, 2003). The III-31 has also demonstrated good convergent validity with other measures of obsessionality (OCCWG, 2003), but its discriminant validity is less strong as it showed overlap with measures of general anxiety and depression.

**Obsessive Beliefs Questionnaire.** A short form of the Obsessive Beliefs Questionnaire (OBQ-44; OCCWG, 2003) was used to assess OC beliefs. Whereas the III-31 measures how individuals appraise specific unwanted intrusive thoughts, the OBQ-44 measures more general belief domains and assumptions. The OBQ-44 consists of 44 questions covering three empirically-derived subscales: 1) responsibility for harm, 2) perfectionism and intolerance for uncertainty, and 3) importance and control of thoughts. For example, OBQ-44 questions include: “For me, not preventing harm is as bad as causing harm”, “If I have aggressive thoughts or impulses about my loved ones, this means I may secretly want to hurt them”, and, “I should be upset if I make a mistake.” Participants rate the degree to which each statement reflects the way that they think most of the time, on a 7-point Likert scale.

The OBQ-44 has demonstrated good to excellent internal consistency in both clinical and nonclinical samples, with Cronbach alphas ranging from .89 - .95 (OCCWG, 2005). The OBQ has been found to discriminate OCD patients from individuals with other anxiety
disorders and nonclinical samples (OCCWG, 2005), providing evidence of its criterion validity. In addition, the OBQ-44 demonstrates good convergent validity with the Padua Inventory (Sanavio, 1988), a measure of OCD symptoms, and it has demonstrated some evidence of discriminant validity. Although no information is currently available on the test-retest reliability of the OBQ-44, the full version of the Obsessive Beliefs Questionnaire (OBQ-87; OCCWG, 2001) has demonstrated good test-retest reliability, ranging from \( r = .67 \) to \( r = .82 \) in a student sample (OCCWG, 2003). Given that the three subscales of the OBQ-44 are highly correlated with both the total score and with each other, only the total score was used in this study.

**Thought-Action Fusion Scale.** The Thought-Action Fusion Scale (TAF; Shafran et al., 1996) was included to measure beliefs related to thought-action fusion. Thought-action fusion refers to two distinct beliefs: having unacceptable thoughts is equivalent to engaging in the behaviour (Moral TAF); and thinking about negative events makes the events more likely to occur (Likelihood TAF). For each of the 19 statements, participants indicate their agreement on a 5-point Likert scales. Examples of statements include: “Having a blasphemous thought is almost as sinful to me as a blasphemous action,” and “If I think of myself being in a car accident this increases the risk that I will have a car accident.” The TAF has demonstrated good internal consistency, with Cronbach alphas ranging from .75 - .96 (Rassin, Merckelbach, Muris, & Schmidt, 2001; Shafran et al., 1996). In addition, Rassin and colleagues (2001) report that the TAF possessed moderate test-retest reliability \( (r = .52) \) and demonstrated significant correlations with other measures of obsessionality including the MOCI and Padua Inventory.
Obsessive-Compulsive Inventory - Revised. Symptoms of obsessive-compulsive disorder were assessed with the Obsessive-Compulsive Inventory – Revised (OCI-R; Foa et al., 2002; Hajcak, Huppert, Simons, & Foa, 2004). The OCI-R is an 18-item abbreviated version of the original Obsessive-Compulsive Inventory (OCI; Foa, Kozak, Salkovskis, Coles, & Amir, 1998). On a scale from 0 (not at all) to 4 (extremely), participants rate the extent to which they have been distressed or bothered by OCD symptoms within the past month. The OCI-R total score demonstrates excellent internal consistency, ranging from Cronbach’s alphas of .81 (Foa et al., 2002) to .88 (Hajcak et al., 2004), and excellent test-retest reliability ($r = .82$; Foa et al., 2002). Hajcak and colleagues (2004) report moderate convergent validity with another measure of OCD symptoms, the Maudsley Obsessive-Compulsive Inventory (Hodgson & Rachman, 1977), and excellent convergent validity with the Padua Inventory (Sanavio, 1988). In addition, the OCI-R was found to be a distinct construct from depression and worry, providing evidence of its discriminant validity.

The OCI-R provides empirically derived cut-off scores making it useful for discriminating between individuals likely to receive a diagnosis of OCD and those unlikely to receive such a diagnosis. Foa and colleagues (2002) reported that a cut-off score of 21 achieved the best sensitivity and specificity for discriminating between an OCD sample and a normal control sample. At this cut-off score, the OCI-R achieved a sensitivity of 65.6% and a specificity of 63.9%. A cut-off score of 21 was used in the current study to classify participants as high versus low on obsessive-compulsive symptomatology.

Beck Depression Inventory (BDI-II). The Beck Depression Inventory (BDI-II; Beck, Steer, & Brown, 1996) is a 21-item self-report inventory. It is one of the most commonly used self-report measures of depression, and is accepted to be one of the better measures of
this construct. The BDI-II has demonstrated high internal consistency, with coefficient alphas ranging from .91 (Dozois, Dobson, & Ahnberg, 1998) to .93 (Beck et al., 1996) among college samples. The BDI-II has also demonstrated good test-retest reliability, with correlations ranging from \( r = .93 \) (Beck et al., 1996) to \( r = .96 \) (Sprinkle et al., 2002). The convergent validity of the BDI-II is supported by a significant correlation of \( r = .71 \) (Beck et al., 1996) with another measure of depression, the Hamilton Rating Scale for Depression (HRSD; Hamilton, 1960, 1967) and by a strong correlation of \( r = .83 \) (Sprinkle et al., 2002) with depressed mood symptoms from the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I; First, Spitzer, Gibbon, & Williams, 1997).

**Procedure**

Participants completed this study in groups of up to ten, depending on the number of participants who attended a given testing session. This was done in part to enhance anonymity for the participants in an effort to minimize socially desirable responding. After providing informed consent, each participant was randomly assigned to complete either the “Self” or the “Other” version of the vignettes. Participants read the four vignettes and completed the vignette appraisal ratings. After completing the vignette questionnaire, participants identified a personal example of an unwanted intrusive thought. To aid participants in this task, the experimenter read aloud the III-31 instructions, which provide a definition of unwanted intrusive thoughts and include a list of commonly reported examples. After identifying an unwanted intrusive thought that they had experienced, participants completed the remaining questionnaires. Upon completion, participants sealed their completed questionnaires in an envelope before returning them to the experimenter in batch form to ensure anonymity. A full debriefing followed.
Results and Discussion

Preliminary Analyses

Group Equivalence. Preliminary analyses confirmed that participants in the "Self" and "Other" condition were equivalent in terms of gender distribution, $\chi^2 (1, N = 121) = 0.25, p > .50$, ethnic composition, $\chi^2 (1, N = 122) = 0.30, p > .50$, and age of the participants, $t (119) = 0.66, p > .50$. Importantly, participants in the "Self" and "Other" vignette condition did not differ on measures of obsessionality or depression, including the III-31 total score, $t (120) = 0.20, p > .50$, the OBQ-44 total score, $t (120) = 0.02, p > .50$, the OCI-R total score, $t (120) = -0.88, p > .25$, the TAF total score, $t (120) = -1.09, p > .25$, or the BDI-II, $t (120) = -0.22, p > .50$. These analyses indicate that the random assignment procedure successfully produced relatively comparable groups.

Vignette Appraisal Ratings

Internal consistency. The sixteen Likert-type scale questions from the vignette questionnaire were examined for internal consistency and item-total correlations. The alpha reliabilities were calculated for each vignette separately and then averaged together. The vignette appraisal ratings demonstrated strong internal consistency, with Cronbach's alpha ranging from 0.89 to 0.94 for the individual vignettes, and averaging 0.91 for both the Self and Other condition. Intercorrelations between the vignette themes are presented in Table 1. As would be expected, the appraisal ratings were moderately to highly correlated across themes.

Correlations with measures of OC metacognitive beliefs. To examine the relationship between the vignette appraisal ratings and well-validated measures of OC metacognition, Pearson correlation coefficients were calculated between the vignette appraisal ratings and
the III-31, the OBQ-44, and the TAF. Given the high overlap between the appraisal ratings across vignette themes, only the mean appraisal rating was used in these analyses. As predicted, the vignette appraisal ratings were moderately to strongly correlated with all measures of OC metacognition (see Table 2). Because the vignette appraisal ratings were also significantly correlated with the BDI-II, partial correlations were then calculated between the mean vignette appraisal rating and the OC metacognitive measures controlling for the BDI-II. All correlations between the vignette questionnaire and the OC metacognitive measures remained significant and moderate to strong in magnitude. These analyses confirmed that participants’ appraisals of the intrusive thoughts presented in the vignettes were meaningfully associated with their appraisals of their own personal unwanted thoughts (the III-31), as well as with measures of obsessive-compulsive appraisals and beliefs more broadly (the OBQ-44 and TAF).

**Descriptive information.** Means and standard deviations for the vignette appraisal ratings are presented in Table 3. As can be seen, participants’ appraisal ratings were generally quite low, falling in the “not at all” to “somewhat” range, suggesting that participants endorsed few dysfunctional appraisals of the significance of the intrusive thoughts. In contrast, when asked to respond to the question, “How bad or evil do you think this thought is” on a 0 (“not at all bad”) to 100 (“the worst I can imagine”) scale, participants’ responses ranged from means of 35 (for the blasphemous vignette) to 63 (for the aggressive vignette) in the “Other” condition, and from means of 50 (for the blasphemous vignette) to 73 (for the aggressive vignette) in the “Self” condition. Thus, participants judged the thoughts themselves to be moderately bad or evil, but on average, they did not to attach undue significance to the meaning of the thoughts (as indicated by the low appraisal ratings).
Appraisal Ratings and OCD Symptomatology

To explore whether appraisals of the obsession-like thoughts were associated with OCD symptomatology, a Pearson correlation coefficient was calculated comparing the vignette appraisal ratings with the OCI-R. Unlike the measures of obsessive-compulsive metacognition, which assess OC appraisals and OC beliefs, the OCI-R is a measure of OCD symptom severity. The mean vignette appraisal rating was moderately correlated with the OCI-R, \( r = 0.37, p < .001 \). In order to ensure that the significant correlation was not due solely to negative affect, a partial correlation was calculated controlling for the BDI-II. The correlation between the mean vignette appraisal rating and the OCI-R remained significant and moderate in magnitude, \( r = 0.27, p < .01 \). A partial correlation was also calculated between the mean vignette appraisal rating and the BDI-II, controlling for the effects of the OCI-R total score. When the OCI-R total score was controlled for, the correlation between the vignette appraisal ratings and the BDI-II was no longer significant, \( r = .04, p > .50 \), suggesting that the association between the vignette appraisal ratings and the BDI-II was spurious. These results confirm that appraisals of personal significance of the obsession-like thoughts were related to OCD symptomatology over and above negative affect more broadly.

Comparison of High OC and Low OC Participants

In order to compare the appraisal ratings of participants who scored within the clinical range for OCD symptomatology with those who scored within the normal range, participants were divided into two groups based on their total OCI-R score. As recommended by Foa and colleagues (2002), participants were divided into those who scored above the clinical cutoff in the range of OCD patients (42 participants, mean OCI-R score = 31.15, range 21 – 51), and those who scored below the clinical cutoff in the range of
nonclinical individuals (80 participants, mean OCI-R score = 12.00, range 3 – 20). Next, an independent samples t-test was conducted comparing high and low OC participants on their mean vignette appraisal rating. This analysis directly examined whether participants who scored in the range of OCD patients would endorse more dysfunctional appraisals of the vignettes than would participants who scored in the range of nonclinical samples. Results of the t-test confirmed that high OC participants endorsed greater appraisals of personal significance of the vignettes (M = 2.39, SD = 1.06) than did low OC participants (M = 1.97, SD = 1.05), t (120) = 2.11, p < .05, r = .19.

**Appraisal Ratings by Thematic Content and Identity**

To examine whether dysfunctional appraisals would vary depending on the content of intrusive thoughts (the second research question) and to explore whether vignette perspective would influence appraisal ratings (the third research question), the vignette appraisal ratings were used as the dependent variable in a 4 (Thematic Content: Aggressive, Blasphemous, Racist, Sexual; within-participants factor) by 2 (Identity: Self, Other) between-within analysis of variance (ANOVA). The Greenhouse-Geisser adjustment was used to correct for violation of the assumption of sphericity for the repeated measures factor. Results of the ANOVA revealed no main effect of Identity, $F(1,120) = 1.57, p > .10, \eta^2_p = .01$, demonstrating that when collapsing across vignettes, no significant differences emerged between appraisals as a function of identity of the subject in the vignettes. Results did reveal a significant main effect of Thematic Content, $F(2.73, 327.58) = 30.55, p < .0001, \eta^2_p = .20$. Tukey’s method of post-hoc comparisons was employed to examine this main effect. This method of multiple comparisons employs a family-wise Type-I error rate, maintaining control over risk of Type-1 error. These comparisons revealed that participants endorsed
appraisals of personal significance to the greatest extent for the Aggressive vignette ($M = 2.67, SD = 1.44$), followed by the Sexual ($M = 2.06, SD = 1.23$; $q(4, 121) = 8.89, p < .01$) and Racist vignettes ($M = 2.02, SD = 1.21$; $q(4, 121) = 8.38, p < .01$), which in turn received more dysfunctional appraisals than the Blasphemous vignette ($M = 1.70, SD = 1.24$; $4.16 \leq q(4, 121) \leq 5.94, p < .05$). No differences emerged between the Sexual and Racist vignettes, $q(4, 121) = 0.57, p > .10$.

There was a trend for an interaction of Thematic Content by Identity, $F(2.73, 327.58) = 2.47, p = .068, \eta_p^2 = .02$. To explore this weak effect, simple main effects analyses were conducted comparing “Self” and “Other” appraisal ratings across the different vignette themes. No differences were found between the Self and Other condition for the Aggressive, Sexual, or Blasphemous vignettes, $F's(1, 120) < 2.60, p's > .10, \eta_p^2 < .03$. Participants rated the Racist vignette slightly more negatively in the “Self” condition than in the “Other” condition, $F(1, 120) = 3.15, p = .08, \eta_p^2 = .03$, but this effect was not strong enough to be statistically significant at the $p < .05$ level.

**Summary**

The current study was the first to examine how nonclinical participants appraise intrusive thoughts more typical of OCD. Consistent with the extant literature (Clark & Claybourn, 1997; Freeston et al., 1992; OCCWG, 2001, 2003, 2005; Purdon & Clark, 1994a, 1994b), dysfunctional appraisals of the obsession-like thoughts were correlated with obsessive-compulsive symptoms in this sample of nonclinical participants. Moreover, those participants who scored in the clinical range for OCD were found to report more appraisals of personal significance than were those participants who scored in the nonclinical range. These findings build upon past studies and demonstrate that individuals high in OC
symptoms are more likely than those low in OC symptoms to appraise obsession-like thoughts as important and personally significant.

In response to the second research question, appraisal ratings varied depending on the thematic content of the unwanted thoughts presented in the vignettes. In the current study, participants were more likely to endorse appraisals of personal significance for the aggressive vignette, followed by the unacceptable sexual and racist vignettes, followed by the blasphemous vignette. These results support the findings of Clark et al. (2000) and suggest that appraisals vary to some extent based on the content of intrusive thoughts. The final goal of the study was to explore whether vignette identity would influence appraisals of the unwanted thoughts. No differences emerged between appraisals of the self and other vignettes, suggesting that individuals make similar attributions about the personal meaning and importance of thoughts regardless of the identity of the subject portrayed in the vignettes. This last finding provides evidence that people judge the occurrence of socially unacceptable intrusive thoughts similarly, whether asked to imagine that they have the thought themselves or whether someone else has it.

The present study had an important methodological error in that the wording of the vignettes was not held constant across themes. Whereas three of the vignettes stated that the obsessive thought occurred “from time to time,” the racist vignette indicated that the thought came to mind “whenever you see a person of colour.” This difference in the described frequency of thought occurrence may have influenced appraisal ratings. The cognitive theory of obsessions hypothesizes that thought frequency contributes to appraisals, with higher frequency of thought occurrence reinforcing appraisals of personal significance. Therefore, it is possible that participants endorsed dysfunctional appraisals of the racist
vignette to a greater extent than they would have had the instructions been held constant across vignettes. This error was corrected in Study 2.

**Study 2**

A second study explored whether appraisals vary depending on the frequency of intrusive thoughts. Moreover, this second study was designed to examine whether a similar pattern of appraisals would emerge across the four content themes with the inclusion of new exemplars of obsession-like thoughts. Several research questions guided the second study. The primary goal was to replicate the findings of Study 1 with new vignettes using the same four content themes, although the self-other perspective manipulation was not included in Study 2. Accordingly, the first research question was whether the differences in appraisals observed across content themes in Study 1 would be replicated. The second research question was whether appraisals would differ depending on the frequency with which the unwanted intrusive thought occurred. Participants were expected to regard more frequently occurring thoughts as more personally meaningful. The final research question was whether the observed relationship between appraisals of the obsession-like thoughts and obsessive-compulsive symptoms would emerge with the inclusion of new vignettes. To explore these questions, a new sample of participants read four new vignettes covering the same themes as in the first study. A fully repeated measures design was used in which all participants completed appraisal ratings for all four vignettes in both a low frequency and a high frequency condition.
Method

Participants

Participants were 281 students enrolled in Psychology classes at the University of British Columbia. Participants were recruited through the Department of Psychology volunteer participant pool. The only exclusion criterion was that participants required written fluency in the English language. The mean age of the participants was 20.3 years ($SD = 2.2$), and 59.9% of the participants were women. Of participants who reported their ethnic or racial group, 30.9% identified themselves as Caucasian, 47.8% identified as Asian, and 21.2% identified other racial or ethnic backgrounds. All participants received bonus course credit for their participation in the study.

Measures

Vignette Appraisal Ratings. Four new vignettes were created for the purpose of this study. As in Study 1, each vignette portrayed a prototypical obsession involving one of four different themes: aggressive (“you have a sudden, horrific impulse to run an elderly pedestrian over while driving your car”), blasphemous (“you have the sudden, intrusive thought, ‘Jesus Christ was a raving lunatic!’”), racist (“you pass a recent immigrant on the street and you have the sudden, intrusive thought, ‘You don’t belong here! Go back to your own country!’”), and sexual (“you have a sudden, intrusive sexual thought about a child”). For each vignette, participants were asked to complete the appraisal ratings twice; once imagining that they experienced the thought “from time to time,” and a second time imagining that they experienced that thought “quite frequently (several times per week).” The appraisal ratings were identical to those used in Study 1.
Symptom Measures. Participants completed the same five questionnaires used in Study 1, measuring obsessive-compulsive metacognition (III-31, OBQ-44, and TAF), obsessive-compulsive symptomatology (OCI-R), and depression (BDI-II).

Procedure

Participants picked up the questionnaire package in the laboratory, where they received instructions for the study. Upon completion, participants returned their questionnaires to the laboratory, received a full debriefing, and were given course credit for their participation in the study. Of the 300 questionnaires distributed to students, 280 were returned complete, and 1 was returned partially complete.

Results and Discussion

Vignette Appraisal Ratings

Internal consistency. The 16 Likert-type scale questions from each vignette were examined for internal consistency and item-total correlations. The alpha reliabilities were calculated for each vignette separately and then averaged together. Cronbach’s alphas for the individual vignettes ranged from 0.92 to 0.95 and averaged 0.93 in both the low and high frequency conditions. Intercorrelations among the different vignette theme appraisal ratings are presented in Table 4. As in Study 1, the vignette appraisal ratings were moderately to highly correlated across themes.

Correlations with measures of OC metacognitive beliefs. To examine the degree of relationship between the vignette appraisal ratings and well-validated measures of OC metacognition, Pearson correlation coefficients were calculated between the high and low frequency vignette appraisal ratings and the III-31, the OBQ-44, and the TAF. As in Study 1, correlation coefficients were also calculated with the BDI-II to examine the degree of
relationship between the appraisal ratings and negative affect. As presented in Table 5, the high and low vignette appraisal ratings were moderately to strongly correlated with the measures of OC appraisals and OC beliefs, and they were weakly correlated with the BDI-II. After controlling for the BDI-II, all correlations between the vignette appraisal ratings and the OC measures remained significant, and moderate to strong in magnitude (r’s ranged from .35 - .52, all p’s < .001). These analyses confirm that the vignette appraisals ratings were meaningfully associated with well-validated measures of OC appraisals and OC beliefs, and that they were less strongly related to depressive symptoms.

Descriptive information. Means and standard deviations for the vignette appraisal ratings are presented in Table 6. An examination of this table shows that participants’ appraisal ratings for the low frequency condition were comparable to the ratings found in Study 1, with participants endorsing mean appraisals of the personal significance of the obsession-like thoughts in the “not at all” to “somewhat” range. As expected, the appraisal ratings for the high frequency condition were considerably more elevated across all four vignette themes, generally by a full standard deviation. In contrast to the relatively low appraisal ratings, participants reported moderate to high disapproval of the intrusive thoughts, with responses to the question “How bad or evil do you think this thought is” ranging from means of 34 (for the blasphemous vignette) to 71 (for the sexual vignette) in the low frequency condition, and from 40 (for the blasphemous vignette) to 82 (for the sexual vignette) in the high frequency condition.

Appraisal Ratings and OCD Symptomatology

To explore whether participants’ appraisals of the obsession-like thoughts were associated with OCD symptomatology, correlations were calculated comparing the vignette
appraisal ratings with the OCI-R. As displayed in Table 5, the appraisal ratings for both frequency conditions were low to moderately correlated with the OCI-R. When partial correlations were calculated controlling for the BDI-II, correlations remained significant in both the low frequency \( (r = 0.28, p < .001) \) and the high frequency condition \( (r = 0.18, p < .01) \). Partial correlations were also calculated between the vignette appraisal ratings and the BDI-II, controlling for the effects of the OCI-R total score. When the OCI-R total score was controlled for, correlations between the vignette appraisal ratings and the BDI-II were no longer significant \( (\text{low frequency}, r = .07, p > .25; \text{high frequency}, r = .03, p > .50) \). These results suggest that the vignette appraisal ratings were related to the obsessive-compulsive symptomatology to a greater degree than to depression.

Visual inspection of the pattern of correlations presented in Table 5 shows that the correlations between the vignette appraisal ratings and the measures of OC meta-cognitive beliefs and OC symptomatology were larger in the low frequency condition than in the high frequency condition. In order to statistically examine this pattern, the magnitude of the correlation coefficients between the vignette appraisal ratings and measures of OC metacognition and OC symptomatology were compared in the two frequency conditions using the procedure recommended by Meng, Rosenthal, and Rubin (1992) for comparing dependent correlations.

These analyses revealed that appraisals of the obsession-like thoughts were more strongly associated with OC metacognitive measures (the III-31, OBQ-44, and TAF) in the low frequency condition than in the high frequency condition \( (\text{Steiger's } Z^* \text{ ranged from 2.22 to 2.64, } p < .05) \). Similarly, the low frequency vignette appraisal ratings were more highly correlated with the OCI-R than were the appraisals of high frequency thoughts \( (\text{Steiger's } Z^* \text{ ranged from 2.22 to 2.64, } p < .05) \).
= 3.39, $p < .01$). These results demonstrate that participants' appraisals of the infrequently occurring thoughts were more highly correlated with OC metacognitive beliefs and OC symptoms than were appraisals of the frequently occurring thoughts.

**Comparison of High OC and Low OC Participants**

In the next analyses, appraisal ratings were compared between participants who scored in the clinical range with ratings of those who scored in the nonclinical range for obsessive-compulsive symptoms. Participants were divided into two groups based on the OCI-R clinical cut-off score of 21. Independent-samples $t$-tests were conducted comparing the vignette appraisal ratings of 112 high OC participants (mean OCI-R score = 33.93, $SD = 10.34$, range = 21 - 70) with the ratings of 168 low OC participants (mean OCI-R score = 10.98, $SD = 5.16$, range = 0 - 20). Results of the $t$-tests revealed that high OC participants endorsed greater appraisals of personal significance of the intrusive thoughts than did low OC participants in both the low, $t (278) = 5.27, p < .001, r = .30$, and the high frequency conditions, $t (278) = 4.12, p < .001, r = .24$ (see Table 7 for means and $SD$s).

**Appraisal Ratings by Thematic Content and Thought Frequency**

To examine whether appraisals would vary according to thematic content of the intrusive thoughts and to explore potential differences between the High and Low frequency conditions, the vignette appraisal ratings were used as the dependent variable in a 4 (Thematic Content: Aggressive, Blasphemous, Racist, Sexual) by 2 (Frequency: High, Low) repeated measures ANOVA, with repeated-measures on both factors. The Greenhouse-Geisser adjustment was used to correct for violations of the assumption of sphericity for both factors. Results of the ANOVA revealed a significant main effect of Thematic Content, $F (2.59, 725.32) = 230.89, p < .0001, \eta^2_p = .45$. Tukey's method of post-hoc comparisons
indicated that participants endorsed more personally significant appraisals of the Sexual vignette ($M = 4.44$, $SD = 1.56$), followed by the Aggressive ($M = 3.26$, $SD = 1.35$), Racist ($M = 2.93$, $SD = 1.41$), and Blasphemous vignettes ($M = 2.11$, $SD = 1.42$). All mean differences were significant ($6.05 \leq q \leq 29.74$, $p < .01$). Moreover, there was a strong main effect of Frequency, $F (1, 280) = 815.04$, $p < .0001$, $\eta^2_p = .74$, such that the obsession-like thoughts in the High Frequency condition were associated with greater appraisals of personal significance ($M = 3.88$, $SD = 1.24$) than were the obsession-like thoughts in the Low Frequency condition ($M = 2.48$, $SD = 1.11$).

The significant main effects were qualified by a significant Thematic Content by Frequency interaction, $F (2.82, 789.82) = . p < .001$, $\eta^2_p = .20$ (see Figure 1). To explore this interaction, simple main effects analyses were conducted comparing appraisal ratings for High and Low Frequency conditions across the different vignette themes. In all cases, the High Frequency vignettes were appraised more negatively than the Low Frequency vignettes; $q$’s (2, 280) ranged from 19.83 – 34.90, $p$’s < .01. To further explore the interaction, simple main effects analyses were conducted comparing differences in appraisals of the vignette themes in the High and Low Frequency conditions. These analyses revealed a significant simple effect of Thematic Content in both the High Frequency, $F (2.67, 747.94) = 276.82$, $p < .0001$, $\eta^2_p = .50$, and the Low Frequency conditions, $F (2.47, 690.28) = 128.58$, $p < .0001$, $\eta^2_p = .32$. In the High Frequency condition, Tukey’s method of post-hoc comparisons revealed that participants appraised the Sexual vignette as more personally meaningful, followed by the Aggressive, Racist, and Blasphemous vignettes. All mean differences were significant; $q$’s (4, 280) ranged from 8.84 to 33.99, $p$’s < .01. In the Low Frequency condition, Tukey’s post-hoc comparisons revealed that the Sexual vignette was again
associated with the greatest negative appraisals, followed by the Aggressive and Racist vignettes, which did not differ from one another, $q(4, 280) = 0.83, p > .10$, followed by the Blasphemous vignette. All mean differences, with the exception of the difference between the Aggressive and Racist vignettes, were significant; $q$'s $(4, 280)$ ranged from 10.26 to 22.39, $p$'s < .01.

Summary

In keeping with the findings from Study 1, the results of Study 2 revealed that appraisals varied according to thematic content, with a similar, but not identical, pattern of differences emerging between the four vignette themes. In the current study, participants were most likely to attach personal significance to the occurrence of unacceptable sexual thoughts, followed by the aggressive, racist, and blasphemous thoughts. The fact that a different pattern of appraisal ratings emerged in the two studies suggests that specific features of the thoughts over and above thematic content may be critical in how such thoughts are appraised, a possibility that will be considered more fully in the general discussion that follows. Appraisals also varied as a function of frequency of thought occurrence; as predicted from the cognitive theory of obsessions, participants endorsed more negative appraisals of the obsession-like thoughts in the high frequency than in the low frequency condition.

As in Study 1, appraisals of the obsession-like thoughts were correlated with obsessive-compulsive symptoms, providing additional evidence for the relationship between appraisals and obsessionality. Somewhat unexpectedly, the magnitude of the correlations between appraisals and measures of obsessive-compulsive metacognition and obsessive-
compulsive symptoms was stronger in the low than in the high frequency condition. This finding will be discussed in the general discussion that follows.

**General Discussion (Studies 1 and 2)**

The current studies were designed to explore how nonclinical participants appraise prototypical obsessive thoughts. The association between appraisals of personal significance and obsessive-compulsive symptoms had already been established in the literature, so the aims of the current studies were to examine how nonclinical participants appraise intrusive thoughts more typical of OCD and to determine whether appraisals would vary as a function of thematic content and thought frequency. Across both studies, appraisals of intrusive thoughts were correlated with obsessive-compulsive symptoms, as measured by the OCI-R. Furthermore, participants with OCD symptoms in the clinical range were more likely to endorse appraisals of personal significance to the obsession-like thoughts than were participants with symptoms in the nonclinical range. Thus, clear evidence emerged demonstrating that individuals with subclinical OCD symptoms were more likely than those without OCD symptoms to attach undue personal significance to unwanted intrusive thoughts. These results are consistent with the extant research (Clark & Claybourn, 1997; Freeston et al., 1992; OCCWG, 2001, 2003, 2005; Purdon & Clark, 1994a, 1994b) and demonstrate that the previously established relationship between appraisals and OCD symptoms was not due to differences in the content of intrusive thoughts reported by OCD patients and normal controls.

An important finding was that appraisals varied by thematic content and thought frequency. Clear differences emerged in appraisals as a function of thought content, with participants endorsing the strongest personal appraisals of the aggressive and sexual vignettes
in Studies 1 and 2 respectively, and the weakest personal appraisals for the blasphemous vignette in both studies. In the only other study to investigate differences in appraisal processes by thought content, Clark and colleagues (2000) found that appraisals differed between sexual and nonsexual intrusive thoughts. Thus, the content of obsessions may be an important variable influencing appraisals of intrusive thoughts.

Why might some intrusive thoughts be associated with greater dysfunctional appraisals than others? Several variables deserve consideration. One variable of theoretical importance is the extent to which intrusive thoughts violate social norms. Rachman (1998) argues that the primary themes of obsessions are those that contradict the principles of all moral systems. In the current studies, participants were most likely to endorse appraisals of personal significance for the vignettes that described harming a child with a knife (the aggressive vignette from the first study) and having a sexual thought about a child (the sexual vignette from the second study). On the surface, these thoughts appear to contradict social norms to a greater extent than do the other intrusive thoughts presented in the vignettes.

A related possibility is that the aggressive and sexual intrusive thoughts may have contradicted participants’ personal values more than the other intrusive thoughts. Cognitive theories of OCD all share the view that thoughts opposing an individuals’ morals or sense of self are most likely to be subject to distorted appraisals and develop into problematic obsessions (Purdon & Clark, 1999; Rachman, 1998; Salkovskis, 1985). Indeed, the results of a recent study suggest that distressing intrusive thoughts were distinguished from more acceptable intrusive thoughts in the degree to which they contradicted valued aspects of the self (Rowa & Purdon, 2003).
A third variable that may influence appraisals involves the identified "victim" in the obsession. In the current studies, the thoughts most associated with appraisals of personal significance were those that featured young children. Rachman (1998) suggests that the "victims" who tend to appear most commonly in obsessions are the vulnerable members of society (i.e., the young, the elderly). He argues that intrusive thoughts involving helpless members of society are the most repugnant and morally objectionable, and thus the most likely to be negatively appraised. To further this point, Rachman (1998) states that "people rarely (ever?) have harm obsessions about strong people who are capable of defending themselves – there are no Arnold Schwartzzenegger obsessions" (p. 387). Therefore, vulnerability of the "victim" described in each vignette may have influenced appraisals, such that participants may be more likely to attach greater significance to intrusive thoughts about harming vulnerable persons. Future studies are needed to examine whether these and other features of obsessions are important in influencing appraisals of intrusive thoughts.

In both studies, participants were least likely to appraise the blasphemous intrusive thoughts as personally significant or revealing. This result may have been an artifact of the current samples, as the University of British Columbia is a relatively secular community. One might expect that different results would emerge in a sample drawn from a more religious community. It is also possible that the blasphemous vignettes received lower appraisals of personal significance based on the questionnaire used to measure appraisals. Danger themes were prominent in the vignette appraisal rating questionnaire, with many of the questions referring to potentially dangerous outcomes (e.g., "To what extent would this thought mean that you might lose control and do something awful," and "To what extent would this thought mean you are a dangerous person?"). In this way, it is not surprising that
intrusive thoughts related to dangerous outcomes (i.e., the aggressive and sexual vignettes) received higher scores on the appraisal ratings than did intrusive thoughts related to blasphemy. Future studies could redress this limitation by including appraisal items that are directly relevant to blasphemy (e.g., "To what extent does this thought represent a sin?").

In Study 2, appraisal ratings were found to vary as a function of thought frequency, with participants attaching more meaning and significance to the vignettes in the high frequency condition than in the low frequency condition. That frequency would differentially affect appraisals is intuitive and also clearly in keeping with hypotheses from the cognitive theory of obsessions. Rachman (1998) hypothesized a reciprocal relationship between thought frequency and appraisals such that "catastrophic" appraisals of the significance of thoughts results in an escalation in the frequency of thoughts, which in turn reinforces appraisals of the significance of the thoughts (i.e., "the very fact that I am having this thought so often suggests that the thought must be important in some way"). The results of Study 2 are consistent with this hypothesis and suggest that higher frequency of thought occurrence is indeed related to increased appraisals about the significance of thoughts.

An unexpected finding that emerged in Study 2 was that the correlations between appraisals and obsessive-compulsive symptoms were stronger in the low frequency than in the high frequency condition. This suggests that appraisals of low frequency thoughts are more related to subclinical obsessive-compulsive symptoms (as demonstrated by the higher correlation between appraisals and OCD symptoms) than are appraisals of high frequency thoughts (as demonstrated by the weaker correlations between appraisals and OCD symptoms). On the one hand, this finding is consistent with the cognitive model of obsessions, in which Rachman (1997) clearly suggests that occasional intrusive thoughts
develop into frequent, clinical obsessions as the result of appraisals of personal significance. Put another way, the cognitive model is based on the premise that intrusive thoughts start off as *infrequent*, and become frequent over time due to appraisals. However, on the other hand, the current findings suggest that when intrusive thoughts occur relatively frequently, even individuals low in OCD symptomatology endorse appraisals of personal significance thereby weakening the relationship between appraisals and OC symptoms. This has implications for the cognitive theory of obsessions, suggesting that frequent intrusive thoughts that develop suddenly would likely be appraised by most people (even those without obsessive-compulsive symptoms) as meaning something negative and personal. Etiological studies are needed to better understand how obsessions develop.

In general, nonclinical participants in the current study endorsed relatively few personal appraisals of the intrusive thoughts presented in the vignettes. That is, the mean appraisal ratings for the intrusive thoughts were in the low to moderate range. It could be argued that these low appraisal ratings indicate that the intrusive thoughts included in the vignettes were not sufficiently upsetting in content to produce negative appraisals. This interpretation is not likely, however, given that participants tended to judge the vignette thoughts as “bad.” Moreover, the intrusive thoughts included in Studies 1 and 2 were chosen because they represent some of the more upsetting obsessions reported by clinical samples. The fact that participants judged the thoughts to be “bad,” yet did not attach exaggerated significance to the *meaning* of the thoughts, suggests that nonclinical individuals appear able to make some distinction between “bad thoughts” and “bad people.”

There is one clear exception to this conclusion, however. In Study 2, the sexual intrusive thought in the high frequency condition stands out from all of the others. This
thought received considerably higher appraisals ratings of personal significance than any of the other intrusive thoughts in both Study 1 and Study 2. In fact, for the high frequency sexual vignette, over 30% of participants indicated a mean appraisal rating above 6 on a 0 (no agreement with appraisal statements) to 8 (total agreement with appraisal statements) scale, indicating strong endorsement of appraisals of personal significance. In contrast, the only other vignette to have even 10% of participants indicate appraisal ratings above 6 was the high frequency aggressive vignette (as well as the low frequency sexual vignette).

Therefore, it appears that there was something about the intrusive sexual thought about a child, particularly a frequently occurring one, that hit a nerve with many of the participants in this study. This finding is important in that it suggests that normal individuals attach considerable personal significance to the frequent occurrence of some types of intrusive thoughts. Participants may have conceptualized the subject of this vignette as a pedophile as they appraised the target thought.

The results from these studies have several clinical implications. First, the findings from the current studies could be used to educate patients about how “normal” individuals appraise prototypical obsessions. An important component of many cognitive treatments is challenging dysfunctional appraisals. The results from these studies demonstrate that most people are able to disregard intrusive thoughts as benign and unimportant, information that could be used to help patients challenge the validity of their own dysfunctional appraisals. Second, patients with OCD tend to conceal their obsessions out of a fear that they will be judged negatively (Newth & Rachman, 2001). In treatment, patients are often encouraged to reveal the content of their obsessive thoughts to close friends and family in order to help disconfirm their fears. The results from the “Other” condition from Study 1 could be used to
educate patients on how people without OCD are likely to respond to hearing about prototypical obsessions. In this study, participants rated thoughts that occurred for themselves (for whom they have full info on the personality characteristics and morality) or for another person. The results showed that participants did not distinguish between these, suggesting that they do not need special information about the person's "true inner self" to judge intrusive thoughts as harmless.

The findings from these studies also suggest that clinicians should use some caution when recommending that patients disclose the content of their obsessions. For one, the current results suggest that patients should be careful in how they discuss the frequency of their obsessions; patients are more likely to elicit a negative reaction if they emphasize the frequency of certain types of obsessions. Furthermore, the results suggest that the content of the obsessions is important; in the current studies, participants were most likely to endorse personally significant appraisals of thoughts involving young children and thoughts with aggressive and sexual content. Therefore, it might be important to coach patients about how to reveal obsessions that contradict social mores. Moreover, patients might need to educate their confidants about the nature of OCD along with revealing the content of their thoughts in order to provide an explanation for the obsessions.

There were several limitations to the current studies. Importantly, the questions used to measure personally significant appraisals were developed for the purpose of this study, and have not undergone psychometric validation. Unfortunately, it was not possible to use the III-31, a well-validated measure of appraisals, because many of the questions on the III-31 were not relevant to the hypothetical vignettes used in these studies. Instead, the majority of the appraisal questions used in the current studies were based on the Personal Significance
Scale, a questionnaire developed by Rachman (2003) to assess appraisals of personal significance, the core construct of Rachman’s theory. The vignette appraisal ratings were found to possess high internal consistency and to correlate strongly with well validated measures of OC appraisals (the III-31) and OC beliefs (the OBQ-44), providing support for their validity. Nonetheless, this represents an important weakness of the current studies.

This also underscores a broader limitation of studies that attempt to examine appraisal processes. Metacognition is inherently a difficult topic to study; asking people to reflect upon and evaluate their own thoughts is complicated and confusing. Moreover, many measures have been developed to examine dysfunctional appraisals (see OCCWG, 1997, for a review of the questionnaires developed to measure OCD-relevant appraisals and beliefs), and there is still much debate on which underlying constructs are most relevant to OCD. Thus, it will be important for continued research to examine OCD-specific measures of cognition.

While the current studies provided evidence that appraisals vary by thematic content and thought frequency, other potentially critical variables were not included in this study. For one, the emotional impact of the obsessions presented in the vignettes was not controlled for, and may have given rise to different types of emotional responses. For example, the vignettes containing unacceptable sexual themes may have produced emotions such as shock, fear, and disgust, whereas the vignettes containing blasphemous themes may have been associated with shame and guilt. In order to better understand the appraisal process, it will be important to elucidate the influence of the emotional impact of the obsession, in addition to other features of obsessions such as the degree of social unacceptability, the extent to which obsessions contradict personal values, and the identified “victim” in the obsession.
These and other potentially relevant variables should be considered in future studies to better understand the influences on personal appraisals of unwanted intrusive thoughts.

Another direction for future research is to delineate mechanisms of change in the treatment of OCD. If dysfunctional appraisals are indeed causal in the development or maintenance of OCD, it will be important to establish that changes in dysfunctional appraisals accompany symptom remission in OCD. To this effect, Freeston and colleagues (1997) found that a decrease in dysfunctional appraisals was associated with improvement in symptoms in a sample of patients receiving cognitive treatment for OCD. More studies of this topic are needed to determine whether dysfunctional appraisals are causally associated with OCD symptoms.

To conclude, dysfunctional appraisals of intrusive thoughts are central to cognitive theories of OCD and are receiving considerable empirical attention in the literature. The results from Studies 1 and 2 provide support for a relationship between appraisals of personal significance and obsessive-compulsive symptoms, confirming that dysfunctional appraisals may be an important target in clinical interventions (Freeston et al., 1997). Moreover, the results from the current studies highlight the importance of examining features of obsessions that differentially affect appraisals. The results of the current studies provide evidence that thematic content and thought frequency are two such variables; further investigation of variables that may influence appraisal processes is warranted.
Table 1: Intercorrelations Between the Vignette Themes for the “Self” and “Other” Versions
(Study 1)

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<th></th>
<th>Aggressive</th>
<th>Blasphemous</th>
<th>Racist</th>
<th>Sexual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggressive</td>
<td>-</td>
<td>.46</td>
<td>.63</td>
<td>.65</td>
</tr>
<tr>
<td>Blasphemous</td>
<td>.59</td>
<td>-</td>
<td>.43</td>
<td>.66</td>
</tr>
<tr>
<td>Racist</td>
<td>.58</td>
<td>.58</td>
<td>-</td>
<td>.62</td>
</tr>
<tr>
<td>Sexual</td>
<td>.76</td>
<td>.74</td>
<td>.52</td>
<td>-</td>
</tr>
</tbody>
</table>

Correlations above diagonal are for the “Self” Version (n = 61); correlations below the diagonal are for the “Other” version (n = 61). All correlations significant at the Bonferroni-correlated alpha level of $p < .003$. 
Table 2: Correlations Between Mean Vignette Appraisal Rating and Metacognitive Measures, OCD Symptomatology, and Depression (Study 1)

<table>
<thead>
<tr>
<th>Mean Vignette Appraisal Rating</th>
<th>Pearson Correlation</th>
<th>Partial Correlation&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Metacognitive Measures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpretation of Intrusions Inventory</td>
<td>.41</td>
<td>.38</td>
</tr>
<tr>
<td>Obsessive Beliefs Questionnaire</td>
<td>.51</td>
<td>.48</td>
</tr>
<tr>
<td>Thought-Action Fusion Scale</td>
<td>.39</td>
<td>.35</td>
</tr>
<tr>
<td><strong>OCD Symptomatology</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obsessive-Compulsive Inventory</td>
<td>.34</td>
<td>.27</td>
</tr>
<tr>
<td><strong>Depression</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beck Depression Inventory</td>
<td>.22</td>
<td>--</td>
</tr>
</tbody>
</table>

<sup>a</sup> Partial correlation controlling for BDI-II.

Note: After applying the Bonferroni correction, correlations above \( r > 0.25 \) remained significant at \( p < .006 \) (\( N = 122 \)).
Table 3: Vignette Appraisal Ratings by Theme and Identity (Study 1)

<table>
<thead>
<tr>
<th></th>
<th>Aggressive</th>
<th>Blasphemous</th>
<th>Racist</th>
<th>Sexual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Self Version</td>
<td>2.62</td>
<td>1.45</td>
<td>1.88</td>
<td>1.35</td>
</tr>
<tr>
<td>Other Version</td>
<td>2.73</td>
<td>1.43</td>
<td>1.52</td>
<td>1.11</td>
</tr>
</tbody>
</table>

Note: Participants indicated their agreement with appraisals of personal significance on a 0 ("not at all") to 8 ("totally/definitely") scale.
Table 4: Intercorrelations Between the Vignette Themes for the Low Frequency and High Frequency Conditions (Study 2)

<table>
<thead>
<tr>
<th></th>
<th>Aggressive</th>
<th>Blasphemous</th>
<th>Racist</th>
<th>Sexual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggressive</td>
<td>-</td>
<td>.45</td>
<td>.59</td>
<td>.33</td>
</tr>
<tr>
<td>Blasphemous</td>
<td>.38</td>
<td>-</td>
<td>.55</td>
<td>.22</td>
</tr>
<tr>
<td>Racist</td>
<td>.50</td>
<td>.55</td>
<td>-</td>
<td>.37</td>
</tr>
<tr>
<td>Sexual</td>
<td>.58</td>
<td>.26</td>
<td>.51</td>
<td>-</td>
</tr>
</tbody>
</table>

Correlations above diagonal are for the Low Frequency condition; correlations below the diagonal are for the High Frequency condition. All correlations significant at the Bonferroni-correlated alpha level of $p < .003$ ($N = 281$).
Table 5: Correlations Between Mean Vignette Appraisal Rating and Metacognitive Measures, OCD Symptomatology, and Depression (Study 2)

<table>
<thead>
<tr>
<th>Metacognitive Measures</th>
<th>Low Frequency</th>
<th>High Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpretation of Intrusions Inventory</td>
<td>.56</td>
<td>.48</td>
</tr>
<tr>
<td>Obsessive Beliefs Questionnaire</td>
<td>.47</td>
<td>.38</td>
</tr>
<tr>
<td>Thought-Action Fusion Scale</td>
<td>.57</td>
<td>.48</td>
</tr>
<tr>
<td>OCD Symptomatology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obsessive-Compulsive Inventory</td>
<td>.37</td>
<td>.23</td>
</tr>
<tr>
<td>Depression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beck Depression Inventory</td>
<td>.25</td>
<td>.15</td>
</tr>
</tbody>
</table>

Note: After applying the Bonferroni correction, correlations of $r > 0.17$ remained significant at $p < .005 (N = 281)$. 
Table 6: Vignette Appraisal Ratings by Theme and Frequency Condition (Study 2)

<table>
<thead>
<tr>
<th>Theme</th>
<th>Low Frequency</th>
<th>High Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggressive</td>
<td>2.35</td>
<td>4.16</td>
</tr>
<tr>
<td>Blasphemous</td>
<td>1.71</td>
<td>2.51</td>
</tr>
<tr>
<td>Racist</td>
<td>1.36</td>
<td>1.63</td>
</tr>
<tr>
<td>Sexual</td>
<td>2.30</td>
<td>3.57</td>
</tr>
<tr>
<td></td>
<td>1.40</td>
<td>1.62</td>
</tr>
<tr>
<td></td>
<td>3.58</td>
<td>5.30</td>
</tr>
<tr>
<td></td>
<td>1.76</td>
<td>1.58</td>
</tr>
</tbody>
</table>

Note: Participants indicated their agreement with appraisals of personal significance on a 0 (“not at all”) to 8 (“totally/definitely”) scale.
Table 7: Mean Vignette Appraisal Ratings for High and Low OC Participants (Study 2)

<table>
<thead>
<tr>
<th>OC Symptomatology</th>
<th>Low OC Participants (N = 168)</th>
<th>High OC Participants (N = 112)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Low Frequency</td>
<td>2.21</td>
<td>1.00</td>
</tr>
<tr>
<td>High Frequency</td>
<td>3.65</td>
<td>1.27</td>
</tr>
</tbody>
</table>

Note: OC = Obsessive-compulsive
Figure 1: Average appraisal ratings by thematic content for high and low frequency conditions.
CHAPTER 3 - STUDY 3

Introduction

In his cognitive theory of obsessions, Rachman (1997) argues that individuals with OCD attach excessive significance and importance to their unwanted intrusive thoughts. These “catastrophic misinterpretations” of the significance of thoughts in turn produce anxiety and distress, and motivate active resistance of such thoughts. Paradoxically, active resistance of thoughts is believed to be an ineffective strategy that contributes to an increase in the occurrence of such thoughts (Wegner et al., 1987). Thus, Rachman proposes a dynamic model whereby dysfunctional appraisals of thoughts, combined with active resistance of such thoughts, leads to a vicious cycle of anxiety, resistance, and increased frequency of intrusive thoughts. Study 3 of this dissertation project was designed to directly examine this dynamic model of OCD and investigate the combined effects of dysfunctional appraisals and thought suppression on the frequency of intrusive thoughts, anxiety, and mood state.

Rachman’s cognitive theory of obsessions assigns critical roles to dysfunctional appraisals and thought suppression in the persistence of obsessions. As reviewed in Chapter 1, empirical studies offer support for several aspects of this theory. First, correlational studies, including Studies 1 and 2 from this dissertation project, provide evidence of a relationship between dysfunctional appraisals and obsessive-compulsive symptoms, although they do not establish causality. They cannot rule out, for example, the possibility that more frequently occurring intrusive thoughts cause changes in appraisals rather than the appraisals causing more frequent intrusions.
A second line of evidence relevant to Rachman's theory demonstrates that thought suppression contributes to a paradoxical increase in the frequency of thoughts, although the findings have been mixed. While some studies have found an ironic effect of suppression with personally relevant thoughts, many have not. There are a number of potential explanations for these discrepant findings, including methodological differences. One intriguing possibility is that the inconsistent results may be a function of differences in the personal meaning and significance of the target thoughts used in various studies. Even among studies that explicitly used personally generated target thoughts, participants may have selected target thoughts that differed considerably with respect to their personal significance or degree of distress associated with them. Cognitive theories of OCD would predict that differences in appraisals about the meaning of the target thoughts would lead to corresponding differences in the results of suppression.

In addition, while a number of studies examined suppression of personally relevant negative thoughts, which better reflect the kinds of thoughts experienced by patients with OCD, the use of personally relevant thoughts introduces other important confounds. First, because participants each select a unique target thought, there is no consistency across participants and internal validity is weakened. Second, while a number of studies have attempted to compare the suppression of personally relevant thoughts with neutral thoughts, these studies failed to control for the valence and novelty of the target thought. Personally relevant thoughts differ from neutral "white bear" thoughts in a number of important ways. They are more negative, more meaningful, and lack novelty, compared to "white bear" thoughts. Moreover, as suggested by Tolin (2002), individuals have experience with their own personally relevant thoughts, and may have developed idiosyncratic strategies for
dealing with these thoughts that make such thoughts less likely to demonstrate a paradoxical effect of suppression within a laboratory suppression task.

Therefore, the purpose of the current study was to examine whether the effects of thought suppression would vary as a function of personal meaning of the target thought, and resulting dysfunctional appraisals about the thought. Specifically, this study aimed to build on previous thought suppression studies by investigating whether personal meaning of the target thought would interact with suppression effort to influence thought frequency, mood, and anxiety. Based on the cognitive theory of obsessions, appraisals about the personal significance of the target thought were expected to moderate the effects of thought suppression on subsequent frequency of thoughts, self-reported anxiety, and mood.

This quasi-experimental study was also designed to address several limitations in the extant thought suppression literature. In a departure from thought suppression studies that included personally relevant thoughts, the current study included a single, novel, target thought in order to maintain experimental control over the task and increase the internal validity of the study. To examine the influence of personal meaning of the thought, two distinct groups of participants were selected based on the hypothesis that the groups would differ in their appraisals of the target thought. Specifically, a blasphemous thought was selected to serve as the target thought for the suppression task, and two different groups of participants were recruited on the basis of religiosity. The first group consisted of highly religious individuals and the second group consisted of participants for whom religion was unimportant. Highly religious participants were expected to endorse greater appraisals of personal significance of the target thought than were participants for whom religion was unimportant.
The use of a single, novel, target thought conferred a number of benefits. For one, it increased the internal validity of the experimental design, by maintaining control over the stimulus. In addition, it allowed for the examination of whether the effects of thought suppression would vary as a function of appraisals of personal meaning without the confound of prior experience with the specific thought. Thus, the target thought was selected to vary by group on personal meaning while being less likely to vary by novelty or personal experience.

A nonclinical sample was appropriate for two reasons. First, as discussed earlier, nonclinical individuals experience unwanted intrusive thoughts (e.g., Freeston et al., 1991; Niler & Beck, 1989; Purdon & Clark, 1993; Rachman & de Silva, 1978; Salkovskis & Harrison, 1984). Second, given that the purpose of this study was to examine the role of appraisals of personal meaning and thought suppression as a model for the development of obsessions, it was important to examine this in individuals who had less experience with suppression.

Methodological Considerations

In recent reviews of the thought suppression literature (Abramowitz et al., 2001; Purdon & Clark, 2000), authors have commented on the difficulty in drawing conclusions across studies due to the many methodological differences between studies. For example, studies have employed different research designs, participants, control conditions, target thoughts, target thought recording methods, and length of thought monitoring intervals. Moreover, many thought suppression studies have been criticized along methodological grounds. For example, a number of the studies employed cross-over designs (Kelly & Kahn, 1994; McNally & Ricciardi, 1996; Rutledge, 1998), in which participants were first
instructed to suppress or express the target thought, after which the instructions were reversed. Cross-over designs have been criticized for confounding instructions (i.e., suppress vs. express) with experience with the task (see Purdon & Clark, 2000 for a complete review of methodological concerns in early thought suppression studies). In response to this criticism, studies now employ a control condition in which the control group is instructed to monitor occurrences of the target thought during both intervals rather than first express and then suppress target thoughts.

Similarly, studies have differed in type of control condition, with some studies employing expression instructions (Kelly & Kahn, 1994; Rutledge, 1998) in which participants are told to actively think about the target thought, whereas other studies have used “mention” controls (McNally & Ricciardi, 1996; Salkovskis & Campbell, 1994; Smari et al., 1995; Trinder & Salkovskis, 1994), where participants are told to think about whatever they like, including the target thought. Expression instructions have been criticized for lacking in ecological validity, as individuals with OCD very seldom try to actively think about material that is upsetting to them (Purdon & Clark, 2000). A number of more recent studies have used “do not suppress” instructions in an attempt to prevent participants from engaging in suppression attempts (Purdon, 2001; Purdon & Clark, 2001; Purdon et al., 2005).

Studies have also differed in the method used to record thought occurrences. Some studies used verbal or written stream instructions, in which participants recorded all thoughts into an audio recorder or on paper, while others used bell rings or key presses to mark thought occurrences. As discussed in recent reviews (Abramowitz et al., 2001; Purdon & Clark, 2000), overt methods of recording thoughts may be sensitive to participant reactivity and reporting bias, making them less appropriate for tasks involving upsetting or undesirable
target thoughts. Studies have also varied with regards to the content of thoughts to be suppressed. Kelly and Kahn (1994) and Rutledge (1998) used personally relevant negative thoughts that were more akin to worries than to obsessions, whereas other studies included target thoughts that were more obsession-like in nature (Belloch et al., 2004; Purdon, 2001; Purdon & Clark, 2001; Salkovskis & Campbell, 1994; Trinder & Salkovskis, 1994).

The current study was designed to include many of the methodological recommendations suggested by Abramowitz and colleagues (2001) and Purdon and Clark (2000) in order to overcome previous limitations in the literature. Target thought occurrence was recorded with an unobtrusive method to minimize participant response bias. Moreover, the control group received “do not suppress” instructions in an attempt to reduce participants’ natural tendency to try to control unwanted thoughts. “Do not suppress” instructions are also of greater clinical relevance, in that they involve an active strategy (as opposed to monitor-only instructions) that may prove useful with patients. Finally, an obsession-like thought was selected to serve as the target thought.

Hypotheses

The present study was designed to investigate several key tenets of Rachman’s cognitive theory of obsessions. Specifically, this study aimed to examine whether appraisals of personal significance and thought suppression would exert direct and interactive effects on the frequency of thoughts, anxiety, and mood. I hypothesized that thought suppression and appraisals of personal meaning would each act as main effects in predicting frequency of thoughts, anxiety, and negative affect. I further hypothesized an interaction between thought suppression and appraisals such that the effects of thought suppression would vary as a function of the personal meaning of the target thought.
There were several specific hypotheses of the current study. First, consistent with the results of recent thought suppression studies that used similar methodological features (Belloch et al., 2004; Purdon & Clark, 2001), suppression was expected to attenuate the natural decay in target thought frequency over time. Second, I sought to examine whether appraisals of personal significance would moderate the effects of suppression. The cognitive theory of OCD proposes that intrusive thoughts appraised as personally meaningful will produce anxiety and motivate suppression attempts, resulting in a paradoxical increase in thoughts. In contrast, the cognitive theory of OCD predicts that intrusive thoughts appraised as insignificant and irrelevant will neither give rise to anxiety nor motivate suppression, and therefore should be less likely to produce an increase in thoughts. Based on this theory, I hypothesized that suppression would result in a more robust rebound effect in the high meaning compared to the low meaning group.

Third, based on the cognitive theory of obsessions, I predicted that when the target thought was appraised as high in personal meaning, participants would rate target thought occurrences as more distressing and less acceptable than when the target thought was low in personal meaning. Similarly, I predicted that participants in the suppression condition would be more distressed by target thought occurrences and rate such occurrences as less acceptable than participants in the “do not suppress” condition because the occurrences represent a failure of thought control. Moreover, I predicted an interaction between suppression condition and personal meaning of the thought such that highly religious participants in the suppression condition would rate target thought occurrences as more distressing and less acceptable than would the other participants.
Fourth, cognitive theories predict that dysfunctional appraisals of intrusive thoughts will lead to mood disturbance and increased anxiety. Thought control efforts, because largely unsuccessful, are also believed to contribute to negative mood and anxiety. Therefore, I hypothesized that appraisals of the significance of the target thought and thought control effort would each act as main effects in predicting negative mood and anxiety. Moreover, I predicted an interaction of dysfunctional appraisals and thought control effort on mood and anxiety.

**Method**

**Participants**

One hundred and twenty participants were recruited from the university campus and surrounding community. Highly religious individuals \( n = 60 \) from Christian backgrounds were recruited from religious colleges, local churches, and psychology classes. Individuals who were low in religious involvement \( n = 60 \) were recruited from psychology classes, the general university community, non-religious clubs, and non-religious organizations in the community (e.g., community centres, libraries). Individuals were selected for participation based on responses to a screening questionnaire of religiosity and proficiency in English. Participants selected for the high religious sample were of the Christian faith, reported strong personal involvement in religion, and attended religious activities at least weekly. In fact, 51.7% reported between 1 – 6 hours participation in religious activities per week, and the remaining 48.3% reported greater than 6 hours of weekly involvement in religious activity. Participants selected for the low religious sample reported no weekly participation in religious activity and denied any influence of religion on their personal beliefs. All participants were fluent in English and were at least 18 years of age.
Most of the participants were women (74.2%), and the gender ratio was similar across religious groups, $\chi^2 (1, N = 120) = .04, p > .50$. The mean age of the participants was 22.8 years ($SD = 7.8$), with no differences across groups, $F (1, 118) = 0.40, p > .50, \eta_p^2 = 0.003$. Approximately half of participants were Caucasian (50.9%), with the remainder indicating that they were from Asian (38.4%) or other ethnic backgrounds (10.9%). The groups did not differ on ethnic composition, $\chi^2 (2, N = 120) = 5.15, p = .08$. Participants had an average of 14.8 years of education and there were no differences across groups, $F (1, 118) = 0.02, p > .50, \eta_p^2 < .001$. Finally, 80.8% of the participants were single, 7.5% were married, and the remainder were cohabitating or in long-term relationships. The groups did not differ with regards to relationship status, $\chi^2 (2, N = 120) = 5.18, p = .08$.

**Apparatus**

The thought suppression task was presented on a Pentium IV desktop computer running Superlab software. All instructions were presented on a 19-inch colour monitor in a quiet, distraction-free room, and participant responses were recorded via keypress.

**Materials**

**Screening Questionnaire.** A brief screening questionnaire assessed religiosity and English proficiency of potential participants. Four questions assessed participants’ level of religious participation and degree of commitment to religious activities. These questions were based on a questionnaire developed by Sica, Novara, and Sanavio (2002). An additional two questions assessed proficiency in English.

**Obsessive Beliefs Questionnaire.** The brief version of the Obsessive Beliefs Questionnaire (OBQ-44; OCCWG, 2005) was used to assess beliefs and assumptions related to OCD. See the description from Study 1 for more information on this measure.
Obsessive-Compulsive Inventory - Revised. Symptoms of obsessive-compulsive disorder were assessed with the Obsessive-Compulsive Inventory – Revised (OCI-R; Foa et al., 2002; Hajcak et al., 2004). See the description from Study 1 for more information on this measure.

Positive and Negative Affect Schedule. The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) is a 20-item self-report scale that measures positive and negative mood states. The scale consists of 10 adjectives describing positive emotions (e.g., excited, enthusiastic) and 10 adjectives describing negative emotions (e.g., scared, upset), yielding two affect scores. Participants rate the degree to which they feel each emotion on a scale from 1 (“very slightly or not at all”) to 5 (“extremely”). For the current study, only the PANAS negative affect (NA) scale was included, as the cognitive theory of obsessions makes no predictions about an association between dysfunctional appraisals and positive affect. The PANAS NA scale was administered before and after the thought suppression task in order to measure potential changes in mood. At each time point, participants rated the extent to which they felt each emotion at that present time.

The PANAS scales have shown excellent internal consistency, with a Cronbach’s alpha of .85 for negative affect when “present moment” instructions were used (Watson et al., 1988). The PANAS scales have also shown excellent convergent and divergent validity. Importantly, the PANAS scales have also been shown to be sensitive to changes in mood (Watson et al., 1988). Notably, the negative affect scale, but not the positive affect scale, was found to correlate with perceived stress. In addition, the PANAS scales are often used as manipulation checks in mood induction studies (Phillips, Smith, & Gilhooly, 2002; Srivastava, Sharma, & Mandal, 2003).
Personal Significance Scale. An abbreviated version of the Personal Significance Scale (PSS; Rachman, 2003) was included in this study to measure dysfunctional appraisals related to the personal significance of the target blasphemous thought. Seven of the original twenty questions were not appropriate for the purpose of this study, and so only the thirteen questions of relevance to the present study were selected. For each question, participants were asked to imagine that they experienced the target thought and to rate the extent to which they agreed with statements relating to the target thought on a scale from 0 (not at all) to 8 (totally agree). For example, the PSS includes the following questions: “To what extent would this thought mean that you are a bad, wicked person?” and “To what extent would this mean that you should fight against and resist these thoughts?” The PSS is a recently developed instrument that has not undergone psychometric validation, although it is currently being used in federally funded research on obsessions (M. Whittal, personal communication, September 2004). It was included in the present study because it measures a core construct of Rachman’s cognitive theory of obsessions for which no validated measure exists. In the current study, the PSS demonstrated strong internal consistency, with Cronbach’s alpha = .90. Moreover, in previous data collected in our laboratory, the 13 questions of the PSS used in the present study correlated strongly with the Interpretation of Intrusions Inventory (the III-31), $r = .64$. In addition, the PSS correlated poorly with measures unrelated to the construct of appraisals, such as baseline negative affect ($r = -.13$).

Ego-Dystonic Questionnaire-Dislike. Seven questions from the Ego-Dystonic Questionnaire (EDQ; Purdon, in press) were included in this study to measure the extent to which participants disliked the target blasphemous thought and the degree to which the target thought conflicted with their morals. Unlike the PSS, which measures dysfunctional
appraisals about the personal significance of the thought, the EDQ-D measures judgments about the thought itself. For example, the EDQ-D includes the following statements: “This thought is upsetting because it violates my sense of morality and decency,” and “This thought conflicts with my personality, or, my sense of ‘who I am.’” Participants rate the extent to which they agree or disagree with each statement as it applied to the target blasphemous thought on a 7-point Likert scale. While the EDQ-D is a newly developed measure that has not undergone psychometric validation, it demonstrated strong internal consistency in the current study, with Cronbach’s alpha = 0.94. Moreover, it demonstrated an expected pattern of correlations, with a moderately strong association with the other measure of appraisals, the PSS ($r = -0.44$), and no association with measures unrelated to the construct of appraisals, such as baseline PANAS-NA ($r = -0.06$).

**Thought Suppression Task Rating Scales.** After each thought monitoring period, participants completed three rating scales, measuring: (1) the acceptability of target thought occurrences (“How acceptable was it to you to have some thoughts related to the story?”), rated on a 1 (“completely acceptable”) to 7 (“completely unacceptable”) scale; (2) the anxiety caused by occurrences of the target thought (“How anxious did you feel as a result of thoughts related to the story?”), rated on a 1 (“not at all anxious”) to 7 (“extremely anxious”) scale; and (3) suppression effort (“How hard did you try to get rid of thoughts related to the story?”), rated on a 1 (“did not try at all”) to 7 (“tried my hardest to push thoughts from my mind”) scale. The suppression effort rating served as a manipulation check for the thought suppression task.

**Thought Control Strategies Questionnaire.** The Thought Control Strategies Questionnaire (TCSQ) was included to measure participants’ use of thought control
strategies during each interval of the thought suppression task. The TCSQ was designed for this study based on items from the Cognitive Intrusions Questionnaire (Freeston et al., 1991) and the Revised Obsessive Intrusions Inventory (Purdon & Clark, 1994b). The TCSQ consists of 9 questions that ask participants to rate the extent to which they used various strategies in response to target thought occurrences during the monitoring task on a scale from 1 (never) to 5 (constantly). Examples of questions include: “Said ‘stop’ to myself,” “Tried to replace the thought with another,” and “Distracted myself with the things around me.” The TCSQ demonstrated good internal consistency, with Cronbach’s alpha = 0.80. Moreover, it displayed preliminary evidence of convergent validity, in that it correlated with the suppression effort ratings for both Interval 1 ($r = .54$) and Interval 2 ($r = .42$). However, it also correlated with baseline PANAS-NA ratings ($r = .28, p < .0001$) suggesting the pre-task negative mood was related to thought control effort during the task.

**Procedure**

Potential participants completed a brief screening questionnaire over the telephone or via e-mail to determine eligibility for this study. Individuals who met study criteria were invited to participate in the study and were scheduled for an appointment. On the day of the scheduled appointment, participants were briefed on the nature of the study, and they provided informed consent. Participants were informed that the purpose of the study was to explore what people think about different kinds of thoughts, to examine how people respond to their thoughts, and to determine the effectiveness of different methods of responding to thoughts.

After providing informed consent, half of the participants were randomly assigned to complete the OCD measures (the OBQ-44 and the OCI-R); the other half completed the
OCD measures upon completion of the thought suppression task (see Figure 2 for a diagram of the procedure). Prior to beginning the thought suppression task, all participants completed the PANAS NA scale to assess baseline mood and then were randomly assigned to the “Suppress” \((n = 60)\) or “Do Not Suppress” \((n = 60)\) condition. Participants were then seated in front of the computer, in a distraction-free room, where they received instructions for the thought suppression task. The thought suppression task began with a one-minute practice trial to orient participants to the requirements of the task. All participants received the following instructions for the practice trial:

You will be asked to monitor your thoughts for two separate five-minute intervals. We would like you to get some practice with this method before you begin. During the next minute, we would like you to monitor your thoughts. During this time, you may think about anything you like, including thoughts about Starbucks, other coffee shops, or anything related to coffee. If a thought about Starbucks, other coffee shops, or anything related to coffee should come into your mind, please press the spacebar. It is important that you press the spacebar anytime you have a thought about Starbucks, other coffee shops, or anything related to coffee. Please continue in the same way for the full minute.

Participants were given one minute to monitor their thoughts, after which the experimenter answered questions and clarified details of the task as necessary. Following the practice trial, participants read the following short vignette, which included the target blasphemous thought (listed below in italics):

You decide to volunteer at a local soup kitchen that serves people who are homeless, most of whom are also mentally ill. As you start talking to the people who regularly
come for a hot meal, you learn more about them. One woman has delusions that she is an agent of the Space Police, here on earth to monitor activities and report back to the mother ship. One of the men believes he is Jesus Christ and engages in some behaviour consistent with that belief. At first you simply see him as having a delusion, but later, you begin to ponder the philosophical question of how a true messiah might be treated in today’s society. What if this man really were Jesus? What is the difference between this man and Jesus Christ himself? After serving the patrons, you sit down at a table with fellow volunteers, waiting for the minister at the soup kitchen to begin saying grace. As the minister starts to pray, you find yourself looking up at the crucifix hanging above the soup kitchen. While looking at the crucifix, you suddenly have a thought, “Jesus Christ was not the Messiah; Jesus Christ was just a raving lunatic!” The thought is accompanied by an image of Jesus Christ as a psychotic homeless man roaming the streets talking to himself.

After reading this vignette, participants completed the questionnaires assessing their judgments of the target thought (the EDQ-D) and appraisals of the personal significance of the thought (the PSS). Next, participants re-read the vignette in order to prime the story, and then they began the thought suppression task. During the first interval of the thought suppression task, participants were given either “Suppress” or “Do Not Suppress” instructions, dependent upon their random assignment. Participants in the suppress condition received the following instructions, based on the instructions used in Salkovskis and Campbell (1994) and Purdon and Clark (2001):

During the next five minutes, you will be asked to monitor your thoughts. During this time, you may think about anything you like, however, we ask that you try as
hard as you can to suppress all thoughts related to the story you read, including
thoughts related to “Jesus Christ,” “Jesus Christ was not the Messiah” or “Jesus
Christ was just a raving lunatic.” If one of these thoughts or a similar thought should
come into your mind, please press the space bar and try to remove it from your mind immediately. It is important that you try as hard as you can to remove this thought from your mind whenever it occurs. Anytime you have a thought about the story such as “Jesus Christ,” “Jesus Christ was not the Messiah” or “Jesus Christ was just a raving lunatic,” please press the space bar. Please continue in the same way for the full five minutes.

Participants in the “Do Not Suppress” condition received similar instructions, but they were specifically instructed not to suppress the thought. Participants in this condition received the following instructions:

During the next five minutes, you will be asked to monitor your thoughts. During this time, you may think about anything you like, including thoughts related to the story you read such as “Jesus Christ,” “Jesus Christ was not the Messiah” or “Jesus Christ was just a raving lunatic.” If one of these thoughts or a similar thought should come into your mind, please press the space bar, and continue to let all thoughts flow through your mind. It is important that you try not to control your thoughts but instead simply allow all thoughts to come into your mind freely. Anytime you have a thought about the story such as “Jesus Christ,” “Jesus Christ was not the Messiah” or “Jesus Christ was just a raving lunatic,” please press the space bar. Please continue in the same way for the full five minutes.
Participants monitored their thoughts for five minutes and pressed the spacebar whenever a target thought entered their mind. At the end of the five minutes, participants made ratings of suppression effort, anxiety caused by target thought occurrences, and acceptability of target thought occurrences, and they completed the Thought Control Strategies Questionnaire.

Participants then received instructions for the second interval of the thought suppression task. During this second interval, all participants received “Do Not Suppress” instructions. The instructions were nearly identical for both conditions, except for the instructions enclosed in brackets below:

During the next five minutes, we again ask that you monitor your thoughts. [During this time/This time, however], you may think about anything you like, including thoughts related to the story you read such as “Jesus Christ,” “Jesus Christ was not the Messiah” or “Jesus Christ was just a raving lunatic.” If one of these thoughts or a similar thought should come into your mind, please press the space bar and continue to let all thoughts flow through your mind. It is important that you try not to control your thoughts but instead simply allow all thoughts to come into your mind freely. Anytime you have a thought about the story such as “Jesus Christ,” “Jesus Christ was not the Messiah” or “Jesus Christ was just a raving lunatic,” please press the space bar. Please continue in the same way for the full five minutes.”

Participants monitored their thoughts for five minutes and pressed the spacebar whenever a target thought entered their mind. At the end of the five minutes, participants completed the three ratings scales (suppression effort, anxiety, and acceptability) and the Thought Control Strategies Questionnaire for the second time. Participants also completed the PANAS NA rating for a second time to measure post-task mood. Those participants assigned to complete
the OCD measures at the end of the task did so at this time (no order effects were observed, so this factor will not be considered further in this document). Finally, all participants were debriefed and thanked for their participation.

**Results**

**Preliminary Analyses**

**Symptom measures and baseline mood.** Importantly, the High Religious and Low Religious groups did not differ with respect to obsessive-compulsive symptoms as measured by the OCI-R, \( t (117) = -0.84, p > .25, d = 0.16 \), or OC beliefs as measured by the OBQ-44, \( t (118) = 0.56, p > .50, d = 0.10 \). See Table 8 for means and standard deviations across groups. Moreover, the groups did not differ on baseline PANAS-NA ratings, \( t (118) = -0.65, p > .50, d = 0.12 \).

**Manipulation check.** To examine whether participants followed experimental instructions, the suppression effort ratings were used as the dependent variable in a 2 (Group: High Religious vs. Low Religious) by 2 (Instructions: “Suppress” vs. “Do Not Suppress”) by 2 (Interval: 1 vs. 2; within-subjects factor) repeated measures analysis of variance (ANOVA). Means and standard deviations for suppression effort ratings are presented in Table 9. Results of the ANOVA revealed a significant main effect of Interval, \( F (1, 116) = 145.13, p < .0001, \eta_p^2 = .56 \), with higher suppression ratings during Interval 1 than Interval 2. Results also revealed a significant main effect of Instructions, \( F (1, 116) = 25.37, p < .0001, \eta_p^2 = .18 \), with higher suppression ratings in the “Suppress” condition than the “Do Not Suppress” condition. There was no main effect of Religion, \( F (1, 116) = 0.12, p > .50, \eta_p^2 = .001 \), suggesting that suppression effort did not differ as a function of religious involvement. Importantly, the main effects were qualified by a significant Instructions by Interval
interaction, $F(1, 116) = 66.47, p < .0001, \eta^2_p = .36$, and a trend for an Interval by Religion interaction, $F(1, 116) = 2.90, p = .09, \eta^2_p = .02$. There were no other 2-way or 3-way interactions (all $F's < 1.0, p's > .25, \eta^2_p < .01$).

To examine the significant Instructions by Interval interaction, simple main effects analyses were conducted comparing suppression effort ratings across the different instruction conditions during Interval 1 and Interval 2. These results confirmed that participants complied with the experimental instructions; during Interval 1, participants in the “Suppress” condition reported significantly greater suppression effort than did participants in the “Do Not Suppress” condition, $F(1, 116) = 60.39, p < .0001, \eta^2_p = .34$, whereas during Interval 2, no differences emerged between conditions, $F(1, 116) = 0.43, p > .50, \eta^2_p = .004$.

To explore the trend for an Interval by Religion interaction, simple main effects analyses were conducted comparing the suppression effort ratings of High Religious versus Low Religious participants during Intervals 1 and 2. These analyses revealed no differences in suppression effort ratings between High and Low Religious participants during Interval 1, $F(1, 116) = 1.23, p > .25, \eta^2_p = .01$, or during Interval 2, $F(1, 116) = 0.83, p > .25, \eta^2_p = .01$.

To further explore participants’ use of effortful thought control strategies, the total score from the Thought Control Strategies Questionnaire was entered into a 2 (Group: High Religious vs. Low Religious) by 2 (Instructions: “Suppress” vs. “Do Not Suppress”) by 2 (Interval: 1 vs. 2; within-subjects factor) ANOVA. Means and standard deviations are presented in Table 9. Results of the ANOVA revealed a significant main effect of Interval, $F(1, 116) = 96.39, p < 0.0001, \eta^2_p = .45$, with higher thought control effort ratings during Interval 1 than Interval 2, and a significant main effect of Instructions, $F(1, 116) = 4.79, p =$
0.03, $\eta_p^2 = .04$, with higher ratings in the “Suppress” condition than the “Do Not Suppress” condition. There was no main effect for Religion, $F(1, 116) = 2.42, p > .10, \eta_p^2 = .02$.

These main effects were qualified by a significant Instructions by Interval interaction, $F(1, 116) = 33.78, p < 0.001, \eta_p^2 = .23$. Simple main effects analyses revealed that during Interval 1, participants in the “Suppress” condition used more effortful thought control strategies than did participants in the “Do Not Suppress” condition, $F(1, 116) = 19.01, p < 0.001, \eta_p^2 = .14$. During Interval 2, there were no differences in effortful thought control strategies between conditions, $F(1, 116) = 0.13, p > 0.5, \eta_p^2 = .001$. This further confirms that participants given suppression instructions used more strategies to try to control their thoughts than participants given “Do Not Suppress” instructions.

There were no other significant two-way interactions, $F's < 2.0, p's > .25, \eta_p^2 < .02$, although there was a statistical trend for a three-way interaction of Instructions by Interval by Group, $F(1, 116) = 3.36, p = 0.07, \eta_p^2 = .03$. To understand the nature of this potential interaction, two follow-up 2 (Group: High Religious vs. Low Religious) by 2 (Interval: 1 vs. 2; within-subjects factor) ANOVAs were conducted for the “Suppress” and “Do Not Suppress” conditions separately. In the “Suppress” condition, the ANOVA revealed a significant main effect of Interval in the expected direction, $F(1, 58) = 106.77, p < 0.001, \eta_p^2 = .65$, a significant interaction of Interval by Group, $F(1, 58) = 4.53, p = 0.04, \eta_p^2 = .07$, but no main effect of Group, $F(1, 58) = 1.43, p > .10, \eta_p^2 = .02$. Follow-up analyses of the Interval by Group interaction revealed that during Interval 1, there were no differences between High and Low Religious participants, $F(1, 58) = 0.01, p > .50, \eta_p^2 < .01$. However, during Interval 2, High Religious participants showed a trend towards using more effortful thought control strategies than Low Religious participants, $F(1, 58) = 3.88, p = .05, \eta_p^2 = .
In the “Do Not Suppress” condition, the ANOVA revealed a significant main effect of Interval, $F(1, 58) = 9.37, p = .003, \eta_p^2 = .14$, with participants using more effortful thought control strategies during Interval 1 than during Interval 2. There was no main effect of Group, $F(1, 58) = 1.03, p > .25, \eta_p^2 = .02$, nor an Interval by Group interaction, $F(1, 58) = 0.12, p > .50, \eta_p^2 < .01$.

**Appraisals of the blasphemous thought.** Participants completed appraisal ratings of the target blasphemous thought prior to beginning the experimental thought suppression task. An important assumption underlying the hypotheses in the current study was that highly religious participants would endorse more personally significant appraisals of the target blasphemous thought than would low religious participants. In order to test this assumption, total scores from the two appraisal measures, the PSS and the EDQ-D, were entered into two separate 2 (Group: High Religious vs. Low Religious) by 2 (Instructions: “Suppress” vs. “Do Not Suppress”) ANOVAs. Religious participants were expected to have higher PSS scores than low religious participants, indicating greater dysfunctional appraisals of personal significance of the target thought. Furthermore, it was expected that religious participants would find the target blasphemous thought more ego-dystonic than would low religious participants, as indicated by lower scores on the EDQ-D. No differences were expected with respect to Instructions, which was included as a factor in the ANOVAs as a check on random assignment to groups.

See Table 8 for means for the PSS and EDQ-D. For the PSS ratings, results revealed a significant main effect of Group, $F(1, 116) = 16.08, p < 0.0001, \eta_p^2 = .12$. Consistent with the study hypotheses, High Religious participants endorsed more dysfunctional appraisals of the target blasphemous thought than did Low Religious participants. There was no main
effect of Instructions, $F(1, 116) = 0.61, p > .25, \eta_p^2 < .01$, and no significant interaction, $F(1, 116) = 0.39, p > .50, \eta_p^2 < .01$.

A similar pattern of results emerged for the EDQ-D ratings. The results indicated a significant main effect for Group, $F(1, 116) = 89.95, p < 0.0001, \eta_p^2 = .44$. The High Religious participants rated the target thought as more ego-dystonic than did the Low Religious participants. There was no main effect of Instructions, $F(1, 116) = 0.40, p > .50, \eta_p^2 < .01$, and no significant interaction, $F(1, 116) = 0.12, p > .50, \eta_p^2 < .01$.

These results provide strong support for the underlying rationale of the study. That is, the significant main effect of Group confirms that highly religious participants were more likely to appraise the target blasphemous thought as personally significant (as measured by the PSS) and to judge the target thought as more ego-dystonic (as measured by the EDQ-D) than were participants for whom religion was unimportant. These results also confirm that participants in the “Suppress” and “Do Not Suppress” conditions did not differ on pre-manipulation appraisal ratings.

Tests of the Main Hypotheses

Hypotheses 1 and 2 - Effects of suppression and personal meaning on target thought frequency. The primary questions of interest in this study were whether appraisals of personal significance and thought suppression would exert direct and interactive effects on the frequency of target thoughts. To examine these hypotheses, target thought frequency as measured by keypress was used as the dependent variable in a 2 (Group: High Religious vs. Low Religious) by 2 (Instructions: “Suppress” vs. “Do Not Suppress”) by 2 (Interval: 1 vs. 2, within subjects factor) ANOVA. A logarithmic transformation was applied to the frequency
data in order to correct for a significant positive skew in the data. Raw means and standard deviations across groups and intervals are presented in Table 9.

There were no main effects of Instructions, Interval, or Group, indicating that target thought frequency was generally comparable across levels of these variables (see Table 10 for the complete ANOVA table). However, as illustrated in Figure 3, a significant Interval by Instructions interaction was observed. To break down this interaction, simple main effects analyses were performed comparing target thought frequency across Intervals in the “Suppress” and “Do Not Suppress” condition. These analyses revealed that participants in the “Do Not Suppress” condition showed a significant reduction in the frequency of target thoughts from Interval 1 to Interval 2, $F(1, 116) = 13.69, p < 0.001, \eta^2_p = .10$. In contrast, participants in the “Suppress” condition showed a marginally significant increase in the frequency of target thoughts from Interval 1 to Interval 2, $F(1, 116) = 3.14, p < 0.08, \eta^2_p = .03$. Thus, hypothesis 1 was partially supported; whereas participants in the “Do Not Suppress” condition showed a significant decrease in target thoughts over time, participants instructed to suppress the thought reported an increase in thoughts, although this increase was not strong enough to be statistically significant.

Results of the ANOVA also revealed a marginally significant three-way Interval by Instructions by Group interaction. The presence of a three-way interaction indicates that the Interval by Instructions interaction described above differed between High Religious and Low Religious participants. To explicate the nature of this interaction, two follow-up 2 (Instructions: “Suppress” vs. “Do Not Suppress”) by 2 (Interval: 1 vs. 2) ANOVAs were conducted for the High Religious and Low Religious groups separately. In the High Religious group, no main effects of Interval or Instructions were observed, $F$'s (1, 58) < 2.00,
p's > .15, \( \eta_p^2 < .04 \). Importantly, a significant Interval by Instructions interaction emerged, \( F(1, 58) = 15.54, p < .0001, \eta_p^2 = .21 \). To break down this interaction, simple main effects analyses were performed comparing target thought frequency across Intervals for the “Suppress” and “Do Not Suppress” conditions separately. These analyses revealed that participants given suppression instructions showed a marginally significant increase in target thought frequency from Interval 1 to Interval 2, \( F(1, 58) = 3.24, p = .08, \eta_p^2 = .05 \), whereas participants given “Do Not Suppress” instructions showed a significant decrease in target thought frequency from Interval 1 to Interval 2, \( F(1, 58) = 14.25, p < .001, \eta_p^2 = .20 \).

Moreover, during Interval 1 participants in the “Do Not Suppress” condition reported higher target thought frequency than did participants in the “Suppress” condition, \( F(1, 58) = 8.29, p < .01, \eta_p^2 = .12 \), whereas during Interval 2 this pattern was reversed such that participants in the “Suppress” condition reported significantly higher target thought frequency than did participants in the “Do Not Suppress” condition, \( F(1, 58) = 7.25, p < .01, \eta_p^2 = .11 \). This pattern is consistent with a paradoxical effect of thought suppression within the High Religious sample.

In the Low Religious group, results of the 2 (Instructions: “Suppress” vs. “Do Not Suppress”) by 2 (Interval: 1 vs. 2) ANOVA revealed a trend for a main effect of Instructions, \( F(1, 58) = 3.18, p = .08, \eta_p^2 = .05 \), whereby participants in the “Do Not Suppress” condition reported more target thoughts across intervals than did those in the “Suppress” condition. There was no main effect of Interval, \( F(1, 58) = 0.26, p > .50, \eta_p^2 < .01 \), and no Instructions by Interval interaction, \( F(1, 58) = 2.17, p > .10, \eta_p^2 = .04 \). This pattern is clearly not consistent with a paradoxical effect of thought suppression. Instead, this pattern suggests that for participants in the Low Religious sample, initial suppression
instructions resulted in fewer target thoughts across intervals than did initial nonsuppression. These results provide support for hypothesis 2, demonstrating the thought suppression had differential effects on target thought frequency depending on the personal meaning of the target thought.

**Hypothesis 3: Anxiety and acceptability ratings.** The cognitive theory of obsessions predicts that the suppression of a personally meaningful thought should lead to increased anxiety and evaluation of target thought recurrences as unacceptable. In order to examine these predictions, participants' anxiety ratings and target thought acceptability ratings were examined. Following each interval of the thought suppression task, participants rated their level of anxiety on a 1 ("not at all anxious") to 7 ("extremely anxious") rating scale and the acceptability of target thought occurrences on a separate 1 ("totally unacceptable") to 7 ("completely acceptable") rating scale. Means and standard deviations are presented in Table 9. Anxiety ratings were entered into a 2 (Group: High Religious vs. Low Religious) by 2 (Instructions: "Suppress" vs. "Do Not Suppress") by 2 (Interval: Interval 1 vs. Interval 2; within-subjects factor) ANOVA. There was a significant main effect of Group, $F(1, 116) = 7.83, p = .006, \eta^2_p = .06$, with highly religious participants reporting higher levels of anxiety than low religious participants across both intervals. There was also a significant main effect of Interval, $F(1, 116) = 38.95, p < .0001, \eta^2_p = .25$, indicating that participants reported an overall decrease in anxiety levels from Interval 1 to Interval 2 which likely reflects general adjustment to the procedures and setting. Contrary to the hypotheses, there was no main effect of Instructions, nor were there any significant interactions ($F$'s < 2.0, $p$'s > .10, $\eta^2_p < .02$).
Thought acceptability ratings were entered into a 2 (Group: High Religious vs. Low Religious) by 2 (Instructions: "Suppress" vs. "Do Not Suppress") by 2 (Interval: 1 vs. 2, within-subjects factor) ANOVA. Results revealed a main effect of Group, $F(1, 116) = 22.29, p < 0.001, \eta_p^2 = .16$, with highly religious participants rating target thought occurrences as less acceptable than the low religious participants. There was also a main effect of Interval, $F(1, 116) = 4.04, p = 0.047, \eta_p^2 = .03$, whereby thought acceptability ratings were lower during Interval 1 than during Interval 2. There was no main effect of Instructions, $F(1, 116) = 0.35, p > .50, \eta_p^2 < .01$.

The main effect of Interval was qualified by a significant Interval by Instructions interaction, $F(1, 116) = 4.04, p = 0.047, \eta_p^2 = .03$. To break down this interaction, simple main effects analyses were performed comparing thought acceptability ratings across Intervals for the "Suppress" and "Do Not Suppress" conditions separately. These analyses revealed that participants given suppression instructions rated the target thought as less acceptable during Interval 1 (when under "suppress" instructions) than during Interval 2 (when suppression instructions were removed), $F(1, 116) = 8.07, p = 0.005, \eta_p^2 = 0.06$. No such differences were observed for participants in the “Do Not Suppress” condition, $F(1, 116) = 0.00, p = 1.00, \eta_p^2 < .01$.

While there were no other significant two-way interactions (all $F$'s < 2.5, $p$'s > .10, $\eta_p^2 < .02$), a trend emerged for a three-way interaction of Instructions by Interval by Group, $F(1, 116) = 2.02, p = 0.09, \eta_p^2 = .02$. To understand the nature of this interaction, two follow-up 2 (Group: High Religious vs. Low Religious) by 2 (Interval: 1 vs. 2; within-subjects factor) ANOVAs were conducted for the “Suppress” and “Do Not Suppress” conditions separately. In the “Suppress” condition, the ANOVA revealed a significant main effect of
Interval, $F(1, 58) = 9.83, p = 0.003, \eta_p^2 = .14$, and a significant main effect of Group, $F(1, 58) = 6.34, p = .02, \eta_p^2 = .01$. There was also a trend for an Interval by Group interaction, $F(1, 58) = 3.72, p = 0.06, \eta_p^2 = .06$. Follow-up analyses of the Interval by Group interaction revealed that during Interval 1, there were no differences between High and Low Religious participants, $F(1, 58) = 2.63, p > .10, \eta_p^2 = .04$. However, during Interval 2, High Religious participants rated target thought occurrences as significantly less acceptable than Low Religious participants, $F(1, 58) = 9.99, p = .003, \eta_p^2 = 0.15$. In the “Do Not Suppress” condition, the ANOVA revealed a significant main effect of Group, $F(1, 58) = 16.53, p < .0001, \eta_p^2 = .22$, with High Religious participants rating target thought occurrences as less acceptable than Low Religious participants across both intervals. There was no main effect of Interval, $F(1, 58) = 0.00, p > .50, \eta_p^2 < .01$, and no Interval by Group interaction $F(1, 58) = 0.36, p > .50, \eta_p^2 < .01$.

**Hypothesis 4: Post-task negative affect and anxiety.** Regression analyses were conducted to examine whether appraisals of personal significance and thought control effort would be related to post-task anxiety and mood. Whereas the previous analyses were conducted to investigate differences across levels of group (highly religious vs. low religious) and instructions (“Suppress” vs. “Do Not Suppress”), the current regression analyses were conducted to examine whether appraisals of the target thought and thought control effort would predict negative mood and anxiety, apart from group status or instructions. The regression analyses differed from the analyses of variance in a number of important ways. The analyses of variance were conducted to investigate differences across levels of group (highly religious vs. low religious) and instructions (“Suppress” vs. “Do Not Suppress”). In those analyses, group status was used as a proxy for appraisals; highly
religious participants were expected to differ from low religious participants in the extent to which they attached exaggerated personal significance to the target blasphemous thought. While this assumption was warranted (as a group, highly religious participants endorsed greater appraisals of personal significance of the target thought), there was also considerable variation in appraisals ratings within both the high and low religious groups. Therefore, the regression analyses were conducted to examine whether post-task mood and anxiety would be predicted based on participants' unique appraisal ratings and thought control effort, apart from group status or instructions. Thus, the regression analyses allowed for an examination of the continuous variables, rather than the dichotomous variables used in the analyses of variance.

The cognitive theory predicts a dynamic model whereby intrusive thoughts, when appraised as personally significant and subjected to attempts at thought control, result in mood disturbance and increased anxiety. To test this model, two separate regression analyses were conducted examining post-task negative affect and post-task anxiety ratings. In each analysis, pre-experimental appraisals of personal significance of the target thought (as measured by the PSS) and use of thought control strategies during the thought suppression task (TCSQ ratings across both intervals) served as the primary predictors. Furthermore, the interaction term of appraisals and thought control effort was added to the models to examine whether the combination of appraisals and thought control would contribute to the prediction of negative affect and anxiety over and above the main effects.

In each regression equation, baseline mood and OCD symptom severity were entered on Step 1 to control for these variables. Frequency of target thought occurrences was entered on Step 2 to examine whether thought frequency would be associated with mood and anxiety.
Pre-experimental appraisals ratings and thought control effort rating were entered on Step 3, and the appraisals by thought control effort interaction term was entered on the fourth and final step.

In the first regression equation, post-task negative affect served as the dependent variable. Preliminary analyses were conducted in order to evaluate the assumptions of multiple regression. Logarithmic transformations were applied to the baseline and post-task PANAS-NA ratings, the PSS ratings, and the total thought frequency ratings, in order to reduce skewness and reduce the number of outliers. An examination of the residuals and Cook’s distance values revealed one case that exerted undue influence on the model, so this case was removed from the analysis. In order to reduce multicollinearity, the predictor variables were centered and the interaction term was created from the cross-products of the centered variables following the recommendations of Aiken and West (1991).

The results of the hierarchical regression analysis are presented in Table 11. After controlling for baseline mood and OCD severity, appraisals and thought control effort both emerged as significant unique predictors of post-task negative affect, such that higher appraisals of personal significance and greater thought control effort were associated with increased post-task negative affect. These main effects were moderated by an appraisals by thought control effort interaction. To clarify the nature of this interaction, post-hoc simple slopes analyses were conducted. Following the procedures recommended by Aiken and West (1991), the interaction was examined by comparing participants who endorsed high appraisals of personal significance (1 SD above the mean PSS ratings) with participants who endorsed low appraisals of personal significance (1 SD below the mean PSS ratings). As displayed in Figure 4, for participants who endorsed high appraisals of the target thought,
thought control effort predicted negative mood, $\beta = 0.42, p < .001$. However, for participants who endorsed low appraisals, thought control effort did not predict negative mood, $\beta = 0.13, p > .10$. These results demonstrate that the combination of dysfunctional appraisals and greater use of thought control strategies predicted negative mood following the thought suppression task.

In the second hierarchical regression analysis, post-task anxiety ratings served as the dependent variable. Preliminary analyses were conducted to examine the assumptions of regression. As in the first regression, an examination of the residuals and Cook's distance values revealed one case that exerted undue influence on the model, so this case was removed from the analysis. The results of the hierarchical regression model are presented in Table 12. After controlling for baseline mood and OCD symptom severity, target thought frequency contributed unique variance to post-task anxiety ratings. On Step 3, dysfunctional appraisals and thought control effort both emerged as significant unique predictors of post-task anxiety. Of note, after these two predictors were entered into the equation, OCD severity no longer contributed unique variance to the model. On Step 4, the addition of the two-way interaction term of dysfunctional appraisals and thought control effort resulted in a significant increase in $R^2$. In order to understand this significant interaction, post-hoc simple slopes analyses were conducted comparing participants who endorsed strong dysfunctional appraisals with those who endorsed few appraisals. As depicted in Figure 5, these analyses revealed that for participants who endorsed strong dysfunctional appraisals of the target thought, thought control effort was significantly related to anxiety ratings, $\beta = 0.51, p < .001$. However, for participants who endorsed few dysfunctional appraisals of the target thought, thought control effort was not significantly associated with anxiety, $\beta = 0.08, p > .50$. In
other words, as predicted by the cognitive theory of OCD, negative appraisals combined with strong efforts to control thoughts predicted post-task anxiety ratings.

**Discussion**

The purpose of this study was to examine the direct and interactive effects of thought suppression and appraisals of personal meaning on thought frequency, mood, and anxiety. This study was quasi-experimental in design; while thought suppression was manipulated, personal meaning of the target thought was not. Instead, a single target thought was employed and two groups of participants were selected with the expectation that they would differ in the extent to which they endorsed appraisals of personal significance of the thought. The primary aim of this study was to investigate whether thought suppression would have differential effects when the target thought was personally meaningful (i.e., for the high religious group) versus when the target thought was unimportant (i.e., for the low religious group). The study hypotheses were examined using both an ANOVA approach as well as a regression approach.

First, a series of analyses of variance were conducted exploring the direct and interactive effects of instructed thought suppression (suppress vs. do not suppress) and personal relevance of the target thought (high religious vs. low religious). These analyses showed support, albeit weak, for differential effect of thought suppression on target thought frequency, depending on the personal meaning of the target thought. When the target thought was meaningful, thought suppression caused the frequency of thoughts to persist or perhaps increase over time, whereas nonsuppression resulted in a significant decline in target thought frequency over time. In contrast, when the thought was less meaningful to participants, suppression did not lead to changes in the frequency of target thoughts. In fact,
participants in the suppression condition reported fewer thought recurrences across both intervals than did participants in the nonsuppression condition. Though only a weak effect, this finding is important because it suggests that suppression of a personally meaningful thought is counter-productive; rather than help push the thought out of the mind, suppression appears to keep the thought present in the mind. Suppression does not appear to have such an effect for target thoughts that are not meaningful. The cognitive theory of obsessions posits that thought suppression is more likely to be used when intrusive thoughts are appraised as personally significant or revealing, rather than when the thoughts are appraised as insignificant. The current findings suggest that when thoughts are appraised as significant, suppression may be particularly problematic.

The cognitive theory also predicts that recurrences of personally meaningful intrusive thoughts should provoke anxiety, and that thought suppression should potentiate this effect. The analysis of variance provided mixed support for this prediction. Clear group differences emerged in anxiety ratings, with the highly religious participants reporting significantly more anxiety than the low religious participants, irrespective of instructions or interval. However, contrary to the study hypotheses, suppression instructions had no effect on anxiety. The current results suggest that personal meaning of the thought, but not thought suppression, was related to anxiety ratings. This result is interesting, and suggests that for the highly religious sample, having any thoughts related to blasphemy may have been anxiety provoking, regardless of whether they were instructed to suppress or not suppress such thoughts. Similarly, it is possible that overall thought frequency, rather than suppression instructions, was related to anxiety. Indeed, results from the regression analyses revealed that target thought frequency was a unique predictor of post-task anxiety ratings. By
extension, these results suggest that when an intrusive thought is personally meaningful, any exemplars of this thought may give rise to anxiety.

A second set of analyses was conducted to examine the study hypotheses from a different perspective. In contrast to the ANOVAs, which allowed for an examination of what participants were instructed to do, and how participants were expected to appraise the target thought, the regression analyses explored participants’ reported use of thought control strategies and their appraisals of the target thought. These regression analyses revealed a very intriguing pattern of results. First, participants’ appraisals of the target thought as personally significant were associated with higher anxiety and more negative mood at the end of the thought suppression task. Second, working harder to control thoughts was also associated with higher post-task anxiety and more negative mood. Most importantly, appraisals and thought control strategies interacted such that the combination of appraisals and thought control strategies was associated with high negative affect and high anxiety. That is, appraisals or thought control strategies alone were not associated with negative affect. Only when both were present did participants report disturbed affect and increased anxiety following the task. These results provide strong support for the cognitive theory, which states that appraisals of personal significance, when combined with the use of thought control strategies such as suppression, lead to an escalating cycle of negative affect and increased anxiety.

It is somewhat perplexing that the findings from the regression analyses provide strong support for the cognitive theory of obsessions, whereas the findings from the ANOVAs provide only weak support for this model. There are a number of possible explanations that may account for this discrepancy. For one, the ANOVAs examined group
differences between suppression and nonsuppression. As discussed previously, these analyses examined what participants were *instructed* to do, whereas the regression analyses examined participants’ reported use of thought control strategies. While the results of the manipulation check demonstrated that as a group, participants complied with experimental instructions, there was also considerable variability in the extent to which individual participants complied with the instructions. Some participants in the suppression condition endorsed relatively low suppression effort, and some participants in the “Do Not Suppress” condition endorsed considerably high suppression effort. Therefore, it is possible that individual differences in participants’ motivation to use thought control strategies, or individual differences in participants’ natural tendency to use such strategies, superceded experimentally imposed instructions. This suggests that an important avenue for future research will be to examine individual differences in natural suppression effort, natural motivation to control thoughts, as well as suppression ability, on subsequent mood, anxiety, and frequency of thoughts. Moreover, it would be informative to explore how individual differences interact with suppression instructions within the context of an experimental suppression paradigm.

This study was also designed to examine whether thought suppression would have differential effects based on the personal meaning of the target thought. To investigate this, high and low religious individuals were selected for participation in the study based on the expectation that these groups would differ in the extent to which they endorsed appraisals of personal significance of the target blasphemous thought. Preliminary analyses of the data confirmed that this expectation was warranted; highly religious participants rated the target blasphemous thought as more ego-dystonic and endorsed greater appraisals of personal
significance than did non-religious participants. Of course, there was also considerable within-group variability in appraisals ratings, which would have affected the between-group comparisons in the ANOVAs, while not affecting the regression analyses.

Moreover, the high and low religious participants would naturally vary along a number of dimensions beyond personal meaning of the target thought and these differences could have impacted the current study in unknown ways. For example, in some samples, religious individuals have endorsed higher levels of subclinical OCD symptoms and stronger obsessive-compulsive beliefs than nonreligious individuals (Abramowitz, Deacon, Woods, & Tolin, 2004; Sica et al., 2002; Steketee, Quay, & White, 1991). No such differences emerged in the current study; high and low religious individuals did not differ on OCD symptomatology, obsessive-compulsive beliefs, or baseline negative affect, making it unlikely that differences in OCD symptomatology or negative affect would alone account for the results of this study. However, other potential differences related to religiosity cannot be ruled out, suggesting that the current results need to be replicated in a different sample of participants.

It is also possible that the target blasphemous thought may not have resulted in large enough between-group differences in appraisals of personal meaning. The goal was to select a target thought that would maximize differences between the high religious sample and the low religious sample with respect to appraisals of the personal significance of the thought. At the same time, it was important that the target thought not be so offensive to the highly religious participants that it presented an ethical problem. Pilot work indicated that the target thought selected for this study met these criteria. However, during the study debriefing, a number of the highly religious participants commented that the target thought was not “bad
enough" to be upsetting to them. Therefore, it is possible that differences in appraisal ratings between the high and low religious groups were weaker than planned, suggesting that the ANOVA results may be somewhat conservative. This problem also points to the larger issue of studying obsessive phenomenon. The content of obsessions is often socially unacceptable and abhorrent, which creates ethical concerns regarding what content is appropriate for use in research.

When taken together, the current findings lend support to Rachman's model suggesting that appraisals about the personal significance of intrusive thoughts, when combined with thought control strategies, are associated with anxiety and negative mood. The findings also provide some support for the more specific hypothesis that suppression of personally meaningful thoughts leads to a paradoxical rebound in thought frequency.

Potential Explanations for Differential Effects of Thought Suppression

It is interesting to question why thought suppression might have differential effects on frequency of personally meaningful target thoughts than for unimportant thoughts. One possibility supported by the present findings is that "catastrophic" appraisals of the personal significance of a thought become associated with increased anxiety and mood disturbance. This negative mood and anxiety, in turn, may interfere with successful thought suppression. Indeed, there is evidence to suggest that negative mood is associated with greater difficulty suppressing thoughts (Wenzlaff, Wegner, & Klein, 1991; Wenzlaff, Wegner, & Roper, 1988). Moreover, negative mood and anxiety may act as a "cognitive load," which has been shown to enhance the paradoxical effects of suppression (see Wenzlaff & Wegner, 2000, for a review of this literature). In this way, personally meaningful thoughts may be particularly
sensitive to the ironic effects of suppression because they provoke negative mood and anxiety.

Another possibility is that when an intrusive thought is personally meaningful, individuals are more motivated to eliminate all occurrences of the target thought. In the current study, highly religious participants invested more effort in thought control strategies than did low religious participants when they were asked to simply monitor their thoughts. Whereas both high and low religious participants reported similar use of thought control strategies when directly instructed to suppress target thoughts, highly religious participants endorsed greater use of thought control strategies even when suppression instructions were removed. Thus, there is evidence that the participants who held more appraisals of personal meaning of the target thought spontaneously employed more thought control strategies than participants who did not hold such appraisals. This finding is similar to the results of Muris and colleagues (1997), who found that spider phobics reported greater suppression effort of spider-related targets than did individuals without a spider phobia. This tendency to use thought control strategies may be one of the very mechanisms through which appraisals contribute to an increasing frequency of thoughts. Prospective studies are needed to examine whether individual differences in the use of thought control strategies are associated with increased frequency of thoughts.

Relevance to the Thought Suppression Literature

How do the current findings fit with the thought suppression literature? When examined over the entire sample without regard to group status, participants in the “do not suppress” condition reported a significant decrease in target thoughts from the first to the second interval, whereas participants in the suppression condition did not show this decline,
and their thought frequency even showed a marginally significant increase over time. These results from the complete sample are consistent with past research reporting that thought suppression attenuated the natural decrease of personally relevant thoughts over time (Belloch et al., 2004; Purdon & Clark, 2001).

When the effects of suppression were examined separately depending on the personal meaning of the target thought, however, differences emerged in the effects of thought suppression according to the meaning of the thought. A number of past studies also found differences in the outcome of a thought suppression task according to the type of thought suppressed (McNally & Ricciardi, 1996; Purdon & Clark, 2001). In Purdon and Clark (2001), participants were able to suppress neutral thoughts and positive personally relevant thoughts but not negative personally relevant thoughts. Similarly, McNally and Ricciardi (1996) reported a significant rebound effect for personally relevant negative thoughts in contrast to the more successful suppression for neutral thoughts. In these past studies, the target thought differed between conditions with some participants instructed to suppress neutral thoughts and others instructed to suppress personally relevant thoughts. A strength of the current study was that the target thought was held constant across participants, thereby controlling for valence and novelty of the target thought. With these controls in place, there was some evidence that thought suppression varied as a function of the personal meaning of the thought. When taken together, there is emerging evidence that thought suppression may have differential effects depending on the personal meaning of the target thought.

A number of studies have failed to demonstrate an ironic effect of suppression when participants' own negative thoughts served as the target thought (Kelly & Kahn, 1994; Purdon & Clark, 2001; Rutledge, 1998). What might account for the differences between
studies? Other than the methodological differences already reviewed, another possibility is that the discrepant results are due to differences in prior experience with the target thought. Whereas participants in the current study were supplied with a novel target thought, studies examining naturally occurring targets use participant-supplied negative intrusive thoughts. As argued by Wenzlaff and Wegner (2000) and Tolin et al. (2002), people may develop extensive strategies to deal with their own intrusive thoughts that work in the short term, thereby interfering with the ironic effects of suppression in a laboratory setting. Moreover, participants may have greater difficulty complying with experimental instructions to suppress or not suppress when they have developed habitual strategies for dealing with their thoughts. Another possibility suggested by Kelly and Kahn (1994) is that individuals may successfully distract themselves from their own intrusive thoughts when in a novel setting, away from the triggers associated with their unwanted intrusive thoughts. For example, an individual bothered by intrusive thoughts of harming a child with a knife may only have difficulty suppressing this thought when around children or when in a setting that involves knives. When in the bland laboratory environment, it may be relatively easy to distract oneself from this type of thought. The current study examined whether the effects of thought suppression would differ according to the personal meaning of the target thought without confounding prior experience with the target thought. Future studies are needed to help tease apart the effects of personal meaning and prior experience on the effects of thought suppression.

In addition, while a number of past studies examined suppression of personally relevant target thoughts (Belloch et al., 2004; Kelly & Kahn, 1994; Purdon, 2001; Purdon & Clark, 2001; Rutledge, 1998), these studies varied considerably with respect to the content of the target thoughts used in the suppression task, with some studies employing thoughts that
were similar to obsessions (Belloch et al., 2004; Purdon, 2001; Purdon & Clark, 2001), while others included thoughts more akin to worries (Kelly & Kahn, 1994; Rutledge, 1998). Obsessions and worries are known to differ in both appraisal processes and thought control strategies employed (Freeston & Ladouceur, 1993; Langlois, Freeston, & Ladouceur, 2000). Thus, it is not surprising that variations in thought content would contribute to differences in the outcome of thought suppression studies. Moreover, past studies using personally relevant thoughts did not control for differences in thought content within participants. The content of intrusive thoughts is known to vary significantly across individuals, and it is likely that the idiosyncratic thoughts identified by participants vary along several dimensions, including thought content (e.g., aggressive, blasphemous, sexual), degree of similarity to obsessions (as opposed to worries or depressive ruminations), and social acceptability. As demonstrated in Studies 1 and 2, appraisals of personal significance can vary as a function of thought content. Thus, it is likely that within-participant variability in target thought content had an effect on the results of thought suppression studies. In the current study, holding the content of the target constant, and using an obsession-like target thought, there was evidence that the effects of a thought suppression task varied according to the personal meaning of the target thought.

Of course, alternate explanations are possible. Importantly, the study was not fully experimental in design, leaving open the possibility that the groups differed in other ways beyond the personal meaning of the target thought. In addition, the questionnaires used to measure appraisals of personal significance and thought control effort were designed for the current study and have not undergone full psychometric validation. This limitation is not unique to the current study, but relates to the broader challenge of attempting to assess meta-cognition. As discussed in Chapter 2, one of the primary challenges of studying cognitive
theories of OCD is that it is extremely difficult to measure what people think about their own thoughts. The definition and measurement of core domains of obsessive compulsive appraisals and beliefs remains an important area for future research.

Future Directions and Conclusion

The cognitive theory proposes a process whereby normal intrusive thoughts develop into clinical obsessions over the course of time – more than over a few minutes as studied in laboratory thought suppression studies. Therefore, it will be important to begin to study this question longitudinally. In the current study, thought frequency during the second interval was not dramatically different between the suppression and nonsuppression groups. However, the pattern of thought recurrences suggests that suppression is associated with a weak increase in thoughts, whereas nonsuppression is associated with a significant decrease in thoughts, and it would have been interesting to examine this pattern over a longer time period. One study has found that suppression results in sustained increases in thoughts over time (Trinder & Salkovskis, 1994). Thus, future studies should examine long-term suppression of personally meaningful thoughts to examine whether suppression maintains thought frequency (or increases it) over time, or whether suppression is a successful strategy for dealing with intrusive thoughts.

To conclude, the results of this study add to an emerging body of literature demonstrating that dysfunctional appraisals of personal significance and thought control are associated with negative mood and anxiety. This study also provides some evidence that suppression of negative, personally meaningful thoughts has deleterious effects on thought frequency, whether by increasing the frequency of thoughts, or by interfering with the otherwise natural decline in thoughts evidenced by the “Do Not Suppress” groups.
Prospective studies are needed to clarify the relative importance of appraisals of personal meaning and thought suppression in the development and maintenance of unwanted intrusive thoughts. A better understanding of the relevant roles that these variables play will help refine the theories and treatments of clinical obsessions.
Table 8: Means and Standard Deviations for Age, OCD Symptoms, OC Beliefs, Baseline Negative Affect, and Appraisals of the Target Thought

<table>
<thead>
<tr>
<th></th>
<th>High Religion</th>
<th>Low Religion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>Age</td>
<td>22.35 (7.05)</td>
<td>23.25 (8.57)</td>
</tr>
<tr>
<td>OCI-R</td>
<td>14.42 (9.59)</td>
<td>15.85 (9.10)</td>
</tr>
<tr>
<td>OBQ-44</td>
<td>143.70 (36.42)</td>
<td>140.03 (34.88)</td>
</tr>
<tr>
<td>PANAS Negative Affect</td>
<td>12.62 (2.92)</td>
<td>13.03 (4.02)</td>
</tr>
<tr>
<td>PSS Appraisals</td>
<td>1.71 (1.42)(^a)</td>
<td>0.86 (0.83)(^b)</td>
</tr>
<tr>
<td>EDQ-D</td>
<td>3.56 (1.52)(^a)</td>
<td>5.91 (1.14)(^b)</td>
</tr>
</tbody>
</table>

Note: \(N = 60\) in each group. OCI-R = Obsessive Compulsive Inventory – Revised; OBQ-44 = Obsessive Beliefs Questionnaire; PANAS = Positive and Negative Affect Schedule; PSS = Personal Significance Scale; EDQ-D = Ego-Dystonicity Questionnaire – Dislike (note that lower scores on the EDQ-D correspond with greater ratings ego-dystonicity). Within each row, means with different superscripts are significantly different from each other at \(p < .05\).
Table 9: Means and Standard Deviations for Suppression Effort, Target Thought Frequency, and Discomfort Ratings, by Group, Suppression Instructions, and Interval

<table>
<thead>
<tr>
<th>Suppression Instructions</th>
<th>Suppress</th>
<th>Do Not Suppress</th>
<th>Suppress</th>
<th>Do Not Suppress</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Interval 1</td>
<td>Interval 2</td>
<td>Interval 1</td>
<td>Interval 2</td>
</tr>
<tr>
<td>(Suppress)</td>
<td>(No Suppress)</td>
<td>(No Suppress)</td>
<td>(No Suppress)</td>
<td>(No Suppress)</td>
</tr>
<tr>
<td>(M (SD))</td>
<td>(M (SD))</td>
<td>(M (SD))</td>
<td>(M (SD))</td>
<td>(M (SD))</td>
</tr>
<tr>
<td><strong>High Religiosity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suppression Effort</td>
<td>4.33 (1.77)</td>
<td>1.80 (1.13)</td>
<td>2.40 (1.30)</td>
<td>2.10 (1.32)</td>
</tr>
<tr>
<td>Thought Control Effort</td>
<td>2.38 (0.59)</td>
<td>1.84 (0.71)</td>
<td>1.99 (0.67)</td>
<td>1.79 (0.60)</td>
</tr>
<tr>
<td>Thought Frequency</td>
<td>12.20 (10.46)</td>
<td>17.37 (24.07)</td>
<td>17.10 (13.22)</td>
<td>11.70 (12.66)</td>
</tr>
<tr>
<td>Anxiety Ratings</td>
<td>2.03 (1.22)</td>
<td>1.70 (1.06)</td>
<td>2.56 (1.33)</td>
<td>1.87 (1.14)</td>
</tr>
<tr>
<td>Acceptability Ratings</td>
<td>4.73 (1.70)</td>
<td>4.90 (1.75)</td>
<td>4.20 (1.97)</td>
<td>4.30 (2.12)</td>
</tr>
<tr>
<td><strong>Low Religiosity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suppression Effort</td>
<td>4.80 (1.61)</td>
<td>1.80 (0.89)</td>
<td>2.53 (1.17)</td>
<td>1.77 (1.04)</td>
</tr>
<tr>
<td>Thought Control Effort</td>
<td>2.37 (0.53)</td>
<td>1.54 (0.43)</td>
<td>1.82 (0.58)</td>
<td>1.66 (.58)</td>
</tr>
<tr>
<td>Thought Frequency</td>
<td>10.40 (13.10)</td>
<td>14.0 (19.02)</td>
<td>18.60 (23.19)</td>
<td>16.33 (20.57)</td>
</tr>
<tr>
<td>Anxiety Ratings</td>
<td>1.83 (1.08)</td>
<td>1.33 (0.71)</td>
<td>1.83 (1.15)</td>
<td>1.23 (0.50)</td>
</tr>
<tr>
<td>Acceptability Ratings</td>
<td>5.40 (1.48)</td>
<td>6.10 (1.125)</td>
<td>6.03 (1.27)</td>
<td>5.93 (1.60)</td>
</tr>
</tbody>
</table>

Note: Suppression Effort = Suppression Effort Rating Scale; Thought Control Effort = Thought Control Strategies Questionnaire; Thought Frequency = number of target thoughts recorded via key press; Anxiety Ratings = Anxiety Rating Scale; Acceptability Ratings = Acceptability Rating Scale.
Table 10: Analysis of Variance for Target Thought Frequency

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>$F$</th>
<th>$\eta_{p}^{2}$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between Subjects</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instructions</td>
<td>1</td>
<td>1.86</td>
<td>.02</td>
<td>.18</td>
</tr>
<tr>
<td>Group</td>
<td>1</td>
<td>0.38</td>
<td>.01</td>
<td>.54</td>
</tr>
<tr>
<td>Instruction X Group</td>
<td>1</td>
<td>1.65</td>
<td>.01</td>
<td>.20</td>
</tr>
<tr>
<td>Error Term</td>
<td>116</td>
<td>(0.48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within Subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interval</td>
<td>1</td>
<td>1.86</td>
<td>.02</td>
<td>.18</td>
</tr>
<tr>
<td>Interval X Instructions</td>
<td>1</td>
<td>14.97*</td>
<td>.11</td>
<td>.0001</td>
</tr>
<tr>
<td>Interval X Group</td>
<td>1</td>
<td>0.43</td>
<td>&lt;.01</td>
<td>.51</td>
</tr>
<tr>
<td>Interval X Group X Instructions</td>
<td>1</td>
<td>3.36†</td>
<td>.03</td>
<td>.07</td>
</tr>
<tr>
<td>Error Term</td>
<td>116</td>
<td>(0.04)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Values enclosed in parentheses represent mean square errors.

† $p < .10$, * $p < .05$
Table 11: Hierarchical Regression Analysis for Variables Predicting Post-task Negative Affect

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>$R^2$</th>
<th>$R^2\Delta$</th>
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</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline Negative Affect</td>
<td>0.59</td>
<td>0.07</td>
<td>.61*</td>
<td>.61</td>
<td>.43*</td>
</tr>
<tr>
<td>OCI-R</td>
<td>0.001</td>
<td>0.001</td>
<td>.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.44 .01</td>
</tr>
<tr>
<td>Baseline Negative Affect</td>
<td>0.59</td>
<td>0.07</td>
<td>.61*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCI-R</td>
<td>0.001</td>
<td>0.001</td>
<td>.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of Thoughts</td>
<td>0.02</td>
<td>0.02</td>
<td>.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.54 .09*</td>
</tr>
<tr>
<td>Baseline Negative Affect</td>
<td>0.53</td>
<td>0.07</td>
<td>.55*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCI-R</td>
<td>0.00</td>
<td>0.001</td>
<td>-.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of Thoughts</td>
<td>0.02</td>
<td>0.02</td>
<td>.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appraisals of Personal Significance</td>
<td>0.07</td>
<td>0.03</td>
<td>.16*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thought Control Effort</td>
<td>0.02</td>
<td>0.01</td>
<td>.26*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.55 .02*</td>
</tr>
<tr>
<td>Baseline Negative Affect</td>
<td>0.54</td>
<td>0.07</td>
<td>.55*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCI-R</td>
<td>0.00</td>
<td>0.001</td>
<td>.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of Thoughts</td>
<td>0.01</td>
<td>0.02</td>
<td>.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appraisals of Personal Significance</td>
<td>0.07</td>
<td>0.03</td>
<td>.16*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thought Control Effort</td>
<td>0.02</td>
<td>0.01</td>
<td>.28*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appraisals X Thought Control Effort</td>
<td>0.06</td>
<td>0.03</td>
<td>.14*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: N = 119; OCI-R = Obsessive Compulsive Inventory - Revised; * p < .05
### Table 12: Hierarchical Regression Analysis for Variables Predicting Anxiety Ratings

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$SE_B$</th>
<th>$\beta$</th>
<th>$R^2$</th>
<th>$R^2\Delta$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline Negative Affect</td>
<td>-0.10</td>
<td>0.19</td>
<td>-.05</td>
<td>.06</td>
<td>.06</td>
</tr>
<tr>
<td>OCI-R</td>
<td>.01</td>
<td>.01</td>
<td>.26*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td>.16</td>
<td>.10*</td>
</tr>
<tr>
<td>Baseline Negative Affect</td>
<td>-0.06</td>
<td>0.18</td>
<td>-.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCI-R</td>
<td>0.01</td>
<td>0.01</td>
<td>.21*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of Thoughts</td>
<td>0.16</td>
<td>0.04</td>
<td>.32*</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>0.01</td>
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<td>0.04</td>
<td>.28*</td>
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<tr>
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<td>0.07</td>
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Note: $N = 119$; OCI-R = Obsessive Compulsive Inventory – Revised; $^* p < .05$
Figure 2: Diagram of the procedure for Study 3.

Note: OBQ-44 = Obsessive Beliefs Questionnaire; OCI-R = Obsessive Compulsive Inventory Revised; PANAS-NA = Positive and Negative Affect Schedule - Negative Affect; PSS = Personal Significance Scale; TCSQ = Thought Control Strategies Questionnaire; a Half of the participants were randomly assigned to complete the OBQ-44 and the OCI-R at the end of the task.
Figure 3: Raw frequency of target thought occurrences during the thought suppression task.
Figure 4: Simple regression slopes of the interaction between appraisals and thought control effort in predicting post-task negative affect.

Note: N = 119; Appraisals measured with the Personal Significance Scale (High = +1 SD, Low = −1 SD)
Figure 5: Simple regression slopes of the interaction between appraisals and thought control effort in predicting post-task anxiety ratings.

Note: N = 119; Appraisals measured with the Personal Significance Scale (High = +1 SD, Low = -1 SD)
CHAPTER IV: CONCLUSION

The purpose of this dissertation project was to examine several hypotheses from Rachman's (1997) cognitive theory of obsessions. Studies 1 and 2 were conducted to investigate a fundamental prediction of the model, that appraisals of personal significance of socially unacceptable thoughts should be related to obsessive-compulsive symptoms. Study 3 was designed to examine whether the effects of thought suppression would vary for thoughts appraised as meaningful versus those thoughts appraised as unimportant. This final discussion section will review the findings from these three studies as they apply to the cognitive theory of obsessions, will set out a research agenda for future studies, and will discuss the clinical implications of these findings.

A primary aim of this dissertation project was to examine the connection between appraisals of intrusive thoughts and obsessive-compulsive symptoms. If appraisals are to be implicated in the development or persistence of obsessions, they need, at a minimum, to be meaningfully associated with OCD symptoms. While a relationship between appraisals and OCD symptoms had been established in a number of earlier studies (Clark & Claybourn, 1997; Freeston et al., 1992; OCCWG, 2001, 2003, 2005; Purdon & Clark, 1994a, 1994b), one potential explanation for the previous findings was that the thought content likely differed between the intrusive thoughts reported by nonclinical populations and the clinical obsessions reported by patients with OCD. The results from Studies 1 and 2 provided clear evidence for a relationship between appraisals of intrusive thoughts and subclinical symptoms of OCD, even when the content of the intrusive thoughts was held constant across participants. Furthermore, the current studies were the first to investigate how normal individuals appraise intrusive thoughts more characteristic of OCD. Results revealed that
even when asked to evaluate obsession-like thoughts of upsetting and socially unacceptable content, normal individuals, by and large, did not attach exaggerated significance to the thoughts. These findings are important in that they suggest that most people are able to dismiss intrusive thoughts as unimportant and insignificant. When taken together with past studies, the results from Studies 1 and 2 provide support for the connection between appraisals and OCD symptoms, and represent an important first step in validating the cognitive model of obsessions.

Studies 1 and 2 also extended past research by examining factors that contribute to appraisals of unwanted intrusive thoughts. The results of these studies demonstrated that appraisals of intrusive thoughts varied as a function of two theoretically important factors: thought content and thought frequency. In terms of content, nonclinical participants in the current studies were most likely to attach appraisals of personal significance to the aggressive and unacceptable sexual intrusive thoughts, providing preliminary evidence that people attach more significance to some types of thoughts than to others. Clear differences also emerged in appraisals of personal significance between high frequency and low frequency intrusive thoughts. When the intrusive thoughts were infrequent, participants did not attach undue significance to the thoughts and were able to dismiss them as relatively unimportant. In contrast, when the intrusive thoughts were described as occurring more frequently (up to several times per week), participants were more likely to attach greater meaning to the thoughts, particularly to the intrusive thought with unacceptable sexual content. While generally consistent with Rachman’s (1997) theory of obsessions, the results also suggest that normal individuals are more likely to attach considerable significance to intrusive
thoughts under certain conditions, such as when the thoughts have particularly objectionable
content, or when they occur with high frequency.

Another aim of this dissertation project was to examine the direct and interactive
effects of appraisals of intrusive thoughts and thought suppression. Whereas Studies 1 and 2
helped establish the relationship between appraisals and OCD symptoms, Study 3 employed
a more rigorous research design to investigate whether appraisals of personal significance,
when combined with thought suppression, would be associated with increased frequency of
thoughts, anxiety, and mood disturbance. Several findings were supportive of the cognitive
theory of obsessions (Rachman, 1997). First, target thought occurrences produced more
anxiety when the target blasphemous thought was high in personal meaning than when it was
low in personal meaning, supporting Rachman’s assertion that intrusive thoughts that are
appraised as meaningful will produce anxiety. Second, there was some evidence for a
connection between personal meaning of the target thought and use of thought control
strategies, suggesting that intrusive thoughts appraised as important are more likely to
motivate thought control attempts. Additionally, there was some evidence that thought
suppression had differential effects for thoughts appraised as meaningful versus those
thoughts appraised as unimportant. Specifically, compared to nonsuppression, suppression
of a personally meaningful thought resulted in a weak increase in the frequency of target
thoughts. Moreover, appraisals of personal meaning, when combined with thought control
effort, were associated with negative mood and increased anxiety.

When taken together, the studies of this dissertation project made a unique
contribution to the literature. First, the studies examined the cognitive theory of obsessions
using both correlational and quasi-experimental designs. Second, the current studies were
designed to examine the importance of appraisals of intrusive thoughts from a different point of view from past studies. As opposed to previous studies, which employed personally relevant thoughts in the examination of appraisals and thought suppression, the current studies used experimenter-supplied intrusive thoughts. In the first two studies, participants read vignettes about prototypical obsessions and indicated their appraisals about these thoughts. In the third study, a single target thought was employed and two distinct groups of participants were selected with the expectation that they would differ in the extent to which they endorsed negative appraisals of the thought. This represents a strength of the current studies, in that it provided increased control over the stimuli, improved the internal validity of the studies, and allowed for the examination of appraisals of personal significance free of the confound of personal experience with the target thought.

While there were clear benefits to this methodology, the use of experimenter-supplied target thoughts may have impacted appraisals of the intrusive thoughts. While the current studies were designed to examine the relevance of appraisals of personal significance to OCD, it is quite possible that appraisals about responsibility may have also been a factor. One potential consequence of using experimenter-supplied, as opposed to personally relevant, target thoughts was that participants may have felt less responsibility for the thoughts. That is, because the thoughts were not a product of their own mind they may have been less likely to attach personal significance to the thoughts. If true, the appraisal ratings across all three studies were likely lower than they would have been for personally relevant intrusive thoughts. This may have been particularly true for the religious participants in Study 3, who may have felt less perceived responsibility for the blasphemous target thought, given that it was supplied to them by the experimenter, rather than something they thought of
themselves. This sense of decreased responsibility might have made the thought suppression results weaker than they would be for naturally occurring thoughts. Indeed, laboratory manipulations designed to decrease perceived responsibility have been shown to be associated with decreases in compulsive behavior (Ladouceur et al., 1995; Lopatka & Rachman, 1995; Shafran, 1997). Therefore, though the current studies were not designed to examine responsibility, perceived responsibility may have played a role in how participants appraised the intrusive thoughts. Future studies should examine the potential role of perceived responsibility in appraisals of personal significance of intrusive thoughts.

What Other Variables Influence Appraisals?

These studies provide clear evidence that appraisals vary as a function of thought content and thought frequency. Numerous other variables also undoubtedly influence appraisals of personal significance. In Rachman’s (1997) cognitive theory, he suggests that cognitive biases and beliefs likely set the stage for appraisals of the significance of intrusive thoughts. The OCCWG defines beliefs as, “relatively enduring assumptions that are held by an individual and that are pan-situational rather than specific to a particular event” (OCCWG, 1997, p. 670). This definition is partially based on the work of Aaron T. Beck, who discussed the role of general beliefs in the development of emotional problems. Beck and his colleagues stated that “relatively stable cognitive patterns form the basis for the regularity of interpretations of a particular set of situations” (Beck, Rush, Shaw, & Emery, 1979, p. 12). These general beliefs are purported to develop based on an individual’s life experiences, culture, and religion. Cognitive models of emotional disorders posit that events (for example, unwanted intrusive thoughts) will interact with an individual’s belief system to give rise to particular types of appraisals. In the case of OCD, general beliefs and cognitive biases
related to how people think about their own thoughts may make people more vulnerable to attach exaggerated significance to their thoughts.

Rachman (1997, 1998) suggests that thought-action fusion is one such cognitive bias that makes people more vulnerable to appraising intrusive thoughts in a negative way. As discussed earlier in this manuscript, thought-action fusion relates to two types of beliefs: first, the belief that having bad thoughts is the moral equivalent to engaging in bad behaviour, and second, the belief that thinking about something increases the probability of its occurrence. Such beliefs plausibly increase the likelihood of misinterpreting the significance of unwanted thoughts. For example, an intrusive thought about harming a loved one would be more likely to be interpreted as meaningful and revealing for a person who holds strong thought-action fusion beliefs, than for a person who does not believe that thoughts are equivalent to actions. Indeed, the results of Studies 1 and 2 revealed that appraisals of personal significance were related to thought-action fusion, providing evidence of an association between TAF beliefs and appraisals of intrusive thoughts. Moreover, considerable research demonstrates that TAF beliefs are associated with OCD symptoms (e.g., Shafran et al., 1996)

Other metacognitive beliefs are also likely to influence appraisals of personal significance. Metacognitive beliefs are beliefs about the importance given to thoughts, beliefs about the need to control thoughts, and beliefs about the power of thoughts (Wells, 2000). There is evidence that metacognitive beliefs are associated with OCD symptoms (Gwilliam, Wells, & Cartwright-Hatton, 2004; Myers & Wells, 2005), and that one subtype of metacognitive belief, termed “cognitive self-consciousness,” may be particularly relevant to OCD (Cartwright-Hatton & Wells, 1997; Janeck, Calamari, Riemann, & Heffelfinger,
Cognitive self-consciousness refers to the degree to which individuals are aware of their own thoughts and the extent to which they focus on their thoughts. An exaggerated awareness of one's thoughts could increase the likelihood that an individual would negatively appraise the significance of their intrusive thoughts. Thus, individual differences such as cognitive self-consciousness or metacognitive beliefs likely combine with thought characteristics like thought content and frequency to shape the way individuals appraise the occurrence of unwanted intrusive thoughts.

Research Agenda

The results from this dissertation project provide a good springboard for future studies. A natural extension of this work would be to investigate individual differences in how people appraise the personal significance of intrusive thoughts. As discussed above, the cognitive theory predicts that some people are more vulnerable to attaching significance to their thoughts than others (Rachman, 1997, 1998). For example, Rachman (1998) suggests that people of “tender conscience” (p. 390) are more likely to be vulnerable to such appraisals. Moreover, the theory posits that appraisals will interact with a person's belief system and personal background. Indeed, in Study 3 of this dissertation, there was evidence that appraisals of the target blasphemous thought varied according to the religious background of the participants. An important next step in understanding the connection between appraisals and OCD symptoms will be to examine the relevant factors, such as personality traits or beliefs, that make people more vulnerable to appraising intrusive thoughts as personally significant. Further investigation of the relevance of thought-action fusion and other metacognitive beliefs is particularly indicated.
The frequency results from the current project have implications for the cognitive theory that warrant further consideration. An implicit assumption of the cognitive theory of obsessions is that intrusive thoughts begin as relatively infrequent cognitive phenomena that increase in frequency over time as a result of “catastrophic” appraisals. However, little is known about the actual etiology of obsessions. There is some evidence that intrusive thoughts increase in frequency during times of stress (Horowitz, 1975; Rachman & Hodgson, 1980), and anecdotal reports suggest that for a minority of individuals, obsessive-compulsive disorder has a clear and prominent onset (de Silva & Marks, 1999; de Silva & Rachman, 1998). The results of Study 2 suggest that intrusive thoughts with a more dramatic onset will be more likely to be appraised as personally significant by average people (i.e., not those with obsessive-compulsive symptoms). Therefore, an important avenue for future research is to investigate the etiology of obsessions to determine the natural course of intrusive thoughts.

Longitudinal studies aimed at investigating a group of individuals who may be at increased risk of experiencing intrusive thoughts are needed to map out the trajectory from “normal” intrusive thoughts to clinical obsessions and to establish whether appraisals of intrusive thoughts are causally related to the development of obsessions. One situation in which there is a predictable spike in intrusive thoughts is during pregnancy and shortly after childbirth, a time when many parents (both mothers and fathers) experience an increase in intrusive thoughts related to their infants (Abramowitz, Schwartz, & Moore, 2003; Abramowitz, Schwartz, Moore, & Lenzmann, 2003). This presents an ideal opportunity to examine the natural course of intrusive thoughts, and to explore whether individuals who attach exaggerated significance to their intrusive thoughts experience an increase in the frequency of intrusive thoughts over time. Such studies are currently being undertaken by
several groups (see Abramowitz, Khandker, Nelson, Deacon, & Rygwall, 2006; N. Fairbrother, personal communication, September 2004), and they have the potential to clarify the role of appraisals in the etiology of OCD.

In addition, the findings from Study 3 suggest the need for more research examining the connection between suppression of personally meaningful thoughts and negative affect. Although several studies have investigated the connection between suppression and mood (Purdon, 2001; Purdon & Clark, 2001; Purdon et al., 2005; Wenzlaff & Luxton, 2003; Wenzlaff et al., 1991), more such studies are warranted. In particular, it will be important to examine not only the influence of suppression on subsequent mood, but also the potential effects of mood on suppression. For example, there is some indication that negative mood interferes with suppression of negative thoughts (Wenzlaff et al., 1988) and that the paradoxical rebound of thoughts is enhanced when mood state (either positive or negative) is similar during suppression and subsequent expression (Wenzlaff et al., 1991). Furthermore, the results from Study 3 suggested that there were important differences between instructed suppression and participants' reported thought control effort. Therefore, another avenue for future studies will be to explore individual differences in motivation to suppress, success at suppression, and use of thought control strategies. For example, although Wenzlaff and his colleagues (1988) have shown that depressed persons have more difficulty suppressing certain types of thoughts, no studies have compared the degree to which those with OCD are able to use thought suppression in an adaptive way. In fact, research has not clarified the conditions under which thought suppression and other strategies of thought control are functional versus maladaptive. Finally, studies that examine the long-term effects of thought
suppression are needed to determine whether thought suppression is indeed implicated in the persistence of obsessional thoughts.

Clinical Implications

Importantly, the results of this research have implications for the treatment of obsessions and support the strategy of targeting appraisals related to personal significance and thought suppression in treatment. First, it may be useful to include an assessment of patients' negative appraisals of intrusive thoughts and use of thought control strategies in the initial evaluation. The vast majority of clinical interviews focus on the content of obsessions and resulting compulsions, but few specifically target maladaptive appraisals or thought control strategies. This information could prove useful in targeting treatment interventions to the patient's unique concerns. Second, once negative appraisals have been identified, treatments that focus on challenging the validity of these appraisals and replacing them with more adaptive and healthy interpretations of the meaning of intrusive thoughts may prove helpful. Finally, in Study 3 of this dissertation, participants in the "do not suppress" group reported a significant decrease in the frequency of thoughts over time. Thus, it is apparent that unwanted thoughts naturally fade away, much like anxiety, urges to engage in compulsions, and other unpleasant psychological experiences associated with OCD. Knowing that this is the natural course of unwanted thoughts, if they are not suppressed, can be hopeful information for patients who are struggling to drop the use of thought control strategies during treatment.

As such, treatments that focus on challenging maladaptive appraisals and reducing patients' reliance on thought control strategies may prove effective. Indeed, recently developed cognitive behavioural treatments for obsessions that specifically target appraisals
and attempt to normalize intrusive thoughts are showing initial signs of successful symptom reduction (Freeston, Leger, & Ladouceur, 2001; Williams, Salkovskis, Forrester, & Allsopp, 2002). Moreover, other treatments such as Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999) may also be of benefit. Considered one of the treatments in the “third wave” of behavioural therapy, ACT targets metacognition and thought control strategies by encouraging patients to consider “the possible benefits of acceptance of the obsession and other private events such as anxiety over attempting to control them” (Twohig, Hayes, & Masuda, 2006, p. 7). A recent multiple-baseline study demonstrated that ACT was successful in reducing symptoms of OCD (Twohig et al., 2006). Further research will be necessary to determine the mechanisms of change in the treatment of OCD and to explore whether changes in appraisals and changes in use of suppression strategies result in improvements in OCD symptoms.

Collectively, the results from this dissertation project are supportive of Rachman’s (1997, 1998) cognitive theory of obsessions, which suggests that appraisals of intrusive thoughts are implicated in OCD. Specifically, the current studies demonstrated that appraisals of intrusive thoughts are related to subclinical OCD symptoms, that appraisals vary according to thought content and thought frequency, and that appraisals of personal significance, when combined with thought control effort, are associated with negative mood and anxiety. Longitudinal studies are needed to outline the natural course of intrusive thoughts and to examine whether appraisals play a causal role in the development of obsessions. Similarly, future studies that investigate the long-term effects of suppression on personally meaningful intrusive thoughts will help facilitate our understanding of the importance of these variables in OCD.
Endnotes

1 Given that the current sample was comprised of a near equal number of Asian and Caucasian participants, potential group differences in OC symptoms and vignette appraisal ratings were examined. As a group, the Asian participants scored higher on the OBQ-44 and the BDI-II and they endorsed more negative appraisals of the blasphemous and racist vignettes. To ensure that ethnicity was not acting as a moderator, all of the primary analyses were run including ethnicity as a covariate. All reported significant effects remained when ethnicity was included as a covariate in the analyses.

2 As in Study 1, Asian participants scored higher on measures of OC symptoms and beliefs and the vignette appraisals with the exception of the sexual vignettes, which they rated equivalently to participants of European ethnicity. Other than these differences in raw means, no other analyses revealed significant ethnic differences, indicating that ethnicity did not serve as a moderator for the effects reported in these studies.

3 Note that lower scores on the EDQ-D correspond with greater ratings of ego-dystonicity.
REFERENCES


APPENDICES

Appendix A: Study 1 Materials

Vignettes ("Self" Version)

The following questionnaire consists of four brief scenarios, each of which is followed by a series of questions. The scenarios are about unusual thoughts that people sometimes have. Please read each scenario carefully, and then respond the questions as honestly as possible.

Participants read the following vignettes:

Scenario #1: Aggressive Vignette

Imagine that you often go over and babysit your six-year-old niece. Occasionally, while babysitting and preparing sandwiches for your lunch, you have a sudden, horrific impulse to stab your niece with a sharp kitchen knife. You are very upset about having this thought.

Scenario #2: Sexual Vignette

Imagine that occasionally, while driving to school with your brother, you have a sudden intrusive thought about having sex with your brother. You are noticeably upset about having this thought. (Please note: If you do not have a brother, imagine that you occasionally have a sudden intrusive thought about having sex with a close family member).

Scenario #3: Blasphemous Vignette

Imagine that you are a very religious person. From time to time while engaged in silent prayer, you have a sudden, terrible image of urinating on the Bible. You are very upset by this thought. (Please note: If this does not relate to your own religion, please imagine yourself urinating on a Holy Text of your religion).

Scenario #4: Racist Vignette

Imagine that whenever you see a person of colour, the thought "Nigger!" intrudes into your mind. You are very upset by this thought, as you feel that you are an egalitarian person with progressive politics.
Vignette Appraisal Ratings ("Self" Version)

After reading each vignette, participants completed the following questions:

Now answer the following questions, using the following scale:

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<tr>
<td></td>
<td>Not at all</td>
<td>Somewhat</td>
<td>Totally/ Definitely</td>
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Imagine that you had this thought. To what extent would this thought:

1. ...reveal something important about you? 
   0 1 2 3 4 5 6 7 8

2. ...mean that you might lose control and do something awful?
   0 1 2 3 4 5 6 7 8

3. ...mean that you might go crazy one day?
   0 1 2 3 4 5 6 7 8

4. ...mean that you are a dangerous person?
   0 1 2 3 4 5 6 7 8

5. ...mean that you are untrustworthy?
   0 1 2 3 4 5 6 7 8

6. ...mean that one day you might actually carry out some actions related to the thoughts?
   0 1 2 3 4 5 6 7 8

7. ...mean that you are a bad, wicked person?
   0 1 2 3 4 5 6 7 8

8. ...mean that you are weird?
   0 1 2 3 4 5 6 7 8

9. Do you think that you would avoid certain people or places because of this thought?
   0 1 2 3 4 5 6 7 8

10. Do you think you would be crazy or mentally unstable because you had this thought?
    0 1 2 3 4 5 6 7 8

11. To what extent do you find this thought disturbing?
    0 1 2 3 4 5 6 7 8
12. These thoughts would mean that I am immoral.  

13. I would be concerned about being left unattended with children.  

14. I would feel compelled to take action (i.e. report to the authorities, or report this to someone else).  

15. I believe that having this thought is just as bad as acting on it.  

16. I would disapprove of myself for having this thought.  

17. How bad or evil do you think this thought is?  

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<tr>
<th>Not at all bad</th>
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<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
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<th>90</th>
<th>100</th>
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<td>56</td>
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18. Briefly, what do you think about this thought? Is there anything you would do as a result of having this thought?
Vignettes ("Other" Version)

Participants randomly assigned to the "Other" version read the following vignettes:

Scenario #1: Aggressive Vignette

Your best friend approaches you looking for advice. Your friend confides in you that occasionally while babysitting her six-year-old niece and preparing sandwiches for their lunch, she has a sudden, horrific impulse to stab her niece with a sharp kitchen knife. Your friend explains that she is very upset about having this thought.

Scenario #2: Sexual Vignette

Your best friend approaches you looking for advice. She confesses that occasionally, while driving to school with her brother, she has a sudden intrusive thought about having sex with her brother. She is noticeably upset about having this thought.

Scenario #3: Blasphemous Vignette

Your best friend, who is a very religious person, confides in you that from time to time while engaged in silent prayer, he has a sudden, terrible image of himself urinating on the Bible. He is very upset by this thought.

Scenario #4: Racist Vignette

Your best friend approaches you in a state of distress. He tells you that whenever he sees a person of colour, the thought "Nigger!" intrudes into his mind. He is very upset by this thought, as he feels that he is an egalitarian person with progressive politics.
Vignette Appraisal Ratings (“Other” Version)

After reading each vignette, participants completed the following questions:

Now answer the following questions, using the following scale:

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<tr>
<td>Not at all</td>
<td>Somewhat</td>
<td>Totally/ Definitely</td>
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</table>

To what extent do these thoughts:

1. …reveal something important about your friend? 0 1 2 3 4 5 6 7 8
2. …mean that your friend might lose control and do something awful? 0 1 2 3 4 5 6 7 8
3. …mean that your friend might go crazy one day? 0 1 2 3 4 5 6 7 8
4. …mean that your friend is a dangerous person? 0 1 2 3 4 5 6 7 8
5. …mean that your friend is untrustworthy? 0 1 2 3 4 5 6 7 8
6. …mean that one day your friend may actually carry out some actions related to the thoughts? 0 1 2 3 4 5 6 7 8
7. …mean that your friend is a bad, wicked person? 0 1 2 3 4 5 6 7 8
8. …mean that your friend is weird? 0 1 2 3 4 5 6 7 8
9. Do you think that your friend would avoid certain people or places because of this thought? 0 1 2 3 4 5 6 7 8
10. Do you think your friend is crazy or mentally unstable because he/she has these thoughts? 0 1 2 3 4 5 6 7 8
11. To what extent do you find this thought disturbing? 0 1 2 3 4 5 6 7 8
12. These thoughts mean that my friend is immoral.  

13. I would be concerned leaving children unattended with my friend. 

14. I would feel compelled to take action (i.e. report to the authorities, or report this to someone else). 

15. I believe that having this thought is just as bad as acting upon it. 

16. I disapprove of my friend for having this thought. 

17. Your friend is disturbed by this thought. How bad or evil do you think this thought is? 

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<th>Not at all bad</th>
<th>0</th>
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<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
<th>The worst I can imagine</th>
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18. Briefly, what advice would you give to your friend? 

____________________________________________________
____________________________________________________
____________________________________________________
____________________________________________________
Appendix B: Study 2 Materials

Vignettes

Scenario #1: Aggressive Vignette

You drive into school everyday. From time to time, while you are stopped at a crosswalk waiting for an elderly pedestrian to cross the street, you have a sudden, horrific impulse to run them over in your car. You are very upset about having this thought.

Scenario #2: Sexual Vignette

Imagine that from time to time, while helping a young child (for example, a niece or nephew) use the washroom, you have a sudden, intrusive sexual thought about the child. You are noticeably upset about having this thought.

Scenario #3: Blasphemous Vignette

You are a very religious person. From time to time while engaged in silent prayer, you have the sudden, intrusive thought “Jesus Christ was a raving lunatic!” You are noticeably upset by this thought.

Scenario #4: Racist Vignette

You live in an area populated by people of many different ethnicities and cultural backgrounds. From time to time when you pass a recent immigrant on the street, you have the sudden, intrusive thought “You don’t belong here! Go back to your own country!” You are very upset by this thought, as you feel that you are an egalitarian person with progressive politics.
Vignette Appraisal Ratings – Low Frequency Vignettes

After reading each vignette, participants completed the following questions:

Now answer the following questions, using the following scale:

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td>Somewhat</td>
<td>Totally/ Definitely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Imagine that you have this thought *from time to time* (i.e. only occasionally).

To what extent would this thought:

...reveal something important about you? 0 1 2 3 4 5 6 7 8

...mean that you might lose control and do something awful? 0 1 2 3 4 5 6 7 8

...mean that you might go crazy one day? 0 1 2 3 4 5 6 7 8

...mean that you are a dangerous person? 0 1 2 3 4 5 6 7 8

...mean that you are untrustworthy? 0 1 2 3 4 5 6 7 8

...mean that one day you might actually carry out some actions related to the thoughts? 0 1 2 3 4 5 6 7 8

...mean that you are a bad, wicked person? 0 1 2 3 4 5 6 7 8

...mean that you are weird? 0 1 2 3 4 5 6 7 8

Do you think that you would avoid certain people or places because of this thought? 0 1 2 3 4 5 6 7 8

Do you think you would be crazy or mentally unstable because you had this thought? 0 1 2 3 4 5 6 7 8

To what extent do you find this thought disturbing? 0 1 2 3 4 5 6 7 8
These thoughts would mean that I am immoral. 0 1 2 3 4 5 6 7 8

I would be concerned about being left unattended with children. 0 1 2 3 4 5 6 7 8

I would feel compelled to take action (i.e. report to the authorities, or report this to someone else). 0 1 2 3 4 5 6 7 8

I believe that having this thought is just as bad as acting on it. 0 1 2 3 4 5 6 7 8

I would disapprove of myself for having this thought. 0 1 2 3 4 5 6 7 8

How bad or evil do you think this thought is?

Not at all bad 0 10 20 30 40 Neutral 50 60 70 80 The worst I can imagine 90 100

Briefly, what do you think about this thought? Is there anything you would do as a result of having this thought?

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________
**Vignette Appraisal Ratings – High Frequency Vignettes**

Now, imagine that you have this thought *very frequently* (i.e. the thought occurs very often, many times a week).

Answer the following questions, using the following scale:

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>Somewhat</td>
<td>Totally/ Definitely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If you had this thought *very frequently*, to what extent would this thought:

- ...reveal something important about you? 0 1 2 3 4 5 6 7 8
- ...mean that you might lose control and do something awful? 0 1 2 3 4 5 6 7 8
- ...mean that you might go crazy one day? 0 1 2 3 4 5 6 7 8
- ...mean that you are a dangerous person? 0 1 2 3 4 5 6 7 8
- ...mean that you are untrustworthy? 0 1 2 3 4 5 6 7 8
- ...mean that one day you might actually carry out some actions related to the thoughts? 0 1 2 3 4 5 6 7 8
- ...mean that you are a bad, wicked person? 0 1 2 3 4 5 6 7 8
- ...mean that you are weird? 0 1 2 3 4 5 6 7 8

Do you think that you would avoid certain people or places because of this thought? 0 1 2 3 4 5 6 7 8

Do you think you would be crazy or mentally unstable because you had this thought? 0 1 2 3 4 5 6 7 8

To what extent do you find this thought disturbing? 0 1 2 3 4 5 6 7 8
Remember to answer these questions as if you have this thought *very frequently*.

These thoughts would mean that I am immoral.  

I would be concerned about being left unattended with children.  

I would feel compelled to take action (i.e. report to the authorities, or report this to someone else).  

I believe that having this thought is just as bad as acting on it.  

I would disapprove of myself for having this thought.  

<table>
<thead>
<tr>
<th>How bad or evil do you think this thought is?</th>
<th>The worst I can imagine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all bad 0</td>
<td>10 20 30 40 Neutral 50 60 70 80</td>
</tr>
</tbody>
</table>

Briefly, what do you think about this thought?  Is there anything you would do as a result of having this thought?

______________________________________________________________________________

______________________________________________________________________________
Appendix C: Measures for Study 3

Religious Screening Questionnaire

1) What is your current religious affiliation, if any:
   - none (religion is not an important part of my life)
   - Catholic
   - Protestant
   - Other Christian, namely _________________________
   - Jewish
   - Islamic
   - Sikh
   - Hindu
   - Buddhist
   - Agnostic
   - Atheist
   - Other, namely _________________________

2) What is your degree of personal involvement in your religion, on a scale from 0 which means no involvement to 100, which means deep involvement in religion:

<table>
<thead>
<tr>
<th>No Involvement</th>
<th>Deeply Involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
<td></td>
</tr>
</tbody>
</table>

3) Have your manners been strongly influenced by religious principles?
   - not at all
   - somewhat
   - quite a lot
   - very much
4) How much time do you devote to religious activities each week?
   ___ none
   ___ 1 - 2 hours
   ___ 3 - 5 hours
   ___ 6 - 10 hours
   ___ 10 - 15 hours
   ___ more than 15 hours

5) Do you regularly attend religious activities or events?
   ___ No
   ___ Yes. If yes, please ask for specifics, and check all that apply.
       ___ Religious activities
       ___ Religious schools
       ___ Religious associations/clubs
       ___ Religious services

6) If person indicated involvement in one of the above, ask:
   How often do you attend _____ (insert above answer or answers)?
   ___ less than once a month
   ___ 1 - 3 times per month
   ___ once per week
   ___ more than once per week
   ___ daily

7) What is your native language (the language you first learned)?

8) If your native language is not English, for how many years have you spoken English?
    ___
Vignette

Please read the following scenario carefully.

You decide to volunteer at a local soup kitchen that serves people who are homeless, most of whom are also mentally ill. As you start talking to the people who regularly come for a hot meal, you learn more about them. One woman has delusions that she is an agent of the Space Police, here on earth to monitor activities and report back to the mother ship. One of the men believes he is Jesus Christ and engages in some behaviour consistent with that belief. At first you simply see him as having a delusion, but later, you begin to ponder the philosophical question of how a true messiah might be treated in today's society. What if this man really were Jesus? What is the difference between this man and Jesus Christ himself? After serving the patrons, you sit down at a table with fellow volunteers, waiting for the minister at the soup kitchen to begin saying grace. As the minister starts to pray, you find yourself looking up at the crucifix hanging above the soup kitchen. While looking at the crucifix, you suddenly have a thought, "Jesus Christ was not the Messiah; Jesus Christ was just a raving lunatic!" The thought is accompanied by an image of Jesus Christ as a psychotic homeless man roaming the streets talking to himself.
Rating Scales – Time 1

During the previous monitoring period...

i) ...how hard did you try to get rid of thoughts related to the story, such as “Jesus Christ was not the Messiah; Jesus Christ was a raving lunatic?”

<table>
<thead>
<tr>
<th>Did not try at all/let thoughts flow freely</th>
<th>Tried a little</th>
<th>Tried a lot</th>
<th>Tried my hardest to push thoughts from my mind</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

ii) ...how anxious did you feel as a result of thoughts related to the story, such as “Jesus Christ was not the Messiah; Jesus Christ was a raving lunatic?”

<table>
<thead>
<tr>
<th>Not at all anxious</th>
<th>Mildly anxious</th>
<th>Moderately anxious</th>
<th>Extremely anxious</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

iii) ...how acceptable was it to you to have some thoughts related to the story, such as “Jesus Christ was not the Messiah; Jesus Christ was a raving lunatic?”

<table>
<thead>
<tr>
<th>Completely unacceptable</th>
<th>Moderately unacceptable</th>
<th>Somewhat unacceptable</th>
<th>Neutral</th>
<th>Somewhat acceptable</th>
<th>Moderately acceptable</th>
<th>Completely acceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>
Thought Control Strategies Questionnaire – Time 1

Please rate how often you used each of the following strategies when you had a thought about the story, such as

“Jesus Christ was not the Messiah; Jesus Christ was a raving lunatic!”

...during the previous thought monitoring period:

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>A little</th>
<th>Sometimes</th>
<th>A lot</th>
<th>Constantly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Reasoned with myself, trying to prove that the thought was irrational</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2) Distracted myself by thinking something pleasant</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3) Tried to replace the thought with another</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4) Distracted myself with the things around me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5) Performed a thought or action to neutralize the thought</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6) Said “stop” to myself</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7) Reassured myself that everything was okay</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8) Said a prayer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9) Other:</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Rating Scales – Time 2

During the previous monitoring period...

iv) ...how hard did you try to get rid of thoughts related to the story, such as "Jesus Christ was not the Messiah; Jesus Christ was a raving lunatic?"

<table>
<thead>
<tr>
<th>Did not try at all/let thoughts flow freely</th>
<th>Tried a little</th>
<th>Tried a lot</th>
<th>Tried my hardest to push thoughts from my mind</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

v) ... how anxious did you feel as a result of thoughts related to the story, such as "Jesus Christ was not the Messiah; Jesus Christ was a raving lunatic?"

<table>
<thead>
<tr>
<th>Not at all anxious</th>
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</tr>
</tbody>
</table>

vi) ... how acceptable was it to you to have some thoughts related to the story, such as "Jesus Christ was not the Messiah; Jesus Christ was a raving lunatic?"

<table>
<thead>
<tr>
<th>Completely unacceptable</th>
<th>Moderately unacceptable</th>
<th>Somewhat unacceptable</th>
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<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>
Thought Control Strategies Questionnaire – Time 2

Please rate how often you used each of the following strategies when you had a thought about the story, such as

"Jesus Christ was not the Messiah; Jesus Christ was a raving lunatic!"

...during the previous thought monitoring period:

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>A little</th>
<th>Sometimes</th>
<th>A lot</th>
<th>Constantly</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Reasoned with myself, trying to prove that the thought was irrational</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Distracted myself by thinking something pleasant</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Tried to replace the thought with another</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Distracted myself with the things around me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Performed a thought or action to neutralize the thought</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Said “stop” to myself</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Reassured myself that everything was okay</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>Said a prayer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>Other:</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
Appendix D: UBC Research Ethics Board’s Certificates of Approval