

THE RELATIONSHIP BETWEEN RELIGIOSITY, SPIRITUALITY, AND OBSESSIVE-
COMPULSIVE DISORDER

by

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ABSTRACT

Some OCD researchers have suggested that highly religious individuals may be predisposed toward developing obsessive-compulsive disorder (OCD), but results regarding the relationship between religiosity and OCD symptoms are mixed. Notable weaknesses in the literature include the frequent use of measures with unknown psychometric properties that do not differentiate between various facets of religiosity (e.g., fundamentalism, spirituality, etc.), study of a limited range of religious affiliations, and predominant use of undergraduate student samples. Other research has demonstrated positive benefits of religiosity/spirituality for mental health. The current study attempted to clarify the relationship between OCD symptoms/cognitions and religiosity/spirituality using multidimensional measures of religiosity/spirituality. Seven hundred and forty-six nonclinical (students and community members) and 24 clinical participants (with a principal diagnosis of OCD) from a wide range of religious affiliations completed questionnaires assessing religiosity/spirituality and OCD symptoms/cognitions. In both samples, Obsessive-

compulsive (OC) symptoms were either not significantly related or significantly, negatively related to religiosity and spirituality, but religious crisis was significantly, positively related to OC symptoms. In the nonclinical group, none of the facets of spirituality moderated the relationships between religiosity and fundamentalism or moral TAF. All facets of spirituality significantly moderated the relationship between religiosity and scrupulosity (all $ps < .02$), but additional variance explained was trivial (all $\Delta R^2 < .004$). In the clinical sample, only the universality facet of spirituality (i.e., the belief that the universe is ordered and all of humanity is connected) significantly moderated the relationship between religiosity and fundamentalism ($t = -5.60, p < .001, 95\% CI = -.53 \text{ to } -.24, \Delta R^2 = .17$) and between religiosity and moral thought-action fusion (moral TAF; $t = -2.14, p = .04, 95\% CI = -.38 \text{ to } -.005, \Delta R^2 = .184$). High religiosity was only associated with high fundamentalism or moral TAF when universality was low. None of the facets of spirituality significantly moderated the relationship between religiosity and scrupulosity (all $ps = ns$, all $\Delta R^2 < .001$). Religiosity and spirituality appear to be unrelated or negatively related to OC symptoms. However, religious individuals with OCD who experience religious crisis may benefit from psychoeducation/consultation with religious professionals to address these difficulties.

Keywords: obsessive-compulsive disorder; obsessions; compulsions; religiosity; spirituality; cognitive; thought-action fusion

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The Relationship Between Religiosity, Spirituality, and Obsessive-Compulsive Disorder

According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (*DSM-5*; American Psychiatric Association, 2013), Obsessive-Compulsive Disorder (OCD) is a mental disorder marked by the presence of recurrent obsessions and/or compulsions of sufficient severity as to be either time consuming (e.g., taking in excess of 1 hour per day) or result in significant distress or impairment. Obsessions are defined as recurrent and persistent thoughts, urges, or images that cause significant anxiety or distress in most individuals and are experienced as intrusive or unwanted at some time during the course of symptoms. Typical domains of obsessions include fears of contamination, recurrent doubting, ordering or symmetry, aggressive or horrific impulses that are experienced as intrusive and unwanted, or intrusive and unwanted sexual imagery that the individual experiences as upsetting. The individual typically attempts to ignore, suppress, or neutralize such thoughts, urges, or images. Compulsions are defined as repetitive, overt or mental behaviours performed with the goal of reducing anxiety (which is often related to an obsession) or preventing a feared outcome. These behaviours are typically not realistically related to the obsessions or outcomes that they are meant to neutralize or prevent, and are excessive in nature. Typical compulsions include washing or cleaning, counting, checking, ordering, or other repetitive behaviours. The degree of insight is specified in the following manner: good or fair insight (i.e., the individual realizes that OCD-related beliefs are definitely or likely not true, or that they may not be true), poor insight (i.e., the individual indicates that OCD-related beliefs are perceived to be probably true), or absent insight/delusional beliefs (i.e., the individual indicated that OCD-related beliefs are perceived to be absolutely true). Tic-related OCD is specified when an individual has a current tic disorder or past history of a tic disorder (*DSM-5*; American Psychiatric Association, 2013).

The *DSM-5* (American Psychiatric Association, 2013) indicates that OCD is also often marked by avoidance of situations related to obsessional content and that engagement in compulsions may be extremely time-consuming, causing significant impairment in daily functioning across several domains. OCD is often comorbid with major depressive disorder, specific phobia, social anxiety disorder, generalized anxiety disorder, panic disorder, eating disorders, “cluster C” personality disorders, and tic disorders (Rasmussen & Eisen, 2002). Lifetime prevalence rates for DSM-IV defined OCD in adults living in the United States have been estimated at 1.8% and 1-year prevalence rates have been estimated at 1.1% (Kessler, Berglund, Demler, Jin, Merikangas, & Walters, 2005). Prevalence is reportedly slightly higher in women in comparison to men in adult samples, and slightly higher in boys in comparison to girls in child samples (Antony, Downie, & Swinson, 1998). Most individuals seeking treatment for OCD report preexisting subclinical symptoms prior to onset of OCD symptoms of clinical significance and approximately 65% of those with a principal diagnosis of OCD experience onset prior to age 25 years (Rasmussen & Eisen, 2002). Onset is typically earlier in males compared to females. Course is typically chronic with fluctuating symptoms. However, 6% to 14% of individuals with OCD may experience a deteriorating course and 10% to 15% experience an episodic course. An episodic course is more prevalent in children or adolescents than in adults (Rasmussen & Eisen, 2002). There is some evidence supporting a familial pattern in OCD. Concordance rates for OCD in monozygotic twins are significantly higher than in dizygotic twins; and rates of the disorder are notably higher in first-degree relatives of those with OCD or tic disorders than in the general population (Dougherty, Rauch, & Greenberg, 2009).

Changes in the diagnostic criteria for OCD from the Fourth Edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV*; American Psychiatric Association, 1994) to the Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorder (*DSM-5*; American Psychiatric Association, 2013) included replacing the term *impulses* with *urges* to more clearly differentiate between the symptoms of OCD and Impulse Control Disorders. Obsessional content is now described as *intrusive and unwanted* rather than *inappropriate* because of cultural variations in what is considered inappropriate. Criterion A wording was also altered to indicate that obsessions *in most individuals* result in anxiety or distress to account for individuals with OCD who do not experience significant anxiety or distress in response to obsessions. References to specific differential diagnosis between OCD, psychotic disorders (i.e., with respect to the *DSM-IV* requirement that the individual realizes that the thoughts are the product of his or her own mind rather than occurring through thought insertion), and generalized anxiety disorder (i.e., with respect to the *DSM-IV* requirement that the symptoms not be accounted for by excessive, real-life worries) were removed and placed in the general context of the requirement that symptoms are not better accounted for by another *DSM-5* disorder. Notably, Hoarding Disorder became a separate disorder, distinct from OCD. The insight specifier was also expanded from merely indicating the presence or absence of poor insight to include good or fair insight, poor insight, or absent insight/delusional beliefs. Finally, given frequent comorbidity with tic disorders, an additional specifier was added to denote *Tic-related OCD*.

Cognitive Theories of OCD. Early behavioural theory of OCD was based on Mowrer's (1947) two-factor model of fear conditioning. This theory posited that fear of particular stimuli originates through classical conditioning (i.e., that an unpleasant outcome is initially paired with a particular stimulus, forming a classically-conditioned fear response) and is maintained through

operant conditioning (i.e., the individual begins to avoid these stimuli, which reinforces avoidance and prevents extinction of the fear response). Salkovskis (1998) noted that *exposure and response prevention* (ERP), a commonly employed behavioural treatment for OCD, is based on this theory. It is posited that classically conditioned obsessions (e.g., fear of contamination) are maintained through compulsive behaviours (e.g., repetitive hand washing) that prevent fear extinction. When the individual is exposed to feared stimuli and prevented from engaging in compulsive behaviours, it is believed that the individual is given the opportunity to learn that the feared consequence does not occur, thus facilitating gradual fear extinction with repeated exposure.

Salkovskis (1998) suggested that the need for cognitive theories of OCD became apparent because of the limitations of ERP treatment and various observations in research and clinical practice that could not be adequately explained by behavioural theory. It was noted that treatment refusal and dropouts were common in ERP and that impairment was often still considerable in clients who had successfully completed ERP treatment. It was also noted that behavioural theory of OCD applies equally as well to anxiety disorders and, as such, does not specifically explain the development and maintenance of OCD. Rachman and De Silva's (1978) seminal research indicated that intrusive thoughts (with similar content to those reported by individuals with OCD) were reported by approximately 90% of a nonclinical sample. As such, it became clear that the mere presence of intrusive cognitions could not account for the development and maintenance of OCD and that exploration of cognitive processes associated with these intrusions might yield a more precise explanation (Salkovskis, 1998).

Salkovskis (1985) proposed one of the best known cognitive theories of OCD. This theory posits that, because the vast majority of the general population reports intrusive thoughts similar to those reported by individuals with OCD, the factor that differentiates these two groups is the catastrophic misinterpretations that individuals with OCD make in response to these intrusions. Salkovskis suggested that individuals with OCD exhibit a pathologically elevated sense of responsibility related to their intrusive thoughts such that they believe that their intrusive thoughts may result in harm to themselves or others and that they are responsible to take action (typically in the form of overt or covert compulsions) to prevent such harm. For instance, if an individual who does not have OCD experiences an unexpected, intrusive thought of pushing someone in front of a train, that individual is unlikely to assign much importance to this thought and it is likely to be dismissed quickly. Understood in the context of Salkovskis' cognitive theory, an individual with OCD who experiences a similar intrusion might conclude that having such a thought indicates that they may have actual intent to push someone in front of a train and that they must take preventative action (e.g., avoid the train station, neutralize the thought) in order to prevent themselves from doing so. The resulting attempts at mental overcontrol purportedly result in increased distress due to: resulting failure of thought suppression or cognitive rebound effects, increased salience of responsibility appraisals due to attempts to prevent harm, and engaging in neutralization that pre-empts the possibility of encountering disconfirming information. Salkovskis also identified a number of common appraisals seen in individuals with OCD relating to responsibility including: the necessity of controlling one's thoughts, the belief that thoughts of performing a harmful action are nearly equivalent to performing that action, the belief that failing to prevent harm is equivalent to perpetrating that harm, the belief that failure to engage in mental neutralization following an intrusion is

equivalent to wishing the harm implied in the intrusion to occur, and the belief that remote likelihood of a harmful outcome actually occurring does not diminish one's responsibility to attempt to prevent resulting harm. As such, treatment of OCD in context of this theory targets the individual's interpretation of intrusions rather than attempting to prevent or reduce the frequency of their occurrence.

Similarly, Rachman (1993, 1997, 1998) proposed that individuals with OCD have a tendency to fuse thought and action as if they were nearly equivalent. In the context of Rachman's theory, *thought-action fusion* (TAF) takes two forms. Moral TAF is defined as the belief that unacceptable thoughts are morally equivalent to performing a related action (e.g., thinking about cheating on one's spouse is the moral equivalent of doing so). Likelihood TAF is defined as the belief that unacceptable thoughts increase the likelihood of a related event occurring (e.g., thinking about harm coming to a loved one increases the likelihood that this harm will actually occur). TAF is framed in the context of this theory as a belief that increases the likelihood that an individual will make catastrophic interpretations of intrusive thoughts. These catastrophic misinterpretations of unwanted, intrusive thoughts are believed to result in and maintain obsessional thinking. Treatment is therefore designed to target and reduce these misinterpretations, hopefully resulting in a reduction of distress in response to intrusions and eliminating the need to engage in compulsive behaviours aimed at reducing distress.

Rachman's (2006) theoretical work in OCD has more recently focused specifically on the fear of contamination (which is the most common obsessional content in OCD). This theory further delineates fears of contamination into two categories: contact contamination (defined as physical contact with disease, dirt, or any substance deemed to be harmful) and mental contamination (defined as an internal sense of having been contaminated that typically occurs

without physical contact with a substance and may occur through interactions with a person or persons). The concept of mental contamination, although not entirely new, is more precisely explained in Rachman's recent theoretical framework and more adequately explains cases where both forms of contamination fears are observed to overlap with each other in ways that are often difficult to explain within the context of earlier cognitive theories of OCD. Rachman further delineated mental contamination into the following subtypes: physical violation, psychological violation, morphing, and self-contamination. A common example of the physical violation subtype of mental contamination is a sense of internal uncleanness after being sexually violated. Rachman noted that sexual assault may in some cases be the genesis of a sense of internal contamination that leads an individual to engage in compulsive washing. Psychological contamination is explained as a sense of internal contamination arising from perceived, non-physical violation. For instance, an individual who perceives that he or she has been repeatedly mistreated by a supervisor at work may have a sense of mental contamination that leads him or her to engage in compulsive washing upon returning home from work each night. Morphing is described as the belief that merely interacting with an individual who possesses undesirable characteristics may result in being personally tainted by these undesirable characteristics, or in more extreme cases, that one will *morph* into the undesirable person and become just like him or her. For instance, an individual might avoid interacting with others whom he or she believes to be mentally ill due to a fear that contact with such an individual will result in the development of mental illness. Finally, self-contamination is the belief that one can be contaminated by one's own thoughts or urges without any physical contact with any substance. For instance, a devoutly religious individual who experiences intrusive thoughts of a blasphemous nature may feel

internally contaminated by such thoughts, resulting in compulsive washing to *wash away* the distressing mental content (Rachman, 2006).

The most notable strength of Rachman's (2006) theory of mental contamination appears to be its explanatory power for the development of contamination-related obsessions and compulsions that is markedly more specific than earlier cognitive theory of OCD. Contamination fears are also somewhat puzzling in that they appear to continue despite the fact that the feared contamination never occurs. Rachman suggests that contamination fears often do not diminish over time because an individual's fear of hypothetically contaminated objects is reinforced by the subjective experience of fear each time when exposed to the object. That is, direct exposure to a hypothetical contaminant results in anxiety, leading to an appraisal of danger, or an appraisal of increased probability of harm. As such, treatment in this theoretical model incorporates discussion of this self-perpetuating cycle into exposure work. Rachman also suggests that therapeutic interventions directly target and reduce anxious arousal experienced when in direct contact with a feared contaminant (e.g., employing relaxation techniques or tranquilizing medication at the time of exposure to the feared contaminant) in order to break the association between anxious arousal, contamination fears, and appraisals of danger. In cases of mental contamination, Rachman recommends that standard behavioural treatment (i.e., ERP) be supplemented with cognitive techniques focusing on the primary (i.e., human) source of contamination. It is recommended that cognitive aspects of treatment focus on: identifying the specific, human source of contamination, examining the individual's reasoning underlying appraisals of current threat related to the person(s) viewed as a source of contamination, and examining the evidence for and against these appraisals and generating alternative appraisals (Rachman, 2006).

O'Connor, Aardema, and Pélisseir (2005) also proposed a cognitive theory of OCD, the *Inference-Based Approach (IBA)*, that purports that understanding the reasoning processes associated with obsessions is more important than identifying specific beliefs or appraisals in OCD. However, this theory is not directly applicable to the current proposed research and, as such, will not be discussed further.

Cognitive Features of OCD. An international working group was formed in the mid 1990s to attempt to synthesize past research results related to cognitive features of OCD and to create measures to assess the central cognitive features of OCD. The *Obsessive Compulsive Cognitions Working Group* (OCCWG) initially identified 19 domains of belief thought to be important etiological and maintenance factors in OCD, which were subsequently reduced to six central factors: importance of thoughts, need to control thoughts, responsibility, overestimation of threat, intolerance of uncertainty, and perfectionism (Taylor, Kyrios, Thordarson, Steketee, & Frost, 2002).

Importance of thoughts is conceptualized as the belief that intrusive thoughts indicate something significant about the individual (i.e., that the individual is abnormal or bad), that experiencing an intrusive thought increases the likelihood that feared outcomes connected with the thought will occur (e.g., experiencing an intrusive urge to push an individual in front of a train means that one is more likely to act on the impulse), and that intrusive thoughts should be accorded importance simply because they have occurred (Thordarson & Shafran, 2002). This definition of the cognitive factor of importance of thoughts directly incorporates Rachman's, (1993, 1997, 1998) theory of OCD and related constructs of moral TAF (i.e., the belief that experiencing a negative intrusive thought means that one is an immoral person) and likelihood TAF (i.e., the belief that experiencing a negative intrusion increases the likelihood that feared

outcomes related to the intrusive thought will actually occur). However, it should be noted that it appears that importance of thoughts is not unique to OCD and this cognitive factor may also be implicated in posttraumatic stress disorder and generalized anxiety disorder (Thordarson & Shafran, 2002).

Need to control thoughts was defined by the OCCWG as the belief that it is both necessary and possible to control intrusive thoughts, images, or impulses (Purdon & Clark, 2002). Four related belief domains identified included: the importance of hypervigilance with respect to maintaining control over intrusive thought content, control of intrusive thoughts as a virtue, the likelihood of negative consequences of failure at controlling intrusions (e.g., losing one's mental health), and the importance of efficiency in controlling intrusions (i.e., one's ability to maintain control of thoughts should remain constant over time). Again, it was noted that this cognitive factor may not be unique to OCD and may be present in other anxiety-related disorders (Purdon & Clark, 2002).

Inflated sense of responsibility was also identified by the OCCWG as an important cognitive factor in OCD, and this directly implicates Salkovskis' (1985) theory of OCD. This highly influential theory suggests that individuals with OCD exhibit a pathologically elevated sense of responsibility with respect to intrusions. It is proposed that these individuals believe that their intrusive thoughts may result in harm to themselves or others and that they are responsible to take action (typically in the form of compulsive behaviours) to prevent harm. Salkovskis and Forrester (2002) note that the definition of inflated responsibility implicates Rachman's (1993, 1997, 1998) TAF as well as importance of thoughts and the need to control thoughts such that they are indistinguishable from each other and likely form a single construct. It was also noted

that inflated responsibility is also likely implicated in other anxiety-related disorders, particularly generalized anxiety disorder (Salkovskis & Forrester, 2002).

Overestimation of threat is defined as the tendency to overestimate the severity of possible negative outcomes and has been demonstrated in research to be related to risk-taking behaviour (Sookman & Pinard, 2002). Individuals with OCD appear to be less willing to take risks and tend to overestimate the severity of negative outcomes relative to nonclinical controls. However, probability overestimation is a cognitive factor that appears to be common to all anxiety-related disorders rather than unique to OCD (Sookman & Pinard, 2002).

Intolerance of uncertainty has received more direct attention and study in the generalized anxiety disorder literature, but was posited by the OCCWG as an important cognitive domain in OCD. Sookman & Pinard (2002) note that the construct has rarely been studied in OCD, but that theorists have posited that those with OCD may have a high need for certainty in order to predict or control outcomes and that this fuels pathological doubt. However, OCCWG results have indicated a high correlation between overestimation of threat and intolerance of uncertainty in OCD. Also, given that intolerance of uncertainty is clearly implicated in generalized anxiety disorder and major depressive disorder, it is not unique to OCD (Gentes & Ruscio, 2011).

Finally, perfectionism was identified by the OCCWG as relevant cognitive feature of OCD (Frost, Novara, & Rhéaume, 2002). Research has indicated elevated levels of perfectionism in the families of those with OCD and a positive correlation has been demonstrated between subclinical OCD symptoms and perfectionism in nonclinical samples. Also, in clinical OCD samples, perfectionism appears to be particularly related to obsessions and compulsions related to washing, checking, and “just right” perceptions. However, research results have also indicated that perfectionism is strongly correlated with the other five cognitive domains identified by the

OCCWG. Perfectionism is also common to anxiety and other disorders, and is not unique to OCD (Egan, Wade, & Shafran, 2011).

As noted by Clark (2002), a review of the six cognitive features of OCD identified by the OCCWG reveals that none of these domains appear to be specific to OCD. They may be implicated in other anxiety-related disorders as well as other mental disorders. The six identified cognitive domains are also strongly intercorrelated. However, it should be noted that one of the scales generated by the OCCWG to measure the six identified cognitive domains, the *Obsessional Beliefs Questionnaire* (OBQ; Steketee & Frost, 2001), was later revised. The original 87-item scale was reduced to 44 items and the number of subscales was reduced from six to three (Responsibility/threat estimation, Perfectionism/Certainty, and Importance/Control of Thoughts) to address the issue of high intercorrelations between subscales, yielding the revised OBQ-44 (Steketee, 2005). This reportedly resulted in a modest reduction in intercorrelations between subscales.

OCD Symptomatology and Religiosity/Spirituality. Researchers have long speculated that religiosity/spirituality may play an etiological role in OCD. However, it has been asserted before that the examination of such a relationship requires a multidimensional analysis of the construct of religiosity/spirituality, which has typically not occurred in the OCD literature (Fitz, 1990). Fitz (1990) noted that research prior to 1990 evidenced some relationship between measures of anxiety or maladjustment and religious-themed superstition and ritualism (but *not* other aspects of religiosity/spirituality such as theism or idealism) and stated that anecdotal evidence taken from case studies of OCD in religious settings indicate that OCD might be etiologically related to strict, authoritarian, religious upbringing.

The relationship between religiosity and obsessions and compulsions has been investigated in nonclinical samples. Sica, Novara, and Sanavio (2002) examined the relationship between religiosity and obsessions and compulsions in an Italian community (nonclinical) sample. Participants were divided into highly religious (e.g., Catholic nuns and friars), moderately religious (e.g., attenders of regular Catholic services and activities), and low religious (e.g., individuals who expressed no interest in religious activities) groups. Findings indicated that religious individuals scored significantly higher than did nonreligious individuals on measures of obsessions and compulsions. Also, scores on measures of control of thoughts and overimportance of thoughts were significantly, positively associated with obsessions and compulsions only for religious participants.

Siev, Chambless, and Huppert (2010) examined religious affiliation as a moderator of the relationship between Moral-TAF and obsessions and compulsions in a student population incorporating individuals of the Christian and Jewish faiths. They found that religiosity was not significantly associated with obsessions or compulsions for either religious group. For Christians, moral-TAF was positively associated with religiosity, but not obsessions or compulsions. For Jews, moral-TAF was positively associated with obsessions and compulsions, but not religiosity.

Yorulmaz, Gençöz, and Woody (2010) investigated a number of relevant factors hypothesized to be related to OCD symptoms in an undergraduate student sample derived from Canada and Turkey. They found that religiosity was a significant predictor of obsessive-compulsive symptom severity only in the Turkish student sample. The authors opined that this difference might be explained by the more ritualized nature of Islamic religious practices.

Inozu, Karanci, and Clark (2012) investigated the relationship between religious fundamentalism and OCD symptoms in student samples from Turkey (primarily of the Muslim faith) and Canada (primarily of the Christian faith). Participants were screened using a measure of religious fundamentalism and dichotomized into high religiosity and low religiosity groups (actually high and low fundamentalism) in both samples. It was found that religious fundamentalism was positively associated with obsessions in both the Turkish and Canadian samples after controlling for depressive and anxiety symptoms. The relationship between obsessional symptoms and religious fundamentalism was partially mediated by generalized guilt, high moral standards, beliefs regarding the importance of thoughts and the importance of controlling thoughts, and beliefs regarding responsibility for and the threat of intrusive thoughts. The authors suggested that high moral standards embraced by individuals holding fundamentalist religious views might be unique mechanisms through which religious fundamentalism is related to obsessional content. That is, highly religious individuals may experience an extreme degree of generalized guilt related to intrusive thoughts that violate their high moral standards, leading to exceptional efforts at neutralizing thoughts that they believe are particularly repugnant to God in order to regain moral purity (Inozu, Karanci, & Clark, 2012). However, the data for this study were cross-sectional. It should be noted that the validity of mediated regression analyses with cross-sectional data has been seriously questioned in the literature. It has been demonstrated that these results can be biased and may not be replicated in longitudinal designs that assess mediation (see Maxwell & Cole, 2007; Maxwell, Cole, & Mitchell, 2011). However, other scholars have suggested that statistical mediation in the context of cross-sectional research still provides useful information regarding the relationships between variables of interest beyond that provided by simple correlations and suggest distinguishing between temporal (longitudinal) and

atemporal (cross-sectional) mediation (Winer, Cervone, Bryant, McKinney, Liu, & Nadorff, 2016).

Silton, Flannelly, Galek, and Ellison (2014) examined the relationship between religiosity (assessed using a three-item scale designed for the study that queried participants about frequency of service attendance, perceived strength of religious devotion, and perception of the likelihood of the existence of God), beliefs about God (e.g., punitive, benevolent, disengaged), obsessive thoughts, and compulsive behaviours using a random community sample of American adults. Results indicated no relationship between religiosity and obsessive thoughts or compulsive behaviours. Belief in a punitive God was significantly, positively associated with both obsessive thoughts and compulsive behaviours. Belief in a benevolent God was significantly, negatively associated with obsessive thoughts and compulsive behaviours. Belief in a disengaged God was not significantly related to obsessive-compulsive symptoms.

Vassiliou (2015) conducted a study examining the relationship between religiosity and OCD symptoms using both self-report questionnaires and an experimental task measuring illusion of control in a sample of British undergraduate students. The experimental task involved observing sets of straight lines of varying heights on a computer screen. Participants were instructed to use the up and down arrow keys on the computer keyboard in order to move the lines in the centre of the screen. However, participants were unaware that their keyboard presses had no effect on line position. After completing the task, they were asked to estimate the extent of their control over the lines. They also completed questionnaires assessing religiosity (assessed using *Plante and Boccaccini's Santa Clara Strength of Religious Faith Questionnaire*, 1997) and OCD symptoms. Results indicated that OCD symptoms were positively associated with both religiosity and perceived degree of control during the experimental task.

Dèttore, Berardi, and Pozza (2016) examined the relationship between religiosity (using a three-item questionnaire designed for the study assessing service attendance, perceived effect of religious principles on action, and weekly time devoted to religious activities), OCD symptoms, and obsessive-compulsive cognitions in an Italian community sample incorporating Jewish, Catholic, and Muslim participants. Participants were dichotomized into high and low religious groups based on the results of the religiosity questionnaire. Results indicated that Muslims scored higher on all categories of obsessive-compulsive cognitions than the other two groups, with the exception of inflated responsibility, which was only significantly higher than the Catholic group. Muslims also scored significantly higher on all domains of OCD symptoms than the Catholic or Jewish groups. Level of religiosity was unrelated to any of the outcome variables and did not moderate the relationship between religious affiliation and OCD symptoms or obsessive-compulsive cognitions.

Other research has examined the role of religiosity in individuals with OCD, with mixed results. Steketee, Quay, and White (1991) examined religiosity in the context of a sample of patients with OCD and other anxiety-related disorders. They found that individuals with OCD were not significantly more religious and did not report a significantly greater degree of guilt than individuals with other anxiety-related disorders. However, severity of OCD symptoms was positively associated with guilt and religiosity and individuals with religious obsessions reported a higher degree of religiosity. Conversely, Tek and Ulug (2001) found no evidence of a relationship between religious practices (using a scale of religious practices developed for the study) and religious obsessions or other subtypes of obsessions or compulsions. Results indicated that the only significant predictor of religious obsessions was having a relatively greater variety of obsessions. The authors concluded that religiosity was unlikely to be a determining factor in

OCD. Agorastos et al. (2012) investigated the relationship between religiosity/spirituality and obsessive-compulsive symptoms comparatively in participants with a diagnosis of OCD, a diagnosis of another DSM-IV anxiety disorder, and nonclinical participants. The study authors found no significant differences between groups on various aspects of religiosity/spirituality with the exception of negative religious coping (i.e., the belief that one is being punished by God or has been abandoned by God). Participants with diagnoses of OCD or another anxiety disorder scored significantly higher on negative religious coping than did healthy controls. However, there was no significant difference on negative religious coping between those with OCD and those with another anxiety disorder. Himle, Taylor, and Chatters (2012) studied the relationship between religious involvement (using a scale of religious practices developed for the study) and OCD in an American sample of African Americans and Black Caribbeans. They found that none of the religious variables were significantly related to OCD diagnostic status with the exception of religious coping and religious service attendance. Participants with a diagnosis of OCD were significantly more likely to report engaging in prayer during stressful situations and reported significantly lower attendance at religious services as compared to participants without the diagnosis.

When OCD symptoms focused more exclusively on religious obsessions and compulsions predominate, this is often referred to in the literature as *scrupulosity*. Although scrupulosity is generally considered to be a subtype of OCD, Miller and Hedges (2008) note that it appears somewhat distinct in that religious obsessions often appear to be more ego-syntonic than typical OCD symptoms. Compulsions are also less prevalent in scrupulosity, TAF appears more prevalent in scrupulosity, and there appears to be a greater degree of symptom overlap with obsessive-compulsive personality disorder. Treatment response is also typically poorer in

scrupulosity. As such, some researchers would argue that scrupulosity should be a separate diagnostic entity. Abramowitz, Huppert, Cohen, Tolin, and Cahill (2002) developed the *Penn Inventory of Scrupulosity* (PIOS) to measure religious-themed obsessions and compulsions. The factor structure of the measure yielded two subscales: Fear of God, and Fear of Sin. Results indicated that the measure was strongly, positively correlated with a single-item measure of strength of religious belief as well as a measure of obsessions and compulsions in a large undergraduate student sample. The association between the PIOS and obsessive-compulsive symptoms was replicated in an additional confirmatory factor analysis and validity study (Olatunji, Abramowitz, Williams, Connolly, & Lohr, 2007). It appears that the PIOS has not been used extensively in research with clinical OCD samples, but preliminary evidence suggests that the relationship observed in nonclinical samples between religiosity, OC symptoms, and the PIOS may not carry over to an OCD clinical sample (Nelson et al., 2006). However, these results are preliminary and likely need to be replicated.

Witzig and Pollard (2013) investigated the relationship between religiosity, spiritual wellbeing (defined as an individual's subjective sense of connectedness to God and adjustment with respect to existential matters such as life purpose and satisfaction in relation to one's spiritual beliefs), religious fundamentalism, obsessional beliefs, scrupulosity, and obsessive-compulsive symptoms in an American nonclinical sample of Fundamentalist Protestant Christians (Anabaptists). The study authors found no significant relationship between fundamentalism and scrupulosity. A negative correlation was found between both scrupulosity and religiosity and scrupulosity and spiritual well being, but these became nonsignificant when anxiety was included in the analyses as a covariate. Religiosity was significantly, negatively associated with scrupulosity and positively associated with fundamentalism. Spiritual wellbeing

was significantly, negatively associated with obsessive-compulsive symptoms, obsessional beliefs, and scrupulosity.

Hale and Clark (2013) conducted a study investigating the relationship between religiosity and intrusive thoughts in a dichotomized sample of high religiosity and low religiosity Canadian undergraduate student participants. High religiosity participants scored significantly higher than did low religiosity participants on measures of obsessions, compulsions, scrupulosity, generalized guilt, and guilt-related negative thoughts. There was no significant difference in the frequency of intrusive thoughts reported by the two groups. Further analyses suggested that generalized guilt was an important mechanism in heightened obsessionality in the high religiosity group, but that there was no evidence that guilt specifically regarding intrusive thoughts predicted obsessionality in highly religious individuals.

Fergus and Rowatt (2014) conducted a study examining the relationship between religiosity (using a 4-item scale assessing frequency of religiosity including service attendance, reading of religious texts, engagement in prayer or meditation, and self-reported strength of religious devotion), perceived attachment to God, OCD symptoms (including scrupulosity), and obsessive-compulsive cognitions. They found that religiosity was significantly, positively associated with scrupulosity and obsessive-compulsive symptoms. With respect to obsessive-compulsive cognitions, religiosity was also positively associated with beliefs regarding the importance of thoughts and the importance of controlling thoughts and beliefs regarding responsibility for intrusive thoughts. Scrupulosity was positively associated with attachment anxiety in one's perceived relationship with God (e.g., one's perception that God is inconsistent in his reactions towards one).

Taken together, these findings demonstrate some inconsistency with respect to the relationship between religiosity and OCD symptoms in both nonclinical and clinical samples. The literature has frequently found a relationship between religiosity and obsessional symptoms. Conversely, a relationship between religiosity and compulsions is less frequently observed in the literature. When such a relationship is observed, it appears to be primarily in religious contexts with a relatively high degree of religious ritual (e.g., Yorulmaz, Gençöz, and Woody, 2010).

A good deal of this inconsistency is likely due to continued inadequate measurement of the construct of religiosity/spirituality in the literature. Again, some researchers operationally define religiosity as religious observance. Others erroneously measure religious fundamentalism and label it as religiosity (e.g., Inozu et al., 2012). Others measure the construct in an extremely simplistic manner (e.g., using a single-item measure; e.g., Abramowitz et al., 2002). This again highlights the need for precise definition and multidimensional assessment of the construct of religiosity/spirituality in this literature to facilitate comparison across studies and more specific, firm conclusions. Also, given the equivocal nature of the findings, it appears likely that religiosity is a potential sphere in which OCD symptoms may manifest rather than a specific determinant of the disorder. Cross-cultural research on OCD appears to demonstrate that the core phenomenology of OCD is very similar across cultures, although it appears that cultural factors (including religion) may affect obsession content (Fontenelle, Mendlowicz, Marques, & Versiani, 2004).

Cognitive Features of OCD and Religiosity/Spirituality. The overwhelming majority of the research literature investigating the relationship between religiosity/spirituality and cognitive features of OCD has employed the construct of TAF. TAF has been measured in the related literature primarily using the *TAF Scale* developed by Shafran et al. (1996). It has also

been measured more behaviourally by employing an in-vivo task (Rachman, Shafran, Mitchell, Trant, & Teachman, 1996) in which participants are asked to think of a loved one and write a sentence stating that one hopes that the aforementioned loved one will experience a car accident. Participants are then usually asked to rate their feelings of anxiety and guilt for writing such a sentence as well as to estimate the probability of the event actually occurring, the degree of personal responsibility if the event were to occur, and the degree of personal immorality implied by writing such a sentence.

A causal relationship between TAF and obsessional thinking has been demonstrated experimentally to some degree with nonclinical populations. Rassin, Merckelbach, Muris, and Spaan (1999) conducted an experiment in which high school students underwent an EEG examination and were informed that the apparatus was capable of reading simple thoughts such as “apple.” Experimental participants were informed that thinking of the word “apple” would result in an electric shock being administered by the apparatus to another participant in an adjacent room. Control participants were instructed to think of anything they wished, including the word “apple” during the EEG test. The study results indicated that experimental participants reported more intrusive thoughts (thoughts of the word “apple”), greater discomfort, greater anger towards themselves in response to intrusive thoughts, and greater efforts to avoid intrusive thoughts. However, similar research does not appear to have been conducted with a clinical OCD sample, so it is unclear whether these results would be replicated in individuals with a diagnosis of OCD.

A number of researchers have investigated the association between religiosity/spirituality and TAF in the context of various religions and cultures. Rassin and Koster (2003) investigated the nature of this relationship using a sample of Belgian and Dutch psychology undergraduate students. Participants identified their religious affiliation categorically (e.g., Catholic, Protestant, Jewish, Hindu, etc.) and rated their degree of religious involvement on a 100-point *Visual Analogue Scale* (ranging from 0 – not at all, to 100 – very much). Obsessive-compulsive complaints were measured using the *Maudsley Obsessional Compulsive Inventory* (MOCI; Hodgson & Rachman, 1977). TAF was measured using Shafran, Thordarson, and Rachman's (1996) *TAF-Scale*. Results indicated a positive relationship between moral-TAF and degree of religious involvement amongst both Protestant and Catholic Christians. A positive relationship was observed between likelihood (others)-TAF and degree of religious involvement for Catholics only. A negative relationship was observed between likelihood (self)-TAF and degree of religious involvement for Protestants only. No significant relationship was found between degree of religious involvement amongst other religious groups (including atheism) and TAF. A positive relationship between obsessive-compulsive complaints and degree of religious involvement was observed for Catholics only.

Abramowitz, Deacon, Woods, and Tolin (2004) investigated the relationship between obsessive-compulsive symptoms/cognitions and religiosity/spirituality using an American undergraduate sample that included individuals from various Protestant denominations and Atheists/Agnostics. Although they did not use the TAF-scale (Shafran et al., 1996), they investigated a number of closely related obsessional beliefs (importance of thoughts, control of thoughts, responsibility for thoughts) using the *Obsessional Beliefs Questionnaire* (Steketee & Frost, 2001). Religiosity/Spirituality was assessed using a 3-item scale wherein participants were

asked to rate the strength of their religious affiliation, religious beliefs, and degree of agreement with the teachings of their religious group. Participants rated each item on a 5-point Likert scale (1 = not at all strong, 3 = somewhat strong, and 5 = very strong). Those who rated all three items as a “5” were classified as “highly religious.” Those who rated all three items as a “3” were classified as “moderately religious.” OCD symptoms were measured using the *Obsessive-Compulsive Inventory – Revised* (OCI-R; Foa et al., 2002). Results indicated that, as predicted, the highly religious group demonstrated significantly greater scores on the OCI-R obsessions subscale as well as on the OBQ control of thoughts, importance of thoughts, and responsibility subscales. The authors suggested that these results demonstrate that highly religious Protestants believe their thought content to be very important, that their thought content should be controlled, and that uncontrolled thought content can directly lead to negative outcomes for which one would be directly responsible.

Siev and Cohen (2007) investigated the relationship between religiosity/spirituality and TAF in the context of a web-based study using snowball sampling. Participants were initially recruited through advertisement in a variety of faith-based contexts (e.g., religious organizations, faith-based campus groups, etc.) and participants were asked to communicate study information to others who shared similar religious beliefs. TAF was measured using the TAF-scale (Shafran et al., 1996) and religiosity/spirituality was measured using a 6-item scale (Cohen, Malka, Rozin, & Cherfas, 2006) wherein participants rated their religiosity, spirituality, observance of religious requirements, belief in religious teachings, importance of faith with respect to one’s identity, and importance of faith in demonstrating one’s personality to others. Items were rated on a 5-point Likert scale (1 – not at all, 5 – extremely/deeply) and summed to yield a total score. Participants identified their religious affiliation as Orthodox Jewish, Conservative Jewish, Reform Jewish, or

Christian. Results indicated that Orthodox Jewish and Christian participants scored significantly higher on the measure of religiosity/spirituality than did Conservative or Reform Jewish participants. Religiosity/spirituality was significantly, positively correlated with moral-TAF in the Christian group. The correlation was nonsignificant for all other groups. There were no significant differences observed in likelihood (self)-TAF scores for any of the religious groups and scores were uniformly very low. Scores were also uniformly low for likelihood (others)-TAF across religious groups. However, a small but significant difference was observed in that the Orthodox Jewish group scored somewhat higher than the Christian group on the likelihood (others)-TAF subscale. The authors stated that all groups scored markedly lower than the obsessional group from the Shafran et al. (1996) normative data sample and suggested that this indicates that individuals from these religious groups may consider thoughts to be equivalent to actions, but do not generally demonstrate related obsessional symptoms.

A structural equation modelling study investigated the relationship between Religiosity/Spirituality and TAF employing an American undergraduate student sample (Marino, Lunt, & Negy, 2008). Religiosity/Spirituality was assessed using the *Religious Life Inventory* (RLI; Batson & Ventis, 1982), which reportedly measures internal, external, and interactional dimensions of religiosity. The scale comprises 32 items rated on a 9-point Likert scale. TAF was measured using the TAF scale (Shafran et al., 1996), but it appears that a total scale score was used in analyses rather than differentiating between moral and likelihood TAF. Obsessive-compulsive symptoms were measured using the *Padua Inventory* (Sanavio, 1988) and the *Revised Obsessive Intrusions Inventory* (ROII; Purdon & Clark, 1993). Results indicated that religiosity was predictive of an elevated sense of responsibility and TAF. In turn, both TAF and

obsessive-compulsive symptoms were significant predictors of self-reported engagement in neutralization.

Yorulmaz, Gençöz, and Woody (2009) investigated the relationship between religiosity/spirituality and TAF in a sample of Muslim undergraduates in Turkey and Christian undergraduates in Canada. Religiosity/spirituality was assessed using a 7-item scale designed for the study to measure religious involvement, the personal impact of religious principles, and religious observance. Items were rated using a 5-point Likert scale (ranging from “none” to “very much/daily”). TAF was measured using the TAF scale (Shafran et al., 1996). Participants were dichotomized into high and low religiosity groups based on their religiosity/spirituality scale scores. No significant differences were observed between Muslims and Christians with respect to their scores on moral-TAF and likelihood-TAF. However, those in the high religiosity group, irrespective of religious affiliation, scored significantly higher on moral-TAF than the low religiosity group. Both groups scored uniformly low on likelihood-TAF with no significant differences. Christians in the low religiosity group scored lower on moral-TAF than did any other group.

Another study investigated the relationship between TAF and religiosity/spirituality using both questionnaires and the sentence completion paradigm (Berman, Abramowitz, Pardue, and Wheaton, 2010). A sample of undergraduate students was screened and eligible participants were dichotomized according to self-reported religiosity. Those who reported being Agnostic or Atheist comprised one group and those who scored above the cut-off (>33) for high religiosity on the *Santa Clara Religious Faith Scale* (SCRFS; Plante & Boccacini, 1997) comprised the second group. TAF was assessed using the TAF scale (Shafran et al., 1996). A variation of Rachman, Shafran, Mitchell, Trant, and Teachman’s (1996) sentence paradigm was used.

Participants were instructed to think of a close relative and insert the relative's name into two sentences. The first sentence mirrored the Rachman et al. (1996) car accident scenario. The second sentence was presented in a similar format, but involved expressing the desire to have sex with the aforementioned close relative. Findings indicated that the highly religious group scored significantly higher than the Atheist/Agnostic Group on Moral-TAF, but no differences were observed between groups for Likelihood-TAF. Following the two-sentence paradigm in-vivo task, participants were asked to rate on a 100-point Visual Analogue Scale their anxiety, predicted likelihood of the event occurring, and moral wrongness of having such a thought for each sentence. There was no difference between groups in reported anxiety levels for either the car accident or incest sentence, and both groups reported a low to moderate degree of anxiety for both tasks. Likelihood was rated across groups as low for the car accident sentence and extremely low for the incest sentence, but highly religious participants did report significantly higher likelihood than atheistic/agnostic participants with respect to the car accident sentence. Both groups rated moral wrongness as high for the car accident scenario and extremely high for the incest scenario, but the highly religious group rated the moral wrongness of the incest scenario significantly higher than did the atheist/agnostic group. The authors suggested that the significant difference in ratings of moral wrongness in response to the incest sentence implies that highly religious individuals feel more morally responsible for thoughts regarding actions that are highly controllable (i.e., the choice to engage in incest) than those that are less controllable (i.e., a relative experiencing a car accident). These results were also framed in the context of incest-related thoughts being particularly taboo for highly religious individuals. It was suggested that further research might examine the role of personal responsibility in moral-TAF. It was also suggested that the study procedures be conducted using a clinical OCD sample.

Cougle, Purdon, Fitch, and Hawkins (2013) suggested that inconsistency in findings regarding the relationship between TAF, religiosity, and obsessive-compulsive symptoms might be explained by intent associated with intrusive thoughts. The study authors created an altered version of the *TAF Scale* (TAF Scale; Shafran, Thordarson, & Rachman, 1996) for use in the study, the *Moral TAF Intentionality Scale* (Cougle et al., 2013) wherein 12 TAF Scale items were altered to reflect intentional thoughts (e.g., willingly thinking about harm coming to another) and 12 items were explicitly worded to reflect intrusive thoughts (e.g., having unwanted intrusive thoughts of harm coming to another). Participants also completed the original TAF Scale and measures of religiosity (using a 2-item measure assessing religious affiliation and frequency of prayer), depression, anxiety, obsessive-compulsive symptoms, and obsessive-compulsive cognitions. Participants also completed an adapted version of the classic sentence completion task (Rachman, Shafran, Mitchell, Trant, & Teachman, 1996) wherein participants are asked to think of an individual and write a sentence stating that one hopes that the aforementioned individual will experience a car accident. One of two sentences was displayed on a computer screen implying intentionality (i.e., “I hope _____ will be in a car accident) or not implying intentionality (i.e., _____ will be in a car accident). Participants were then asked to reproduce the sentence on a provided piece of paper. Afterwards, they were given 1 minute to potentially engage in neutralization while the experimenter left the room. They were queried about the use of neutralization or religious strategies (e.g., prayer) when the experimenter returned. Participants rated their levels of anxiety and guilt prior to writing, immediately after writing, and after the neutralization period. They also rated their perceived responsibility if the accident occurred and likelihood that the accident would occur as a result of their thoughts following writing out the sentence. Results indicated that participants considered intentional

thoughts to be significantly more immoral than intrusive thoughts. Beliefs regarding the immorality of intrusive thoughts were significantly, positively related to all domains of obsessive-compulsive cognitions, but beliefs regarding the immorality of intentional thoughts were only related to beliefs regarding the importance of thoughts and the importance of controlling thoughts. Beliefs regarding the immorality of both intentional and intrusive thoughts were positively related to scrupulosity. Only beliefs regarding the immorality of intentional thoughts was positively associated with religiosity (specifically, prayer frequency). None of the moral TAF scales were significantly related to OCD symptoms. With respect to the sentence completion task, there were no differences between conditions in postwriting or postneutralization period anxiety, perception of responsibility if the accident were to occur, likelihood of the accident occurring as a result of one's thoughts, or engagement in neutralization. Those in the intentional condition reported a greater sense of guilt than those in the nonintentional condition. In the intentional sentence condition, only moral TAF was significantly, positively associated with postwriting and postneutralization period anxiety. In the nonintentional condition, moral TAF and OCD symptoms were positively associated with postwriting anxiety, and OCD symptoms and scrupulosity were positively associated with postneutralization period anxiety. With respect to neutralization frequency in the intentional condition, neutralizers reported significantly greater moral TAF than nonneutralizers. In the nonintentional condition, neutralizers reported greater obsessions and scrupulosity than nonneutralizers. The authors stated that these results suggest that perceptions of the immorality of intentional thoughts are directly related to religiosity, but intrusive moral TAF is more directly relevant to the understanding of OCD processes.

Williams, Lau, and Grisham (2013) investigated the hypothesized role of TAF as a mediator of the relationship between religiosity (assessed using *Plante and Boccaccini's Santa Clara Strength of Religious Faith Questionnaire*, 1997) and obsessive-compulsive symptoms in a sample of Australian university students who self-identified as Christian, Jewish, or Atheist/Agnostic. In addition to completing questionnaires, participants completed an adapted version of the classic sentence completion task (Rachman, Shafran, Mitchell, Trant, & Teachman, 1996) wherein they were asked to think of and name a person they dislike and were asked to imagine this person being in a car accident for 30 seconds, followed by a 5-minute period wherein they were to free to think of anything but were asked to count the frequency of intrusive thoughts regarding the aforementioned individual experiencing a car accident. They were asked to rate their subjective experiences of distress, guilt, feelings of responsibility, and efforts to suppress the target thought during the procedure. Results indicated that religiosity was not significantly correlated with TAF or OCD symptoms in the Atheist/Agnostic or Jewish groups. A significant positive relationship was observed between religiosity, moral TAF, and OCD symptoms in the Christian group. Christians also reported a significantly higher level of moral thought-actions fusion compared to the other two groups. However, there were no significant differences in OCD symptoms between the Christian, Jewish, and Atheist/Agnostic groups. Mediation analysis indicated that moral TAF significantly mediated the relationship between religiosity and OCD symptoms for the Christian group only. With respect to the experimental task, moral TAF significantly mediated the relationship between religiosity and perceived guilt and responsibility for the Christian group only. It was suggested that these results indicate that obsessional thinking is not directly attributable to religion, but that particular religious teachings may engender TAF that is implicated in the maintenance of OCD. However,

interpretations with respect to statistical mediation should again be viewed cautiously given that the data for this study were cross-sectional (see Maxwell & Cole, 2007; Maxwell, Cole, & Mitchell, 2011).

Inozu, Ulukut, Ergun, and Alcolado (2014) examined the role of TAF as a mediator of the relationship between religiosity (measured using a 5-item questionnaire designed for the study assessing frequency of religious activities and perceived importance of religion in guiding decisions and behaviours) and obsessive-compulsive symptoms in a sample of Muslim Turkish undergraduate university students. Results indicated a significant, positive relationship between religiosity and TAF, obsessions, and washing compulsions. Results also indicated that TAF significantly mediated the relationship between religiosity and OCD symptoms, regardless of subtype. Again, interpretations with respect to statistical mediation should be viewed cautiously given that the data for this study were cross-sectional (see Maxwell & Cole, 2007; Maxwell, Cole, & Mitchell, 2011).

Nelson, Abramowitz, Whiteside, and Deacon (2006) investigated the relationship between scrupulosity, religiosity/spirituality, and a variety of related cognitive constructs (including TAF) using a sample of patients diagnosed with OCD. Participants identified their religious affiliation categorically and rated the overall strength of their religious devotion using a single item measure. Scrupulosity was measured using the *Penn Inventory of Scrupulosity* (PIOS; Abramowitz et al., 2002), OCD symptom content was measured using the OCI-R (Foa et al., 2002), and OCD severity was measured using the *Yale-Brown Obsessive Compulsive Scale* (Y-BOCS; Goodman et al, 1989a, 1989b). Results indicated that Protestants demonstrated a significantly higher degree of scrupulosity (as measured by the PIOS) than did those with no religious affiliation. No other significant differences in PIOS scores were observed between

Protestants, Catholics, and those with no religious affiliation. No significant association was found between PIOS scores and self-reported strength of religious devotion for any of the religious groups individually or for the entire sample. There was a significant, positive association observed between moral-TAF (but not likelihood-TAF) scores and PIOS scores.

Close examination of these collective results indicates that individuals who consider themselves to be highly religious tend to endorse a greater degree of moral-TAF (although results are mixed with respect to likelihood-TAF). However, there are also a number of shortcomings in this literature that are evident. Of particular note is the measurement of the construct of religiosity/spirituality. TAF studies tend to assess this construct in a somewhat simplistic manner, as if it were a unidimensional construct. However, it seems evident upon reflection that adequate measurement of religious faith would require tapping into a number of different aspects of religiosity (e.g., attendance at religious services, personal daily spiritual practices, religious sentiment). The construct of religiosity/spirituality is not well defined in the literature investigating the relationship between religiosity/spirituality and TAF and the notable lack of consistency between studies in the selection of measures of religiosity/spirituality clearly illustrates this. It should also be noted that there is a considerable amount of scientific literature, including well over 100 scales of religiosity/spirituality (Kapuscinski & Masters, 2010), directly concerned with assessing this construct. Although there are well-validated measures of religiosity/spirituality available, researchers in this field typically have chosen to employ single-item Visual Analogue Scales or unvalidated scales designed specifically for individual studies (usually with little in the way of supporting psychometric data). Because these ad-hoc measures tend to measure very different aspects of religiosity/spirituality between studies, it is unclear what exactly is being measured in the literature as a whole. Considering that there is a notable

amount of clinical evidence suggesting that religiosity/spirituality is associated with benefits that may include increased life span, reduced physical disability, increased life satisfaction, and quicker recovery from mental illness (Hall, Meador, & Koenig, 2008), it seems simplistic and perhaps unfair to conclude from the TAF research that religiosity/spirituality as an entire construct is positively associated with TAF (and possibly obsessional symptoms). Clearly, the construct of religiosity/spirituality and its relationship with TAF needs to be investigated in a more multifaceted manner to determine which particular aspects of religiosity/spirituality are associated with TAF.

Another significant weakness evident in this literature is the frequent dichotomization of the variable of religiosity or use of extreme groups. Dichotomization of continuous variables is rarely appropriate and often yields misleading results (see MacCallum, Zhang, Preacher, & Rucker, 2002). While selecting participants with extremely low and extremely high scores on measures of religiosity to form groups may initially be useful in highlighting an effect that otherwise might be missed, doing so may be a statistically unwise practice given that variance is being removed at more moderate levels of the variable (see Preacher, Rucker, MacCallum, & Nicewander, 2005). Forming extreme groups or dichotomizing the variable of religiosity may obscure the nature of the relationship between TAF and religiosity in that it becomes unclear whether the relationship between religiosity and TAF is linear or nonlinear. If a significant relationship between TAF and religiosity only exists at high levels of religiosity, this would have important clinical implications.

Another significant weakness is that research comparing religious groups categorically often fails to account for strength of religiosity between groups. If purported group differences between religious groups in TAF and other related constructs is due to unintended group differences in strength of religious devotion, it is inaccurate to attribute the differences to unique beliefs of particular religious groups.

Finally, the overwhelming majority of this literature employs student samples, so it is unclear whether these findings have any clinical utility. It is often speculated in this literature that high religiosity and elevated TAF (particularly moral-TAF) is associated with OCD and may be an etiological factor in the development of obsessions. Results concerning the relationship between moral-TAF and OCD symptoms in nonclinical samples are mixed. Given the equivocal findings in nonclinical participants, it most certainly remains unclear whether moral-TAF associated with religiosity is significantly associated with pathology in OCD patients. Clearly these findings need to be replicated in clinical samples in order to come to any firm conclusions.

TAF and Magical Ideation. Although TAF, as it is currently conceptualized in the literature, is a relatively new construct, the concept can be observed in psychoanalytic theories of magical thinking or “omnipotence of thoughts” dating back as far as Freud (Shafran & Rachman, 2004) and is implied in Piaget’s account of preoperational magical thinking in children (Berle & Starcevic, 2005). Magical ideation (broadly defined as the tendency to ascribe causality to factors in a manner that is unusual in the context of one’s culture; Eckblad & Chapman, 1983) has most commonly been measured using the *Magical Ideation Scale* (MIS) created by Eckblad and Chapman (1983). The scale was originally designed to measure proneness to psychosis or schizotypy and directly addresses individual differences in magical beliefs related to psychic phenomena or superstitious practices. Einstein and Menzies (2004a, 2004b, 2006) found a

significant, positive relationship between magical ideations and obsessional thinking/compulsions in both nonclinical and clinical OCD samples. Although TAF and superstitious beliefs/behaviours were also significantly, positively related to obsessional thinking/compulsions, this relationship became nonsignificant when the effect of magical ideation was statistically controlled. Einstein and Menzies (2004a, 2004b, 2006) suggested that these findings indicate that magical ideation underlies both TAF and superstition. As such, it appears that TAF and superstition might be thought of as specific examples or applications of the underlying construct of magical ideation.

Religiosity/Spirituality and Superstition. Given the implication of magical ideation and TAF in OCD and the possible relationship between aspects of religiosity/spirituality and OCD, one might also wonder about the role of superstition in religiosity/spirituality. Torgler (2007) noted past mixed results with respect to the relationship between superstition and religiosity/spirituality and examined this relationship utilizing international survey data from 17 countries. Belief in astrology, fortune-tellers, and good luck charms, and their relationship to engagement in religious activities (service attendance, attendance at church functions, and participation in church-based volunteer work) and a single index of self-rated religiosity (ranging from “extremely nonreligious” to “extremely religious”) were examined. In general, findings indicated that participation in religious activities was negatively correlated with superstitious beliefs, but that self-rated degree of religiosity was positively associated with superstitious beliefs.

Baker and Draper (2010) also noted the preponderance of contradictory findings in the literature in this regard and conducted a large population-based survey in the United States to explore more closely the relationship between paranormal beliefs and various aspects of religiosity/spirituality including religious beliefs and religious practice and affiliation. Results indicated that the relationship between religiosity/spirituality and superstition is likely curvilinear. Low religious beliefs and practice were associated with less strength of belief in paranormal phenomena. As both religious belief and practice increased, so did paranormal beliefs. However, a high degree of religious belief and practice was associated with a low degree of belief in the paranormal. It was suggested that the curvilinear relationships observed resolves previous contradictory findings and indicates that those most likely to endorse paranormal beliefs are moderate in their religious beliefs and practice.

Religiosity/Spirituality and Personality. An important question to consider when examining the relationship between religiosity/spirituality and OC symptoms and cognitive factors is whether the domain of religiosity/spirituality is wholly explained by traditional personality factors. Past research findings have most consistently supported a small, positive association between religiosity/spirituality and the personality factors of *conscientiousness* and *agreeableness* (Saroglou, 2002). McCullough, Tsang, and Brion (2003) noted that research examining the relationship between personality factors and religiosity/spirituality has typically used cross-sectional data rather than longitudinal data and that such an approach cannot account for developmental trajectories. As such, they conducted a study with a sample of 492 American adolescents that were followed for 19 years. They found that conscientiousness in adolescence was a significantly, positively related to religiosity in adulthood and that it was the only unique predictor of religiosity in adulthood of the “Big Five” personality factors when the effect of

strength of religious upbringing was statistically controlled. Those who reported a strong religious upbringing were likely to report greater religiosity as adults, but this relationship was moderated by neuroticism such that the relationship was weakened as neuroticism decreased. Strength of religious upbringing was a significantly stronger predictor of adult religiosity than personality factors (McCullough, Tsang, & Brion, 2003). Carlucci, Tommasi, and Saggino (2011) also found in a sample of 125 Italian Catholics that sociodemographic variables (e.g., years of education, church attendance, age) were significantly more strongly predictive of religious fundamentalism than Big five personality factors.

A recent meta-analysis (Saraglou, 2010) examined religiosity/spirituality in a multifaceted manner using 71 research samples (*total N* = 21,715) from 19 countries and revealed significant, positive associations between religiosity and the personality factors of agreeableness, and conscientiousness. Spirituality was significantly, positively associated with openness to experience, extraversion, agreeableness, and conscientiousness. Religious fundamentalism was found to be significantly, positively correlated with agreeableness and conscientiousness, and significantly, negatively related to openness to experience. However, it should be noted that effect sizes were uniformly small. Saraglou (2010) also noted that students (who may not have been particularly religious) and western nations were overrepresented and that there is a significant amount of research indicating that many aspects of religiosity/spirituality are not exhaustively accounted for in the Big Five model of personality.

Given that established personality factors (i.e., the Big Five) do not appear to account for many aspects of religiosity/spirituality, a number of researchers have investigated models of personality including a greater number of factors. Saucier and Goldberg (1998) conducted a lexical study of person-descriptive adjectives and noted that the broad content area of religiosity

appears to have a number of distinct aspects not included in the Big Five personality traits.

Ashton, Lee, and Goldberg (2004) also conducted a similar lexical study and explored six and seven-factor solutions in addition to the traditional five-factor solution, reportedly because several languages other than English had yielded six or seven-factor solutions. They found that the seven-factor solution yielded a seventh factor that was clearly interpretable as religiosity (Ashton, Lee, and Goldberg, 2004). Piedmont (1999) developed a questionnaire to assess spiritual transcendence (defined as the ability to stand outside one's current circumstances and view life from a larger, unified perspective) designed to assess characteristics he believed to be outside of traditional Big Five personality models. He found that the resulting spiritual transcendence scale (STS) was independent of Big Five personality measures and had predictive validity when the influence of Big Five personality traits was statistically controlled. He suggested that spirituality might be described as a sixth personality factor. These results also appear to have been replicated cross-culturally (Piedmont, Ciarrochi, Dy-Liacco, & Williams, 2009; Rican & Janosova, 2010).

Measurement of Religiosity/Spirituality. Hall, Meader, and Koenig (2008) note that the literature concerned with measurement of religiosity and spirituality tends to define religiosity in terms of observable practices (e.g., attendance at services, prayer) associated with a particular religion, and spirituality as an experience of the transcendent (i.e., belief in something greater than oneself) that is not tied to any particular religion. It appears that early health-related research focused on various aspects of religiosity as predictors of health outcomes, but that more recent research has turned towards exploring spirituality as a predictor (Hall, Meader, & Koenig, 2008). However, there appears to be ongoing controversy regarding the degree of overlap between these two constructs and their specific definitions (Kapuscinski & Masters, 2010).

Brief reflection will likely call to mind a number of different facets of one's existence that could be affected by or related to personal religiosity/spirituality. A promising multidimensional measure of religiosity/spirituality was developed by a team of experts in the field assembled by the Fetzer Institute and the National Institute on Aging in 1995. The panel of experts defined 12 domains of religiosity/spirituality deemed to be relevant for health-related research: Beliefs, values, religious preference, organizational religiousness, private religious practices, commitment, meaning, coping, history, forgiveness, daily spiritual experiences, and support. Individual scales were either incorporated from previous research or generated for each of the 12 domains and then items were selected from each of the individual scales to form the 38-item *Brief Multidimensional Measure of Religiousness/Spirituality* (BMMRS; Fetzer Institute, 1999). The scale has also been validated using a very large population in the context of a national survey in the United States. One possible drawback of the scale is that each of the dimensions of religiosity/spirituality must be considered separately and cannot be summed into a general score of religiosity/spirituality. Also, the original working group provided no psychometric evidence for the factor structure of the scale and later work exploring the factor structure suggests several alternate factor structures, all with significantly fewer than 12 factors (Masters et al., 2009). As such, it appears that this promising measure requires further refinement before it can be considered to be the gold standard measure of religiosity/spirituality that its authors had intended it to be.

The *Santa Clara Strength of Religious Faith Questionnaire* (SCSORF; Plante & Boccaccini, 1997a, 1997b) was designed to measure the strength of religious devotion regardless of individual religious association. While the measure appears to present good psychometric properties with respect to reliability, there appears to be somewhat meagre evidence for

discriminant and convergent validity and no available information regarding its factor structure. However, it also appears to be a promising scale for measuring general strength of religious faith with further psychometric refinement.

Kapuscinski and Masters (2010) reported in their review of scales of religiosity/spirituality several measures that appear to have been generated using high-quality practices of scale development and validation and possess good psychometric properties. Of note are the *Assessment of Spiritual and Religious Sentiments* (ASPIRES; Piedmont, 2004) and the *Daily Spiritual Experiences Scale* (DSES; Underwood & Teresi, 2002).

The DSES (Underwood & Teresi, 2002) was developed by the authors to measure individual experiences of the transcendent in daily life as well as the importance the individual places on these experiences across a variety of religious contexts. As such, items were designed to be free of content specifically tied to any one religious group or orientation. The scale appears to have good preliminary validity, reliability, and a clear (unidimensional) factor structure. However, it appears to be concerned only with measuring spirituality rather than both spirituality and religiosity (which may limit its usefulness for the current proposed research).

The ASPIRES (Piedmont, 2004) was designed to measure both spirituality and religiosity in a multidimensional manner. It is divided into two parts: the *Religious Sentiments Scale* and the *Spiritual Transcendence Scale*. The Religious Sentiments facet is divided into two subscales: *Religious Involvement* (measuring one's degree of involvement in religious rituals and the importance placed on these rituals) and *Religious Crisis* (measuring the degree to which one feels alienated from God and from religious community). The Spiritual Transcendence Scale (STS) incorporates three subscales designed to measure different aspects of spirituality: *Universality* (defined as one's belief in unity and life purpose), *Prayer Fulfillment* (defined as

the experience of joy or contentment resulting from prayer or meditation), and *Connectedness* (defined as personal responsibility/connection to others). The ASPIRES appears to have acceptable reliability, validity, and an established factor structure. Related research (Piedmont, Ciarrochi, Dy-Liacco, and Williams, 2009) has further demonstrated validity of the measure, indicating that these constructs have predictive validity beyond standard personality measures. It has also been demonstrated (using the ASPIRES) that religiosity and spirituality, although correlated, appear to be separate constructs that show differential patterns of correlation with a variety of external criteria, suggesting that the use of both constructs is necessary and complementary (Piedmont et al., 2009).

Altemeyer and Hunsberger's (2004) *Revised Religious Fundamentalism Scale* (RRFS) also presents good evidence for validity, reliability, and factor structure (reportedly unidimensional) in its development (Altemeyer & Hunsberger, 1992) and subsequent revision (including cross-cultural research; Altemeyer & Hunsberger, 2004). The scale was designed to measure extremist religious tendencies (i.e., exclusivity of one set of religious teachings believed to reflect essential truth, which must be followed exactly to secure divine favour) rather than religiosity/spirituality in general.

The Current Study Objectives. Given the availability of several well-validated and reliable measures of religiosity/spirituality, it is puzzling why research exploring the relationship between OCD cognitive factors and symptomatology and religiosity/spirituality typically has not employed these measures. Prior research has also typically been limited to a small number of religious groups. Therefore, the current study investigated the relationship between religiosity/spirituality, OC symptoms, OC cognitive features, generalized guilt, and moral standards across a wide variety of religious affiliations employing multidimensional, well-

validated, and psychometrically sound measures of religiosity/spirituality. A primary goal of this study was to specify more precisely which particular aspects of religiosity/spirituality are associated with OCD cognitive factors and symptoms. These relationships were also investigated in a clinical sample of individuals with a principal diagnosis of OCD to determine whether a similar pattern in the relationship between religiosity/spirituality, OC symptoms, and OC cognitive features would be observed in those with a diagnosis of OCD.

Given the highly multicultural population of the Greater Toronto Area, a significant opportunity existed to recruit a sample of nonclinical participants (from both student and community populations) from a wide range of religious backgrounds. The 2001 Canadian Census (Statistics Canada, 2004) indicated the following major religious affiliations (presented in descending order according to frequency) in the general Canadian population: Catholic (43.2%), Protestant (31.8%), No Religious Affiliation (16.2%), Muslim (2.0%), Orthodox Christian (1.6%), Jewish (1.1%), Buddhist (1.0%), Hindu (1.0%), and Sikh (0.9%). Participants were specifically recruited from student and community populations in Toronto within each of these religious groups to explore the relationship between TAF, OC symptomatology, and religiosity/spirituality within each religious context. Since the Religiosity/Spirituality measurement literature makes a distinction between religiosity and spirituality, participants identifying as “spiritual but no current religious affiliation” were also specifically recruited. Individuals identifying as Atheist or Agnostic were also recruited to represent those who do not consider themselves to be spiritual and do not have any religious affiliation. Experimental tasks included the completion of questionnaires related to religiosity/spirituality, OC cognitive factors, OC symptomatology, generalized guilt, and moral standards.

Hypotheses. Past research in nonclinical samples has indicated some differences in moral-TAF, scrupulosity, obsessional thinking, and obsessional beliefs (specifically, importance/control of thoughts and responsibility/threat estimation) according to religious affiliation. However, in many cases, it was unclear whether mean level of religiosity/spirituality/fundamentalism was relatively equal between groups, which calls into question whether these are actual differences. Nonetheless, there appears to be some evidence indicating that Protestants score higher than Catholics on moral-TAF (Rassin & Koster, 2003) and scrupulosity (e.g., Abramowitz et al., 2002). There is also some evidence that Muslims score higher on obsessional thinking and obsessional beliefs (specifically, importance/control of thoughts and responsibility/threat estimation) than Protestants (e.g., Yorulmaz et al., 2009). Therefore, it was hypothesized that Protestants would score significantly higher than Catholics on measures of moral-TAF, scrupulosity, obsessional thinking, and obsessional beliefs (importance/control of thoughts and responsibility/threat estimation) when religiosity, spirituality, and fundamentalism are statistically controlled (H1).

Given prior findings (e.g., Inozu et al, 2012), it was also hypothesized that Muslims would score significantly higher than Christians (as a whole) on measures of moral-TAF, scrupulosity, obsessional thinking, and obsessional beliefs (importance/control of thoughts and responsibility/threat estimation) when religiosity, spirituality, and fundamentalism are statistically controlled (H2).

Considering the lack of prior research concerning Hindu, Sikh, Buddhist, and Christian Orthodox religious affiliation, it was determined that these analyses would be exploratory.

Given that available research indicates that minority groups in Canada are typically underserved with respect to mental health care services (Kohn, 2007), it was anticipated that the majority of clinical participants would be Caucasian and would identify as Christian, Jewish, Spiritual but not Religious, Agnostic, or Atheist. It was deemed unlikely that there would be sufficient numbers of participants affiliated with other religions to facilitate meaningful comparison between religious groups. Therefore, no specific hypotheses were proposed with respect to religious affiliation in the clinical sample.

Given that the construct of scrupulosity is defined in the literature as pathological fear of God and fear of sin, it was hypothesized that scrupulosity would be positively associated with religious crisis (i.e., feelings of alienation from God and from religious community; H3). It was also hypothesized that the positive association observed in prior research between scrupulosity and obsessional thinking (e.g., Nelson et al., 2006) would be replicated (H4). It was also hypothesized that the positive association between fundamentalism and obsessional thinking observed in prior research (e.g., Inozu et al., 2012) would be replicated (H5).

The literature has frequently found a relationship between religiosity and obsessional symptoms. Conversely, a relationship between religiosity and compulsions is rarely observed in the literature. When such a relationship is (rarely) observed, it appears to be primarily in religious contexts with a relatively high degree of religious ritual (e.g., Yorulmaz, Gençöz, and Woody, 2010). As such, no hypotheses were proposed exploring the relationship between religiosity/spirituality and compulsions.

There is little prior research that differentiates between religiosity and spirituality upon which to base hypotheses when examining their relationship with OC symptoms and cognitive features. However, based on the theoretical differentiation between religiosity (i.e., religious behaviours) and spirituality (i.e., experiences of the transcendent that are not necessarily related to religious observance or affiliation) posited by the religiosity/spirituality construct measurement literature, it was hypothesized that the relationship between religiosity (i.e., religious behaviours) and fundamentalism would be moderated by spirituality (i.e., experiences of the transcendent) such that high religiosity would only be positively associated with high fundamentalism when spirituality is low (H6). It was also hypothesized that the relationship between religiosity and moral-TAF (H7) and the relationship between religiosity and scrupulosity would also be moderated by spirituality in a similar manner (H8). Finally, it was predicted that these relationships would remain significant when general depression and anxiety are statistically controlled.

It was also hypothesized that the relationship observed in prior research between scrupulosity and obsessional thinking (e.g., Nelson et al., 2006) would be mediated by moral-TAF (based on a hypothesized extension of the findings of Nelson et al. that demonstrated positive relationships between scrupulosity and moral-TAF and obsessional thinking) and obsessive beliefs (specifically, importance/control of thoughts and responsibility/threat estimation) (H9). It was also hypothesized that the positive association between fundamentalism and obsessional thinking observed in prior research (e.g., Inozu et al., 2012) would be mediated by moral-TAF, obsessive beliefs (specifically, importance/control of thoughts and responsibility/threat estimation), and generalized guilt (as found by Inozu et al., 2012) (H10).

Finally, it was predicted that these relationships would remain significant when general depression and anxiety are statistically controlled.

It was determined that analyses regarding likelihood-TAF would be exploratory given the mixed findings in prior research. It was also determined that analyses regarding OCD symptoms other than obsessional thinking would be exploratory given the inconsistency of past research findings.

Given the dearth of studies examining the relationship between religiosity/spirituality, TAF, and OC symptomatology in a clinical OCD population, it was determined that a clinical OCD sample would also be recruited and would complete the same questionnaires as the nonclinical sample. There does not appear to be any significant evidence from past research of a unique relationship pattern between religiosity/spirituality, OC symptoms, OC cognitive factors, generalized guilt, and moral standards in those with a diagnosis of OCD compared to normal controls. As such, it was hypothesized that these relationships would manifest in a similar manner in clinical participants (H3-10).

Research Importance. The current research addresses a number of notable gaps in the research examining the relationship between cognitive features of OCD, OCD symptomatology, and religiosity/spirituality. Most notably, previous research has typically measured religiosity/spirituality in an overly simplistic manner and has typically used an assortment of ad hoc, unvalidated measures (that often appear to tap into very different aspects of religiosity/spirituality across studies) designed by individual researchers. This practice seems particularly puzzling given the availability of well-validated, multidimensional measures of religiosity/spirituality and makes interpretation of collective findings across studies nearly impossible. The current study addressed this shortcoming through the use of carefully developed

measures of religiosity/spirituality that have demonstrated strong psychometric properties (i.e., known factor structure, adequate reliability and validity), and that recognize the multidimensional nature of the construct based on relevant and well-established theory and research. Given that considerable research evidence indicates that religiosity/spirituality is associated with a number of positive outcomes, it seemed important to identify which particular aspects of religiosity/spirituality may be associated with cognitive features of OCD and OC symptoms. It is unlikely that the purported association with OC cognitive features and OC symptoms is applicable to the entire construct of religiosity/spirituality. In providing psychological intervention to religious individuals (particularly with individuals for whom religiosity is a significant factor in their clinical presentation) religion is an additional aspect of cultural diversity with which therapists must be familiar and must treat carefully. Negative characterization of the entirety of a client's religious faith as a causal factor in OCD symptoms is likely to result in a breach of the therapeutic alliance and be counterproductive in therapy. However, it seems likely that identification of specific aspects of a client's religious beliefs or practices that may be exacerbating OCD symptomatology (e.g., moral TAF), while respecting the client's faith as a whole, is more likely to bode well for therapeutic outcome.

Another significant gap in the literature addressed here is the lack of research concerning a wide variety of major religious groups. Although there is a considerable amount of research exploring the role of religiosity/spirituality in Christian, Jews, Muslims, and Atheist/Agnostics, there appears to be little, if any, comparable research utilizing Buddhist, Sikh, and Hindu samples. It also appears that no prior research has examined religiosity/spirituality in the context of sample of individuals who identify as "Spiritual but no current religious affiliation." Given the highly multicultural nature of the Greater Toronto Area, significant opportunity existed to recruit

a highly diverse sample including individuals who identify with a wide variety of religions, which will serve to elucidate much more specifically the relationship between religiosity/spirituality, cognitive features of OCD, and OCD symptoms in a wider variety of religious contexts.

The relationship between religiosity, a full array of OC cognitive features, and OC symptoms has also rarely been investigated in a clinical OCD population. Again, it was anticipated that the use of psychometrically sound multidimensional measures of religiosity/spirituality would lead to an increased understanding of the role of these factors in clinical presentations of OCD. If prior findings in nonclinical samples are replicable with clinical participants, this will be an important step in identifying which particular aspects of religiosity/spirituality may be unhelpful and should be targeted in psychological treatment.

As noted earlier, the validity of mediated regression analyses with cross-sectional data has been seriously questioned in the literature (see Maxwell & Cole, 2007; Maxwell, Cole, & Mitchell, 2011). Other scholars have suggested that statistical mediation in this context still provides useful information, but recommend distinguishing between temporal (longitudinal) and atemporal (cross-sectional) mediation (Winer, Cervone, Bryant, McKinney, Liu, & Nadorff, 2016). Given the cost of conducting longitudinal research, it seemed reasonable to investigate in the current cross-sectional study whether prior findings regarding atemporal (statistical) mediation would be replicated when measures of religiosity/spirituality with demonstrated validity and reliability that measure the construct in an appropriately multifaceted manner are used.

Method

Participants

Based on power calculations ($1 - \beta = .70$ to $.85$, assuming a medium effect size), it was planned that 275 to 330 nonclinical participants (25 to 30 from each of the 11 religious groups: Catholic, Protestant, Orthodox Christian, Muslim, Jewish, Buddhist, Hindu, Sikh, Spiritual but no current religious affiliation, Agnostic, and Atheist) would be recruited from the community. The final community sample included a total of 396 participants.

It was planned that an additional 275 to 330 nonclinical student participants (25 to 30 from each of the 11 religious groups: Catholic, Protestant, Orthodox Christian, Muslim, Jewish, Buddhist, Hindu, Sikh, Spiritual but no current religious affiliation, Agnostic, and Atheist) would be recruited through the undergraduate psychology participant pool at Ryerson University. The final Ryerson University undergraduate student sample included a total of 350 participants.

Community participants were recruited via online advertisements (e.g., Craigslist, Kijiji) and through Qualtrics Panels, an internet-based service that recruits online research participants. Online advertisements invited individuals who considered themselves religious or spiritual to some degree (or consider themselves atheist/agnostic) to participate in research involving common experiences, thoughts, and beliefs and their relationship with religiosity/spirituality. Eligible individuals were those who endorsed being between the ages of 18 and 65 years and speaking and reading English fluently. Ryerson University undergraduate participants between the ages of 17 and 65 years who were enrolled in introductory psychology courses and spoke and read English fluently were invited to complete questionnaires online.

Clinical participants with a diagnosis of OCD who initially expressed interest in participation were screened to determine eligibility. Eligible clinical participants were between the ages of 18 and 65 years, spoke and read English fluently, and had a principal diagnosis of OCD (confirmed by diagnostic interview, using either the *Structured Clinical Interview for DSM-IV* [SCID-IV; First, Spitzer, Gibbon, & Williams, 1996] or *Mini-International Neuropsychiatric Interview* [MINI; Sheehan et al., 1998], conducted not more than 3 months prior). There were no exclusion criteria with respect to comorbidity. Potential participants who had received psychological treatment for OCD in the past were eligible to participate as long as they had not received such treatment for at least 3 months.

Results were initially examined separately for the student and community groups. Since the results were virtually indistinguishable between the two groups, the decision was made to collapse them into a single group. This combined student and community sample (which will hereafter be referred to as the nonclinical sample) included a total of 746 participants: 505 (67.7%) women and 241 (32.3%) men.

For the nonclinical sample, participants' ages ranged from 17 to 65 years ($M = 30.47$, $SD = 13.88$). Regarding marital status, 442 (59.2%) participants reported being single, 196 (26.3%) participants reported being married, 66 (8.8%) reported cohabitating, 24 (3.2%) were divorced, 10 (1.3%) were widowed, and 8 (1.1%) were separated. With respect to the highest level of education completed, 350 (46.9%) reported being in progress of completing college or university, 183 (24.5%) reported having completed college or university, 77 (10.3%) reported having partially completed college or university, 61 (8.2%) reported having completed a graduate degree, 47 (6.3%) reported having completed high school, 11 (1.5%) reported being in progress of completing a graduate degree, 9 (1.2%) reported partially completing a graduate

degree, and 8 (1.1%) reported having partially completed high school. Regarding ethnicity, 392 (52.5%) participants identified as White/European, 252 (33.8%) identified as South Asian/East Asian/Southeast Asian, 33 (4.4%) identified as Black/Afro-Caribbean/African, 32 (4.3%) identified as Middle Eastern, 23 (3.1%) identified as Biracial/Multiracial, 8 (1.1%) identified as Hispanic/Latin American/European Hispanic, 5 (0.7%) identified as Aboriginal/First Nations/Metis/Inuit, and 1 (0.1%) identified as Other. With respect to religious affiliation, 92 (12.3%) were Catholic Christian, 80 (10.7%) were Spiritual but no current religious affiliation, 77 (10.3%) were Protestant Christian, 73 (9.8%) were Agnostic, 69 (9.2%) were Hindu, 65 (8.7%) were Muslim, 64 (8.6%) were Sikh, 59 (7.9%) were Jewish, 57 (7.6%) were Buddhist, 55 (7.4%) were Orthodox Christian, and 55 (7.4%) were Atheist.

Based on power calculations ($1 - \beta = .70$ to $.85$, assuming a medium effect size), it was planned that 25 to 30 clinical participants with a *DSM-5* principal diagnosis of OCD would be recruited through the Anxiety Treatment and Research Clinic (ATRC), St. Joseph's Healthcare Hamilton. Diagnosis was determined by a diagnostic interview conducted by psychology staff and graduate students supervised by psychology staff at the ATRC (either the *SCID-IV* or *MINI* with supplementary questions from interviewers to determine whether criteria were met for an OCD diagnosis consistent with *DSM-5*). Eligible clinical participants received a diagnostic interview not more than 3 months prior to participation. Other inclusion criteria specified that participants be between the ages of 18 and 65 years and possess sufficient English language fluency to be able to complete the online questionnaires.

The final clinical sample included a total of 24 participants, 14 (58.3%) women and 10 (41.7%) men. Participants' ages ranged from 18 to 61 years ($M = 34.33$, $SD = 12.60$). Regarding marital status, 11 (45.8%) participants reported being single, 10 (41.7%) were married, 2 (8.3%) reported cohabitating, and 1 (4.2%) reported being divorced. With respect to the highest level of education completed, 10 (41.7%) reported having completed college or university, 5 (20.8%) reported having completed a graduate degree, 4 (16.7%) reported having partially completed college or university, 3 (12.5%) reported having completed high school, 1 (4.2%) reported being in progress of completing a college or university degree, and 1 (4.2%) reported partially completing a graduate degree. Regarding ethnicity, 22 (91.7%) participants identified as White/European and 2 (8.3%) participants identified as South Asian/East Asian/Southeast Asian. With respect to religious affiliation, 10 (41.7%) were Catholic Christian, 5 (20.8%) were Spiritual but no current religious affiliation, 5 (20.8%) were Agnostic, 3 (12.5%) were Atheist, and 1 (4.2%) was Protestant Christian. Mean severity of OCD symptoms of the sample as assessed by the *Yale-Brown Obsessive Compulsive Scale* (Y-BOCS; Goodman et al., 1989a, 1989b) was 22.29 ($SD = 7.82$, $range = 10.00 - 37.00$).

Materials

The *Structured Clinical Interview for DSM-IV* (SCID-IV; First, Spitzer, Gibbon, & Williams, 1996) is a well-known semistructured diagnostic interview with good psychometric properties that assesses for mental disorders consistent with *DSM-IV* diagnostic criteria. A typical administration can take up to 2 hours. Zanarini et al. (2000) found good interrater reliability for the OCD diagnosis using the SCID-IV ($median \kappa = .57$). Lobbetael, Leurgans, and Arntz (2011) also reported good interrater reliability for the diagnosis using the SCID-IV ($mean \kappa = .65$). Prior studies at the ATRC have also demonstrated excellent interrater reliability for the

SCID-IV (e.g., Rowa et al., 2015; $\kappa = .89$ for principal diagnosis). Most of the data for this study were collected before the availability of diagnostic interviews for *DSM-5* disorders.

The *Mini-International Neuropsychiatric Interview* (MINI; Sheehan et al., 1998) is a brief semistructured clinical interview with good reliability and validity that was designed to be briefer to administer than other commonly used structured clinical interviews. Good interrater reliability was reported with respect to OCD diagnosis ($\kappa = .85$) using the MINI (Sheehan et al., 1997). Again, most of the data for this study were collected before the availability of diagnostic interviews for *DSM-5* disorders.

The *Yale-Brown Obsessive Compulsive Scale* (YBOCS; Goodman et al., 1989a, 1989b) is a semistructured clinical interview that assesses overall severity of OCD obsessions and compulsions and includes a checklist for major domains of OCD symptoms. It contains a total 10 severity items assessing time, interference, distress, resistance, and control (5 items assessing compulsions and 5 items assessing obsessions) that are each rated on a scale ranging from 0 (no symptoms) to 4 (extreme symptoms). It possesses good psychometric properties (Goodman et al., 1989b). For the current research, the self-report version of the Y-BOCS developed by Baer (2012) was used. Research indicates that the self-report and clinician administered versions of the Y-BOCS are moderately correlated (Federici et al., 2010).

The *Obsessive Compulsive Inventory - Revised* (OCI-R; Foa, Huppert, Leiberg, Langner, Kichic, Hajcak, & Salkovskis, 2002) is an 18-item, self-report questionnaire designed to assess the amount of distress caused by obsessive thinking and compulsive behaviours. The original 42-item OCI has demonstrated good psychometric properties with both clinical and nonclinical samples, but the authors reportedly felt the need to develop a shorter scale for ease of administration. The revised scale also demonstrated generally acceptable psychometric

properties in both clinical and nonclinical samples. However, internal consistency reliability for nonanxious control participants was unacceptably low for the Neutralizing scale ($\alpha = .36$) and somewhat low for the Checking scale ($\alpha = .65$). The OCI-R includes six subscales: Washing, Checking, Ordering, Obsessing, Hoarding, and Neutralizing. Items are rated on a 5-point Likert scale according to distress related to OC symptoms over the past month (ranging from “Not at all” to “Extremely”). Using Receiver Operating Characteristic (ROC) analysis, it was determined that 21 appeared to be an optimal OCI-R total cut-score for discriminating between individuals with a diagnosis of OCD and nonanxious controls. The Obsessing subscale was reportedly a better discriminator than the total scale in this respect and a cut-score of 4 on this subscale was identified as optimal in differentiating between participants with a diagnosis of OCD and nonanxious controls (Foa et al., 2002).

The *Obsessional Beliefs Questionnaire - 44* (OBQ-44; Steketee, 2005) is a 44-item, self-report questionnaire designed to assess the strength of beliefs characteristic of obsessional thinking. The original 87-item OBQ (Steketee & Frost, 2001) demonstrated good psychometric properties in both clinical and nonclinical samples, but the authors noted high intercorrelations between the original six subscales. It was suggested that a smaller pool of items might more effectively capture OCD-related beliefs and require less time to administer in clinical settings. The OBQ-44 also demonstrated acceptable psychometric properties and appeared to yield a modest reduction in intercorrelations between subscales. The OBQ-44 incorporates three subscales: Responsibility/Threat Estimation, Perfectionism/Certainty, and Importance/Control of Thoughts. Items are rated on a 7-point Likert scale (ranging from “Disagree very much” to “Agree very much”).

The *Thought Action Fusion Scale* (TAF Scale; Shafran, Thordarson, & Rachman, 1996) is a 19-item, self-report questionnaire that measures the construct of thought-action fusion (TAF) across three subscales: moral, likelihood-others, and likelihood-self. Items are rated on a 5-point scale ranging from 0 (disagree strongly) to 4 (agree strongly). The moral subscale assesses the degree of belief that thinking about engaging in a morally objectionable behaviour is equivalent to performing such an action (e.g., “When I think unkindly about a friend, it is almost as disloyal as doing an unkind act”). The remaining 2 subscales assess the degree of belief that thinking about an outcome makes it more likely to occur either to oneself (likelihood-self; e.g., “If I think of myself being injured in a fall, this increases the risk that I will have a fall and be injured”) or to others (likelihood-others; e.g., “If I think of a friend/relative falling ill, this increases the risk that he/she will fall ill”). It appears that, in research involving clinical OCD participants, factor analysis reveals that likelihood-others and likelihood-self scales combine into a single factor, but that the converse is true for student and nonclinical community samples. Internal consistency is reported to be good to excellent (Shafran et al., 1996).

The *Penn State Inventory of Scrupulosity* (PIOS; Abramowitz, Huppert, Cohen, Tolin, & Cahill, 2002) is a 19-item self-report questionnaire designed to measure the frequency of religious obsessional thought. Items are rated on a 5-point Likert scale (0 “never” to 4 “constantly”) and the questionnaire includes two subscales: Fear of sin (e.g., “I am afraid of having sexual thoughts”), and fear of God (e.g., “I worry that God is upset with me”). Psychometric properties are reported to be adequate in both in nonclinical (Abramowitz et al., 2002) and clinical samples (Nelson, Abramowitz, Whiteside, & Deacon, 2006).

The *Depression Anxiety Stress Scales, 21-item version* (DASS-21; Lovibond & Lovibond, 1995) measures the degree of negative emotion experienced in the previous week across three domains: depression, anxiety, and stress. Subscale scores are produced for each of these three domains. The DASS is a self-report questionnaire containing 21 items rated on a 4-point scale (0 “did not apply to me at all” to 3 “applied to me very much or most of the time”). The scale reportedly possesses acceptable convergent and discriminant validity and has demonstrated excellent internal consistency reliability across subscales in both nonclinical (Lovibond & Lovibond, 1995) and clinical (Antony, Bieling, Cox, Enns, & Swinson, 1998) samples. The current study employed the measure to statistically control for self-reported depression, and general anxiety.

The *Assessment of Spiritual and Religious Sentiments Scale* (ASPIRES; Piedmont, 2004) is a 35-item self-report questionnaire consisting of two dimensions: Spiritual Transcendence (defined as experiencing a broader purpose and meaning to life as well as connection to the divine) and Religious Sentiments (defined as one’s concrete religious practices, the value one places on these practices). The Spiritual Transcendence facet is divided into three subscales: Universality (measuring the belief that life has a greater purpose), Prayer Fulfillment (measuring one’s perceived ability to connect with a larger reality), and Connectedness (measuring the perception that one is meaningfully connected to and has a responsibility to others). The Religious Sentiments facet is divided into two subscales: Religious Involvement (measuring one’s degree of involvement in religious rituals and the importance placed on these rituals) and Religious Crisis (measuring the degree to which one feels alienated from God and from religious community). Both the Religious Sentiments and Spiritual Transcendence facets have demonstrated acceptable psychometric properties (Piedmont, 2004).

The *Revised Religious Fundamentalism Scale* (RRFS; Altemeyer & Hunsberger, 2004) is a 12-item self-report questionnaire designed to measure the belief that there is only one set of religious teachings that reflect essential truth, which must be followed exactly in order to secure divine favour. Items are rated on a 9-point Likert scale (-4 “very strongly disagree” to +4 “very strongly agree”). Internal consistency reliability is reported to be excellent ($\alpha = .91$; Altemeyer & Hunsberger, 2004).

The *Guilt Inventory* (GI; Kugler & Jones, 1992) is a 45-item scale containing three subscales: trait guilt (e.g., “Guilt and remorse have been a part of my life for as long as I can recall”), state guilt (e.g., “I have recently done something that I deeply regret”), and moral standards (e.g., “I believe in a strict interpretation of right and wrong”). Items are rated on a 5-point Likert scale (0 “very strongly disagree” to 4 “very strongly agree”). The state and trait guilt scales are reportedly highly correlated, but neither is significantly correlated with the moral standards subscale. Internal consistency reliability is reported to be excellent for all three subscales ($\alpha = .89$ for trait guilt, $\alpha = .83$ for state guilt, and $\alpha = .81$ for moral standards). Test-retest reliability is excellent for scales measuring enduring characteristics (i.e., trait guilt and moral standards; $r > .7$) and understandably lower for state guilt ($r = .56$). The measure has also reportedly demonstrated acceptable convergent and discriminant validity (Kugler & Jones, 1992; Jones, Shratter, & Kugler, 2000).

Clinical participants completed all self-report measures and had received either the *SCID-IV* or *MINI* diagnostic interview prior to participation in the current research.¹ Nonclinical participants completed all self-report questionnaires except for the YBOCS and did not participate in a diagnostic interview.

Procedure

Nonclinical participants (community participants who responded to online advertisements, community participants recruited through Qualtrics, and Ryerson University introductory psychology undergraduate participants) completed self-report questionnaires online. After completing questionnaires, nonclinical participants received an online debriefing. They were also given the opportunity to receive a report of the aggregated findings of the study upon its conclusion. Ryerson undergraduate participants received course credit for their participation. Community participants completed questionnaires online in exchange for modest remuneration (\$25).

Clinical participants had previously received a diagnostic interview (either the SCID-IV or MINI; not more than 3 months prior to participation; conducted by psychology staff and graduate students supervised by psychology staff at the ATRC) to confirm a principal diagnosis of OCD. Clinical participants completed self-report questionnaires online and were modestly remunerated (\$25) for their time. They also received online debriefing following questionnaire completion and were given the opportunity to receive a report of the aggregated findings of the study upon its conclusion.

Results

Data Screening. The data were initially screened for normality and the presence of outliers. Outliers greater than three standard deviations from the mean were considered problematic. Inspection of the data revealed that there were no problematic outliers for any of the measures for either the clinical or nonclinical (student and community participant) groups.

For the nonclinical group, all scales with the exception of the *Guilt Inventory* (GI) were positively skewed. For the clinical group, all scales approximated a normal distribution. A number of transformations were performed to attempt to normalize the distributions of scales with a non-normal distribution, but none were uniformly successful. Given that most of the planned analyses incorporate bootstrapping (which does not require the distribution of scores to be normal) and that discussion of transformed variables may not be particularly meaningful or intuitive (e.g., the square root of obsessional thinking), the decision was made to leave scores untransformed. For planned analyses for the nonclinical sample that did not incorporate bootstrapping, parametric tests were employed given that sample size of the nonclinical sample was likely large enough to preclude the necessity of transformations.

Missing Value Analysis. Missing values for individual items were imputed by calculating the mean of the individual participant's responses to other items from the same scale or subscale. These imputed values were used in the calculation of total scale scores. Although mean imputation is generally considered an older and less desirable method for imputing missing values, Tabachnick and Fidell (2007) have noted that, in cases where less than 5% of the sample is missing data, different methods of missing value imputation produce very similar results. Therefore, since the amount of missing data was very small, mean imputation was used for the sake of simplicity.

In rare cases where more than 20% of a total scale or subscale was missing for an individual participant, mean imputation was not carried out and the scale/subscale in question for that participant was excluded from the analysis. Regarding the nonclinical sample, there was at least a small amount of missing data on all of the questionnaires. In rare cases where more than 20% of a total scale or subscale was missing for an individual participant, mean imputation was

not carried out and the scale/subscale in question for that participant was excluded. For the *Obsessive Compulsive Inventory - Revised* (OCI-R), 2 participants' scores were removed from the data on the Hoarding subscale, 2 participants' scores were removed on the Checking subscale, and 1 participant's score on the Obsessing subscale was removed. All five of these participants' total scores on the OCI-R were also removed. For the *Thought Action Fusion Scale* (TAF Scale), 1 participant's score on the Likelihood-Other subscale was removed. This participant's total scale score on the TAF Scale was also removed. The *Assessment of Spiritual and Religious Sentiments Scale* (ASPIRES) is divided into the *Religious Sentiments Scale* (RSS) and *Spiritual Transcendence Scale* (STS) that each are divided into their respective subscales. For the RSS, 6 participants' scores on the Religious Involvement subscale were removed from the data and 6 participants' scores on the Religious Crisis subscale were removed. For the STS, 1 participant's score on the Connectedness subscale was excluded and 1 participant's score on the Universality subscale was removed. Both of these participants' scores on the STS total scale score were also removed. Missing data on the remaining measures in the nonclinical sample were minimal and they were addressed using mean imputation.

Regarding the clinical sample, 1 participant's score on the Responsibility / Threat Estimation subscale of the *Obsessional Beliefs Questionnaire - 44* (OBQ-44) was removed from the data. For the *Obsessive Compulsive Inventory - Revised* (OCI-R), 1 participant's score was excluded on the Hoarding subscale, and 1 participant's score on the Obsessing subscale was removed. Both of these participants' total scores on the OCI-R were also removed. For the *Penn State Inventory of Scrupulosity* (PIOS), 1 participant's score on the Fear of Sin subscale was removed. This participant's total scale score on the PIOS was also removed. There were no missing values on any of the other questionnaires for the clinical sample.

Scale Reliability. Internal consistency values for self-report scales used in the current research for both the nonclinical and clinical samples are reported in Table 1. Most scales/subscales exceeded $\alpha = .80$, which is considered to be in the high reliability range by convention (Murphy & Davidshofer, 2005). A few scales/subscales ranged from $\alpha = .70 - .80$, which is considered to be in the moderate reliability range (Murphy & Davidshofer, 2005). One subscale (The Connectedness subscale of the ASPIRES – STS) demonstrated extremely poor internal consistency reliability in both the nonclinical ($\alpha = .470$) and clinical ($\alpha = .418$) samples.

Interpretation of statistical significance and effect size. It was determined that alpha would be set at .05 to denote statistically significant findings (except when adjusted using alpha correction techniques for post hoc multiple comparisons). Effect sizes are reported and interpreted according to Cohen's (1988) conventions (i.e., for Cohen's d : .20 = small, .50 = medium, .80 = large; for correlations [r]: .10 = small, .30 = medium, .50 = large; for r^2 : .01 = small, .09 = medium, .25 = large).

Table 1

Internal Consistency Reliability (α) of Measures for Clinical and Nonclinical Samples

	Clinical	Nonclinical
DASS-21	-	-
Depression	.946	.912
Anxiety	.877	.797
Stress	.908	.887
GI – Total Score	.902	.889
Trait Guilt	.904	.890
State Guilt	.847	.833
Moral Standards	.816	.727
OBQ-44	-	-
Responsibility/Threat Estimation	.942	.888
Perfectionism/Control	.894	.887
Importance/Control of Thoughts	.891	.893
OCI-R – Total Score	.890	.927
Checking	.801	.726
Hoarding	.806	.719
Washing	.926	.831
Ordering	.967	.844
Neutralizing	.913	.737
Obsessing	.799	.860
PIOS – Total Score	.951	.964
Fear of Sin	.951	.948
Fear of God	.949	.944
RRFS – Total Score	.961	.935
TAF Scale – Total Score	.953	.940
Moral	.945	.936
Likelihood-Self	(.924)	.950
Likelihood-Other	(.977)	.969
Likelihood-Self/Other	.973	(.961)
ASPIRES – RSS	-	-
Religious Involvement	.927	.912
Religious Crisis	.751	.751
ASPIRES – STS – Total Score	.903	.903
Prayer Fulfillment	.935	.941
Universality	.801	.746
Connectedness	.418	.470

DASS-21 = *Depression Anxiety Stress Scales, 21-item version*; GI = *Guilt Inventory*; OBQ-44 = *Obsessional Beliefs Questionnaire – 44 item version*; OCI-R = *Obsessive-Compulsive Inventory – Revised*; PIOS = *Penn State Inventory of Scrupulosity*; RRFS = *Revised Religious Fundamentalism Scale*; TAF Scale = *Thought-Action Fusion Scale*; ASPIRES = *Assessment of Religious and Spiritual Sentiments Scale*; RSS = *Religious Sentiments Scale*; STS = *Spiritual Transcendence Scale*.

Nonclinical Group Results

Upon initial inspection, the Protestant group appeared older than all other groups. Closer inspection revealed that the mean age of the Protestant group was significantly greater than the mean age of the Buddhist, Catholic, Hindu, Jewish, Muslim, Sikh, and Atheist groups (*all ps* < .015), but was not significantly greater than the mean ages of the Christian Orthodox ($p = .075$), Spiritual but not Religious ($p = .138$), or Agnostic ($p = .082$) groups. Chi-square analyses were conducted to test for between-group differences in categorical variables of interest. Proportional composition of the two groups did not significantly differ with respect to sex ($\chi^2 = 13.028, p = .222$).

Marital status was collapsed into three groups: single, married/cohabitating, and separated/divorced/widowed in order to avoid zero cell counts (which violates an assumption of the Chi square test) for infrequently occurring responses (e.g., widowed). For the same reason, education level was also collapsed into three groups: some high school/high school completed, some college or university/college or university in progress/college or university completed, and some graduate school/graduate school in progress/graduate school completed.

Proportional composition of the two groups differed with respect to education level ($\chi^2 = 49.881, p < .001$). Further investigation indicated that the significant effect was driven by differences in the proportion of participants who had completed at least some graduate education. The Buddhist, Protestant, Christian Orthodox, Jewish, Muslim, Agnostic, and Atheist groups did not differ significantly with any of the other groups with respect to the proportion of participants who had completed at least some graduate education (*all ps* > .05). However, a significantly larger proportion of Hindu participants (24.638%) and Sikh participants (17.188%) had completed at least some graduate education in comparison to Catholic (2.174%) participants (*all*

$ps > .05$). Also, a larger proportion of Hindu participants had completed at least some graduate school (24.638%) as compared to Religious but not Spiritual (3.750%) participants ($p < .05$).

The groups also differed significantly in their composition with respect to marital status ($\chi^2 = 32.203, p = .097$). Further investigation indicated that the Buddhist group contained a significantly higher proportion of single participants (73.684%) than all other groups and the Protestant group contained a significantly lower proportion of single participants (42.857%) than all other groups (*all ps* < .05).

Nonclinical Group - Exploratory Comparisons Between Religious Groups. A number of one-way Analysis of Variance (ANOVA) tests were conducted to examine between-group differences on questionnaire scores by religious affiliation. Significant ANOVAs were followed up with post hoc *t*-tests to determine the source of significant differences. It had been planned that one-way Analysis of Covariance (ANCOVA) tests including religiosity, spirituality, and fundamentalism as covariates would be conducted to determine whether results remained significant when these variables were statistically controlled. Unfortunately, these analyses could not be conducted because, between the various religious groups, mean scores significantly differed on the variables of religiosity, spirituality, and fundamentalism (which violates the assumption of independence of covariates in ANCOVA; see below for results regarding group differences in religiosity, spirituality, and fundamentalism). Means and standard deviations for self-report questionnaires by religious group as well as post hoc between group comparisons (employing Tukey's Honest Significant Difference [Tukey, 1949] to control for Type I error inflation) where statistically significant differences existed between groups are presented in Table 2a, Table 2b, and Table 2c. In general, Muslims and Protestants tended to score highest and Atheists and Agnostics tended to score lowest on most measures. However, given that the

relationship between each of these measures and measures of religiosity/spirituality could not be statistically controlled, it is unclear whether these are differences that might be reflected at the population level or if they merely describe the current sample. As such, these results are presented for interest and the generation of future hypotheses here, but will not be discussed further.

Table 2a

Means (Standard Deviations) of Measures for Nonclinical Sample by Religious Affiliation

Scale (<i>F</i>)	Buddhist (<i>n</i> = 57)	Catholic (<i>n</i> = 92)	Prot. (<i>n</i> = 77)	Christian Orthodox (<i>n</i> = 55)	Hindu (<i>n</i> = 69)	Jewish (<i>n</i> = 59)	Muslim (<i>n</i> = 65)	Sikh (<i>n</i> = 64)	Spiritual but not Religious (<i>n</i> = 80)	Agnostic (<i>n</i> = 73)	Atheist (<i>n</i> = 55)
DASS-21											
Dep (0.969)	10.21 (8.53)	10.54 (10.67)	8.16 (8.77)	8.18 (6.87)	9.54 (11.25)	10.07 (9.30)	10.12 (10.61)	8.66 (11.36)	9.50 (9.80)	12.27 (10.43)	9.67 (10.58)
Anx (1.246)	8.74 (7.68)	7.24 (6.66)	6.13 (6.69)	7.64 (6.35)	7.88 (7.92)	9.15 (8.81)	9.07 (8.19)	6.47 (7.23)	8.52 (8.02)	8.05 (7.48)	6.98 (7.68)
Str (1.495)	11.96 (10.18)	12.02 (8.84)	11.01 (9.37)	12.00 (7.23)	9.96 (10.04)	14.88 (11.60)	12.46 (9.90)	9.72 (10.58)	12.00 (8.51)	12.37 (9.85)	9.78 (9.86)
GI – T (3.618)***	136.35 ^{ab} (15.17)	137.27 ^{ab} (19.82)	142.28 ^b (22.05)	134.64 ^{ab} (17.72)	133.24 ^{ab} (23.19)	137.12 ^{ab} (19.48)	142.83 ^b (17.82)	135.89 ^{ab} (22.01)	130.76 ^a (21.31)	132.58 ^{ab} (21.70)	126.18 ^a (21.60)
TrG (1.386)	60.88 (10.50)	61.34 (12.20)	62.42 (14.63)	59.16 (10.29)	58.83 (15.41)	67.71 (13.18)	62.78 (11.16)	60.16 (14.46)	59.69 (13.40)	58.66 (12.90)	56.03 (13.90)
StG (1.057)	29.44 (6.42)	29.08 (7.67)	28.57 (7.70)	27.52 (6.36)	29.03 (7.37)	29.07 (8.01)	29.89 (6.01)	28.72 (7.97)	28.06 (7.12)	28.94 (7.76)	26.32 (8.05)
M (9.625)***	46.04 ^{abc} (5.42)	46.85 ^{bcd} (5.94)	51.29 ^c (6.85)	47.95 ^{cde} (8.39)	45.38 ^{abc} (6.34)	46.34 ^{abc} (6.75)	50.15 ^{de} (6.71)	47.00 ^{bcd} (6.25)	43.01 ^a (6.66)	44.99 ^{abc} (7.21)	43.82 ^{ab} (7.90)
OBQ-44											
R/T (3.996)***	63.73 ^{bc} (13.64)	58.55 ^{ab} (14.58)	62.92 ^{bc} (15.87)	62.69 ^{bc} (14.87)	62.20 ^{bc} (17.61)	56.81 ^{ab} (18.59)	67.88 ^c (14.94)	60.95 ^{abc} (18.30)	58.76 ^{ab} (16.36)	58.39 ^{ab} (13.68)	52.95 ^a (13.84)
P/C (5.840)***	65.47 ^b (13.81)	61.67 ^{ab} (14.45)	62.87 ^{ab} (16.43)	62.57 ^{ab} (14.25)	68.04 ^b (14.96)	62.12 ^{ab} (20.52)	69.99 ^b (14.99)	67.77 ^b (17.57)	56.50 ^a (16.51)	61.34 ^{ab} (14.67)	54.24 ^a (16.07)
I/CT (14.295)***	38.61 ^{cd} (12.98)	34.35 ^{bc} (10.36)	38.94 ^{cd} (13.03)	39.12 ^{cd} (11.99)	41.41 ^d (13.98)	31.03 ^{ab} (13.92)	42.52 ^d (14.87)	39.94 ^{cd} (12.39)	30.40 ^{ab} (12.05)	29.11 ^{ab} (11.23)	25.58 ^a (9.83)

Statistical differences between groups: * $p < .05$, ** $p < .01$, *** $p < .001$. Groups that share individual superscripts do not statistically significantly differ.

DASS-21 = Depression Anxiety Stress Scales, 21-item version; Dep = Depression; Anx = Anxiety; Str = Stress; GI – T = Guilt Inventory Total Score;

TrG = Trait Guilt; StG = State Guilt; M = Moral Standards; OBQ-44 = Obsessional Beliefs Questionnaire – 44-item version;

R/T = Responsibility / Threat Estimation; P/C = Perfectionism/Certainty; I/CT = Importance / Control of Thoughts;

Prot. = Protestant.

Table 2b

Means (Standard Deviations) of Measures for Nonclinical Sample by Religious Affiliation

Scale (F)	Buddhist (n = 57)	Catholic (n = 92)	Prot. (n = 77)	Christian Orthodox (n = 55)	Hindu (n = 69)	Jewish (n = 59)	Muslim (n = 65)	Sikh (n = 64)	Spiritual but not Religious (n = 80)	Agnostic (n = 73)	Atheist (n = 55)
OCI-R-T (4.130)***	21.68 ^b (13.13)	17.87 ^{ab} (12.17)	15.86 ^{ab} (11.76)	18.33 ^{ab} (12.71)	19.25 ^{ab} (17.03)	18.75 ^{ab} (13.36)	22.53 ^b (13.35)	16.97 ^{ab} (16.63)	13.30 ^a (10.88)	15.99 ^{ab} (11.60)	12.47 ^a (10.52)
CH (2.858)**	3.65 ^{bc} (2.79)	3.10 ^{abc} (2.48)	2.75 ^{ab} (2.54)	3.01 ^{ab} (2.46)	2.97 ^{ab} (2.78)	3.07 ^{ab} (2.76)	3.74 ^c (2.62)	2.91 ^{ab} (3.13)	2.06 ^a (2.12)	2.62 ^{ab} (2.38)	2.27 ^{ab} (2.30)
H (2.759)**	4.16 ^b (2.43)	4.09 ^{ab} (2.73)	3.90 ^{ab} (2.67)	3.45 ^{ab} (2.43)	3.97 ^{ab} (3.46)	3.71 ^{ab} (2.63)	4.41 ^b (2.52)	3.06 ^{ab} (3.15)	3.16 ^{ab} (2.40)	3.37 ^{ab} (2.49)	2.62 ^a (2.48)
W (3.948)***	2.81 ^{ab} (2.81)	2.20 ^{ab} (2.77)	1.53 ^a (2.30)	2.42 ^{ab} (2.85)	2.65 ^{ab} (2.94)	2.54 ^{ab} (3.09)	3.49 ^b (3.04)	2.55 ^{ab} (3.02)	1.51 ^a (2.48)	1.76 ^a (2.49)	1.31 ^a (2.26)
OR (2.856)**	4.26 ^{ab} (2.86)	3.63 ^{ab} (2.78)	3.16 ^{ab} (3.02)	4.07 ^{ab} (2.71)	3.81 ^{ab} (3.45)	3.98 ^{ab} (3.28)	4.77 ^b (3.01)	3.38 ^{ab} (3.32)	2.66 ^a (2.65)	3.92 ^{ab} (3.05)	2.98 ^a (2.38)
N (5.066)***	2.98 ^c (2.90)	1.62 ^{abc} (1.99)	1.67 ^{abc} (2.27)	2.09 ^{abc} (2.50)	2.58 ^{bc} (2.99)	2.17 ^{abc} (2.82)	2.88 ^c (2.77)	2.06 ^{abc} (2.63)	1.31 ^{ab} (2.02)	1.66 ^{abc} (2.45)	0.84 ^a (1.61)
OB (1.289)	3.82 (3.45)	3.23 (3.01)	2.84 (2.55)	3.27 (2.70)	3.44 (3.63)	3.27 (3.34)	3.62 (3.06)	2.94 (3.35)	2.59 (2.92)	2.66 (3.20)	2.45 (2.97)
PIOS – T (19.746)***	22.47 ^{bcd} (14.02)	23.89 ^{cd} (14.65)	26.62 ^{de} (14.79)	25.42 ^d (16.07)	23.96 ^{cd} (18.95)	16.25 ^{abc} (15.14)	34.23 ^e (16.25)	20.01 ^{bcd} (19.54)	16.23 ^{abc} (12.59)	15.08 ^{ab} (13.65)	8.27 ^a (8.64)
FOS (11.209)***	17.53 ^{bc} (10.30)	15.88 ^b (9.83)	17.32 ^{bc} (9.87)	16.36 ^b (10.49)	16.70 ^{bc} (13.05)	11.69 ^{ab} (10.43)	22.38 ^c (10.99)	13.77 ^b (13.22)	12.01 ^{ab} (8.81)	11.75 ^{ab} (9.73)	7.53 ^a (7.45)
FOG (38.823)***	4.95 ^{bcd} (4.89)	8.00 ^{de} (5.45)	9.30 ^{ef} (5.79)	9.05 ^{ef} (6.09)	7.26 ^{cde} (6.42)	4.56 ^{bc} (5.24)	11.85 ^f (5.87)	6.23 ^{bcd} (6.83)	4.23 ^{bc} (5.09)	3.33 ^{ab} (4.65)	0.75 ^a (2.26)
RRFS (51.722)***	-16.86 ^{cd} (17.12)	-8.41 ^{de} (16.85)	6.35 ^f (20.64)	0.96 ^{ef} (22.51)	-4.10 ^e (16.70)	-16.22 ^d (20.95)	10.58 ^f (21.34)	-8.30 ^{de} (17.69)	-26.69 ^{bc} (16.99)	-31.13 ^{ab} (14.87)	-37.35 ^a (13.65)

Statistical differences between groups: * $p < .05$, ** $p < .01$, *** $p < .001$. Groups that share individual superscripts do not statistically significantly differ.

OCI-R-T = Obsessive-Compulsive Inventory – Revised – Total Score; CH = Checking; H = Hoarding; W = Washing; OR = Ordering; N = Neutralizing;

OB = Obsessing; PIOS – T = Penn State Inventory of Scrupulosity – Total Score; FOS = Fear of Sin; FOG = Fear of God;

RRFS = Revised Religious Fundamentalism Scale; Prot. = Protestant.

Table 2c

Means (Standard Deviations) of Measures for Nonclinical Sample by Religious Affiliation

Scale (F)	Buddhist (n = 57)	Catholic (n = 92)	Prot. (n = 77)	Christian Orthodox (n = 55)	Hindu (n = 69)	Jewish (n = 59)	Muslim (n = 65)	Sikh (n = 64)	Spiritual but not Religious (n = 80)	Agnostic (n = 73)	Atheist (n = 55)
TAFS – T (18.232)***	30.09 ^{cd} (13.12)	27.70 ^{cd} (12.47)	31.55 ^{cd} (15.37)	32.59 ^d (12.21)	31.42 ^{cd} (16.30)	24.22 ^{bc} (15.62)	33.31 ^d (15.55)	32.69 ^d (15.45)	25.62 ^{bcd} (14.89)	18.71 ^{ab} (13.27)	11.95 ^a (10.60)
M (15.930)***	21.26 ^{cde} (9.91)	20.40 ^{cde} (8.38)	24.21 ^c (11.39)	23.27 ^e (9.75)	22.17 ^{de} (11.14)	16.69 ^{bcd} (10.31)	24.50 ^c (11.53)	23.47 ^e (10.29)	15.99 ^{bc} (9.59)	13.26 ^{ab} (9.54)	9.15 ^a (8.16)
LS (4.731)***	4.47 ^b (3.00)	3.45 ^{ab} (3.10)	3.47 ^{ab} (3.39)	4.04 ^b (2.90)	3.91 ^b (3.56)	3.88 ^b (3.23)	4.05 ^b (3.48)	4.08 ^b (3.47)	4.65 ^b (3.80)	2.89 ^{ab} (3.27)	1.71 ^a (2.60)
LO (11.342)***	4.35 ^{bc} (3.90)	3.85 ^{bc} (3.59)	3.87 ^{bc} (4.53)	5.06 ^c (3.74)	5.33 ^c (4.71)	3.64 ^{bc} (3.70)	4.77 ^{bc} (4.25)	5.14 ^c (4.26)	4.98 ^c (4.82)	2.56 ^{ab} (3.58)	1.09 ^a (2.23)
LSO	-	-	-	-	-	-	-	-	-	-	-
RSS											
RI (92.047)***	23.73 ^{bc} (8.20)	23.47 ^{bc} (7.66)	31.88 ^{de} (10.23)	29.45 ^{de} (9.16)	28.93 ^{de} (9.74)	23.81 ^c (9.88)	33.22 ^e (9.69)	27.90 ^{cd} (10.75)	18.96 ^b (6.67)	14.10 ^a (4.81)	11.53 ^a (2.87)
RC (2.238)*	7.95 ^{ab} (3.26)	8.32 ^b (3.16)	7.91 ^{ab} (3.24)	8.47 ^b (2.99)	8.72 ^b (3.86)	8.25 ^b (2.88)	8.39 ^b (3.67)	7.65 ^{ab} (3.91)	8.04 ^{ab} (3.30)	8.18 ^b (3.47)	6.24 ^a (2.40)
STS – T (33.643)***	78.54 ^{cd} (12.25)	77.18 ^{cd} (11.68)	82.82 ^d (12.05)	80.49 ^d (10.85)	76.54 ^{cd} (17.53)	72.46 ^c (14.69)	82.38 ^d (12.08)	79.95 ^{cd} (17.42)	78.94 ^{cd} (13.52)	63.78 ^b (13.89)	54.43 ^a (10.69)
PF (46.764)***	33.58 ^{cde} (8.28)	31.90 ^{cd} (7.76)	37.14 ^c (8.07)	36.00 ^{de} (7.40)	33.22 ^{cde} (9.52)	28.85 ^c (10.41)	37.75 ^e (7.85)	35.30 ^{de} (10.74)	31.98 ^{cd} (9.30)	22.53 ^b (8.77)	16.55 ^a (6.55)
U (8.486)***	24.23 ^{bc} (4.54)	24.41 ^{bcd} (3.87)	25.04 ^{cd} (4.11)	24.16 ^{bc} (3.41)	23.46 ^{bc} (5.51)	22.97 ^{bc} (4.52)	24.22 ^{bc} (3.53)	24.06 ^{bc} (5.23)	26.92 ^d (4.85)	21.86 ^{ab} (5.24)	19.96 ^a (5.04)
C (3.624)***	20.74 ^b (2.79)	20.87 ^b (2.84)	20.68 ^b (3.32)	20.33 ^b (3.03)	19.86 ^{ab} (3.96)	20.65 ^b (3.73)	20.42 ^b (3.45)	20.72 ^b (4.27)	20.04 ^b (3.82)	19.38 ^{ab} (3.90)	17.92 ^a (3.50)

Statistical differences between groups: * $p < .05$, ** $p < .01$, *** $p < .001$. Groups that share individual superscripts do not statistically significantly differ.

TAFS – T = Thought-Action Fusion Scale – Total Score; M = Moral; LS = Likelihood Self; LO = Likelihood Other;

LSO = Likelihood Self/Other; RSS = Religious Sentiments Scale; RI = Religious Involvement; RC = Religious Crisis;

STS – T = Spiritual Transcendence Scale – Total Score; PF = Prayer Fulfillment; U = Universality; C = Connectedness; Prot. = Protestant.

Nonclinical Group - Planned Comparisons Between Religious Groups. It was hypothesized *a priori* that (H1) Protestants would score significantly higher than Catholics on measures of moral-TAF, scrupulosity, obsessional thinking, and obsessional beliefs (importance/control of thoughts and responsibility/threat estimation). Given the directionality of these hypotheses, one-tailed *t*-tests were conducted. Protestants scored significantly higher than Catholics on moral-TAF ($t = 2.497, p = .007, d = 0.386$), OBQ responsibility/threat estimation ($t = 1.853, p = .032, d = 0.288$), and OBQ importance/control of thoughts ($t = 2.554, p = .006, d = 0.394$). There was no significant difference in scores between Protestants and Catholics for scrupulosity (PIOS; $t = 1.203, p = .115, d = 0.186$) or obsessional thinking (OCI-R Obsessing subscale; $t = -.885, p = .812, d = 0.137$).

It was also hypothesized that (H2) Muslims would score significantly higher than the three Christian groups on measures of moral-TAF, scrupulosity, obsessional thinking, and obsessional beliefs (importance/control of thoughts and responsibility/threat estimation). Given the directionality of these hypotheses, one-tailed *t*-tests were again conducted.

Regarding moral-TAF, Muslims scored significantly higher than Catholics ($t = 2.442, p = .008, d = 0.417$), but not Protestants ($t = .150, p = .441, d = 0.025$) or Christian-Orthodox participants ($t = .621, p = .268, d = 0.114$). Regarding scrupulosity (PIOS), Muslims scored significantly higher than Catholics ($t = 4.163, p < .001, d = 0.675$), Protestants ($t = 2.919, p = .002, d = 0.492$) and Christian-Orthodox participants ($t = 2.975, p = .002, d = 0.545$). With respect to obsessional thinking (OCI-R Obsessing subscale), Muslims did not score significantly higher than Protestants ($t = 1.638, p = .052, d = 0.276$), Catholics ($t = .788, p = .216, d = 0.128$), or Christian-Orthodox participants ($t = .644, p = .261, d = 0.118$). Regarding OBQ responsibility/threat estimation, Muslims scored significantly higher than Catholics ($t = 3.906, p$

$< .001$, $d = 0.633$), Protestants ($t = 1.903$, $p = .030$, $d = 0.321$) and Christian-Orthodox participants ($t = 1.899$, $p = .030$, $d = 0.348$). Regarding OBQ importance/control of thoughts, Muslims scored significantly higher than Catholics ($t = 3.825$, $p < .001$, $d = 0.658$), but not Protestants ($t = 1.529$, $p = .065$, $d = 0.258$) or Christian-Orthodox participants ($t = 1.361$, $p = .088$, $d = 0.249$).

In summary, Protestants scored significantly higher than Catholics on measures of moral TAF and the obsessional beliefs of importance/control of thoughts and responsibility/threat estimation. These effect sizes were uniformly small. There was no significant difference in scores between Protestants and Catholics on measures of scrupulosity and obsessional thinking.

Muslims scored higher than all three Christian groups on measures of scrupulosity (with medium to large effect sizes) and the obsessional belief domain of responsibility/threat estimation (the effect size of the comparison with Catholics was medium to large; the effect sizes of the comparisons with Protestants and the Christian Orthodox group were small to medium). Muslims scored higher than Catholics *only* on measures of moral TAF (the size of the effect was small to medium) and the obsessional belief domain of importance/control of thoughts (the size of the effect was medium to large). Muslims did not score significantly higher than *any* of the Christian groups on obsessional thinking (all effect sizes were trivial to small).

Nonclinical Group - Zero Order Correlational Analyses. It was hypothesized that (H3) scrupulosity (PIOS) would be positively associated with religious crisis (ASPIRES – RSS Religious Crisis; i.e., feelings of alienation from God and from religious community). Correlation was specified as one-tailed given the specified directionality of the hypothesis. Scrupulosity was significantly, positively correlated with religious crisis for the nonclinical sample ($r = .403$, $p < .001$).

It was also hypothesized that (H4) scrupulosity would be positively correlated with obsessional thinking (OCI-R Obsessing subscale). Correlation was again specified as one-tailed given the specified directionality of the hypothesis. Scrupulosity was significantly, positively correlated with obsessive thinking for the nonclinical sample ($r = .556, p < .001$).

It was also hypothesized that (H5) fundamentalism (RRFS) would be positively associated with obsessional thinking (OCI-R Obsessing subscale). Correlation was again one-tailed given the specified directionality of the hypothesis. Fundamentalism was significantly, positively correlated with obsessive thinking ($r = .064, p = .04$). However, it was apparent that the extremely small effect size indicated a trivial relationship that was statistically significant due to the very large sample size.

Given the mixed results of past research regarding the relationship between religiosity and likelihood TAF, exploratory correlational analyses including the full range of variables pertaining to religiosity/spirituality were conducted to further elucidate any possible relationships. Correlations were specified as two-tailed given that analyses were exploratory. Research involving clinical OCD participants indicates that the likelihood-other and likelihood-self scales combine into a single factor, but these two scales remain distinct factors for student and nonclinical community samples (Shafran et al., 1996). However, results are also presented for the likelihood self/other scale here to facilitate direct comparability between the clinical and nonclinical samples in the current research. Results are presented in Table 3.

When the nonclinical sample was analyzed with respect to likelihood TAF, all but two correlations were statistically significant. However, statistically significant effects were generally of a trivial or small size with the exception of correlations between Likelihood TAF and

Religious Crisis. A significant, positive relationship was observed between Likelihood TAF and Religious Crisis that approached a medium effect size.

Table 3

Correlations (r) Between Measures of Religiosity/Spirituality and Likelihood TAF for Nonclinical Sample

	RRFS	RSS-RI	RSS-RC	STS-PF	STS-U	STS-C	STS-Total
TAF Scale							
Likelihood Self	.057	.118**	.255***	.187***	.137***	.145***	.200***
Likelihood Other	.169***	.161***	.258***	.194***	.065	.073*	.166***
Likelihood Self-Other	.126**	.150***	.272***	.202***	.103**	.111**	.192***

TAFS = *Thought-Action Fusion Scale*RRFS = *Revised Religious Fundamentalism Scale*RSS = *Religious Sentiments Scale*, RI = Religious Involvement, RC – Religious Crisis.STS = *Spiritual Transcendence Scale*, PF = Prayer Fulfillment, U = Universality, C = Connectedness.* $p < .05$, ** $p < .01$, *** $p < .001$

Given past mixed results in clinical samples regarding the relationship between compulsions and religiosity, exploratory two-tailed correlational analyses including variables pertaining to religiosity/spirituality were conducted. Results are presented in Table 4. When the nonclinical sample was analyzed with respect to the OCI-R and its subscales, the overwhelming majority of correlations with measures of religiosity/spirituality were statistically significant. However, statistically significant effects were mostly of a trivial or small size with the exception of correlations between the OCI-R and its subscales and Religious Crisis. Significant, positive correlations observed between Religious Crisis and the OCI-R and its subscales were all of a medium effect size or approaching a medium effect size.

In summary, scrupulosity was significantly positively, correlated with religious crisis (the effect size was medium to large) and obsessional thinking (the effect size was large). Religious crisis was significantly, positively correlated with likelihood TAF (effects approached a medium effect size) and the OCI-R and its subscales (effects were uniformly a medium or approaching a medium effect size). Other significant effects observed tended to be of a trivial or small size and were likely statistically significant due to the very large sample size.

Table 4

Correlations (r) Between Measures of Religiosity/Spirituality and OCI-R for Nonclinical Sample

	RRFS	RSS-RI	RSS-RC	STS-PF	STS-U	STS-C	STS-Total
OCI-R Total	.137***	.152***	.341***	.126**	-.013	.155***	.115**
Checking	.112**	.141***	.274***	.120**	-.025	.105**	.095**
Hoarding	.100**	.098**	.318***	.085*	.006	.142***	.092*
Washing	.160***	.148***	.224***	.123**	-.037	.112**	.096**
Ordering	.071	.074*	.268***	.046	-.019	.123**	.053
Neutralizing	.173***	.164***	.294***	.102**	-.003	.106**	.090**
Obsessing	.064	.120**	.274***	.123**	.003	.140***	.115**

OCI-R = *Obsessive-Compulsive Inventory – Revised*RRFS = *Revised Religious Fundamentalism Scale*RSS = *Religious Sentiments Scale*, RI = Religious Involvement, RC – Religious Crisis.STS = *Spiritual Transcendence Scale*, PF = Prayer Fulfillment, U = Universality, C = Connectedness.* $p < .05$, ** $p < .01$, *** $p < .001$

Nonclinical Group - Moderated and Mediated Regression Analyses. Tests of moderated and mediated regression were conducted using PROCESS, a computational tool developed by Hayes (2013). Estimates of effects were generated using bootstrapping analysis, a nonparametric statistical approach that does not require normality of the sampling distribution. Moderation or mediation is assessed using 95% confidence intervals. If the resulting confidence interval does not contain the value of zero, then an indirect effect (i.e., mediation) or conditional effect (i.e., moderation) is significantly different from zero at $p < .05$ (two-tailed). This indicates that the relationship between the independent variable (IV) and dependent variable (DV) is contingent on the proposed moderator or mediator. A significant effect of the IV on the DV is not required to test for indirect/conditional effects using this model (Hayes, 2009).

The size of moderation effects was quantified by referencing additional variance explained between the IV and DV by the moderator variable (ΔR^2). Mediators were tested individually rather than entered simultaneously in order to estimate each of their indirect effects individually (rather than controlling for potential overlap in explained variance between multiple mediators). Also, measures of effect size are only available for simple mediation models (i.e., testing a single moderator). For mediation analyses, there is little information in the literature regarding how to best quantify effect size. Preacher and Kelley (2011) have suggested a measure of effect size, kappa-squared (κ^2), that is defined as the size of the observed indirect effect presented as a proportion of the maximum possible indirect effect that could have occurred given the design and data characteristics. Values are bounded (ranging from 0 to 1, similar to r^2) and standardized. Preacher and Kelley recommend that this measure of effect size be interpreted in a similar manner to r^2 (as originally suggested by Cohen, 1988; .01 = small, .09 = medium, .25 = large).

It was hypothesized that the relationship between religiosity and fundamentalism would be significantly moderated by spirituality such that high religiosity would only be positively associated with high fundamentalism when spirituality is low (H6). It was also hypothesized that the relationship between religiosity and moral-TAF (H7) and the relationship between religiosity and scrupulosity would also be moderated by spirituality in a similar manner (H8). It was also hypothesized that these relationships would remain significant when depression and anxiety were statistically controlled.

To test these hypotheses, the results of 10000 bootstrap resamples were calculated with spirituality (ASPIRES – STS Total) as a moderator of the path between each of the respective IVs and DVs. Analyses using the universality facet of spirituality (ASPIRES – STS Universality) were also conducted given that the universality subscale appeared to be primarily responsible for some of the significant zero-order correlations previously observed in the clinical sample. Analyses using the Prayer Fulfillment subscale (ASPIRES – STS Prayer Fulfillment) were conducted on an exploratory basis. Analyses for the connectedness facet (ASPIRES – STS Connectedness) were not conducted given the scale's poor internal consistency reliability in the current sample.

General spirituality (ASPIRES – STS – Total) did not significantly moderate the relationship between religiosity (ASPIRES – RSS – RI) and fundamentalism (RRFS) for the nonclinical sample ($t = .35, p = .727, 95\% CI = -.01 \text{ to } .01, \Delta R^2 = .0001$), accounting for only an additional 0.01% of variance. The universality facet of spirituality (ASPIRES – STS – U) also was not a significant moderator for the nonclinical sample ($t = 1.04, p = .298, 95\% CI = -.01 \text{ to } .03, \Delta R^2 = .0007$), accounting for only an additional 0.07% of variance. The Prayer Fulfillment facet of spirituality (ASPIRES – STS – PF) was also not a significant moderator for the

nonclinical sample ($t = .83, p = .409, 95\% CI = -.01 \text{ to } .02, \Delta R^2 = .001$), accounting for only an additional 0.1% of variance.

General spirituality (ASPIRES – STS – Total) was nonsignificant as a moderator between the relationship between religiosity (ASPIRES – RSS – RI) and moral thought-action fusion (TAFS Moral) for the nonclinical sample ($t = -1.90, p = .058, 95\% CI = -.01 \text{ to } .0001, \Delta R^2 = .004$), accounting for only an additional 0.4% of variance. The Universality facet of spirituality (ASPIRES – STS – U) did not significantly moderate the relationship between religiosity (ASPIRES – RSS – RI) and moral thought-action fusion (TAFS Moral) for the nonclinical sample ($t = -1.03, p = .304, 95\% CI = -.02 \text{ to } .01, \Delta R^2 = .001$), accounting for only an additional 0.1% of variance. The Prayer Fulfillment facet of spirituality (ASPIRES – STS – PF) was also nonsignificant as a moderator in the relationship between religiosity (ASPIRES – RSS – RI) and moral thought-action fusion (TAFS Moral) for the nonclinical sample ($t = -1.86, p = .062, 95\% CI = -.01 \text{ to } .0003, \Delta R^2 = .004$), accounting for only an additional 0.4% of variance.

General spirituality (ASPIRES – STS – Total) significantly moderated the relationship between religiosity (ASPIRES – RSS – RI) and scrupulosity (PIOS) for the nonclinical sample ($t = -2.79, p = .005, 95\% CI = -.02 \text{ to } -.003, \Delta R^2 = .009$). However, inclusion of this moderator in the model explained only an additional 0.9% of the variance. The Universality facet of spirituality (ASPIRES – STS – U) also significantly moderated the relationship between religiosity and scrupulosity for the nonclinical sample ($t = -2.47, p = .014, 95\% CI = -.05 \text{ to } -.01, \Delta R^2 = .007$). However, inclusion of this moderator explained only an additional 0.7% of the variance. The Prayer Fulfillment facet of spirituality (ASPIRES – STS – PF) also significantly moderated the relationship between religiosity and scrupulosity for the nonclinical sample ($t = -$

3.17, $p = .002$, 95% $CI = -.03$ to $-.01$, $\Delta R^2 = .011$). However, inclusion of this moderator explained only an additional 1.1% of the variance.

In summary, general spirituality and the individual facets of prayer fulfillment and universality did not significantly moderate the relationship between religious involvement and fundamentalism or religiosity and moral TAF. Additional variance explained by incorporating spirituality (or individual facets of spirituality) was less than 0.1% in each of these cases. Although general spirituality and the individual facets of prayer fulfillment and universality did statistically significantly moderate the relationship between religious involvement and scrupulosity, the additional variance explained was extremely small (ranging from 0.7% to 1.1%).

It was hypothesized that (H9) the relationship between scrupulosity and obsessional thinking would be mediated by moral-TAF and obsessive beliefs (specifically, importance/control of thoughts and responsibility/threat estimation). It was also hypothesized that (H10) the relationship between fundamentalism and obsessional thinking would be mediated by moral-TAF, obsessive beliefs (specifically, importance/control of thoughts and responsibility/threat estimation), and generalized guilt. It was also hypothesized that these relationships would remain significant when general depression and anxiety are statistically controlled.

To test these hypotheses, the results of 10000 bootstrap resamples were calculated for proposed mediators of the path between each of the respective IVs and DVs. In the nonclinical sample, moral TAF, importance/control of thoughts (OBQ-ICT), and responsibility/threat estimation (OBQ-RT) significantly, albeit partially mediated the relationship between scrupulosity (PIOS) and obsessional thinking (OCI Obsessing subscale). These mediators all remained

significant when depression and anxiety were statistically controlled. Moral TAF, importance/control of thoughts (OBQ-ICT), responsibility/threat estimation (OBQ-RT), and generalized guilt (GI total score) significantly mediated the relationship between fundamentalism (RRFS) and obsessional thinking (OCI Obsessing subscale). Again, these mediators all remained significant when anxiety and depression were statistically controlled. It is noted that results of atemporal mediation analyses should be viewed cautiously because these results do not guarantee that the proposed mediators will be significant temporal mediators in the context of longitudinal research. Results for the nonclinical group are presented in Table 5.

In summary, the relationship between scrupulosity and obsessional thinking was statistically significantly (atemporally) moderated by moral TAF (the effect was small to medium size), the obsessional belief domain of importance/control of thoughts (the effect approached medium size) and the obsessional belief domain of responsibility/threat estimation (the effect was medium size). The relationship between religious fundamentalism and obsessional thinking was statistically significantly (atemporally) moderated by moral TAF (the effect was small to medium size), the obsessional belief domain of importance/control of thoughts (the effect was medium to large size), the obsessional belief domain of responsibility/threat estimation (the effect was medium size), and generalized guilt (the effect was medium size). However, given that the data presented are cross-sectional, it cannot be inferred that these atemporal moderators reflect longitudinal processes.

Table 5

Summary of Indirect (Mediation) Effects for Nonclinical Group

Independent Variable	Mediators	Dependent Variable	Direct Effect	Indirect Effect	95% CI of Indirect Effect	κ^2
PIOS		OCI-Obs				
	TAFS Moral		.11	-.01	-.02 to -.003*	.05
	OBQ-ICT		.09	.01	.004 to .02*	.07
	OBQ-RT		.11	.02	.01 to .03*	.11
RRFS		OCI-Obs				
	TAFS Moral		-.003	.01	.005 to .02*	.07
	OBQ-ICT		-.02	.02	.02 to .03*	.17
	OBQ-RT		-.004	.01	.008 to .02*	.10
	GI		-.005	.01	.008 to .02*	.11

PIOS = *Penn State Inventory of Scrupulosity*; RRFS = *Revised Religious Fundamentalism Scale*; TAFS = *Thought-Action Fusion Scale*; GI = *Guilt Inventory*. OBQ = *Obsessional Beliefs Questionnaire*, ICT = *Importance / Control of Thoughts*, RT = *Responsibility / Threat Estimation*.

OCI = *Obsessive-Compulsive Inventory – Revised*, Obs = *Obsessing*.

* $p < .05$

Clinical Group Results

A number of independent samples *t*-tests were conducted to examine between-group differences on questionnaire scores by religious affiliation. Given the small sample size in each religious group, for these analyses religious affiliation was collapsed into two groups: *religious/spiritual* (incorporating the Catholic, Protestant, and Spiritual but not Religious groups; $n = 16$), and *not religious/spiritual* (incorporating the Agnostic and Atheist groups; $n = 8$). Although the resulting group sizes remained unequal and small, distributions appeared approximately normal upon inspection. Research has suggested that the *t*-test is valid under these circumstances, but that it is likely that only larger effects will achieve statistical significance (see deWinter, 2013; Zimmerman & Zumbo, 1993, Zumbo and Zimmerman, 1993). Means and standard deviations for self-report questionnaires by individual religious group are presented in Table 6.

Table 6

Means (Standard Deviations) of Measures for Clinical Sample by Religious Affiliation

	Catholic (n = 10)	Protestant (n = 1)	Spiritual but not Religious (n = 5)	Agnostic (n = 5)	Atheist (n = 3)
YBOCS	22.50 (8.58)	20.00	19.40 (7.50)	26.00 (7.25)	21.00 (9.64)
DASS-21	-	-	-	-	-
Depression	15.20 (12.67)	20.00	16.00 (12.73)	32.40 (9.53)	14.00 (17.32)
Anxiety	13.80 (9.77)	8.00	9.20 (6.26)	21.60 (8.29)	12.00 (19.08)
Stress	19.80 (10.69)	20.00	21.20 (9.23)	28.00 (7.21)	14.00 (17.32)
GI – Total Score	156.70 (26.91)	143.00	162.40 (13.89)	163.60 (14.42)	137.67 (17.56)
Trait Guilt	67.40 (14.06)	65.00	77.20 (4.27)	82.40 (6.80)	58.67 (20.26)
State Guilt	35.80 (8.31)	35.00	36.80 (6.10)	36.60 (7.50)	32.00 (4.36)
Moral Standards	53.50 (8.41)	43.00	48.40 (9.10)	44.60 (5.13)	47.00 (7.00)
OBQ-44	-	-	-	-	-
Responsibility/Threat Est.	70.11 (22.94)	45.00	83.20 (14.77)	80.40 (20.45)	48.67 (16.80)
Perfectionism/Certainty	70.30 (20.41)	79.00	80.00 (16.82)	80.80 (14.39)	71.33 (11.85)
Importance/Ctrl of Thoughts	45.86 (12.87)	35.00	47.40 (17.87)	40.80 (16.24)	28.33 (6.81)
OCI-R – Total Score	31.63 (18.13)	23.00	19.60 (5.13)	31.20 (13.42)	13.33 (8.02)
Checking	5.20 (4.05)	6.00	4.60 (2.97)	3.60 (2.61)	3.67 (2.52)
Hoarding	3.44 (4.30)	5.00	2.20 (2.05)	5.20 (2.49)	1.33 (1.53)
Washing	4.90 (4.79)	0.00	2.20 (3.83)	5.80 (4.32)	2.67 (4.62)
Ordering	5.00 (4.97)	4.00	3.20 (2.59)	6.40 (5.03)	2.00 (2.65)
Neutralizing	3.10 (4.04)	3.00	1.20 (2.17)	2.40 (3.36)	2.33 (4.04)
Obsessing	6.33 (3.32)	5.00	6.20 (1.92)	7.80 (0.84)	1.33 (2.31)
PIOS – Total Score	29.22 (18.00)	8.00	17.00 (7.45)	32.80 (15.83)	6.67 (11.55)
Fear of Sin	19.56 (12.72)	6.00	16.40 (7.54)	29.80 (13.44)	6.33 (10.97)
Fear of God	9.78 (5.55)	2.00	0.60 (0.55)	3.00 (3.32)	0.33 (0.58)
RRFS – Total Score	-0.50 (22.24)	-14.00	-38.00 (10.89)	-39.40 (9.94)	-45.67 (4.04)
TAF Scale – Total Score	32.00 (17.95)	32.00	31.40 (10.78)	31.80 (22.29)	12.33 (14.57)
Moral	22.30 (9.97)	25.00	21.20 (11.80)	22.60 (15.85)	5.33 (3.06)
Likelihood-Self/Other	9.70 (9.36)	7.00	10.20 (3.27)	9.20 (7.53)	7.00 (12.12)
ASPIRES – RSS	-	-	-	-	-
Religious Involvement	30.70 (9.93)	23.00	16.40 (5.03)	12.80 (1.79)	10.33 (1.15)
Religious Crisis	9.70 (4.60)	9.00	8.00 (1.41)	10.80 (4.97)	6.00 (2.00)
ASPIRES – STS – Total Score	87.30 (10.58)	73.00	78.00 (9.97)	63.40 (11.06)	59.67 (22.01)
Prayer Fulfillment	39.40 (6.69)	27.00	29.00 (3.81)	21.40 (6.66)	18.33 (8.02)
Universality	26.50 (2.80)	25.00	27.60 (5.64)	22.20 (7.53)	22.00 (8.89)
Connectedness	21.40 (3.06)	21.00	21.40 (4.16)	19.80 (3.11)	19.33 (5.69)

YBOCS = *Yale-Brown Obsessive Compulsive Scale*; DASS-21 = *Depression Anxiety Stress Scales, 21-item version*; GI = *Guilt Inventory*; OBQ-44 = *Obsessional Beliefs Questionnaire – 44 item version*; Threat Est. = Threat Estimation; Ctrl of Thoughts = Control of Thoughts; OCI-R = *Obsessive-Compulsive Inventory – Revised*; PIOS = *Penn State Inventory of Scrupulosity*; RRFS = *Revised Religious Fundamentalism Scale*; TAF Scale = *Thought-Action Fusion Scale*; ASPIRES = *Assessment of Religious and Spiritual Sentiments Scale*; RSS = *Religious Sentiments Scale*; STS = *Spiritual Transcendence Scale*.

Means, standard deviations, *t*-test results, and effect sizes comparing the religious/spiritual and not religious/spiritual groups are presented in Table 7. The spiritual/religious group scored statistically significantly higher than did the not religious/spiritual group on measures of religious fundamentalism, religious involvement (ASPIRES – RSS Religious Involvement), fear of God (PIOS – Fear of God), general spirituality (ASPIRES – STS total score), and spirituality - prayer fulfillment (ASPIRES – STS Prayer Fulfillment). All of these respective effect sizes were, at minimum, large.

Although not statistically significant, the religious/spiritual group scored higher than did the not religious/spiritual group on measures of universality (ASPIRES – STS Universality). This relationship evidenced a large effect size. The religious/spiritual group also scored higher than did the not religious/spiritual group on connectedness (ASPIRES – STS Connectedness), the moral standards subscale of the Guilt Inventory, moral TAF, and obsessive beliefs related to importance/control of thoughts. All of these respective effects sizes were medium to large. Although not statistically significant, the religious/spiritual group scored lower than did the not religious/spiritual group on measures of depression and anxiety. These effect sizes were large.

In summary, based on consideration of both statistical significance and effect size, the religious/spiritual group appeared to score notably higher than the not religious/spiritual group on measures of religious fundamentalism, religious involvement (ASPIRES – RSS Religious Involvement), fear of God (PIOS – Fear of God), general spirituality and each of the individual facets of spirituality, the moral standards subscale of the guilt inventory, moral TAF, and obsessive beliefs related to importance/control of thoughts. The religious/spiritual group appeared to score notably lower than the not religious/spiritual group on measures of depression and anxiety. No hypotheses were proposed regarding differences on measures between the

religious/spiritual group and the not religious/spiritual group. As such, these results are presented for interest and generation of future hypotheses and will not be discussed further.

Table 7

Means (Standard Deviations) and Results of t-tests Comparing Religious/Spiritual and Not Religious/Spiritual Groups Comprising the Clinical Sample

	Religious / Spiritual (<i>n</i> = 16)	Not Religious / Spiritual (<i>n</i> = 8)	<i>t</i>	<i>p</i>	<i>d</i>
YBOCS	21.38 (7.84)	24.13 (7.95)	.806	.429	.349
DASS-21	-	-	-	-	-
Depression	15.75 (11.86)	26.00 (14.26)	1.867	.075	.809
Anxiety	12.00 (8.58)	18.00 (12.96)	1.361	.187	.589
Stress	20.25 (9.57)	22.75 (12.96)	.536	.597	.232
GI – Total Score	157.63 (22.54)	153.88(19.67)	-.400	.693	.173
Trait Guilt	70.31 (12.12)	73.50 (17.16)	.529	.602	.229
State Guilt	36.06 (7.19)	34.88 (6.58)	-.392	.699	.169
Moral Standards	51.25 (8.67)	45.50 (5.53)	-1.701	.103	.736
OBQ-44	-	-	-	-	-
Responsibility/Threat Est.	72.80 (21.48)	68.50 (24.28)	-.437	.666	.192
Perfectionism/Certainty	73.88 (18.66)	77.25 (13.51)	.453	.655	.196
Importance/Ctrl of Thoughts	45.66 (13.90)	36.13 (14.34)	-1.569	.131	.679
OCI-R – Total Score	26.71 (14.85)	24.50 (14.38)	-.340	.737	.150
Checking	5.06 (3.51)	3.63 (2.39)	-1.039	.310	.447
Hoarding	3.13 (3.52)	3.75 (2.87)	.424	.676	.186
Washing	3.75 (4.51)	4.63 (4.41)	.451	.656	.196
Ordering	4.38 (4.16)	4.75 (4.65)	.200	.843	.086
Neutralizing	2.50 (3.44)	2.38 (3.34)	-.085	.933	.035
Obsessing	6.20 (2.73)	5.38 (3.62)	-.616	.544	.270
PIOS – Total Score	23.73 (15.94)	23.00 (19.09)	-.098	.923	.043
Fear of Sin	17.60 (11.01)	21.00 (16.89)	.586	.564	.258
Fear of God	6.43 (6.22)	2.00 (2.88)	-2.381	.026*	.822
RRFS – Total Score	-13.06 (25.32)	-34.68 (8.46)	-4.098	< .001***	1.338
TAF Scale – Total Score	31.81 (14.98)	24.50 (21.12)	-.983	.336	.426
Moral	22.13 (9.88)	16.13 (15.04)	-1.177	.252	.510
Likelihood-Self/Other	9.69 (7.48)	8.38 (8.70)	-.384	.705	.166
ASPIRES – RSS	-	-	-	-	-
Religious Involvement	25.75 (10.58)	11.88 (1.96)	-5.075	< .001***	1.575
Religious Crisis	9.13 (3.72)	9.00 (4.63)	-.072	.944	.032
ASPIRES – STS – Total Score	83.50(10.99)	62.00 (14.56)	-4.057	< .001***	1.757
Prayer Fulfillment	35.38 (7.73)	20.25 (6.80)	-4.692	< .001***	2.032
Universality	26.75 (3.70)	22.13 (7.41)	-1.664	.131	.892
Connectedness	21.38 (3.20)	19.63 (3.85)	-1.181	.250	.512

YBOCS = *Yale-Brown Obsessive Compulsive Scale*; DASS-21 = *Depression Anxiety Stress Scales, 21-item version*; GI = *Guilt Inventory*; OBQ-44 = *Obsessional Beliefs Questionnaire – 44 item version*; Threat Est. = Threat Estimation; Ctrl of Thoughts = Control of Thoughts; OCI-R = *Obsessive-Compulsive Inventory – Revised*; PIOS = *Penn State Inventory of Scrupulosity*; RRFS = *Revised Religious Fundamentalism Scale*; TAF Scale = *Thought-Action Fusion Scale*; ASPIRES = *Assessment of Religious and Spiritual Sentiments Scale*; RSS = *Religious Sentiments Scale*; STS = *Spiritual Transcendence Scale*.

* $p < .05$, ** $p < .01$, *** $p < .001$

The religious/spiritual group (*Mean Age* = 37.813 years, *SD* = 13.73) was significantly older than the not religious/spiritual group (*Mean Age* = 27.375 years, *SD* = 5.85; $t = -2.604$, $p = .016$, $d = .884$). Fisher's exact test was employed instead of Chi-square analyses to test for between-group differences in categorical variables of interest given that the small sample size and likelihood of very small cell sizes that could affect the accuracy of Chi square analyses. Proportional composition of the two groups did not significantly differ with respect to sex ($p = .673$) or education ($p = .651$). There appeared to be a greater proportion of married individuals in the religious/spiritual group ($n = 8$) than the not religious/spiritual groups ($n = 1$), but this difference did not achieve statistical significance ($p = .056$).

Clinical Group - Zero Order Correlational Analyses. It was hypothesized that (H3) scrupulosity (PIOS) would be positively associated with religious crisis (ASPIRES – RSS Religious Crisis; i.e., feelings of alienation from God and from religious community). Correlation was specified as one-tailed given the specified directionality of the hypothesis. As predicted, scrupulosity was significantly, positively correlated with religious crisis ($r = .577$, $p = .002$).

It was also hypothesized that (H4) scrupulosity would be positively correlated with obsessional thinking (OCI-R Obsessing subscale). Correlation was again specified as one-tailed given the specified directionality of the hypothesis. As predicted, scrupulosity was significantly, positively correlated with obsessive thinking ($r = .725$, $p < .001$).

It was also hypothesized that (H5) fundamentalism (RRFS) would be positively associated with obsessional thinking (OCI-R Obsessing subscale). Correlation was again one-tailed given the specified directionality of the hypothesis. Contrary to the hypothesis, fundamentalism was not significantly correlated with obsessive thinking ($r = .137$, $p = .266$).

Given the mixed results of past research regarding the relationship between religiosity and likelihood TAF, exploratory correlational analyses including the full range of variables pertaining to religiosity/spirituality were conducted to further elucidate any possible relationships. Correlations were specified as two-tailed given that analyses were exploratory. There was a significant, positive relationship between religious crisis (ASPIRES – RSS Religious crisis) and Likelihood TAF (TAFS Likelihood Self-Other; $r = .529, p = .008$). Although it did not achieve statistical significance, the negative relationship between Likelihood TAF and universality (ASPIRES – STS Universality; $r = -.341, p = .103$) was of a medium effect size.

Likelihood TAF was not significantly correlated with fundamentalism (RRFS; $r = .037, p = .865$) or prayer fulfillment (ASPIRES – STS Prayer Fulfillment; $r = -.184, p = .389$). These effects sizes were of a trivial or small size. Although not statistically significant, the negative relationship between likelihood TAF and religious involvement (ASPIRES – RSS Religious Involvement; $r = -.246, p = .246$) and likelihood TAF and general spirituality (ASPIRES – STS Total score; $r = -.247, p = .245$), approached a medium effect size.

Given past mixed results in clinical samples regarding the relationship between OCD symptoms and religiosity, exploratory, two-tailed correlational analyses including variables pertaining to religiosity/spirituality were also conducted. There was a significant, negative relationship between OCD symptom severity (YBOCS) and spirituality (ASPIRES – STS Total score; $r = -.424, p = .039$) that appeared to be driven by a significant relationship with the Universality subscale (ASPIRES – STS Universality; $r = -.602, p = .022$) given that the relationships between OCD symptom severity (YBOCS) and the Prayer Fulfillment subscale (ASPIRES – STS Prayer Fulfillment; $r = -.265, p = .212$) and the Connectedness subscale

(ASPIRES – STS Connectedness; $r = -.286, p = .175$) were nonsignificant and were of a substantially smaller effect size. There was a positive correlation between OCD symptom severity (YBOCS) and religious crisis (ASPIRES – RSS Religious crisis; $r = .402, p = .052$) that, although not statistically significant, was of a medium to large effect size. There was no significant relationship between OCD symptom severity (YBOCS) and religious involvement (ASPIRES – RSS Religious Involvement; $r = -.160, p = .455$), or fundamentalism (RRFS; $r = .202, p = .344$).

Given past mixed results in clinical samples regarding the relationship between compulsions and religiosity, exploratory two-tailed correlational analyses including variables pertaining to religiosity/spirituality were conducted. Results are presented in Table 8. None of these analyses reached statistical significance. However, this is not unexpected given the small size of the clinical sample.

Although not statistically significant, the positive relationship between the religious crisis subscale of the ASPIRES – RSS and the hoarding ($r = .390$), washing ($r = .353$), and obsessing ($r = .353$) subscales of the OCI-R evidence a medium effect size. The positive relationship between religious crisis and ordering subscale of the OCI-R ($r = .260$) approached a medium effect size. The positive relationship between religious fundamentalism and the checking subscale of the OCI-R also evidenced a medium effect size ($r = .310$). The negative relationship between religious involvement and the hoarding subscale of the OCI-R ($r = -.251$) approached a medium effect size. Also, the relationships between the universality facet of general spirituality and the hoarding ($r = -.260$) and washing ($r = -.249$) subscales of the OCI-R approached a medium effect size. However, most of the effect sizes of the relationships between measures of religiosity/spirituality and the OCI-R total score and its subscales were of a trivial or small size.

Table 8

Correlations (r) Between Measures of Religiosity/Spirituality and OCI-R subscales for Clinical Sample

	RRFS	RSS-RI	RSS-RC	STS-PF	STS-U	STS-C	STS-Total
OCI-R – Total	.193	-.077	.058	-.032	-.236	.238	-.052
Checking	.310	.176	-.021	.090	-.140	.015	.013
Hoarding	.000	-.251	.390	-.229	-.260	.046	-.229
Washing	.203	.076	.353	-.107	-.249	.029	-.150
Ordering	.082	-.168	.260	.031	-.131	.112	-.001
Neutralizing	.164	-.065	-.046	.065	.042	-.003	.056
Obsessing	.137	.221	.353	.239	.135	-.097	.181

OCI-R = *Obsessive-Compulsive Inventory – Revised*RRFS = *Revised Religious Fundamentalism Scale*RSS = *Religious Sentiments Scale*, RI = Religious Involvement, RC – Religious Crisis.STS = *Spiritual Transcendence Scale*, PF = Prayer Fulfillment, U = Universality, C = Connectedness.

Note: None of the above correlations were statistically significant.

In summary, positive relationships between scrupulosity and religious crisis and scrupulosity and obsessional thinking were statistically significant and of a large effect size. Contrary to the hypothesis, there was no statistically significant relationship between fundamentalism and obsessional thinking and the effect size was small. With respect to exploratory analyses, Likelihood TAF was significant, positively correlated with religious crisis (the effect size was large) and negatively, but nonsignificantly correlated with the universality facet of general spirituality (the effect size was medium), general spirituality (the effect size approached a medium effect size) and religious involvement (the effect size approached a medium size). OCD symptom severity (YBOCS severity score) was nonsignificantly, positively related to religious crisis (medium to large effect size), but significantly, negatively related to the universality facet of spirituality (large effect size) and general spirituality (medium to large effect size). None of the relationships between measures of religiosity/spirituality and the OCI-R and its subscales were statistically significant. Religious crisis was positively related to the hoarding, washing, and obsessing subscales of the OCI-R and these relationships evidenced a medium effect size. Religious crisis was also positively related to the ordering subscale of the OCI-R with an effect approaching medium size. Religious fundamentalism was positively associated with the checking subscale of the OCI-R and evidenced a medium effect size. Religious involvement was negatively correlated with the hoarding subscale of the OCI-R (with an effect approaching medium size). The universality facet of general spirituality was negatively related to the hoarding and washing subscales of the OCI-R (with effects approaching medium size).

Clinical Group - Moderated and Mediated Regression Analyses. Tests of moderated and mediated regression were again conducted using PROCESS, a computational tool developed by Hayes (2013). It is noted that the size of the clinical sample was small and that this may present a challenge regarding the validity of these analyses. However, recent work by Creedon and Hayes (2015) tested these analyses in small samples (as small as $n = 20$) and found that these tests performed acceptably with small sample sizes even when outliers were present in the data. When inspected, the current data did not contain significant outliers. As such, it was determined that it would be reasonable to run these analyses with the current sample and interpret results cautiously.

It was hypothesized that the relationship between religiosity and fundamentalism would be significantly moderated by spirituality such that high religiosity would only be positively associated with high fundamentalism when spirituality is low (H6). It was also hypothesized that the relationship between religiosity and moral-TAF (H7) and the relationship between religiosity and scrupulosity would also be moderated by spirituality in a similar manner (H8). It was also hypothesized that these relationships would remain significant when depression and anxiety were statistically controlled.

To test these hypotheses, the results of 10000 bootstrap resamples were calculated with spirituality (ASPIRES – STS Total) as a moderator of the path between each of the respective IVs and DVs. Analyses using the universality facet of spirituality (ASPIRES – STS Universality) were also conducted given that the universality subscale appeared to be primarily responsible for some of the significant zero-order correlations previously observed. Analyses using the Prayer Fulfillment subscale (ASPIRES – STS Prayer Fulfillment) were conducted on an exploratory basis. Analyses for the connectedness facet (ASPIRES – STS Connectedness) were not

conducted given the scale's poor internal consistency reliability in the current sample. Results are presented in Table 9.

Table 9

Summary of Conditional (Moderation) Effects of Spirituality for Clinical Group

Independent Variable	Moderators	Dependent Variable	Direct Effect (t)	Conditional Effect (t)	ΔR^2	p	95% CI
RSS - RI		RRFS	4.58	-	-	.0002	1.33 to 3.54*
	STS Total		-	-.76	.001	.45	-.07 to .03
	STS - U		-	-5.60	.17	< .00005	-.53 to -.24*
	STS - PF		-	.22	.001	.82	-.06 to .08
RSS - RI		TAFS Moral	1.34	-	-	.19	-.30 to 1.40
	STS Total		-	-2.07	.175	.052	-.08 to .0004
	STS - U		-	-2.14	.184	.04	-.38 to -.005*
	STS - PF		-	-1.75	.13	.10	-.10 to .01
RSS - RI		PIOS Total	.81	-	-	.43	-.83 to 1.89
	STS Total		-	-.15	.001	.88	-.07 to .06
	STS - U		-	.56	.003	.58	-3.14 to 1.82
	STS - PF		-	.35	< .00005	.73	-1.22 to 1.70

RRFS = *Revised Religious Fundamentalism Scale*; TAFS = *Thought-Action Fusion Scale*; PIOS = *Penn State Inventory of Scrupulosity*. RSS = *Religious Sentiments Scale*, RI = *Religious Involvement*.

STS = *Spiritual Transcendence Scale*, U = *Universality*, PF = *Prayer Fulfillment*.

* $p < .05$

Total spirituality (ASPIRES – STS – Total) and the Prayer Fulfillment facet of spirituality (ASPIRES – STS – PF) did not significantly moderate the relationship between religiosity (ASPIRES – RSS – RI) and fundamentalism (RRFS). However, the universality facet of spirituality was a significant moderator of this relationship in the predicted manner and accounted for an additional 16.63% of the variance. Universality remained a significant moderator of this relationship when anxiety and depression were statistically controlled ($t = -6.15, p < .00005, 95\% CI = -.53 \text{ to } -.26, \Delta R^2 = .17$). This interaction is depicted in Figure 1.

The Prayer Fulfillment facet of spirituality (ASPIRES – STS – PF) did not significantly moderate the relationship between religiosity (ASPIRES – RSS – RI) and moral TAF (TAFS Moral). Although not statistically significant, total spirituality (ASPIRES – STS – Total) and the Prayer Fulfillment facet of spirituality moderated this relationship in the predicted manner. However, the universality facet of spirituality (ASPIRES – STS – U) was a statistically significant moderator of this relationship in the predicted manner and accounted for an additional 18.42% of the variance. Universality remained a significant moderator of this relationship when anxiety and depression were statistically controlled ($t = -2.13, p = .047, 95\% CI = -.372 \text{ to } -.003, \Delta R^2 = .169$). This interaction is depicted in Figure 2.

Spirituality (ASPIRES – STS – Total) was not a significant moderator of the relationship between religiosity (ASPIRES – RSS – RI) and scrupulosity (PIOS). Moderator analyses utilizing the individual facets of spirituality were also nonsignificant.

In summary, the relationship between religious involvement and fundamentalism was significantly moderated by universality (but not by general spirituality or prayer fulfillment; additional variance explained by these potential moderators was very small) such that these variables were only positively related when universality was relatively low. The relationship

between religious involvement and moral TAF was also significantly moderated by universality in a similar manner (and by general spirituality and prayer fulfillment to a lesser extent that did not achieve statistical significance). General spirituality and its individual facets did not significantly moderate the relationship between religious involvement and scrupulosity and additional variance explained by these potential moderators was uniformly extremely small.

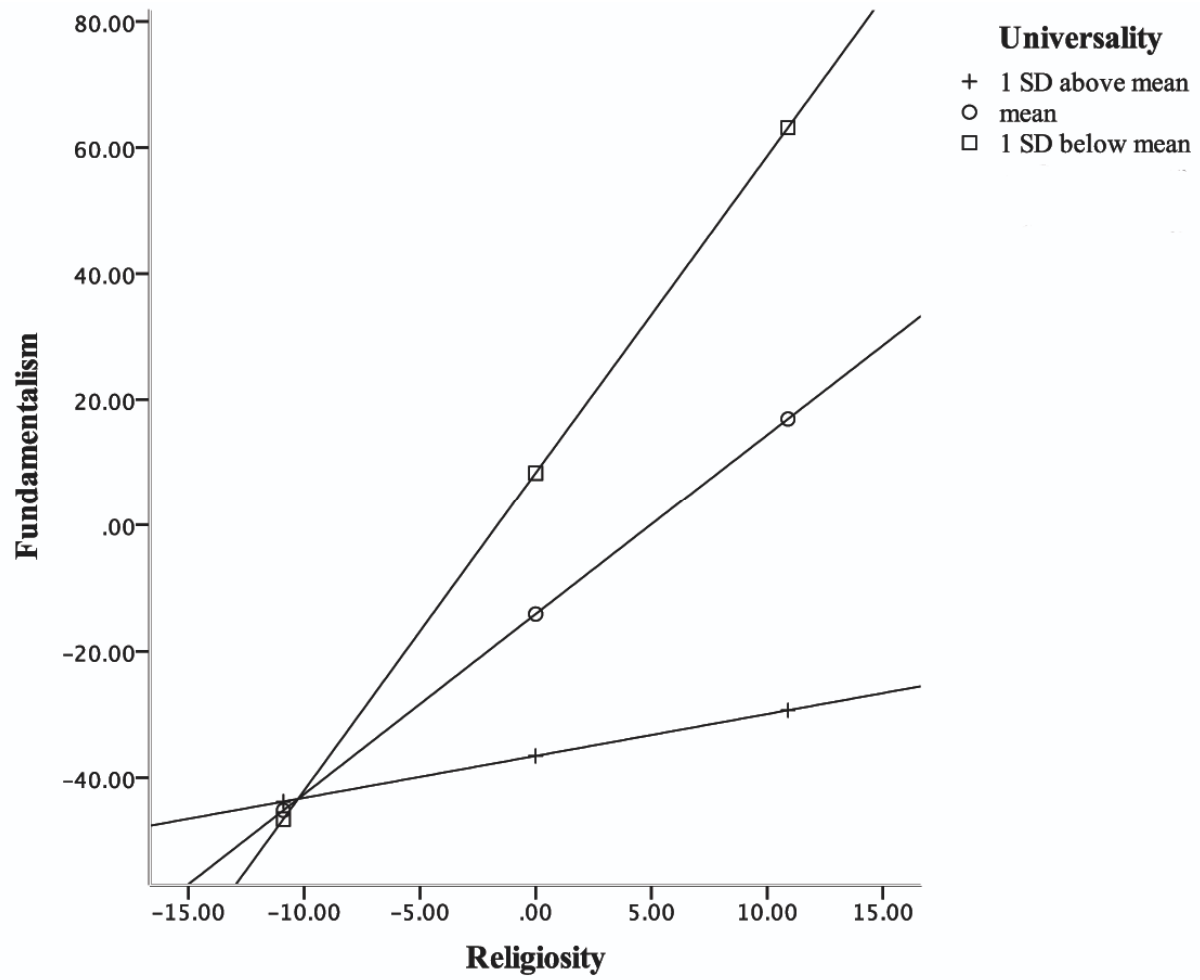


Figure 1. Conditional effect (moderation) of Universality on the relationship between (mean centered) religiosity and fundamentalism.

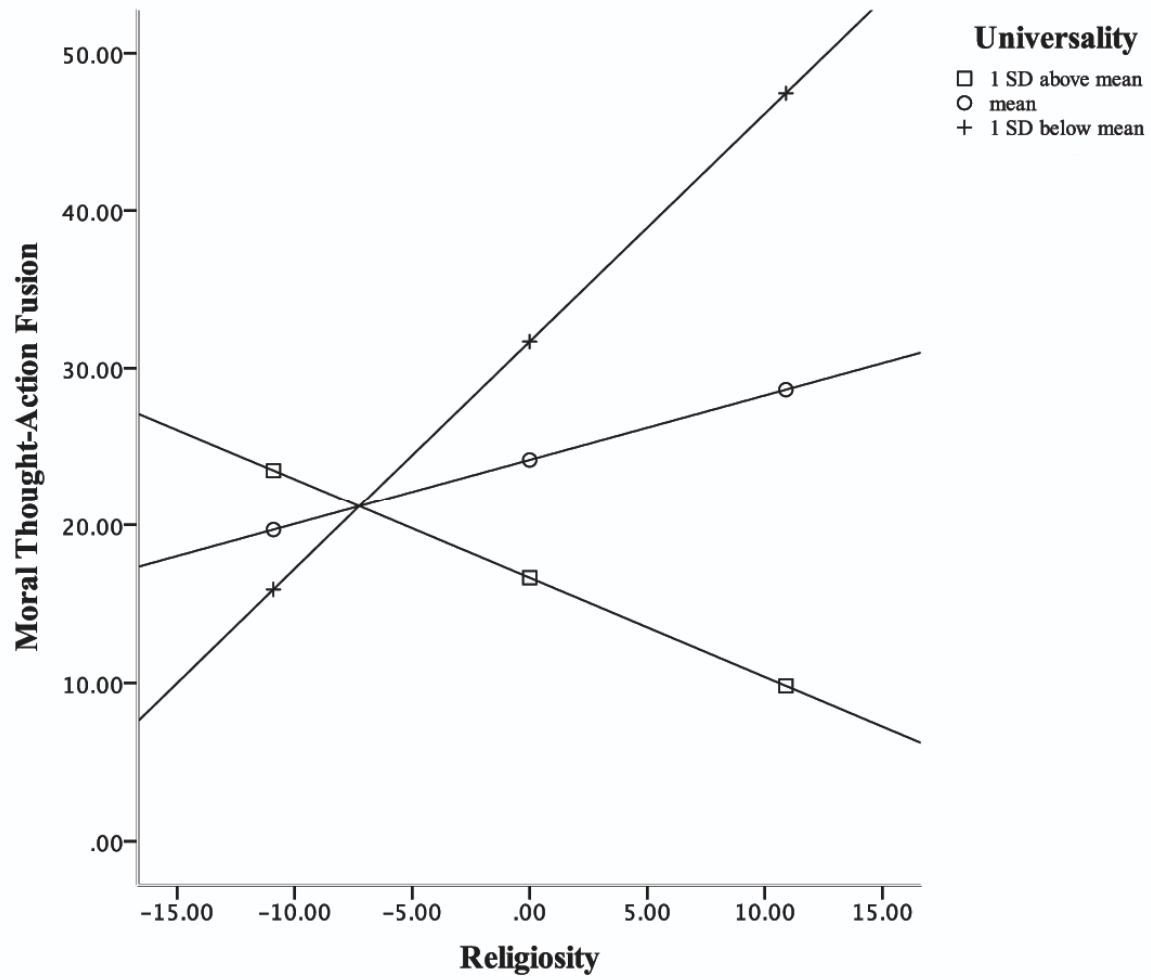


Figure 2. Conditional effect (moderation) of universality on the relationship between (mean centered) religiosity and moral TAF.

It was hypothesized that (H9) the relationship between scrupulosity and obsessional thinking would be mediated by moral-TAF and obsessive beliefs (specifically, importance/control of thoughts and responsibility/threat estimation). It was also hypothesized that (H10) the relationship between fundamentalism and obsessional thinking would be mediated by moral-TAF, obsessive beliefs (specifically, importance/control of thoughts and responsibility/threat estimation), and generalized guilt. It was also hypothesized that these relationships would remain significant when general depression and anxiety are statistically controlled.

To test these hypotheses, the results of 10000 bootstrap resamples were calculated for proposed mediators of the path between each of the respective IVs and DVs. Results are presented in Table 10. None of the proposed mediators significantly mediated the relationship between scrupulosity and obsessive thinking. However, in terms of effect sizes, moral TAF evidenced a small effect size, the obsessional belief domain of importance/control of thoughts evidenced a medium to large effect size, and the obsessional belief domain of responsibility/threat estimation evidenced a large effect size. Also, none of the proposed mediators significantly mediated the relationship between fundamentalism and obsessive thinking. However, in terms of effect sizes, generalized guilt evidenced a medium to large effect size, moral TAF and the obsessional belief domain of importance/control of thoughts evidenced medium effect sizes, and the obsessional belief domain of responsibility/threat estimation evidenced a small effect size. Statistical significance and effect sizes were not appreciably different when depression and anxiety were statistically controlled. However, it should be noted that results of atemporal mediation analyses should be viewed cautiously because these results

do not guarantee that the proposed mediators will be significant temporal mediators in the context of longitudinal research.

Table 10

Summary of Indirect (Mediation) Effects for Clinical Group

Independent Variable	Mediators	Dependent Variable	Direct Effect	Indirect Effect	95% CI of Indirect Effect	κ^2
PIOS		OCI-Obs				
	TAFS Moral		.13	.002	-.03 to .06	.02
	OBQ-ICT		.10	.03	-.02 to .10	.18
	OBQ-RT		.09	.04	-.0003 to .10	.25
RRFS		OCI-Obs				
	TAFS Moral		.001	.02	-.002 to .07	.13
	OBQ-ICT		.002	.01	-.01 to .07	.14
	OBQ-RT		.01	.002	-.03 to .04	.02
	GI		-.002	.02	-.02 to .06	.17

PIOS = *Penn State Inventory of Scrupulosity*; RRFS = *Revised Religious Fundamentalism Scale*; TAFS = *Thought-Action Fusion Scale*; GI = *Guilt Inventory*. OBQ = *Obsessional Beliefs Questionnaire*, ICT = Importance / Control of Thoughts, RT = Responsibility / Threat Estimation.

OCI = *Obsessive-Compulsive Inventory – Revised*, Obs = Obsessing.

Note: None of the mediation analyses above were statistically significant.

Discussion

Summary of Findings. For the nonclinical group, it was hypothesized (H1) that Protestants would score significantly higher than Catholics on measures of moral-TAF, scrupulosity, obsessional thinking, and obsessional beliefs (importance/control of thoughts and responsibility/threat estimation). This hypothesis was partially supported. As predicted, Protestants scored significantly higher than Catholics on measures of moral-TAF, importance/control of thoughts, and responsibility/threat estimation. However, these effect sizes were uniformly small. There were no significant differences in scores between Catholics and Protestants on measures of scrupulosity or obsessional thinking and effects were of a trivial size.

For the nonclinical group, it was also hypothesized (H2) that Muslims would score significantly higher than Christians on measures of moral-TAF, scrupulosity, obsessional thinking, and obsessional beliefs (importance/control of thoughts and responsibility/threat estimation). This hypothesis was partially supported. Muslims scored higher than all three Christian groups on measures of scrupulosity (with medium to large effect sizes) and responsibility/threat estimation (the effect size of the comparison with Catholics was medium to large; the effect sizes of the comparisons with Protestants and the Christian Orthodox group were small to medium). Muslims scored higher than Catholics only on measures of moral-TAF and importance/control of thoughts (effects were small to medium size). There were no significant differences in the degree of obsessive thinking between the Muslim group and the Christian groups (effects were trivial to small size).

It was hypothesized that scrupulosity would be positively associated with religious crisis (H3). This hypothesis was supported in both the clinical and nonclinical samples. It was also hypothesized that scrupulosity and obsessional thinking would be positively correlated (H4). This hypothesis was supported in both the nonclinical and clinical samples. It was also predicted that fundamentalism and obsessional thinking would be positively associated (H5). This hypothesis was not supported in the nonclinical or clinical samples. These results did not change appreciably when depression and anxiety were statistically controlled.

It was hypothesized that, regardless of religious affiliation, the relationship between religiosity (i.e., religious behaviours) and fundamentalism would be moderated by spirituality (i.e., experiences of the transcendent) such that high religiosity would only be positively associated with high fundamentalism when spirituality is low (H6). In the nonclinical sample, this hypothesis was not supported. General spirituality and its individual facets were not significant moderators and additional variance explained was uniformly very small. These results did not change appreciably when depression and anxiety were statistically controlled. In the clinical sample, this hypothesis was partially supported in that only the Universality facet of spirituality significantly moderated this relationship in the predicted manner. General spirituality and Prayer Fulfillment were not significant moderators and additional variance explained was very small for these potential moderators.

It was predicted that the relationship between religiosity and moral-TAF (H7) would be moderated by spirituality in a similar manner. In the nonclinical sample, this hypothesis was not supported. General spirituality and its individual facets were not significant moderators and additional variance explained was uniformly very small. These results did not change appreciably when depression and anxiety were statistically controlled. In the clinical sample, this

hypothesis was supported. Although only the Universality facet of spirituality achieved statistical significance as a moderator of this relationship, general spirituality and prayer fulfillment also explained a significant amount of additional variance when included as moderators.

It was also hypothesized that the relationship between religiosity and scrupulosity would be moderated by spirituality in a similar manner (H8). In the nonclinical sample, although moderation analyses were statistically significant for general spirituality and its individual facets, the amount of additional variance explained was extremely small such that the effects were of no practical importance. These results did not change appreciably when depression and anxiety were statistically controlled. In the clinical sample, this hypothesis was not supported for general spirituality or any of the individual facets of spirituality (moderation analyses were nonsignificant and effect sizes were uniformly small).

It was hypothesized that (H9) the relationship between scrupulosity and obsessional thinking would be mediated by moral-TAF and obsessive beliefs (specifically, importance/control of thoughts and responsibility/threat estimation). In the nonclinical sample, the hypothesis was supported in that all of the mediational analyses were significant. The effect sizes were small to medium for moral TAF, approaching medium for the obsessional belief domain of importance/control of thoughts, and medium for the obsessional belief domain of responsibility/threat estimation. As such, the relative pattern was similar for the nonclinical sample, but effect sizes were slightly attenuated for obsessional beliefs. These results did not change appreciably when depression and anxiety were statistically controlled. None of these mediation analyses were statistically significant for the clinical sample. The effect size for moral TAF was small, suggesting that this effect may not be particularly important. However, the effect sizes for the obsessional belief domains of importance/control of thoughts (medium to large) and

responsibility/threat estimation (large) were substantial, suggesting that these beliefs atemporally mediate the relationship between scrupulosity and obsessional thinking.

It was predicted that (H10) the relationship between fundamentalism and obsessional thinking would be mediated by moral-TAF, obsessive beliefs (specifically, importance/control of thoughts and responsibility/threat estimation), and generalized guilt. In the nonclinical sample, the hypothesis was supported in that all of the mediational analyses were significant. The effect sizes for moral TAF (approaching medium), the obsessional belief domains of importance/control of thoughts (medium to large) and responsibility/threat estimation (medium), and generalized guilt (medium) were substantial, suggesting that these constructs atemporally mediate the relationship between fundamentalism and obsessional thinking. These results did not change appreciably when depression and anxiety were statistically controlled. None of these mediation analyses were statistically significant for the clinical sample. The effect size for the obsessional belief domain of responsibility/threat estimation was small, suggesting that this effect may not be particularly important. However, the effect sizes for moral TAF (medium), the obsessional belief domain of importance/control of thoughts (medium), and generalized guilt (medium to large) were substantial, suggesting that these constructs atemporally mediate the relationship between fundamentalism and obsessional thinking. It is noted that results of atemporal mediation analyses should be viewed cautiously because these results do not guarantee that the proposed mediators will be significant temporal mediators in the context of longitudinal research.

Exploratory Analyses. Correlational analyses regarding OCD symptoms other than obsessional thinking and measures of religiosity/spirituality were exploratory given the inconsistency of past research findings. For the clinical sample, OCD symptom severity (YBOCS) was significantly, negatively related to general spirituality and the universality facet of spirituality (with medium to large effect sizes). The positive relationship between OCD symptom severity (YBOCS) and religious crisis was of a medium effect size, but was not statistically significant. Relationships between OCD symptoms severity (YBOCS) and other measures of religiosity/spirituality were nonsignificant and of a small effect size. Relationships between measures of religiosity/spirituality and compulsions (OCI-R) were all statistically nonsignificant. However, the positive relationships between compulsion subtypes (OCI-R) and religious crisis were of a medium effect size (effect sizes for relationships with other measures of religiosity/spirituality were substantially smaller). In the nonclinical sample, relationships between measures of religiosity/spirituality and compulsions (OCI-R) were generally of a small effect size, with the exception of the positive relationships with religious crisis and compulsion subtypes that were typically medium or approaching medium effect size.

Analyses regarding likelihood-TAF were also exploratory given the mixed findings in prior research. In the clinical sample, there was a significant, positive relationship between religious crisis (RSS-RC) and Likelihood TAF (TAFS – Likelihood Self/Other) that was of a large effect size. The negative relationships between Likelihood TAF and spirituality and Likelihood TAF and religious involvement, although nonsignificant, approached a medium effect size. There was no significant relationship observed between likelihood-TAF and other measures of religiosity/spirituality and effect sizes were uniformly small. In the nonclinical sample, there was also a significant, positive relationship between likelihood TAF and religious

crisis that approached a medium effect size. Relationships between likelihood TAF and other measures of religiosity/spirituality were nonsignificant and effects were generally small.

Interpretation of Results. The current research set out to clarify the relationship between religiosity/spirituality and both cognitive factors and symptoms of OCD given mixed results of past research and inadequacy of measurement of the constructs of religiosity and spirituality common in past research. The first of these questions was whether spirituality might act as a moderator between religiosity and a number of constructs of interest that are either thought to be or known to be related to cognitive factors or symptoms of OCD (i.e., fundamentalism, scrupulosity, moral-TAF). With respect to fundamentalism and moral-TAF, the universality facet of spirituality (i.e., the belief that the universe is ordered and that all of humanity is connected) appeared to buffer against a positive correlation with religious involvement, but only in the clinical participants. Spirituality and its individual facets did not buffer against the positive correlation between religious involvement and scrupulosity in either the clinical or nonclinical groups. The only notable difference between the nonclinical and clinical groups in the aforementioned variables was that the clinical group was somewhat lower in fundamentalism. As such, the reason for the differences in patterns of moderation between the nonclinical and clinical groups is unclear. It may be that spirituality becomes an important coping resource for religious individuals who are experiencing significant distress and impairment associated with the diagnosis and experience of OCD symptoms, but is not relevant for those who are not. However, this is clearly speculative given that these relationships are essentially correlational. Nonetheless, this is an important finding given that there is little, if any, research investigating the relationship between spirituality and OCD-related constructs. This could have important clinical applications if future research replicates these findings. It is often

recommended in CBT protocols that people with OCD symptoms with religious content seek counsel from religious authority figures (e.g., Wilhelm & Steketee, 2006), but there is typically little in the way of specific recommendations about what the content of such counsel should be. If spirituality is an important moderating factor for religious individuals that buffers against moral TAF, religious individuals seeking treatment for OCD may benefit from the inclusion of consultation/psychoeducation with a religious authority figure that is specifically designed to enhance spirituality.

The next question of importance was to investigate atemporal mediators through which relevant variables of interest (i.e., fundamentalism and scrupulosity) might be related to obsessive thinking. Fundamentalism was positively correlated with obsessional thinking in the clinical and nonclinical samples, but effect sizes were trivial to small. Although some past research has demonstrated a positive relationship between fundamentalism and obsessive thinking (e.g., Inozu et al., 2012), this research has often used samples where participants low in religiosity were artificially dichotomized apart from highly religious individuals. Although this might be an important step in early research to determine whether a relationship exists, this may exaggerate the magnitude and importance of relationships between variables and the relationship may not be significant when more moderate groups are studied. The current nonclinical and clinical samples were moderately religious/spiritual and this is likely the reason that the relationship observed in prior research using extreme groups between fundamentalism and obsessive thinking was not replicated in the current research. This suggests that such a relationship may only exist when religious individuals are highly fundamentalist. Since significant relationship between IV and DV is not a requirement of mediation, potential moderators of this relationship were investigated despite the nonsignificant relationship.

It had been hypothesized that moral-TAF, the obsessional belief of importance/control of thoughts (OBQ-ICT), the obsessional belief of responsibility/threat estimation (OBQ-RT), and generalized guilt (GI-Total) were atemporal mediators that would explain how fundamentalism and obsessional thinking are related. In the nonclinical sample, all of the proposed mediators were statistically significant and effects were medium size. For the clinical group, none of the proposed mediators were statistically significant (and this is not unexpected given the small sample size). However, effect sizes were at least medium for moral TAF, importance/control of thoughts, and generalized guilt. Therefore, although fundamentalism and obsessive thinking were positively, but nonsignificantly related in the current nonclinical and clinical samples (that were *not* highly fundamentalist), this relationship appeared to be atemporally mediated by moral TAF, generalized guilt, and importance/control of thoughts. This replicates prior findings (e.g., Inozu et al, 2012; Inozu et al., 2014; Williams et al, 2013). However, it should again be noted that atemporal mediation does not ensure that proposed mediators would be significant mediators in longitudinal research (i.e., when they are measured *prior* to outcome variables to determine whether they might be mechanisms through which the IV has an effect on the DV across time). Only longitudinal research can demonstrate whether generalized guilt, moral TAF, and the belief that one's thought contents are highly important and must be strictly controlled are important mechanisms in how religious fundamentalism may lead to obsessive thinking. An important bridge to determine whether it is worth the time and cost to investigate these mediators in the context of longitudinal research might be quasi-experimental research that experimentally manipulates relevant constructs (e.g., guilt, moral TAF, importance/control of thoughts, responsibility/threat estimation) using a variety of hypothetical written scenarios or using research confederates followed by measuring frequency of intrusive thoughts in a sample of

religious individuals with varying degrees of religious fundamentalism. The current results suggest that incorporation of interventions to target these OCD-related constructs (e.g., guilt, moral TAF, importance/control of thoughts, responsibility/threat estimation; which is often included in CBT protocols for OCD; e.g., see Wilhelm & Steketee, 2006) in addition to exposure with response prevention (ERP) may be particularly important for religious individuals.

As expected, scrupulosity was significantly, positively related to obsessional thinking in both the clinical sample and each of the religious groups of the nonclinical sample. It had been hypothesized that moral-TAF, the obsessional belief of importance/control of thoughts (OBQ-ICT), and the obsessional belief of responsibility/threat estimation (OBQ-RT) were atemporal mediators that would explain how scrupulosity and obsessional thinking are related. In the nonclinical sample, the three proposed mediators were statistically significant and effects were approaching medium size to medium size. In the clinical sample, none of the proposed mediators were statistically significant (which is not surprising given the small sample size). However, effects were medium to large size for the obsessional belief domains of importance/control of thoughts and responsibility/threat estimation. This suggests that the relationship between scrupulosity and obsessive thinking is atemporally mediated by the belief that one's thought contents are highly important and must be strictly controlled and the belief that one's negative thoughts can cause negative outcomes for others for which one would be personally responsible. It is noted that results of atemporal mediation analyses should be viewed cautiously because these results do not guarantee that the proposed mediators will be significant temporal mediators in the context of longitudinal research. However, these results again suggest that incorporation of interventions to target these cognitions (which is often included in CBT protocols for OCD; e.g.,

Wilhelm & Steketee, 2006) in addition to exposure with response prevention (ERP) may be important for religious individuals.

Recent research has found a significant mediating relationship for moral-TAF in the positive relationship between religiosity and OCD symptoms (e.g., Inozu et al., 2014; Williams et al, 2013) in student samples. These findings taken together with the current findings suggest that moral TAF may atemporally mediate the relationship between religiosity and obsessive thinking in community and student populations, but that these results may not translate to individuals with a diagnosis of OCD seeking treatment. Again, results of atemporal mediation analyses should be viewed cautiously because these results do not guarantee that the proposed mediators will be significant temporal mediators in the context of longitudinal research.

Given that the construct of scrupulosity is defined in the literature as pathological fear of God and fear of sin, it was hypothesized that scrupulosity would be positively associated with religious crisis (i.e., feelings of alienation from God and from religious community). This hypothesis was supported in both the nonclinical and clinical samples. However, given the correlational design of the study, causality cannot be established. Religious crisis may occur as a consequence of scrupulosity or may be an underlying cause of scrupulosity. Both variables may be related, but caused by another variable such as importance of thoughts (e.g., an individual experiencing OCD-related intrusive thoughts concerning incest may interpret these thoughts as being indicative of an underlying desire to engage in incest. This may in turn lead to fear that God will be displeased with one's thought content, feelings of alienation from God, and concerns that others of the same religious affiliation might negatively evaluate the individual if one's thoughts were known to them). Nonetheless, this suggests that individuals experiencing clinically significant OCD symptoms also experience religious crisis. As such, it may be

important to include interventions to address feelings of alienation from God and religious community (e.g., consultation/psychoeducation with religious authority figures) into OCD treatment for religious individuals to attempt to resolve feelings of alienation from God and religious community.

In terms of planned comparisons on variables of interest between religious groups in the nonclinical sample, it was hypothesized that Protestants would score significantly higher than Catholics on measures of moral-TAF, scrupulosity, obsessional thinking, and obsessional beliefs (importance/control of thoughts and responsibility/threat estimation). Protestants scored significantly higher than did Catholics on measures of moral-TAF (as found by Rassin & Koster, 2003), importance/control of thoughts, and responsibility/threat estimation. However, there were no significant differences in scores between Catholics and Protestants on measures of scrupulosity (contradicting the findings of Abramowitz et al., 2002) or obsessional thinking. As such, despite greater self-reported tendencies in Protestants to: a) interpret objectionable thoughts as being morally equivalent to committing objectionable actions, b) interpret objectionable thoughts as being reflective of one's true intentions or character and attempt to exert strong control over such thoughts, and, c) feel highly responsible for such thoughts and overestimate the threat of negative consequences arising as a result of such thoughts, this did not appear to extend to any differences in the relative degree of obsessional thinking or scrupulosity between Protestants and Catholics. Given that the current sample and samples used for prior research were not randomly selected, it is unclear whether these differences are merely descriptive of the respective samples or if these differences are descriptive of the respective populations.

For the nonclinical group, it was also hypothesized that Muslims would score higher than Christians on measures of moral-TAF, scrupulosity, obsessional thinking, and obsessional beliefs (importance/control of thoughts and responsibility/threat estimation). Muslims scored higher than all three Christian groups on measures of scrupulosity and responsibility/threat estimation. Muslims scored higher than Catholics *only* on measures of moral-TAF and importance/control of thoughts. There were no significant differences in the degree of obsessive thinking between the Muslim group and the three Christian groups and effect sizes were trivial to small. That is, Muslims self-reported a significantly greater tendency than all Christian groups to: a) feel highly responsibility for the content of their thoughts and any possible related negative outcomes, and, b) fear offending God or committing actions perceived to be sinful. Muslims self-reported a significantly greater tendency than Catholics, but not Christian Orthodox or Protestant Christians, to: a) interpret objectionable thoughts as being morally equivalent to committing objectionable actions, and, b) interpret objectionable thoughts as being reflective of one's true intentions or character and attempt to exert strong control over such thoughts. Despite these differences, there was no difference in the relative degree of obsessional thinking between the Muslim group and the three Christian groups in the current sample. This finding contradicts past research indicating greater obsessional thinking in Muslims as compared to Christians (Yorulmaz et al., 2009; Yorulmaz et al., 2010). However, it should be noted that both prior studies employed Turkish Muslim samples in comparison to Canadian Christian samples. Therefore, the difference observed between religious groups in these two studies may reflect differences in culture between Canadian and Turkish peoples rather than religious differences. Again, given that the current sample and samples used for prior research were not randomly

selected, it is unclear whether these differences are merely descriptive of the respective samples or if these differences are descriptive of the respective populations.

Although learning how a variety of religious groups compare, on average, on a variety of OCD-related constructs is a potentially interesting question from a purely investigative perspective, it may not be particularly important from a clinical perspective. It appears that a substantial amount of the early research in this literature focused on potential differences between religious groups on OCD-related cognitive factors. However, given advancements in the field more recently, it seems appropriate that this literature move on to more universal research questions that have the potential to illuminate relevant cognitive processes that apply to religious people regardless of their religious affiliation.

Unfortunately, the internal consistency of the Connectedness subscale of the ASPIRES was unacceptably low in the current nonclinical and clinical samples. As such, planned analyses concerning this subscale were not conducted as it would be unclear what the subscale in the current samples is measuring and interpretation of results would likely be meaningless. It appears that the Connectedness subscale of the ASPIRES has evidenced poor internal consistency reliability in some prior cross-cultural research and that this was attributed to cross-cultural differences in how participants understand or interpret item content (e.g., Piedmont & Leach, 2002; Piedmont, Werdel, & Fernando, 2009). It appears that the current study is the first research to use the ASPIRES with a Canadian sample. It may be that individual items of the connectedness subscale of the spiritual transcendence scale were poorly understood or interpreted in an idiosyncratic manner by participants comprising the current multicultural and religiously diverse Canadian sample.

Interpretation of Exploratory Analyses Results. Correlational analyses regarding likelihood-TAF and religiosity/spirituality measures of interest were exploratory given the mixed findings in prior research. The most frequent and large correlations occurred between Likelihood-TAF and religious crisis (RSS-RC) in both the nonclinical and clinical samples. That is, concern that thoughts about negative events occurring to oneself or others will result in the negative outcomes occurring was positively associated with feelings of alienation from God or feelings of disconnection from religious community. Correlations between Likelihood-TAF and other measures of religiosity/spirituality effect sizes tended to be small. This supports the results of prior research in the field that has most often found no significant relationship between religiosity/spirituality and likelihood TAF. Although causation cannot be established given the correlational design of the current research, the correlation between religious crisis and likelihood TAF suggests that religious individuals may expect negative outcomes via likelihood TAF and interpret them as punishment from God. This again suggests that religious individuals seeking treatment for OCD may benefit from psychoeducation/consultation with trusted religious authority figures to address these concerns.

Correlational analyses regarding OCD symptoms other than obsessional thinking (and OCD severity in the case of the clinical sample) and measures of religiosity/spirituality were also exploratory given the inconsistency of past research findings. For the clinical group, OCD symptoms severity (YBOCS) was significantly, negatively related to general spirituality (STS – Total). This relationship appeared to be driven primarily by a negative relationship of a large effect size with the Universality facet of spirituality (STS – U). That is, individuals with a diagnosis of OCD with a greater degree of self-reported belief in a common bond with humanity and an ordered universe also tended to have less severe OCD symptoms. There was also a

positive relationship between OCD symptom severity (YBOCS) and religious crisis. That is, individuals with a diagnosis of OCD with a greater degree of feelings of alienation from God and religious community tended to have more severe OCD symptoms. Of course, the directionality/causality of these relationships cannot be established given the correlational nature of the data. Relationships between OCD symptoms severity (YBOCS) and religious involvement (RSS – RI) and religious fundamentalism (RRFS) were all nonsignificant and effect sizes were uniformly small. In terms of clinical implications, this further suggests that religious individuals seeking treatment for OCD may benefit from the inclusion of psychoeducation/consultation with trusted religious authority figures to enhance spirituality (particularly the belief in a common bond with humanity and an ordered universe) and attempt to resolve feelings of alienation from God and religious community.

In the nonclinical sample, only religious crisis was significantly, positively associated with some compulsion subtype scales of the OCI-R. Other relationships with measures of religiosity/spirituality were nonsignificant and effect sizes were typically small. Relationships between subtypes of OCD symptoms (OCI-R-Total and all subscales including the Obsessing subscale) and all measures of religiosity/spirituality were nonsignificant in the clinical sample (which is not unexpected given the small sample size), but some effects were approaching medium size or were medium size. Religious crisis and religious fundamentalism were positively correlated with a few compulsion subtype scales of the OCI-R. Also, a few OCI-R compulsion subtype scales were negatively correlated with religious involvement and spirituality. This is an important finding in that it suggests that religiosity and spirituality are generally unrelated to OCD, but that religious individuals experiencing symptoms of OCD may experience unique difficulties with respect to their perception of their relationship with God and religious

community. This again suggests that religious individuals seeking treatment for OCD may benefit from the inclusion of psychoeducation/consultation with trusted religious authority figures to attempt to resolve feelings of alienation from God and religious community.

Recent research results continue to be mixed with respect to the relationship between religiosity and OCD symptoms. Research with undergraduate student samples using either ad-hoc, unvalidated, unidimensional measures of religiosity (e.g., Inozu et al, 2012; Inozu et al., 2014) or the *Santa Clara Strength of Religious Faith Questionnaire* (Plante & Boccaccini, 1997; which contains items that assess aspects of both religiosity and spirituality) as a measure of religiosity (e.g., Vassiliou, 2015; Williams et al., 2013) have tended to find a relationship between religiosity and OCD symptoms. However, recent research employing community samples of a variety of religious affiliations and using other measures of religiosity/spirituality either found no relationship between OCD symptoms and religiosity/spirituality (e.g., Dèttore et al., 2016), found a negative relationship between OCD symptoms and religiosity/spirituality (e.g., Witzig & Pollard, 2013), or found that OCD symptoms were related only to very specific religious practices (e.g., Himle et al., 2012 found that OCD symptoms were related to Catholic religious affiliation and engaging in prayer in stressful situations, but not to service attendance, general frequency of prayer, or engaging with religious media). As such, it appears that the literature examining the relationship between religiosity/spirituality and OCD continues to be plagued by measurement issues and lack of differentiation between religiosity and spirituality that likely explains the continued mixed findings. Given that the current research clearly differentiated between religiosity and spirituality using a measure that is likely the most well validated measure of religiosity and spirituality available currently (ASPIRES; Piedmont, 2004) and the most diverse sample with respect to religious affiliation to date, it is suggested that the

current results significantly clarify the true relationship between OCD symptoms, religiosity, and spirituality.

Strengths and Limitations. There are a number of key strengths and limitations to the current research. In terms of notable strengths, this appears to be the first study in this area of inquiry to incorporate such a wide variety of religious groups. Notably, there does not appear to be any prior research investigating the relationship between religiosity/spirituality and OCD in people who identify as Sikh, Hindu, Buddhist, Christian Orthodox, or Spiritual but not Religious. Given that the current study incorporated all of the major religious groups of Canada according to Census Canada data, the generalizability of the study results to the Canadian population is likely to be quite favourable in comparison to prior research. These results may inform future research questions concerning religious groups not previously studied. Another significant strength is that the current study is one of the few that has differentiated between spirituality and religiosity. These two constructs have often been confounded in prior research, limiting the interpretability of prior findings. Finally, the use of demonstrably reliable and valid measures of religiosity and spirituality in the current research is a significant improvement over past research that typically employed unidimensional measures of religiosity/spirituality that often appeared to be haphazardly constructed for specific studies, ignoring existing valid and reliable measures of these constructs. Hopefully, this will set a precedent for the use of reliable and valid measures that differentiate between religiosity and spirituality in future research.

In terms of limitations, the most significant limitation is likely the correlational design of the current research. Although a number of potentially important associations were identified, causality cannot be inferred without follow-up experimental research or longitudinal research exploring proposed causal mechanisms over time. Experimental research might employ random

assignment with hypothetical scenarios or using confederates designed to manipulate potential mechanisms of interest (e.g., moral TAF, importance/control of thoughts, responsibility/threat estimation) followed by measurement of outcomes of interest (e.g., frequency of intrusive thoughts, perceived responsibility, perceived threat of negative outcomes occurring following the experimental manipulation). For instance, the classic sentence paradigm could be used to induce TAF and then followed by providing participants with written materials designed to prime or alleviate importance of thoughts (e.g., experimental participants could be provided with a bogus empirical study briefing stating that thought content is highly predictive of actions. Control participants could receive a reading discussing the frequency of intrusive thoughts in the general population and reassuring participants that these thoughts likely do not reflect one's intentions or general character). Ratings could then be obtained from participants regarding frequency of intrusive thoughts, guilt, and other constructs of interest. If quasi-experimental research reveals significant effects, this may justify the cost and time demands of conducting longitudinal research that could identify possible risk factors for the development of OCD in religious people (e.g., importance/control of thoughts) and then follow participants over time to determine whether these factors predict the development of OCD symptoms in the future.

The current sample was moderately religious/spiritual, which may explain why some prior findings in the literature (e.g., the lack of significant relationship between religious fundamentalism and obsessive thinking in the current research) were not replicated with the current sample (although this might also be considered a strength in terms of clarifying whether previous findings translate to moderately religious/spiritual individuals).

Given that the current sample was not randomly selected, generalizations about differences between religious groups on key variables at the population level could not be made. Thus, differences in variables observed between religious groups may only describe the current sample rather than true differences in the population according to religious affiliation. It had been hoped that sufficient sampling would roughly equate most religious groups on variables of religiosity/spirituality in the nonclinical sample in order to facilitate analyses that could control for the influence of religiosity/spirituality on other variables of interest. Given that there were significant differences in religiosity/spirituality between groups, these analyses could not be conducted.

Future Directions. With respect to the nonclinical sample, the current research could be replicated with a number of modifications to clarify findings. Replicating the current nonclinical study with a national, random sample of participants from each of the religious groups could clarify whether there are true differences according to religious affiliation on key variables at the population level. However, as stated previously, how various religious groups differ on average on various OCD-related constructs may not be particularly important from a clinical perspective. It appears that a substantial amount of the early research in this literature focused on potential differences between religious groups on OCD-related cognitive factors. However, it seems appropriate that this literature now focus on more universal research questions that have the potential to illuminate cognitive processes that apply to religious people regardless of their religious affiliation. Also, recruiting comparison groups of highly religious/spiritual individuals (e.g., members of religious orders, clergy, theological students, etc.) from each of the religious groups could clarify whether there are differential effects in relationships between key variables (e.g., relationships between variables that are nonsignificant in moderately religious/spiritual

individuals but highly significant in highly religious/spiritual individuals) when comparing moderately religious/spiritual individuals to highly religious/spiritual individuals.

With respect to clinical research, although the current study was correlational, a number of potentially important variables were identified that could impact the treatment of OCD in religious individuals, particularly those with religious content to their symptoms. Spirituality appeared to be related to OCD symptom severity in those with a diagnosis of OCD. Also, religious crisis was related to Likelihood-TAF. Although these are only correlational findings and causation cannot be determined, these findings warrant further investigation. It has often been recommended in the literature that individuals with religious content to their OCD symptoms consult with religious professionals (e.g., clergy) in addition to standard treatment for OCD (i.e., Cognitive Behavioural Therapy incorporating Exposure with Response Prevention; ERP) to maximize treatment benefits and increase treatment adherence. However, it appears that this has rarely been formally studied beyond limited discussion of single cases. The current findings might warrant further investigation of an experimental nature of CBT for OCD. Individuals with a diagnosis of OCD with symptoms with religious content could be randomly assigned to receive either standard treatment or standard treatment including religious psychoeducation/consultation with religious professionals (e.g., clergy) designed to enhance participants' focus on spirituality and alleviate religious crisis. Treatment outcome could be compared between groups to determine whether the addition of psychoeducation/consultation regarding religiosity/spirituality with religious professionals results in improved outcomes for religious individuals seeking treatment for OCD.

There also appears to be a need for research to specify and test complex theoretical models (e.g., via structural equation modelling) incorporating a wide variety of OCD-related constructs (i.e., moral TAF, importance/control of thoughts, responsibility/threat estimation, generalized guilt) in religious and nonreligious individuals. Such research could follow these individuals over time to determine whether particular cognitive processes that are believed to be risk factors for the development of OCD predict the development of OCD symptoms. Similar research could also follow religious and nonreligious individuals with OCD over time after receiving psychological treatment to determine whether changes in particular cognitive processes believed to be associated with OCD predict the degree of symptom improvement and relapse rates.

Conclusion. The results of the current study indicate that, in moderately religious undergraduate students and community members from a wide variety of religious affiliations, religiosity/spirituality is generally not related to obsessions or compulsions. However, religious individuals experiencing obsessions and compulsions appear to experience feelings of alienation from God and from religious community.

In individuals diagnosed with OCD who are moderately religious, spirituality appears to be negatively related to OCD symptom severity. Likelihood-TAF (i.e., concerns that one's thoughts about negative outcomes occurring to oneself or others increases the likelihood that negative outcomes will occur) appears to be positively related to religious crisis, but not spirituality or religious involvement. Religiosity appears to be unrelated to obsessive thinking or compulsive behaviours.

Future research should investigate these variables in highly religious clinical and nonclinical samples to determine if results from the current study will be replicated in highly religious individuals. Quasi-experimental research might be conducted to manipulate proposed causal factors in obsessive thinking and compulsive behaviours in a laboratory context. This could clarify whether constructs identified as atemporal mediators in recent research and the current research are predictive of obsessive thinking and compulsive behaviours and determine whether the cost and time of longitudinal research would be justified. There also appears to be a need for research testing more complex theoretical models that incorporate a wide variety of OCD-related cognitive constructs and assess their influence in the development of OCD and changes following treatment for OCD over time. Future research should also likely focus more on constructs as they apply across a wide variety of religious affiliations rather than focusing on mean differences between religious groups on constructs of interest that may ultimately have little clinical utility. Future experimental research should also examine the effect of formal inclusion of religious psychoeducation/consultation (likely delivered by religious professionals) into standard OCD psychological treatment to enhance spirituality and reduce religious crisis in comparison to standard CBT for OCD.

Appendix A – Nonclinical Community Participants – Online Consent



Consent Agreement

An investigation of religiosity, spirituality, guilt, perfectionism, and intrusive thoughts

You are being asked to participate in a research study. Before you give your consent to be a volunteer, it is important that you read the following information to be sure you understand what you will be asked to do.

Investigator:

Leigh Henderson (PhD Candidate), Department of Psychology, Ryerson University

Supervisor:

Dr. Martin Antony PhD C. Psych, Department of Psychology, Ryerson University

Purpose of the Study:

This study is concerned with examining the relationship between religiosity, spirituality, guilt, perfectionism, and intrusive thoughts to determine which aspects of religiosity and spirituality may or may not be associated with intrusive thoughts, perfectionism, and generalized guilt.

Approximately 330 participants will be recruited.

Description of the Study:

Participation in this research will involve the completion of self-report questionnaires online, which will require up to 60 minutes of your time.

What is Experimental in this Study:

None of the procedures or questionnaires used in this study are experimental in nature. The only experimental aspect of this study is the gathering of information for the purpose of analysis.

Risks or Discomforts:

Answering questions regarding personal religiosity and spirituality, guilt, perfectionism, and intrusive thoughts may be uncomfortable for some individuals. You may choose not to answer particular questions that you do not wish to answer. You may also discontinue your participation, either temporarily or permanently, at any time. If you experience distress as a result of your participation in this study, you may contact the investigator for a list of available community-based counselling resources.

Benefits of the Study:

The results of this research will increase understanding regarding the relationship between religiosity/spirituality, guilt, perfectionism, and intrusive thoughts, which may facilitate the enhancement of psychological treatments for religious individuals experiencing anxiety difficulties. However, there is no guarantee that you will receive any benefits from participating in this study. A list of resources for addressing intrusive thoughts that are distressing may be provided to you following participation by contacting the investigator.

Confidentiality:

The data you provide is confidential. Data will be identified only by sequential participant numbers and in no way will anyone be able to match data to persons. When your survey responses are transferred to an electronic database for use in the planned analyses, these data sets will include only your participant number as an identifier. The database will be password protected. No unique identifiers will be included in any of the data sets used in the analyses of this project. Group information will be summarized for any presentation or publication of results and will not contain identifying information of individual participants. Data will be retained for 7 years subsequent to publication and then will be permanently destroyed. This online survey is hosted by Qualtrics, a websurvey company located in the USA and as such, is subject to U.S. laws; in particular, the US Patriot Act, which allows authorities access to the records of internet service providers. This survey or questionnaire does not ask for personal identifiers. However, if you choose to participate in the survey, you understand that your responses to the survey questions will be stored, and can be accessed, in the USA. The security and privacy policy for the websurvey company can be found at the following link: <http://www.qualtrics.com/security-statement/>.

Please note that IP addresses will be tracked to prevent multiple responses from the same IP address (i.e., prevent an individual participant from completing the survey multiple times). Once recruitment for the study is completed, IP addresses will be removed from the data.

Incentives to Participate:

You will receive a \$15 Starbucks electronic gift card delivered by email in exchange for your participation. You may choose not to answer particular questions or decide to discontinue your participation due to discomfort at any point and you will still receive full compensation.

Please note that remuneration will be provided for a maximum of ONE response from any particular IP address.

Voluntary Nature of Participation:

Participation in this study is voluntary. Your choice of whether or not to participate will not influence your future relations with Ryerson University. If you decide to participate, you may refuse to answer any particular question and you are free to withdraw your consent or stop your participation altogether at any time.

Questions about the Study:

If you have questions later about the research, you may contact:

Leigh Henderson

416-979-5000 ext. 2184 (after pressing '1')

email: leigh.henderson@psych.ryerson.ca

If you have questions regarding your rights as a human subject and participant in this study, you may contact the Ryerson University Research Ethics Board for information.

Lynn Lavallée, Ph.D., Associate Professor (lavallee@ryerson.ca)

Chair, Research Ethics Board

c/o Office of the Vice President, Research and Innovation

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**Debriefing: *An investigation of religiosity, spirituality, guilt, perfectionism,
and intrusive thoughts***

Thank you for your participation in the study. The purpose of this study is to examine the relationship between religiosity/spirituality and perfectionism, guilt, moral standards, and intrusive thoughts. Prior research has found a relationship between religiosity (i.e., practices such as religious meeting attendance or reading of sacred texts) and guilt, moral standards, and intrusive thoughts, but has not typically considered spirituality (i.e., experiencing something greater than oneself). Other prior research has also indicated that religiosity may serve as a protective factor against mental and physical illness and may lead to more positive treatment outcomes when mental or physical illness is experienced. The current research seeks to further explore and resolve this apparent contradiction in previous research and may serve to improve psychological treatments for religious individuals.

If you are currently experiencing psychological distress and would like to discuss your concerns with a mental health professional in a safe and confidential environment, please feel free to contact us for further information regarding self-help resources as well as available psychological services in the Toronto area.

Once again, we would like to thank you for your participation. Please feel free to contact us if you have any further questions pertaining to this research.

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If you have questions regarding your rights as a human subject and participant in this study, you may contact the Ryerson University Research Ethics Board for information.

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Appendix C – Nonclinical Qualtrics Community Participants – Online Consent



Consent Agreement

An investigation of religiosity, spirituality, guilt, perfectionism, and intrusive thoughts

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Leigh Henderson (PhD Candidate), Department of Psychology, Ryerson University

Supervisor:

Dr. Martin Antony PhD C. Psych, Department of Psychology, Ryerson University

Purpose of the Study:

This study is concerned with examining the relationship between religiosity, spirituality, guilt, perfectionism, and intrusive thoughts to determine which aspects of religiosity and spirituality may or may not be associated with intrusive thoughts, perfectionism, and generalized guilt.

Approximately 330 participants will be recruited.

Description of the Study:

Participation in this research will involve the completion of self-report questionnaires online, which will require up to 60 minutes of your time.

What is Experimental in this Study:

None of the procedures or questionnaires used in this study are experimental in nature. The only experimental aspect of this study is the gathering of information for the purpose of analysis.

Risks or Discomforts:

Answering questions regarding personal religiosity and spirituality, guilt, perfectionism, and intrusive thoughts may be uncomfortable for some individuals. You may choose not to answer particular questions that you do not wish to answer. You may also discontinue your participation, either temporarily or permanently, at any time. If you experience distress as a result of your participation in this study, you may contact the investigator for a list of available community-based counselling resources.

Benefits of the Study:

The results of this research will increase understanding regarding the relationship between religiosity/spirituality, guilt, perfectionism, and intrusive thoughts, which may facilitate the enhancement of psychological treatments for religious individuals experiencing anxiety difficulties. However, there is no guarantee that you will receive any benefits from participating in this study. A list of resources for addressing intrusive thoughts that are distressing may be provided to you following participation by contacting the investigator.

Confidentiality:

The data you provide is confidential. Data will be identified only by sequential participant numbers and in no way will anyone be able to match data to persons. When your survey responses are transferred to an electronic database for use in the planned analyses, these data sets will include only your participant number as an identifier. The database will be password protected. No unique identifiers will be included in any of the data sets used in the analyses of this project. Group information will be summarized for any presentation or publication of results and will not contain identifying information of individual participants. Data will be retained for 7 years subsequent to publication and then will be permanently destroyed. This online survey is hosted by Qualtrics, a websurvey company located in the USA and as such, is subject to U.S. laws; in particular, the US Patriot Act, which allows authorities access to the records of internet service providers. This survey or questionnaire does not ask for personal identifiers. However, if you choose to participate in the survey, you understand that your responses to the survey questions will be stored, and can be accessed, in the USA. The security and privacy policy for the websurvey company can be found at the following link: <http://www.qualtrics.com/security-statement/>.

Please note that IP addresses will be tracked to prevent multiple responses from the same IP address (i.e., prevent an individual participant from completing the survey multiple times). Once recruitment for the study is completed, IP addresses will be removed from the data.

Incentives to Participate:

You may choose not to answer particular questions due to discomfort and you will still receive full compensation.

Please note that remuneration will be provided for a maximum of ONE response from any particular IP address.

Voluntary Nature of Participation:

Participation in this study is voluntary. Your choice of whether or not to participate will not influence your future relations with Ryerson University. If you decide to participate, you are free to withdraw your consent and to stop your participation at any time.

At any point in the study, you may refuse to answer any particular question or stop participation altogether.

Questions about the Study:

If you have questions later about the research, you may contact:

Leigh Henderson

416-979-5000 ext. 2184 (after pressing '1')

email: leigh.henderson@psych.ryerson.ca

If you have questions regarding your rights as a human subject and participant in this study, you may contact the Ryerson University Research Ethics Board for information.

Lynn Lavallée, Ph.D., Associate Professor (lavallee@ryerson.ca)

Chair, Research Ethics Board

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**Debriefing: *An investigation of religiosity, spirituality, guilt, perfectionism,
and intrusive thoughts***

Thank you for your participation in the study. The purpose of this study is to examine the relationship between religiosity/spirituality and perfectionism, guilt, moral standards, and intrusive thoughts. Prior research has found a relationship between religiosity (i.e., practices such as religious meeting attendance or reading of sacred texts) and guilt, moral standards, and intrusive thoughts, but has not typically considered spirituality (i.e., experiencing something greater than oneself). Other prior research has also indicated that religiosity may serve as a protective factor against mental and physical illness and may lead to more positive treatment outcomes when mental or physical illness is experienced. The current research seeks to further explore and resolve this apparent contradiction in previous research and may serve to improve psychological treatments for religious individuals.

If you are currently experiencing psychological distress and would like to discuss your concerns with a mental health professional in a safe and confidential environment, please feel free to contact us for further information regarding self-help resources as well as available psychological services in your area.

Once again, we would like to thank you for your participation. Please feel free to contact us if you have any further questions pertaining to this research.

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Consent Agreement

An investigation of religiosity, spirituality, guilt, perfectionism, and intrusive thoughts

You are being asked to participate in a research study. Before you give your consent to be a volunteer, it is important that you read the following information to be sure you understand what you will be asked to do.

Investigator:

Leigh Henderson (PhD Candidate), Department of Psychology, Ryerson University

Supervisor:

Dr. Martin Antony PhD C. Psych, Department of Psychology, Ryerson University

Purpose of the Study:

This study is concerned with examining the relationship between religiosity, spirituality, guilt, perfectionism, and intrusive thoughts to determine which aspects of religiosity and spirituality may or may not be associated with intrusive thoughts, perfectionism, and generalized guilt.

Approximately 330 participants will be recruited from PSY 102/202 for the study.

Description of the Study:

Participation in this research will involve the completion of self-report questionnaires online, which will require approximately 60 minutes of your time.

What is Experimental in this Study:

None of the procedures or questionnaires used in this study are experimental in nature. The only experimental aspect of this study is the gathering of information for the purpose of analysis.

Risks or Discomforts:

Answering questions regarding personal religiosity and spirituality, guilt, perfectionism, and intrusive thoughts may be uncomfortable for some individuals. You may choose not to answer particular questions. You may also discontinue your participation, either temporarily or permanently, at any time. If you experience distress as a result of your participation in this study, we advise you that the university offers a confidential counselling service to all current students. Students may receive ten sessions free per academic year. The Centre for Student Development and Counselling (CSDC) is located in the lower level of Jorgenson Hall (JOR-07C) and will accept either walk-in or telephone calls (416-979-5195) to schedule an intake appointment with a counsellor.

Benefits of the Study:

The results of this research will increase understanding regarding the relationship between religiosity/spirituality, guilt, perfectionism, and intrusive thoughts, which may facilitate the enhancement of psychological treatments for religious individuals experiencing anxiety

difficulties. However, there is no guarantee that you will receive any benefits from participating in this study. A list of resources for addressing intrusive thoughts that are distressing may be provided to you following participation by contacting the investigator.

Confidentiality:

The data you provide is confidential. Data will be identified *only* by sequential participant numbers and in no way will anyone be able to match data to persons. When your survey responses are transferred to an electronic database for use in the planned analyses, these data sets will include only your participant number as an identifier. The database will be password protected. No unique identifiers will be included in any of the data sets used in the analyses of this project. Group information will be summarized for any presentation or publication of results and will not contain identifying information of individual participants. Data will be retained for 7 years subsequent to publication and then will be permanently destroyed. This online survey is hosted by Qualtrics, a websurvey company located in the USA and as such, is subject to U.S. laws; in particular, the US Patriot Act, which allows authorities access to the records of internet service providers. This survey or questionnaire does not ask for personal identifiers or any information that may be used to identify you. However, if you choose to participate in the survey, you understand that your responses to the survey questions will be stored, and can be accessed, in the USA. The security and privacy policy for the websurvey company can be found at the following link: <http://www.qualtrics.com/security-statement/>.

Incentives to Participate

You will receive course credit in exchange for your participation. You may choose not to answer particular questions or decide to discontinue your participation due to discomfort at any point and you will still receive full credit.

If you are uncomfortable with the data you provide being used for research, you may also choose to complete a “walk through” of the study, wherein your responses are not collected. You will still receive full credit. Please contact the researcher via email for further information if you wish to complete a “walk through.”

Voluntary Nature of Participation:

Participation in this study is voluntary. Your choice of whether or not to participate will not influence your future relations with Ryerson University. If you decide to participate, you are free to withdraw your consent and to stop your participation at any time without penalty or loss of benefits to which you are allowed.

At any particular point, you may refuse to answer any particular question or stop participation altogether.

Questions about the Study:

If you have questions later about the research, you may contact:

Leigh Henderson

416-979-5000 ext. 2184 (after pressing '1')

email: leigh.henderson@psych.ryerson.ca

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Debriefing: *An investigation of religiosity, spirituality, guilt, perfectionism, and intrusive thoughts*

Thank you for your participation in the study. The purpose of this study is to examine the relationship between religiosity/spirituality and perfectionism, guilt, moral standards, and intrusive thoughts. Prior research has found a relationship between religiosity (i.e., practices such as religious meeting attendance or reading of sacred texts) and guilt, moral standards, and intrusive thoughts, but has not typically considered spirituality (i.e., experiencing something greater than oneself). Other prior research has also indicated that religiosity may serve as a protective factor against mental and physical illness and may lead to more positive treatment outcomes when mental or physical illness is experienced. The current research seeks to further explore and resolve this apparent contradiction in previous research and may serve to improve psychological treatments for religious individuals.

If you are currently experiencing psychological distress and would like to discuss your concerns in a safe and confidential environment, please be aware that the Ryerson Centre for Student Development and Counselling (CSDC) is a free resource located on campus. Staff at the Counselling Centre provides support and guidance for a range of concerns including anxiety, low mood, and academic difficulties. The contact information for the CSDC is as follows:

Centre for Student Development and Counselling

Website: <http://www.ryerson.ca/counselling/index.html>

Email: csdc@ryerson.ca

Phone: 416-979-5195

Location: JOR-07C (Lower level of Jorgensen Hall, 380 Victoria Street)

Once again, we would like to thank you for your participation. Please feel free to contact us if you have any further questions pertaining to this research.

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Psychology PhD Student

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Dr. Martin Antony

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Appendix G – Clinical Participants – Online Consent



PARTICIPANT INFORMATION SHEET

Title of Study: The Relationship Between Religiosity, Spirituality, and Obsessive-Compulsive Disorder

Locally Responsible Investigator: Dr. Randi McCabe

Principal Investigator: Mr. Leigh Henderson

Co-Investigators: Dr. Martin M. Antony, Dr. Naomi Koerner, and Dr. Karen Rowa

St. Joseph's Healthcare, Hamilton

Department of Psychiatry and Behavioural Neurosciences

Anxiety Treatment and Research Centre

You are being invited to participate in a research study conducted by Mr. Leigh Henderson, Dr. Randi McCabe, Dr. Martin Antony, Dr. Naomi Koerner, and Dr. Karen Rowa because you have been previously diagnosed with Obsessive-Compulsive Disorder.

In order to decide whether or not you want to be a part of this research study, you should understand what is involved and the potential risks and benefits. This form gives detailed information about the research study that will be discussed with you. Once you understand the study, you will be asked to sign this form if you wish to participate. Please take your time to

make your decision. Feel free to discuss it with your friends and family, or your family physician.

WHY IS THIS RESEARCH BEING DONE?

Research has demonstrated a relationship between religiosity and thinking patterns often associated with obsessive-compulsive disorder. However, research has also demonstrated that religiosity may be a protective factor against mental illness and that people who are religious and experience mental illness may have a better outcome from psychotherapy than those who are not religious. This apparent contradiction in the literature needs to be addressed.

WHAT IS THE PURPOSE OF THIS STUDY?

Past research has often measured religiosity inadequately or has not differentiated between religiosity (i.e., religious practices such as reading of religious texts or attending religious services) and spirituality (i.e., a subjective experience of connecting with something greater than oneself). Considering the apparent contradictions in the research literature, the current research proposes to adequately measure religiosity and spirituality to determine which specific factors of religiosity and spirituality are associated with thought patterns of OCD and which aspects are unrelated and may function as protective factors against mental illness.

WHAT WILL MY RESPONSIBILITIES BE IF I TAKE PART IN THE STUDY?

If you volunteer to participate in this study, you will be asked to complete a package of questionnaires online via computer. The questionnaire package will take approximately 60 minutes to complete.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?

Some participants may feel uncomfortable answering questionnaires about their psychological symptoms and their religious beliefs. You are free to choose not to answer any question, without penalty.

HOW MANY PEOPLE WILL BE IN THIS STUDY?

A total of 30 participants will be recruited for this study.

WHAT ARE THE POSSIBLE BENEFITS FOR ME AND/OR FOR SOCIETY?

We cannot promise any personal benefits to you from your participation in this study. However, the information we obtain from this study may help us to provide better treatments in the future for patients with anxiety.

IF I DO NOT WANT TO TAKE PART IN THE STUDY, ARE THERE OTHER CHOICES?

It is important for you to know that you can choose not to take part in the study and continue on just as you do now. Your health care provider will discuss this alternative with you. Choosing not to participate in this study will in no way affect your care or treatment now or your future access to treatment.

WHAT INFORMATION WILL BE KEPT PRIVATE?

Your data will not be shared with anyone except with your consent or as required by law. All personal information such as your name, address, phone number, OHIP number, family physician's name will be removed from the data and will be replaced with a number. A list linking the number with your name will be kept in a secure place, separate from your file. The data, with identifying information removed will be securely stored in a locked office in the research laboratory.

For the purposes of ensuring the proper monitoring of the research study, it is possible that a member of the Hamilton Integrated Research Ethics Board (HIREB) may consult your research data and medical records. However, no records that identify you by name or initials will be allowed to leave the hospital. By signing this consent form, you or your legally acceptable representative authorize such access.

If you are admitted to another hospital for any reason or die from natural or other causes while participating in this study, your medical records will be requested in order to collect information relevant to your study participation. By signing this consent form, you are allowing such access.

If the results of the study are published, your name will not be used and no information that discloses your identity will be released or published without your specific consent to the disclosure. However, it is important to note that this original signed consent form and the data that follows, may be included in your health record.

CAN PARTICIPATION IN THE STUDY END EARLY?

If you volunteer to be in this study, you may withdraw at any time and this will in no way affect the quality of care you receive at this institution. You have the option of removing your data from the study. You may also refuse to answer any questions you don't want to answer. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

WILL I BE PAID TO PARTICIPATE IN THIS STUDY?

You will be given a \$25 gift card (Chapter's or Starbucks - your choice) delivered via email following questionnaire completion as a token of our appreciation.

WILL THERE BE ANY COSTS?

Your participation in this research project will not involve any additional costs to you or your health care insurer.

WHAT HAPPENS IF I HAVE A RESEARCH-RELATED INJURY?

If you are injured as a direct result of taking part in this study, all necessary medical treatment will be made available to you at no cost. Financial compensation for such things as lost wages, disability or discomfort due to this type of injury is not routinely available. However, if you sign this consent form it does not mean that you waive any legal rights you may have under the law, nor does it mean that you are releasing the investigator(s) and/or institution(s) from their legal and professional responsibilities.

IF I HAVE ANY QUESTIONS OR PROBLEMS, WHOM CAN I CALL?

If you have any questions about the research now or later, or if you think you have a research-related injury, please contact Mr. Leigh Henderson or Dr. Randi McCabe.

CONTACT INFORMATION:

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Appendix H – Clinical Participants – Online Debriefing



Debriefing: The Relationship Between Religiosity, Spirituality, and Obsessive-Compulsive Disorder

Thank you for your participation in the study. The purpose of this study is to examine the relationship between religiosity/spirituality and OCD symptoms, guilt, moral standards, and perfectionism. Prior research has found a relationship between religiosity (i.e., practices such as religious meeting attendance or reading of sacred texts) and OCD symptoms, guilt, and moral standards, but has not typically considered spirituality (i.e., experiencing something greater than oneself). Other prior research has also indicated that religiosity may serve as a protective factor against mental and physical illness and may lead to more positive treatment outcomes when mental or physical illness is experienced. The current research seeks to further explore and resolve this apparent contradiction in previous research and may serve to improve psychological treatments for religious individuals with OCD.

If you are currently experiencing psychological distress and would like to discuss your concerns with a mental health professional in a safe and confidential environment, please feel free to contact us for further information regarding self-help resources as well as available psychological services in the Hamilton area.

Once again, we would like to thank you for your participation. Please feel free to contact us if you have any further questions pertaining to this research.

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Endnotes

¹ The ATRC merged with another outpatient clinic in Hamilton during data collection for the current study. Prior to the merger, the standard diagnostic interview at the ATRC was the *SCID-IV*. However, some clinicians who joined the ATRC use the *MINI* diagnostic interview rather than the *SCID-IV*.

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