

**INVESTIGATING RELIGIOUS ORIENTATION AND THE  
ATTRIBUTION MODEL OF MENTAL ILLNESS STIGMA**

by

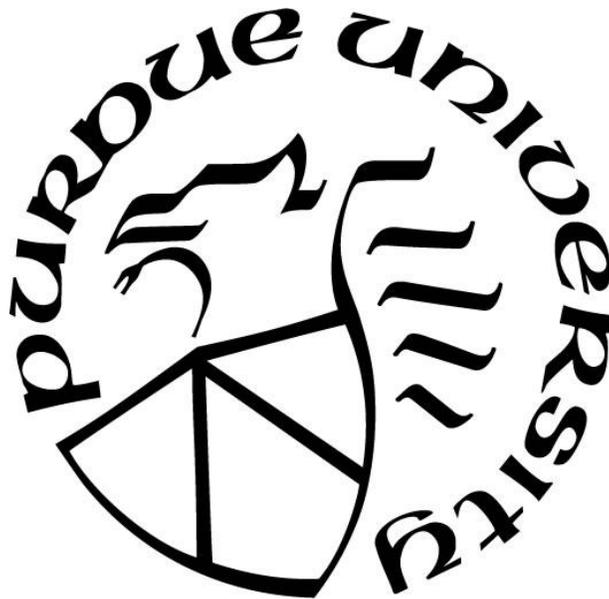
**Annalee V. Johnson-Kwochka**

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**THE PURDUE UNIVERSITY GRADUATE SCHOOL  
STATEMENT OF COMMITTEE APPROVAL**

Dr. Michelle P. Salyers, Chair

Department of Psychological Sciences

Dr. Kyle Minor

Department of Psychological Sciences

Dr. Leslie Ashburn-Nardo

Department of Psychological Sciences

Dr. Laura Stull

Department of Psychology, Anderson University

**Approved by:**

Dr. Nicholas J. Grahame

Head of the Graduate Program

*For my family*

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## ABSTRACT

Author: Johnson-Kwochka, Annalee, V. MS

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Title: Investigating Religious Orientation and the Attribution Model of Mental Illness Stigma.

Committee Chair: Michelle Salyers

**Objectives:** The Attribution Model of mental illness stigma posits that attributions about the causes and controllability of mental illness contribute to prejudicial emotional reactions, which in turn may lead to discriminatory behaviors towards people with mental illnesses. Given that people make different assumptions about different mental illnesses, if this model is correct, it suggests that specific diagnoses would elicit different types of stigma. Another important, but unexamined, predictor is extrinsic religious orientation, which correlates positively with other types of prejudice and may predict higher levels of mental illness stigma. The purpose of this study was to test the Attribution Model of stigma and examine the relationships between diagnosis, religious orientation, and stigma.

**Methods:** Participants (n = 334) were recruited via Amazon Mechanical Turk, randomized to read one of three vignettes about a person with a mental illness (i.e., schizophrenia, anorexia nervosa, depression), and completed measures of mental illness stigma, religious orientation and affiliation, familiarity with mental illness, and authoritarianism. Using latent variable path analysis, analysis of covariance, and multiple regression analyses, relationships in the Attribution Model of mental illness stigma were assessed, as well as the impact of diagnosis and extrinsic religiosity on specific aspects of stigma as measured by the Attribution Questionnaire-27 subscales (i.e., blame, anger, pity, danger/fear, avoidance, segregation, and coercion).

**Results:** Assessment of the Attribution Model indicated moderate overall model fit after respecification. Path coefficients indicated strong relationships between variables that were generally consistent with paths predicted by the model. One notable exception was that feelings of pity were not associated with greater helping behaviors. Analysis of covariance suggested that diagnosis was a key predictor of stigma, and that schizophrenia was the most stigmatized. Multiple regression analyses revealed that extrinsic religiosity was also an important predictor of stigma; extrinsic religiosity appeared to increase certain types of stigma, and moderate the relationship between diagnosis and stigma overall.

**Discussion:** Although the respecified Attribution Model fit the data fairly well, the findings suggest that either the scale or the model would benefit from further refinement. Results support prior evidence that severe mental illnesses like schizophrenia are more stigmatized than other diagnoses. Extrinsic religiosity was also predictive of increased stigma, both directly and indirectly. As a moderator, extrinsic religiosity may decrease the impact of diagnosis on stigma, raising stigma for diagnoses perceived as more “controllable” (i.e., anorexia nervosa, depression) such that levels were similar to schizophrenia. Limitations and suggestions for future research are discussed.

## INTRODUCTION

Since the 1960's, mental health service providers, researchers, and advocates have attempted to educate and engage the American public in an effort to eliminate stereotypes about and discrimination against people with mental illness (Goffman, 1986). Their work has produced numerous nonprofit organizations, anti-stigma campaigns, and a significant body of research. As a result of these efforts, members of the American public today are frequently exposed to depictions of people living with specific mental illnesses in media and popular culture (although these representations are not always accurate), and access to mental health care in the United States has somewhat improved (Hinshaw & Cicchetti, 2000; Mark, Levit, Vandivort-Warren, Buck, & Coffey, 2011; Phelan, Link, Stueve, & Pescosolido, 2000). Still, people diagnosed with mental illnesses today experience stigma and social rejection in a diverse range of environments, including work, daily social interaction, and healthcare (Cechnicki, Angermeyer, & Bielańska, 2011; Penn, Kommana, Mansfield, & Link, 1999; Pescosolido, Medina, Martin, & Long, 2013; Teachman, Wilson, & Komarovskaya, 2006).

When we write about public stigma associated with mental illness, it is essential to recognize that stereotypes and discrimination differ according to the specific diagnosis in question. Research indicates that assumptions about people diagnosed with anorexia nervosa differ significantly from assumptions about people with schizophrenia, for example (Crisafulli, Thompson-Brenner, Franko, Eddy, & Herzog, 2010). People diagnosed with severe mental illnesses such as schizophrenia or bipolar disorder also appear to elicit the greatest quantity of stigma, as compared to more common illnesses like major depressive disorder (Corrigan et al., 2003; Corrigan et al., 2001; Crisp et al., 2000; Loch et al., 2014; Mestdagh & Hansen, 2013; Stewart, Keel, & Schiavo, 2006). The source of differences in stigma by diagnosis may be

explained by differential attributions that members of the public make about certain mental illness diagnoses, as explained in the Attribution Model of stigma (Corrigan et al., 2003).

One area of research in public stigma has examined how stereotypes about mental illness vary across demographic factors and cultural groups (e.g., race, gender, familiarity with mental illness, professional training) (Anglin, Link, & Phelan, 2006; Rao, Feinglass, & Corrigan, 2007). Strategies for ameliorating public stigma have included tailoring anti-stigma interventions to specific groups, e.g., criminal justice professionals or students in professional programs (Corrigan, Morris, Michaels, Rafacz, & Rüsche, 2012). It is possible that modifying anti-stigma interventions according to the specific beliefs of certain groups would improve the outcomes of anti-stigma campaigns. Among these groups might be religiously-affiliated people; existing research suggests that Christian religious beliefs are associated with negative beliefs about mental illnesses (Wesselmann & Graziano, 2010). Religious belief and adherence to religion varies widely, even among American Christians, and it is possible that individuals' motivation to be involved with organized religion has a relationship to their endorsement of public stigma. For example, among American Christians, extrinsic religious orientation (a type of motivation) has previously been correlated with prejudice toward racial, sexual, and other minorities (Johnson, Rowatt, & LaBouff, 2012). Below, I review current research on public mental illness stigma, the Attribution Model, and ways in which diagnosis and religious orientation might affect public mental illness stigma.

### **Mental illness stigma**

Stigma can be defined broadly as composed of four co-occurring constructs: 1) the labeling of an out-group, 2) endorsement of stereotypes and negative attributions about that group, 3) perceived separation and difference from the now-stigmatized group, and 4) this

labeling and separation then leads to status loss and discrimination (Link & Phelan, 2001).

Mental illness stigma is multidimensional and includes public stigma, self-stigma, and courtesy stigma. This research will address public stigma, defined as the prejudice against mental illness and discrimination against people with mental illnesses endorsed by the general population, which in turn affects an individual person (Corrigan, Markowitz, Watson, Rowan, & Kubiak, 2003). Public stigma itself is multifaceted. The endorsement of specific stereotypes and negative attributions about mental illness depend upon the mental illness diagnosis in question and may include assumptions about dangerousness or responsibility for one's illness.

Corrigan and colleagues (2003) have developed the Attribution Model of mental illness stigma, one of the most-researched conceptualizations of the causes of mental illness stigma. They postulate that attributions about the causes, controllability, and dangerousness of a mental illness influence the public's beliefs about personal responsibility for an illness, which then influence emotional responses and discriminatory or helping behavior; see Figure 1 for a hypothesized model of these relationships. Studies examining the Attribution Model find that beliefs about the cause of mental illness and perceptions of dangerousness predict discriminatory responses (e.g., the unwillingness to help or hire those with mental illnesses) and support for coercive treatment in institutional settings (Corrigan et al., 2003; Lee et al., 2014). Therefore, in the current study, I hypothesize that increasing perceptions of dangerousness will lead to greater fear, which will in turn lead to decreases in desires to help people with mental illness, increasing avoidance behavior, and increasing support for coercive treatment. Corrigan and colleagues (2003) also find that beliefs about controllability impact beliefs about a person's responsibility for their mental illness (e.g., if someone is believed to be more in control of their mental illness, they are also held more responsible for the symptoms). For these reasons, in the current study I

hypothesize that perceptions of greater blame (i.e., perceiving that the person in the vignette is to blame for their own illness) will lead to decreases in pity, and corresponding increases in anger and fear, which will in turn lead to increasing support social segregation from people with mental illnesses.

### **Factors that predict stigma**

Given the centrality of stereotypes about mental illness in the Attribution Model, it is likely that people will endorse different levels and kinds of stigma when confronted with different types of mental illnesses. In particular, severe mental illnesses (mental disorders that have a substantial impact on daily functioning and/or lead to hospitalization, most often including schizophrenia and bipolar disorders) appear to be most subject to public stigma (Corrigan et al., 2003; Corrigan et al., 2001; Crisp et al., 2000; Loch et al., 2014; Mestdagh & Hansen, 2013; Stewart, Keel, & Schiavo, 2006). In the current study, I hypothesize that schizophrenia will elicit greater perceptions of dangerousness and subsequent fear, leading to greater avoidance of and desire for segregation from people with schizophrenia. In measures of overall stigma, I hypothesize that schizophrenia will be more highly stigmatized than anorexia nervosa, which will be more highly stigmatized than depression. Supporting my hypotheses, previous research has found that people with schizophrenia are generally perceived as more dangerous than people with other mental illnesses, particularly diagnoses that do not involve the experience of psychosis (Loch et al., 2014). Other research has shown that schizophrenia elicits more negative opinions than depression, eating disorders, or panic attacks, and that the public believes that people with schizophrenia are less likely to recover from their illness than people with other mental illnesses (Crisp et al., 2000). Evidence also suggests that people with schizophrenia are generally not perceived as in control of or responsible for their illnesses. On

the other hand, people with anorexia nervosa or depression are generally perceived as less dangerous, but more responsible for their own illnesses (Crisafulli et al., 2010; Stewart, Schiavo, Herzog, & Franko, 2008). Stewart and colleagues (2006) examined public perceptions of individuals diagnosed with anorexia nervosa as compared to people diagnosed with other mental or non-mental disorders. Their research found that participants anticipated more discomfort interacting with a person with schizophrenia as compared to people with anorexia nervosa, but that participants believed the person with anorexia nervosa was “better able to pull him/herself together if he/she wanted to,” was more to blame for his/her condition, and was acting this way for attention (Stewart et al., 2006). Given this research, in the current study I hypothesize that anorexia nervosa will elicit the greatest blame, leading to subsequent feelings of anger and endorsement of coercive treatment for their illness. On the other hand, given that participants may be most familiar with depression (in comparison with the other two mental illnesses) and familiarity with mental illness generally decreases stigma (Angermeyer, Matschinger, & Corrigan, 2004), I hypothesize that depression will elicit the greatest sense of pity and desire to help.

People from different cultural backgrounds appear to endorse different levels and types of public mental illness stigma. In the United States, Rao and colleagues (2007) have found that African Americans and Asian Americans are more likely than Caucasians to perceive people with mental illness as dangerous and tend to want more distance from them. Other research finds that although African Americans perceive people with mental illnesses as more likely to be dangerous, African Americans are also less likely to believe that individuals with mental illness should be blamed or punished for violent behavior (Anglin et al., 2006). Some researchers have also found evidence of gender differences in public mental illness stigma, but findings are not

consistent. Corrigan and colleagues (2003) found that males were more likely to believe that a hypothetical person with schizophrenia was “responsible” for his illness, and expressed less pity and more anger toward the hypothetical person with schizophrenia. However, in a large British survey of public opinions about people with one of 7 different mental illnesses, researchers found no significant differences between the opinions of men and women (Crisp et al., 2000). Finally, a broad body of previous research indicates that prejudicial attitudes about persons with mental illness are inversely related to familiarity, or knowledge and experience, with serious mental illness (Corrigan, Green, Lundin, Kubiak, & Penn, 2001; Holmes, Corrigan, Williams, Canar, & Kubiak, 1999; Penn et al., 1994). People who know someone with a severe mental illness may be less likely to perceive people with mental illnesses as dangerous, and may not desire as much social distance from people with mental illness (Penn et al., 1994). Race, gender, and familiarity may be important factors to consider when examining predictors of stigma and will be examined as potential confounds in the current study.

## **Religiosity**

### **Ways of measuring religiosity**

In contemporary research on psychology and religion, the terms “religion” and “religiosity” (synonymous with “religiousness”) refer primarily to fixed systems of beliefs and institutional and ideological commitments, e.g., membership in a particular Christian denomination, and the strength of participants’ belief or involvement in religion (Hill & Pargament, 2008). In contrast, “spirituality” is generally understood to refer to “humans’ search for meaning in life,” and while it may be related to religion for certain individuals (i.e., people who finding meaning in life through membership in a particular organized religion), spirituality may be unrelated to religion for other individuals (e.g., atheists) (Tanyi, 2002). In the present

research I focus on religiosity, because adherence to specific belief systems and membership in particular communities may be related to beliefs about members of stigmatized groups, particularly those with mental illnesses.

Religiosity can be conceptualized along a number of domains, including affiliation with specific, organized religious belief systems, commitment to tenets of religious belief, and motivation to be involved with religious communities. Many researchers examining the link between religion and health have used global measures of religiosity, e.g., asking participants to identify their religious affiliation (Hill & Edwards, 2013). Perhaps the simplest commonly-used measure of religiosity is a single-item questionnaire about how often participants attend religious services (Hill & Pargament, 2008). Researchers have also defined and measured religiosity as participants' perceived "closeness to God," as their level of "religious commitment" (the degree to which a person adheres to their religious values and uses them in daily living), or as their motivation to be involved with religion – their "religious orientation" (Worthington et al., 2003; Zwingmann, Klein, & Büssing, 2011). Religious orientation is often used as an indicator of the intensity or centrality of religious belief in a person's life, and helps capture the pervasiveness of religious influence in daily life (Williams, 2003). It is important to note that there is broad disagreement in the research literature about the best way to measure the importance of religion in daily life, or even about which aspects of religious belief (e.g., faith, participation in community, tradition) are most relevant to the research questions at hand. Below, and in the present research, I focus on religious orientation.

### **Religious orientation**

Allport and Ross (1967) developed the concept of "religious orientation" in the context of measuring racial prejudice among American Christians. A person's religious orientation

indicates the motivating forces behind their involvement in religion. Allport and Ross initially proposed two opposing poles of religious orientation: extrinsic religiosity and intrinsic religiosity. People with a highly extrinsic religious orientation see religion or membership in a religious community as a means to ends other than faith - that is, they find religion useful to provide security, solace, sociability, status, or self-justification. Conversely, people with a highly intrinsic religious orientation see religion as a means to express faith; these individuals internalize their chosen creed and endeavor to follow it fully. Today, researchers typically understand intrinsic and extrinsic orientations not as opposite poles but as differing dimensions, thus, extrinsic and intrinsic religiosity are not mutually exclusive; someone could be highly internally and externally oriented toward religion, or they could be low on both dimensions (e.g., if they were not religious). Religious orientation (as opposed to other measures of religiosity, e.g., closeness to God) may have an important theoretical relationship to stigma because it partly attempts to capture the social dimension of religious belief. For example, a highly extrinsic orientation to religion may indicate a desire to participate in communities that espouse a rigid set of social norms. Therefore, in these tight-knit communities, people who violate social norms (e.g., by exhibiting symptoms of mental illness) may be particularly ostracized.

### ***Extrinsic religious orientation and prejudice***

Allport and Ross (1967) found that participants with a more extrinsic orientation toward religion demonstrated greater racial prejudice than people with a more intrinsic orientation. Since then, a number of studies have examined the correlates of religious orientation (Barrett, Patock-Peckham, Hutchinson, & Nagoshi, 2005; Mak & Tsang, 2008; Maltby & Day, 2000; Sciarra & Gushue, 2003). A meta-analysis of religious orientation found that extrinsic religiosity was associated with negative characteristics (e.g., racial prejudice) and was not related to measures of

religious commitment; Intrinsic religiosity demonstrated no correlation with prejudice (Donahue, 1985). In a more recent study, intrinsic religiosity was similarly found to be unrelated to discriminatory attitudes toward sexual or racial minorities (Kirkpatrick, 1993). Extrinsic religious orientation has been positively correlated with covert prejudicial beliefs towards members of minority racial groups, women, members of lower socioeconomic classes, and sexual minorities (Chambers, 2017). As noted by Donahue (1985), the vast majority of research on religion and prejudice has been conducted in primarily Christian, largely protestant populations (Flere & Lavrič, 2007).

### ***Religious orientation and stigma***

Unfortunately, there is little existing literature examining the relationship between religious orientation or religious affiliation and public stigma related to mental illness. Qualitative research with religious leaders (primarily Christian clergy) has indicated that many religious leaders espouse a mix of secular and religiously-based explanations and beliefs about mental illness, and that clergy often recognize a need to refer their congregants to mental health professionals (Conley & Wolfe, 2011; Little, 2013). However, these studies are limited by small sample sizes and snowball sampling methods, so it is possible that researchers are interviewing a biased sample. Literature on mental illness stigma among non-Christian religious groups in the United States is even more limited. In the Muslim-American community, existing literature suggests strong stigma against people with mental illness, particularly because of concerns with family social standing; disclosure of mental illness is considered “shameful” (Ciftci, 2012). Qualitative research with Pakistani Muslim and Afro-Caribbean Christian groups suggests that community stigma associated with mental illness has led to a preference for private coping

strategies (rather than seeking mental health services) among members of these groups (Cinnirella & Loewenthal, 1999).

The strongest evidence for a link between religion and mental illness stigma comes from two exploratory studies on Christian religious beliefs about mental illness. Wesselmann and Graziano (2010) examined how Christian religious beliefs affect perceptions of people with mental illness. Their data suggests that Christian religious beliefs about mental illness focus on beliefs about sin and morality (e.g., “Moral weakness is the main cause of mental illness”) and spiritually-oriented causes and treatments (e.g., “Persons suffering from mental illnesses are being tormented by the devil”). Christian religious beliefs about mental illness were associated with negative attitudes about mental illness (e.g., “Many people with mental illnesses simply refuse to take responsibility for their lives”) and to other individual differences that predict prejudice toward stigmatized groups (e.g., religious fundamentalism, right wing authoritarianism). In a later study, Wesselmann and colleagues (2015) investigated how Christian religious beliefs about mental illness influenced the types of social support or treatment that individuals would be willing to endorse for people with mental illness. Their analysis found that a Christian belief that mental illness is caused by immorality and sinfulness and that mental illnesses have spiritual treatments predicted a preference for endorsing spiritual social support, e.g., praying together, recommending that a person see a spiritual leader for counseling (as opposed to recommending “secular” treatments like medication). Additionally, Christians who identified themselves as evangelical (as opposed to Roman Catholic or mainline Protestant) were more likely to believe that mental illnesses have spiritual causes and treatments, and were more likely to endorse a preference for spiritual social supports. Given that many of the religious beliefs about mental illness (e.g., “many people with mental illnesses simply refuse to take

responsibility for their lives,” “moral weakness is the main cause of mental illness”) had a central theme of controllability, in the current study I hypothesize that illnesses that are generally perceived to be more controllable (i.e., anorexia nervosa) would elicit more stigma from people with a highly extrinsic orientation to religion.

### **The current study**

The current study has three primary aims. In aim one, I examine the Attribution Model of stigma via a confirmatory factor analysis of the attribution questionnaire used to measure mental illness stigma and a latent variable path analysis of the structural model suggested by the Attribution Model. See Figure 1 for a hypothesized model of these relationships, and Table 1 for a comprehensive list of my hypotheses across all aims.

Aim two has two parts, in which I assess the impact of two important predictors of public stigma: 1) diagnosis and 2) religious orientation. For part one, given evidence that public beliefs about people with mental illnesses change according to the specific diagnosis, participants randomized to read vignettes based on diagnoses should have differing levels of stigma. For diagnoses perceived as more dangerous, I hypothesize that fear, avoidance, and segregation will also be elevated. For diagnoses perceived as more controllable or more to blame, I hypothesize that coercion and anger will also be elevated. While researchers have examined the specific stereotypes associated with particular diagnoses, few have compared overall levels of mental illness stigma across different diagnoses (Anderson, Jeon, Blenner, & Wiener, 2015; Corker et al., 2015; Krendl & Freeman, 2017) and none have examined all facets of the Attribution Model across different diagnoses.

In the second part of aim two, I assess the role of extrinsic religiosity as a possible moderator of the relationship between specific diagnoses and different aspects of mental health

stigma. Overall, I hypothesize that illnesses that are perceived as more controllable (i.e., anorexia nervosa) will elicit greater stigma from people who have a highly extrinsic orientation towards religion. I also hypothesize that extrinsic religiosity will have a main effect on mental illness stigma, in that participants with higher extrinsic religiosity will report higher levels stigma across stigma subscales and diagnoses. See Figure 2 for a diagram of the hypothesized moderation.

Aim three is exploratory, to further understand the role of religion in stigma. Research on intrinsic religiosity and religious coping suggests a positive relationship between intrinsic religiosity and well-being (Hackney & Sanders, 2003). I examine the possible relationships between intrinsic religiosity, extrinsic religiosity, and mental illness stigma using moderated moderation, that is, does high intrinsic religiosity moderate the hypothesized moderating effect of high extrinsic religiosity on the relationship between diagnosis and mental illness stigma? See Figure 3 for a diagram of the hypothesized moderated moderation. In addition, given that previous research has focused primarily on Christian religions, and some limited research has shown positive correlations between religious affiliation and prejudice (Chambers, 2017; Flere & Lavrič, 2007), I will examine the relationship between religious affiliation and stigma; I hope to explore other religious affiliations (e.g. Muslim, Jewish, Hindu) as well as Christianity.

## **METHODS**

### **Procedures**

This was a cross-sectional study using an experimental design in which participants were recruited via Amazon Mechanical Turk. After providing informed consent, participants were randomly assigned to a vignette about a person with a mental illness in which the diagnosis differed (i.e., schizophrenia, anorexia nervosa, or major depressive disorder) and then completed all measures via an online survey created in Qualtrics (*Qualtrics, 2005*). At the end of the survey, participants were assigned a code verifying their completion, and were paid \$2.00. Participants whose responses passed attention checks were paid an additional \$0.20. The survey was estimated to take between 10 – 20 minutes to complete, so compensation translates to roughly an \$8.00 hourly wage.

### **Participants**

All participants were required to be at least 18 years of age, reside in the United States, and speak English. For inclusion in the data analysis and in order to maintain data quality, participants were also required to pass checks for attention (e.g., questions prompting the participant to select “5” as the answer) and quality (i.e., asking participants to identify the mental illness diagnosis described in the vignette that they read) embedded in the Qualtrics survey. Existing research suggests that these quality checks are sufficient to gather quality data in MTurk research (Hauser & Schwarz, 2016; Kees, Berry, Burton, & Sheehan, 2017). Of 410 total participants, 334 (81%) provided correct answers to attention and quality checks embedded within standard survey items. Analyses were performed on data from these 334 participants; of these, 114 were randomized to vignette about schizophrenia, 110 to the vignette about anorexia

nervosa, and 110 to the vignette about depression. Participants whose data passed manipulation and attention checks did not vary significantly by vignette; 9 (7%) surveys from participants who saw the vignette about schizophrenia were removed, 15 (12%) surveys from participants who saw the vignette about anorexia nervosa were removed, and 15 (12%) surveys from participants who saw the vignette about depression were removed.

### **Measures**

Participants first answered brief demographic questions and completed measures of religious affiliation. Participants were then randomly assigned to read one of three vignettes before completing the Attribution Questionnaire (AQ-27). After completing the AQ-27, participants completed the remaining measures, i.e., the Social Distance Scale (SDS), Level of Contact Report (LOR), Age Universal Intrinsic-Extrinsic scale-12, and the Very Short Authoritarianism scale (VSA). Variables and the measures used to assess them are outlined below (full measures and their scoring procedures are included in Appendix 1):

### **Independent variables**

#### ***Religious orientation***

Religious orientation was measured using the Age Universal I-E scale-12, a 12-item questionnaire designed to assess participants' orientation toward religion (extrinsic, intrinsic, or both) (Maltby, 1999, 2002; Maltby & Lewis, 1996). The I-E scale has been used with both religious and non-religious people of all ages. Over time, versions of the I-E scale have been revised in order to refine the factor structure. The current scale has 12 items. For the current study, I have altered the language of the scale, replacing references to "church" with "religious services" in order to expand the measure to people adhering to non-Christian religions. Both

subscales of the Age Universal I-E scale-12 have good internal consistency in prior research (Intrinsic subscale  $\alpha = 0.90$ , Extrinsic subscale  $\alpha = 0.88$ ; Maltby & Lewis, 1996) and in our sample (Intrinsic subscale  $\alpha = 0.94$ , Extrinsic subscale  $\alpha = 0.83$ ). Previous research (Donahue, 1985) has hypothesized three subscales, demarcating a difference between “extrinsic-social” (related to social activity in religious settings) items and “extrinsic-personal” items. In our sample, these items were highly correlated ( $r = .90$ ) and were considered as one extrinsic subscale.

### ***Religious affiliation***

Participants identified their personal religious affiliation, e.g., “Orthodox Christian” “Protestant,” “Roman Catholic,” “Mormon,” “Jewish,” “Muslim,” “Hindu,” “Buddhist.” If participants did identify with any of the identified religions, they could select “Other” (and fill in an optional blank), “Agnostic,” or “Atheist.” Participants who identified themselves as affiliated with any branch of Christianity were also asked to identify whether or not they considered themselves “evangelical.”

### **Dependent variables**

#### ***Mental illness stigma***

Mental illness stigma was assessed using the Attribution Questionnaire. The AQ-27 is a 27-item questionnaire that first presents a vignette involving a person living with mental illness, and then asks a series of questions measuring factors related to stigma based on an attributional model of stigma. The AQ-27 is scored on 9 subscales: *blame*, *anger*, *pity*, *help*, *dangerousness*, *fear*, *avoidance*, *segregation*, and *coercion*. The AQ-27 is theoretically driven (Corrigan, Markowitz, Watson, Rowan, & Kubiak, 2003; Pingani et al., 2012) and has been shown to be

reliable and valid (Corrigan & Watson, 2002; Pinto, Hickman, Logsdon, & Burant, 2012). In a sample of college students, the AQ-27 demonstrated good test-retest reliability across subscales ( $> .75$ ), content validity through factor analysis, and convergent validity with measures of social distance (Brown, 2008). The original AQ-27 presents a vignette about a man (Harry) with schizophrenia, but I have modified the survey to present vignettes about a woman (Kim) with either schizophrenia, major depressive disorder, or anorexia nervosa. I chose to change the vignette to be about a woman because anorexia nervosa is stereotypically associated with women (whereas the other two diagnoses are generally perceived as more gender-neutral), and a man with anorexia nervosa might be more stigmatized by way of violating gender expectations (Griffiths, Mond, Murray, & Touyz, 2014). The vignettes are the same on all features except diagnosis. In our sample, the overall scale demonstrated excellent internal consistency ( $\alpha = 0.91$ ), and each subscale demonstrated at least acceptable internal consistency (Blame  $\alpha = .80$ , Anger  $\alpha = .92$ , Pity  $\alpha = .79$ , Help  $\alpha = .82$ , Dangerousness  $\alpha = .94$ , Fear  $\alpha = .93$ , Avoidance  $\alpha = .77$ , Segregation  $\alpha = .92$ , Coercion  $\alpha = .66$ ).

### ***Social distance***

Desire for social distance from people with mental illness was measured using the 7-item Social Distance Scale (SDS), which asks participants to rate each item on a 1 to 4-point willingness scale. The sum of ratings equals social distance, with higher scores representing greater desire for distance from people with a mental illness. The SDS has good internal consistency ( $\alpha = 0.75$ ,  $\alpha = 0.89$  in our sample) and validity, correlating with the Dangerousness Scale ( $r = .46$ ) (Penn et al., 1994) of the Attribution Questionnaire. This scale is often used as a proxy measure for behavioral indices of discrimination against people with mental illness.

## **Covariates**

In addition to race and gender, I included two scales in my analyses to control for potential confounding variables.

### ***Familiarity with mental illness***

Given the role of familiarity with mental illness in predicting stigma, I included a measure of familiarity as a potential covariate in my analyses (Angermeyer et al., 2004). The 12-item Level of Contact Report (LOR) lists 12 situations that vary in intimacy with persons with mental illness. These situations vary from least intimate contact (“I have observed, in passing, a person that I believe had a mental illness”), to medium intimacy (“I have worked with a person who had a severe mental illness at my place of employment”) to high intimacy (“I have a mental illness”). When the LOR was developed, the 12 situations were ranked in order of intimacy of contact. Inter-rater reliability for rank-order was high; the mean correlation between raters was .83 (Corrigan et al., 2001). A subsequent sample of 100 research participants validated the rank order (Holmes et al., 1999).

### ***Authoritarianism***

Because extrinsic religiosity and prejudice toward outgroups have commonly been associated with authoritarianism (Altemeyer & Hunsberger, 1992; Wilkinson, 2004), we included a measure of authoritarianism as a potential covariate in our analyses. The Very Short Authoritarianism scale (VSA) is a 6-item scale designed to measure three aspects of authoritarianism: authoritarian submission, authoritarian aggression, and conventionalism (Bizumic & Duckitt, 2018; Mavor, Louis, & Sibley, 2010). The VSA asks participants to indicate their level of agreement (from 1, “very strongly agree,” to 9, “very strongly disagree”)

with statements such as, “what our country needs most is discipline, with everyone following our leaders in unity.” The VSA has demonstrated satisfactory internal consistency ( $\alpha > .70$ ), the expected three-factor structure, and convergent validity with the widely used 36-item Right Wing Authoritarianism scale (Bizumic & Duckitt, 2018). In our sample, the internal consistency of the VSA was good ( $\alpha = 0.86$ ).

## **Analyses**

### **Preliminary analyses**

To describe the participant sample, I computed frequency statistics of demographic variables (described below). In order to gauge baseline relationships between variables, I computed a Pearson’s correlation matrix and summary statistics of key variables see Tables 2 and 3).

### ***Aim 1***

To test the Attribution Model of stigma as hypothesized in the existing literature and in the Attribution Questionnaire, I conducted path analysis with latent variables. Path analysis with latent variables makes a distinction between the structural relationship between latent variables and the measurement model of manifest indicators that make up these constructs. Multiple indicators are used for each latent variable; in this study, individual items of the AQ were used to indicate the latent constructs from their corresponding subscales. All models were conducted using MPLUS (Muthén & Muthén, 1998) and evaluated using Maximum Likelihood, which utilizes a mean-adjusted chi-square statistic that is robust to multivariate nonnormality. The tested models were covariance structure models. Missing data was minimal (13 observations) and was deleted listwise. My analyses followed the recommended two-step procedure (Anderson

& Gerbing, 1988); First, confirmatory factor analysis (CFA) was used to develop a measurement model that demonstrated acceptable fit with the data – that the AQ items fit into the latent constructs outlined in Figure 1. After fitting the measurement model with the data, causal paths between the latent variables (as hypothesized in Figure 1) were estimated. Using the modification indices available in MPLUS and based on existing theory around stigma, I iteratively respecified the measurement and path models to better fit the current data. Because the chi-square test is very sensitive to sample size and often rejects well-fitting models (Ullman & Bentler, 2012), three indices and their cutoff points were utilized to assess goodness of fit for all models: the comparative fit index (CFI; values of .95 or greater), the root-mean-square error of approximation (RMSEA; values of .07 or less) (Steiger, 2007), and the standardized root-mean-square residual (SRMR; values of .08 or less) (Hu & Bentler, 1999). The bootstrap method was used to provide standard errors and significance tests for the indirect and total effects (Shrout & Bolger, 2002).

## ***Aim 2***

To examine the relationship between overall stigma and specific mental illness diagnoses, I conducted one-way analysis of covariance (ANCOVA) predicting overall mental illness stigma from the specific diagnoses, schizophrenia, anorexia nervosa, and depression. Race, gender, familiarity with mental illness, and authoritarianism were included as covariates in each model. To examine the relationship between specific diagnoses and particular dimensions of stigma, I conducted separate ANCOVAs predicting each subscale (from the Attribution Questionnaire) as well as desired social distance (from the Social Distance Scale) from the specific diagnoses. The subscales of the Attribution Questionnaire are: *blame, anger, pity, help, dangerousness, fear,*

*avoidance, segregation, and coercion*. The predicted relationships between specific diagnoses and dimensions of mental illness stigma are depicted in Table 1.

To examine the relationship between religious orientation and overall mental illness stigma, I conducted moderation analyses using Andrew Hayes' regression-based approach to moderation (Hayes, 2013) to predict stigma from the specific diagnoses, with extrinsic religious orientation as a moderator. I used PROCESS model one to run this analysis. An overview of the moderation model I used in this analysis is provided in Figure 2. Race, gender, familiarity with mental illness, and authoritarianism were included as covariates in each model. I evaluated model fit by assessing the statistical significance (interpreting significance at  $p < 0.05$ ) and amount of variance accounted for in the model which is assessed by an F-test. I assessed for moderation by examining the statistical significance of the interaction between extrinsic religious orientation and specific diagnosis; a bias-corrected 95% bootstrap confidence interval using 10,000 bootstrap samples was used to assess for the statistical significance of the effect. Moderation was supported if the interaction effect was statistically different from zero, as indicated by a 95% bias-corrected bootstrap confidence interval that is above zero. If moderation was present, I examined the conditional effects of diagnosis at different values of the moderator, extrinsic religious orientation (i.e., one standard deviation above and below the mean). To examine the relationship between specific diagnoses and particular dimensions of stigma as impacted by religious orientation, I conducted separate models in PROCESS using moderation (model 1) to predict each subscale (from the Attribution Questionnaire) as well as desired social distance (from the Social Distance Scale) from the specific diagnoses.

### *Exploratory aims*

To examine the relationship between intrinsic religious orientation, extrinsic religious orientation, and mental illness stigma, I ran model three in PROCESS using moderated moderation to predict stigma from the specific diagnoses, using both intrinsic religious orientation and extrinsic religious orientation as moderators. An overview of the moderation model I used in this analysis is provided in Figure 3. I evaluated model fit by assessing the amount of variance accounted for in the model, and I assessed for moderated moderation by examining the statistical significance of the interaction between extrinsic religious orientation, intrinsic religious orientation, and specific diagnosis ( $\alpha = 0.05$ ). If significant, I examined the conditional effects of diagnosis at different values of the moderators, extrinsic religious orientation and intrinsic religious orientation (e.g., one standard deviation above and below the mean).

In order to examine religious affiliation, I originally wanted to explore the relationship between different religious affiliations (e.g., Christian, Muslim, Hindu, Jewish) and stigma. However, the current sample had only  $n = 28$  participants who identified themselves as a member of a non-Christian religion. I examined demographic differences between participants who were affiliated with Christianity compared to participants who were affiliated other religions. The groups differed by race ( $F(1, 180) = 4.7, p = .03$ ) such that people who identified with Non-Christian religious groups had more participants who identified as African American or Asian. However, the groups not differ on gender, ethnicity, employment, income, or education level. Therefore, I collapsed the religious affiliation categories into two groups: religious and non-religious, as assessed by participants' self-reported affiliation with an organized religion ("religious") or self-identification as atheist, agnostic, or spiritual but not religious

(“nonreligious”). To examine possible differences in stigma between religious and non-religious people, I conducted separate ANCOVAs predicting each subscale (from the Attribution Questionnaire) as well as desired social distance (from the Social Distance Scale) from religious affiliation. Race, gender, familiarity with mental illness, and authoritarianism were included as covariates in each model

### **Power analyses**

In order to determine appropriate sample size for my analyses, I conducted power analyses using G\*Power (Faul, Erdfelder, Lang, & Buchner, 2007). For Aim 1, based on effect sizes previously reported in an assessment of the Attribution Model of mental illness stigma (Corrigan et al., 2003), I estimated a moderate effect size of  $f^2 = 0.25$ . Given 9 latent factors in the SEM model, with three indicators for each factor, minimal missing data, and significance level  $\alpha = 0.05$ , I estimated that a minimum of 281 participants would be necessary for 80% power. For ANCOVA analyses in Aim 2, with significance level  $\alpha = 0.05$ , and including 3 groups in the model (schizophrenia, anorexia nervosa, and depression), I estimated that 159 participants were necessary for 80% power in ANCOVA analyses. For hierarchical linear regression (moderation analyses) conducted in Aim 2, with a significance level  $\alpha = 0.05$  and including 3 predictor variables in the model (diagnosis, extrinsic religious orientation, intrinsic religious orientation), 75 participants will be necessary for 80% power. I concluded that 300 participants would be necessary for 80% power across analyses.

## RESULTS

### Preliminary analyses

Among the 334 participants whose data were analyzed, 139 (42%) were female, 269 (81%) identified as White or Caucasian, and 300 (90%) identified as non-Hispanic. Two hundred and twenty-five (67%) reported that their annual income was less than \$50,000 per year, and 194 (58%) had at least a bachelor's degree. In terms of religious affiliation, 147 (44%) identified themselves as Agnostic, Atheist, or otherwise non-affiliated with any organized religion, 158 (47%) were affiliated with Orthodox, Protestant, or Catholic denominations of Christianity, and 28 (8%) were affiliated with other religions including Judaism, Islam, Hinduism, and Buddhism. Among self-identified Christians, 39.7% considered themselves evangelical.

A Pearson's correlation matrix was computed to examine relationships between variables. Relationships between demographic variables indicated that female gender had a significant, though small, positive relationship with both intrinsic religiosity ( $r = .16$ ) and identifying oneself as religious ( $r = .15$ ). Minority race also had a significant positive relationship with intrinsic religiosity ( $r = .16$ ), identifying oneself as religious ( $r = .14$ ), and a stronger positive relationship with extrinsic religiosity ( $r = .33$ ). See Table 2 for summary statistics of key variables and Table 3 for the full correlation matrix.

### Aim 1

#### Measurement model

The measurement model describes the nature of the relationship between the latent variables and the manifest indicator variables that compose the latent factors. The model from our data was comprised of 9 latent constructs: blame, dangerousness, fear, pity, anger, help,

coercion, segregation, and avoidance. Indicator variables for the latent constructs are displayed in Figure 1. Initial analysis of the model revealed moderate model fit (CFI = 0.92, RMSEA = 0.080, SRMR = 0.063) but indicated that the latent variable covariance matrix was not positive definite due to negative residual variance in the indicator variables for the latent variable fear. Given that the correlation between the fear and dangerousness subscales was very high ( $r = .92$ ), I concluded that the indicator variables for the fear and dangerousness subscales were measuring a single latent variable. I respecified the measurement and structural models with a combined danger/fear variable, which demonstrated slightly better fit on the RMSEA index and whose correlation matrix was positive definite (CFI = 0.92, RMSEA = 0.079, SRMR = 0.063). This iteration of the measurement model indicated via modification indices (Modification Index = 90.6, StdXY EPC = 1.3) that AQ6 (“I think Kim poses a risk to her neighbors unless she is hospitalized”) which had originally been used to indicate segregation, better estimated the respecified latent variable danger/fear. Therefore, AQ6 was moved to indicate danger/fear and segregation was specified using only AQ15 and AQ17. Scores from both of the newly calculated subscales demonstrated excellent internal consistency (danger/fear  $\alpha = .97$ , segregation  $\alpha = .92$ ). See Table 4 for standardized and unstandardized factor loadings from the final measurement model, which demonstrated moderate model fit (CFI = 0.93, RMSEA = 0.073, SRMR = 0.062). See Figure 4 for the final measurement model.

### **Structural model**

A path analysis of the theoretical model was completed next. I tested the hypothesized structural model (which hypothesized only indirect paths between stereotypes through prejudices to discriminatory or helping behaviors; see Figure 1) with the final measurement model, revealing poor model fit (CFI = 0.89, RMSEA = 0.086, SRMR = 0.083).

MPlus modification indices suggested that adding direct paths from stereotypes (blame and danger/fear) to discriminatory or helping behaviors (help, coercion, segregation, and avoidance) would improve model fit. Given that it is unlikely that prejudices (pity, anger) completely mediate the relationship between stereotypes (blame and danger/fear) and discrimination (help, coercion, segregation, and avoidance), I added direct paths (as shown in blue in Figure 5). Still, the final revised model displayed moderate model fit (CFI = 0.94, RMSEA = 0.070, SRMR = 0.061).

Figure 5 provides standardized and unstandardized paths coefficients for paths between all of the variables (i.e., direct paths between stereotypes and discriminatory or helping behaviors as well as mediational paths from stereotypes through prejudice to discriminatory or helping behaviors). The unstandardized path from pity to avoidance ( $r = -.40$ ) was significant and strong, but was not in the hypothesized direction. The unstandardized paths from blame to anger ( $r = .43$ ) danger/fear to anger ( $r = .48$ ) and pity to help ( $r = .75$ ) were significant and strong in the hypothesized direction. All of the direct paths between stereotypes and discriminatory or helping behaviors were significant, with particularly strong paths from danger/fear to segregation ( $r = .84$ ), and from blame to avoidance ( $r = -.33$ ); the path from blame to avoidance was not in the hypothesized direction.

## **Aim 2**

### **Analysis of covariance**

Guided by the measurement model above, for the remainder of the analyses, the AQ subscales danger and fear were combined into one danger/fear subscale (resulting in 8 subscales), and item AQ6 was removed from the calculation of segregation and added to the danger/fear subscale. ANCOVAs examined differences in stigma between the three diagnoses

for total stigma, the 8 AQ subscales, and for social distance. There were significant effects of diagnosis on stigma for total stigma ( $F(2, 324) = 5.4, p = .01$ ), and for 5 of the 8 AQ subscales: blame ( $F(2, 328) = 14.3, p < .00$ ), danger/fear ( $F(2, 321) = 12.5, p < .00$ ), avoidance ( $F(2, 330) = 10.9, p < .00$ ), segregation, ( $F(2, 331) = 4.8, p = .01$ ), and coercion ( $F(2, 330) = 9.4, p < .00$ ). Contrary to my hypotheses, there were no differences in mean desired social distance scores across groups, or for the AQ subscales anger, pity, or help.

As hypothesized, post-hoc comparisons revealed that participants who viewed the vignette about schizophrenia reported the greatest amount of overall stigma. Also as hypothesized, participants who viewed the vignette about schizophrenia reported the greatest desire for segregation, endorsement of coercive treatment, and perception of danger/fear across the three groups. Participants reported the greatest desire to avoid the subject with schizophrenia, but also wished to avoid the subject with depression more than the subject with anorexia nervosa; this was consistent with my hypothesis for schizophrenia, but contrary to my hypothesis for depression. As hypothesized, participants who viewed the vignette about anorexia nervosa reported the greatest blame of the three groups. However, participants did not endorse greater anger or coercion for people with anorexia nervosa. Results and group means for post hoc comparisons are displayed in Table 5.

### **Moderation analyses**

Moderation analyses were conducted to examine the possible moderating effect of extrinsic religious orientation on predicting stigma and social distance from mental illness diagnosis, with race, gender, familiarity with mental illness, and authoritarianism included as covariates. In the model predicting total stigma from diagnosis, extrinsic religiosity trended toward increasing total stigma ( $b = 9.8, t = 1.8, p = .07, CI: -0.8 - 20.4$ ), and there was a

significant interaction between extrinsic religiosity and the effect of diagnosis on total stigma moving from schizophrenia to depression ( $b = 16.5$ ,  $t = 2.2$ ,  $p = .03$ ,  $CI: 1.8 - 31.2$ ). Because the predictor variable was categorical (schizophrenia = 1, anorexia nervosa = 2, depression = 3),  $b$  values indicate changes in the dependent variable when the vignette changes. I examined the conditional effects of diagnosis at one standard deviation above and below mean extrinsic religiosity. At mean extrinsic religiosity and one standard deviation below the mean, schizophrenia was significantly more stigmatized than anorexia nervosa or depression. Consistent with my hypothesis for anorexia nervosa, at one standard deviation above mean extrinsic religiosity, stigma for anorexia nervosa and depression increased such that they were no longer significantly different than schizophrenia (see Figure 6) – I had not hypothesized this result for depression. All model results and conditional effects of extrinsic religiosity at one standard deviation above and below the mean are displayed in Tables 6 and 7.

In the model predicting anger from diagnosis, extrinsic religiosity significantly increased anger overall ( $b = 1.9$ ,  $t = 2.1$ ,  $p = .04$ ,  $CI: 0.1 - 3.9$ ), and there was a significant interaction moving from schizophrenia to anorexia nervosa, consistent with my hypothesis ( $b = 2.8$ ,  $t = 2.1$ ,  $p = .03$ ,  $CI: 0.2 - 5.5$ ). I examined the conditional effects of diagnosis at one standard deviation above and below mean extrinsic religiosity. As predicted, at mean extrinsic religiosity and one standard deviation below the mean, there were no significant differences in anger between the three diagnosis. However, at one standard deviation above the mean for extrinsic religiosity, anger at anorexia nervosa was significantly greater than anger at schizophrenia or depression (see Figure 7).

In the models predicting danger/fear and coercion from diagnosis, contrary to my predictions, extrinsic religiosity did not have significant main effects. However, there were

significant interactions moving from schizophrenia to anorexia nervosa for danger/fear ( $b = 7.0$ ,  $t = 2.2$ ,  $p = .03$ , CI: 0.8 – 13.2) and from schizophrenia to depression for both subscales (danger/fear,  $b = 7.9$ ,  $t = 2.6$ ,  $p = .01$ , CI: 1.8 – 14.0, coercion, ( $b = 3.4$ ,  $t = 2.7$ ,  $p = .01$ , CI: 0.9 – 5.9). I examined the conditional effects of diagnosis at one standard deviation above and below mean extrinsic religiosity. At mean extrinsic religiosity and one standard deviation below the mean, schizophrenia elicited significantly greater perceptions of danger/fear and coercion when compared to anorexia nervosa and depression. However, at one standard deviation above mean extrinsic religiosity, danger/fear and coercion significantly increased for depression such that they no longer different than schizophrenia (see Figure 8). Contrary to my hypothesis, danger/fear and coercion did not significantly increase for anorexia nervosa, which remained significantly different from depression and schizophrenia.

In the models predicting avoidance and social distance from diagnosis, extrinsic religiosity did not have any significant main effects, but there were significant interactions on both scales moving from schizophrenia to depression (avoidance,  $b = 2.9$ ,  $t = 2.1$ ,  $p = .04$ , CI: 0.2 – 5.2; social distance,  $b = 0.4$ ,  $t = 2.4$ ,  $p = .02$ , CI: 0.1 – 0.7). I examined the conditional effects of diagnosis at one standard deviation above and below mean extrinsic religiosity. Contrary to my predictions, avoidance of and desired social distance from schizophrenia decreased as extrinsic religiosity increased, whereas avoidance and desired social distance from depression increased as extrinsic religiosity increased (see Figures 9 and 10).

In the models predicting blame and segregation from diagnosis, extrinsic religiosity had a significant main effect, increasing blame and segregation towards all diagnoses at all values of the moderator (blame,  $b = 3.7$ ,  $t = 4.0$ ,  $p < .00$ , CI: 1.9 – 5.5; segregation,  $b = 2.3$ ,  $t = 3.5$ ,  $p < .00$ ,

CI: 1.0 – 3.6). This was consistent with my predictions; however, contrary to my hypotheses there were no significant interaction effects between diagnosis and extrinsic religiosity.

Contrary to my predictions, there were no significant main or interaction effects in the models predicting pity or help from diagnosis. Across all diagnoses and at all values of extrinsic religiosity, scores for pity and help were generally high (mean pity = 20.3, mean help = 19.4 out of a total possible score of 27).

### **Exploratory aims**

In order to explore whether intrinsic religious orientation moderated the effect of extrinsic religiosity (as a moderator) on the relationship between diagnosis and stigma, moderated moderation analyses were conducted to predict stigma and social distance from diagnosis with both extrinsic religiosity and intrinsic religiosity as moderators. Contrary to my hypotheses, and although the overall model predicting total stigma was significant ( $F(15, 291) = 5.0, p < .00$ ) and accounted for 20.5% of the variance in the model, there were no significant interactions between extrinsic religiosity, intrinsic religiosity, and diagnosis; Intrinsic religiosity did not have significant main or interaction effects for the majority of outcomes tested, and did not have any significant interactions with extrinsic religiosity. Among moderated moderation analyses predicting blame, anger, danger/fear, avoidance, coercion, segregation, pity, help, and social distance from diagnosis with both extrinsic religiosity and intrinsic religiosity as moderators, only the model predicting avoidance had significant interaction effects. In the model predicting avoidance, there was a significant interaction between diagnosis and intrinsic religiosity moving from schizophrenia to anorexia nervosa ( $b = -2.9, t = 2.1, p = .04, CI: 0.1 - 5.7$ ). I examined the conditional effects of diagnosis at one standard deviation above and below mean intrinsic and extrinsic religiosity. At high levels of intrinsic religiosity, avoidance of

anorexia nervosa increased whereas avoidance of schizophrenia decreased (see Figure 11). There was also a significant main effect of intrinsic religiosity ( $b = -2.0$ ,  $t = -2.0$ ,  $p = .04$ ,  $CI: -4.0 - -.04$ ), indicating that higher intrinsic religiosity reduced avoidance behavior across diagnoses.

ANCOVAs were conducted to examine any differences in stigma between religious and non-religious people for total stigma, the 8 AQ subscales, and for social distance. Race, gender, familiarity with mental illness, and authoritarianism were included as covariates. People who were affiliated with an organized religion reported significantly greater total stigma ( $F(1, 323) = 31.7$ ,  $p < .00$ ), as well as greater blame ( $F(1, 327) = 24.6$ ,  $p < .00$ ), anger ( $F(1, 327) = 31.5$ ,  $p < .00$ ), danger/fear ( $F(1, 320) = 20.6$ ,  $p < .00$ ), segregation ( $F(1, 331) = 23.1$ ,  $p < .00$ ), and coercion ( $F(1, 329) = 39.7$ ,  $p < .00$ ). Religiously affiliated people also reported a greater desire for social distance, ( $F(1, 322) = 6.0$ ,  $p = .02$ ). There were no mean differences between religious and non-religious people on pity, help, or avoidance. Results and group means are displayed in Table 8.

## DISCUSSION

The primary purposes of this study were to examine the ability of the Attribution Model to explain mental illness stigma, and to hone in on the impact of two key predictors: the specific diagnosis of the person with a mental illness and the religious orientation of the participant. With some minor modification, the Attribution Model demonstrated a moderate fit with the data. Both diagnosis and religious orientation had significant impacts on stigma, with schizophrenia being the most stigmatized, and high extrinsic religiosity moderating the relationship between diagnosis and stigma. Below, I discuss major findings from each aim.

### **Appropriateness of the Attribution Model to explain stigma**

The initial measurement model of the Attribution Model did not fit well; this was primarily caused by extremely high correlations between the fear and danger subscales. Model fit was moderate after collapsing fear and danger items into one subscale and moving one item to a better fitting latent factor, but the results raise questions about the true factor structure of the attribution questionnaire and the parsimony of the Attribution Model. One previous study conducted exploratory factor analysis with responses from the attribution questionnaire and found a six-factor structure, with four factors having acceptable psychometric properties: fear/dangerousness, help/interact (which includes the help and segregation scales), forcing treatment (the coercion subscale), and negative emotions (the anger subscale) (Brown, 2008). Together with my findings, this suggests that a fruitful path may be to more thoroughly explore the factor structure of the Attribution Questionnaire, which might lead to a revised, simpler version of the measure.

Coefficients in the structural model supported many of the hypotheses in the Attribution Model, and are largely consistent with much of the previous research (Corrigan et al., 2003; Corrigan, 2002). Higher perceptions of danger/fear were associated with increased anger and decreased pity, and also to increased support of coercive treatment, desire for social segregation from people with mental illnesses, increased avoidance behavior, and a decreased desire to help people with mental illnesses. This converges with Corrigan's (2002) findings that increased perceptions of dangerousness were related to increased avoidance and endorsement of coercive treatment, although Corrigan's study tested an earlier version of the Attribution Model using a slightly different version of the Attribution Questionnaire.

Attributing blame to the person with a mental illness was directly associated with greater anger towards the person with a mental illness, and with decreased pity. This is inconsistent with research testing the earliest versions of the Attribution Model and Attribution Questionnaire, which found that "personal responsibility" (a construct related but not equivalent to blame, which included controllability and responsibility) was not related to anger and pity (Corrigan, 2002). The current version of the blame subscale used in our study represents three converging constructs: responsibility, controllability, and the notion that the vignette subject is at fault for their condition. It is possible that the addition of being "at fault" for one's illness increased the relevance of this construct, strengthening the relationships with pity and anger; this interpretation is supported by a second test of the attribution model in which blame was measured using the same constructs that I did, and found similar results to mine; that blame was positively associated with avoidance and endorsement of coercive treatment (Corrigan et al., 2003). My study replicated these results, and also found that increased blame was directly associated with increased desire for social segregation.

Contrary to my hypotheses and to Corrigan and colleague's (2003) findings, higher blame was associated with a small but significant increase in the desire to help people with mental illnesses. In addition, the relationship between anger and help was not significant; in two previous studies, Corrigan and colleagues (2002, 2003) found that anger was associated with less of a desire to help. It may be possible that the intervening years of effort to reduce public stigma against mental illness have effectively changed the relationship between anger, blame, and helping behavior. Members of the public may be able to blame people for having mental illnesses and subsequently be angry at them, but simultaneously want to help (or at the very least, recognize that they *should* want to help) people with mental illnesses. This idea is supported by the generally high scores on help among participants in the study (mean help = 19.4), and by the increasing prevalence of public influence campaigns designed to make people more familiar with and more educated about mental illnesses (Corrigan et al., 2012; Corrigan & Shapiro, 2010).

### **Diagnosis as a predictor of stigma**

I examined the relationship between three different diagnoses (schizophrenia, anorexia nervosa, and depression) and different aspects of mental illness stigma. Total stigma was highest among participants who read the vignette about a person with schizophrenia; this is consistent both with my hypotheses and with previous research suggesting that the general public exhibits greater stigma towards severe mental illness (Corrigan et al., 2003; Corrigan et al., 2001; Crisp et al., 2000; Loch et al., 2014; Mestdagh & Hansen, 2013; Stewart, Keel, & Schiavo, 2006). The analyses with the stigma subscales highlight potential explanations for the greater stigma attached to schizophrenia, relative to anorexia nervosa or depression; schizophrenia was perceived as more dangerous/elicited greater fear, and participants who read the vignette about schizophrenia wanted to be socially segregated from people with schizophrenia and were more

likely to endorse coercive treatment. Based on my conclusions from the path analysis of the attribution model, it is possible that participants' desire for social segregation and support for coercive treatment stems directly from the assessment that people with schizophrenia might be dangerous.

Participants endorsed the greatest desire to avoid contact with people with schizophrenia. However, contrary to my original hypotheses, participants who read the vignette about depression also endorsed significantly greater avoidance than participants who read the vignette about anorexia nervosa. I had reasoned that participants would be most familiar with depression and therefore would feel more comfortable around people with depression. However, it is possible that the result for depression is explained by assumptions about controllability and severity; existing research suggests that the general public views anorexia nervosa as less severe and more controllable than other mental illnesses (Crisafulli et al., 2010; Stewart et al., 2006, 2008), which may lead to greater comfort being around people with anorexia nervosa than people with depression.

Consistent with my hypotheses, participants who read the vignette about a person with anorexia nervosa blamed her more for her illness than did participants who read about schizophrenia or depression; this was the only subscale in which anorexia nervosa was most stigmatized relative to the other illnesses. The specific questions that make up the blame subscale in the attribution questionnaire address responsibility, controllability, and the question of whether or not "Kim" is at fault for her own condition. Therefore, these results are consistent with prior research on stereotypes associated with anorexia nervosa, suggesting that the general public broadly believes that eating disorders are controllable and that people with anorexia

nervosa could pull themselves together if they wanted to (Crisafulli et al., 2010; Stewart, Schiavo, Herzog, & Franko, 2008; Stewart et al., 2006).

There were no differences across diagnoses in the pity, help, or anger subscales of the attribution questionnaire. Feelings of pity for the person in the vignette and desire to help the person in the vignette were both generally high (mean pity = 20.3, mean help = 19.4), suggesting that participants may have a baseline level of empathy towards all three illnesses in question, although the pity subscale includes multiple constructs – concern, sympathy, and pity.

### **Future research and implications for diagnosis**

My results, as well as existing research, make it clear that the public stigma attached to specific diagnoses differs significantly. Future research should endeavor to contextualize the results found in this analysis with regards to the diagnoses in question, which could also add to our understanding of the attributions at the core of mental illness stigma. Specifically, future research might further examine the assumptions and emotional reactions at the core of avoiding people with depression as opposed to avoiding people with anorexia nervosa. My results also have important practical implications for anti-stigma campaigns; when confronting stigma, advocates must consider all of the potential stereotypes attached to mental illness. In situations where a specific type of diagnosis is most common (e.g., on certain sports teams where eating disorders are common, or in homelessness advocacy settings where schizophrenia might be more common), it may be necessary to tailor anti-stigma work to target the specific stereotypes that a given diagnosis is most likely to activate.

### **Extrinsic religiosity as a predictor of stigma**

Religiosity was another predictor of interest in this study. Broadly speaking, and consistent with my hypotheses, higher levels of extrinsic religiosity were associated with increased mental illness stigma – that is, extrinsic religiosity had a main effect, associated with increased blame, desire for segregation, anger, and total stigma. Extrinsic religiosity was also a moderator of the relationship between diagnosis and stigma. For overall stigma and perceptions of danger/fear, high levels of extrinsic religiosity negated the differential impact of diagnosis. At mean or lower levels of extrinsic religiosity, schizophrenia was perceived as significantly more dangerous than anorexia nervosa or depression. However, as extrinsic religiosity increased, perceptions of danger/fear increased for both anorexia nervosa and depression, such that at high levels of extrinsic religiosity, all diagnoses were perceived as equally dangerous. For anger, moderation was a little different. At high levels of extrinsic religiosity, anger increased for depression and anorexia nervosa, but not for schizophrenia. This might be because both depression and anorexia nervosa (but particularly anorexia) are perceived as more controllable than schizophrenia, as was demonstrated in the ANCOVA analyses. This effect of increased anger at depression and anorexia nervosa is also consistent with my path analysis results, indicating that increased blame is associated with increased anger. For avoidance, moderation analyses were puzzling. Inconsistent with my initial hypotheses, this analysis suggested that avoidance of depression increased with extrinsic religiosity, and that avoidance of anorexia nervosa did not change as extrinsic religiosity increased. However, for schizophrenia, avoidance *decreased* as extrinsic religiosity increased. At both mean and high levels of extrinsic religiosity, the mean avoidance for schizophrenia and depression were not significantly different from each

other. It is not clear why this diagnostic group might engender different patterns of avoidance at different levels of extrinsic religiosity.

Aside from avoidance, the remainder of the analyses suggested a fairly consistent pattern—that extrinsic religiosity was associated with increased mental illness stigma. We suggest two key factors that may explain these findings. First, extrinsic religiosity indicates participation in religious services motivated by the desire to find community and social support (Donahue, 1985), and many religious communities are historically conservative, with strict social norms (Iannaccone, 1994). Indeed, research has shown extrinsic religiosity to be associated with increased social conformity (Rodriguez & Henderson, 2010). It is possible that people with mental illnesses violate social norms, which may be particularly troubling for people with high extrinsic religiosity, motivating them to endorse greater stigma.

Second, it is also possible that specific religious beliefs about the causes and controllability of mental illness contribute to increased stigma. In particular, Christian religious beliefs about the causes of mental illness focus on sin and morality (e.g., “moral weakness is the main cause of mental illness”) and participants from Christian backgrounds may minimize psychosocial or biological causes of mental illness, thus perceiving mental illnesses as generally more controllable and people with mental illnesses as more to blame for their conditions (Wesselmann & Graziano, 2010). This explanation would be consistent with the moderation effects for anorexia nervosa found in this aim – given that anorexia nervosa is generally perceived as more controllable than other mental illnesses, people who believe that mental illnesses in general are due to personal error (and that this constitutes a significant moral failing) might endorse increased stigma for anorexia nervosa.

### **Exploratory aims for religiosity**

Given previous research indicating that intrinsic religiosity correlates with positive coping behaviors (Hackney & Sanders, 2003), I explored the possibility that intrinsic religiosity might have some protective effects with regard to stigma, specifically that it would moderate the effects of extrinsic religiosity (that is, moderating the moderator). However, the relationship between intrinsic religiosity and stigma was largely nonexistent for the all outcomes except avoidance. Higher intrinsic religiosity was associated with reduced avoidance behavior across diagnoses, and at high levels of intrinsic religiosity, avoidance of anorexia nervosa increased whereas avoidance of schizophrenia decreased (see Figure 11). The lack of significant relationships between intrinsic religiosity and different aspects of stigma suggests that it is not simply religious affiliation and faith that predict greater stigma. Rather, extrinsic motivation to be involved in religious communities predicts mental illness stigma.

I also explored whether or not affiliation with any organized religion impacted stigma, although participants were primarily from Christian denominations. Results indicated that religiously affiliated people endorsed greater stigma on all subscales except for pity, help, and avoidance. These results are largely consistent with my findings on extrinsic religiosity and stigma. This correspondence makes sense, given that only religiously affiliated people would endorse high extrinsic religiosity.

### **Future research and implications for religiosity**

It would be useful to further investigate the precise underpinnings of the association between extrinsic religiosity and mental illness stigma, with both qualitative and quantitative research. First, because researchers disagree on which aspects of religious life are most important to measure in relation to prejudice, it will be important to assess this relationship using additional

measures of religiosity, e.g., the index of spiritual experiences (Kass, Friedman, Leserman, Zuttermeister, & Benson, 1991) or a measure of the centrality of religion (Huber & Huber, 2012). Such measures might target other facets of religious life and help researchers to tease out the precise aspects of religion that most directly impact mental illness stigma. We can also work to understand the nuanced ways in which religion impacts stigma through qualitative research with members of various religions about their beliefs about mental illnesses and how those beliefs connect to faith and religious life. Although qualitative research has limited generalizability, it may be particularly helpful in exploratory contexts. In our study, small sample sizes precluded examinations of different religions; in contrast, in-depth interviews with faith leaders and people of faith can provide richness and context (Maxwell, 2004; Watkins, 2012). Because prior research examining religiosity and stigma (and much of the research on religiosity in general) focuses primarily on Christian religious belief, it will also be necessary to conduct targeted research with non-Christian religious groups in an effort to understand how diverse faith backgrounds and belief systems affect beliefs about mental illness. This research will likely require targeted recruitment and partnership with diverse faith communities.

The impact of extrinsic religiosity on mental illness stigma has clear practical implications. Specifically, it may be beneficial to develop anti-stigma programming that is targeted to faith communities. Reviews of the literature have found positive and negative associations between religious belief and mental health; in some cases, religion serves as a source of comfort and hope, while in others, religious belief can lead to spiritual struggles that inhibit recovery from mental illness (Ellison, Fang, Flannelly, & Steckler, 2013; Koenig, 2009; Seybold & Hill, 2001). Anti-stigma work could be built around connections between faith leaders and mental health professionals, who can partner with and educate each other on the

needs and values of particular faith communities and the local resources available to treat mental illness. Since churches, temples, and mosques serve as the center of community life for many people, this work could simultaneously decrease stigma and facilitate help-seeking within houses of worship.

### **Study limitations**

This research was conducted with a sample of participants from Amazon Mechanical Turk (Mturk), which may have resulted in a restricted sample. Although participants recruited through Mturk are shown to be significantly more representative of the US population than samples recruited within university student populations (Buhrmester, Kwang, & Gosling, 2011), existing work suggests that our results may not generalize; Mturk workers are less religious than the general US population (Lewis, Djupe, Mockabee, & Wu, 2015). Current data indicates that 70% of the US population identifies as Christian, that 6% are affiliated with religions other than Christianity, and that 23% are unaffiliated with any organized religion (NW, Washington, & Inquiries, n.d.). Therefore, it is probable that our sample exhibited lower mean extrinsic and intrinsic religiosity than we would find in the general population; this may have affected the relationships we found in this study.

Finally, this study's conclusions are also limited by the measures available for assessing religious orientation. Researchers have critiqued the Age Universal I-E scale-12 for its development within primarily Christian or nonreligious populations, and question the validity of using this measure with non-Christian religious groups (Tiliopoulos, Bikker, Coxon, & Hawkin, 2007). This was not likely a substantial problem for our sample, given that few participants were members of non-Christian religions.

## **Conclusion**

Overall, my results support the idea that attributions about the dangerousness and controllability of a mental illness contribute to mental illness stigma. Specific diagnoses activate differing stereotypes about mental illnesses, and extrinsic religiosity appears to change attributions about dangerousness and controllability for some illnesses more than others, although extrinsic religiosity may increase stigma overall. Further research is necessary to refine the Attribution Model and better distinguish between stereotypes, prejudice, and discriminatory or helping behaviors towards people with mental illnesses.

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## TABLES

Table 1. Aims and hypotheses for the current study

<b>Aim 1: Testing the Attribution Model</b>	
Factor	Hypotheses
Blame	Higher blame will lead to decreases in pity, and increases in anger and fear
Dangerousness	Higher dangerousness will lead to decreases in pity, and increases in anger and fear
Pity	Higher pity will lead to increases in help, and decreases in coercion, segregation, and avoidance
Anger	Higher anger will lead to decreases in help, and increases in coercion, segregation, and avoidance
Fear	Higher fear will lead to decreases in help, and increases in coercion, segregation, and avoidance
<b>Aim 2: Predictors of mental illness stigma</b>	
Aim 2A: The impact of diagnosis	
Diagnosis	Hypothesized highest dimensions of stigma
Schizophrenia <sup>1</sup>	Fear – level of fear of the person with mental illness Avoidance – avoidance of the person with mental illness Segregation – desire to be socially segregated from the person with mental illness Dangerousness – perceptions that the person with mental illness is dangerous
Anorexia Nervosa	Coercion <sup>2</sup> – agreement that forced mental health treatment would be appropriate for the person with mental illness Blame – blaming the person with mental illness for their illness Anger – anger toward the person with mental illness
Depression	Pity – feelings of pity for the person with mental illness Help – desire to help the person with mental illness
Aim 2B: The impact of religious orientation	
Factor	Hypotheses
Total Stigma	Higher extrinsic religiosity will have a main effect, increasing stigma across all diagnoses <sup>3</sup> . Higher extrinsic religiosity will also interact with diagnosis, increasing stigma for anorexia. These hypotheses were examined for the stigma subscales as well.
<b>Aim 3: Exploratory aims</b>	
Factor	Hypotheses
Intrinsic Religiosity	High intrinsic religiosity will moderate the effect of high extrinsic religiosity, such that high extrinsic religiosity will no longer lead to greater stigma.
Religious affiliation	Participants who are affiliated with any organized religion will endorse greater stigma as compared to participants who are not affiliated with an organized religion.

Note: dimensions of stigma come from the subscales measured in the Attribution Questionnaire (AQ-27) (Corrigan et al., 2003).

<sup>1</sup>Schizophrenia is hypothesized to be associated with higher levels of total stigma (a sum of the subscales of stigma measured in the AQ\_27) relative to anorexia nervosa and depression.

<sup>2</sup>Coercion is hypothesized to be highest for both anorexia nervosa and schizophrenia relative to depression.

<sup>3</sup>I predict main effects of extrinsic religiosity increasing stigma across diagnosis for all stigma subscales.

Table 2. Summary statistics for key variables

	N	%		
Female gender <sup>1</sup>	139	41.6%		
Minority race <sup>2</sup>	65	19.5%		
Hispanic ethnicity <sup>3</sup>	33	9.9%		
Religious <sup>4</sup>	182	54.7		
	M	SD	Min	Max
Age	35.8	10.3	19	72
Intrinsic religiosity <sup>5</sup>	1.8	0.8	1	3
Extrinsic religiosity <sup>5</sup>	1.6	0.6	1	3
Authoritarianism <sup>6</sup>	4.9	2.2	1	9
Blame <sup>7</sup>	10.9	6.0	3	27
Anger	8.4	6.1	3	27
Pity	20.4	5.2	3	27
Help	19.4	5.6	3	27
Danger/fear	19.7	14.8	7	63
Avoidance	12.5	5.9	3	27
Segregation	5.5	4.4	2	18
Coercion	13.2	5.8	3	27
Total stigma	101.1	34.4	36	198
Social distance <sup>8</sup>	2.3	0.7	1	4
Familiarity with mental illness <sup>9</sup>	6.7	2.9	1	11

<sup>1</sup> Male is coded as 0, Female is coded as 1

<sup>2</sup> White/Caucasian is coded as 0, minority is coded as 1

<sup>3</sup> Non-Hispanic is coded as 0, Hispanic is coded as 1

<sup>4</sup> Non-religious is coded as 0, religious is coded as 1

<sup>5</sup> Age Universal I-E Scale-12: 1 – 3, higher scores indicate higher religiosity

<sup>6</sup> Very Short Authoritarianism Scale: 1 – 9, higher scores indicate higher authoritarianism

<sup>7</sup> Attribution Questionnaire: 1 – 9, higher scores indicate greater endorsement of the trait

<sup>8</sup> Social Distance Scale: 1 – 4, higher scores indicate greater desire for social distance

<sup>9</sup> Level of Familiarity Scale: 1 – 11, higher scores indicate greater familiarity

Table 3. Correlations between key variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1.Female Gender <sup>1</sup>																	
2.Age	.09																
3.Minority Race <sup>2</sup>	-.02	-.17**															
4.Hispanic Ethnicity <sup>3</sup>	-.12*	-.16**	.29**														
5.Religious <sup>4</sup>	.15**	.04	.14**	.07													
6.Intrinsic Religiosity <sup>5</sup>	.16**	.07	.16**	.07	.67**												
7.Extrinsic Religiosity <sup>5</sup>	.07	-.06	.33**	.16**	.60**	.74**											
8.Authorit. <sup>6</sup>	.05	.02	.12*	.01	.00	.01	.03										
9.Blame <sup>7</sup>	-.07	-.11	.14*	.25*	.26**	.24**	.31**	.05									
10.Anger	-.09	-.16**	.18**	.31**	.29**	.19**	.35**	-.01	.62**								
11.Pity	.13*	.14*	.07	.06	.06	.06	.01	.05	-.17**	-.24**							
12.Help	.03	.07	.07	.06	.01	.11*	-.01	.03	-.06	-.23**	.56**						
13.Danger/Fear	-.10	-.14*	.26**	.34**	.25**	.18**	.34**	.07	.37**	.73**	-.19**	-.30**					
14.Avoidance	.09	-.03	.00	-.10	.06	-.02	.03	.04	-.04	.24**	-.24**	-.51**	.32**				
15.Segregation	-.16**	-.21**	.31**	.31**	.25**	.16**	.37**	.08	.45**	.67**	-.16**	-.25**	.83**	.26**			
16.Coercion	-.04	-.06	.21**	.20**	.34**	.18**	.29**	.04	.32**	.55**	.03	-.11*	.67**	.29**	.65**		
17.Total Stigma	-.08	-.12*	.25**	.31**	.31**	.19**	.36**	.05	.53**	.82**	-.16**	-.42**	.92**	.48**	.85**	.77**	
18.Social Distance <sup>8</sup>	-.00	.08	.14	-.01	.15**	.09	.15**	.03	.11*	.23**	-.14	-.39**	.31**	.59**	.27**	.31**	.44**

\*  $\alpha < 0.05$ ; \*\*  $\alpha < 0.01$

<sup>1</sup> Male is coded as 0, Female is coded as 1

<sup>2</sup> White/Caucasian is coded as 0, minority is coded as 1

<sup>3</sup> Non-Hispanic is coded as 0, Hispanic is coded as 1

<sup>4</sup> Non-religious is coded as 0, religious is coded as 1

<sup>5</sup> Age Universal I-E Scale-12: 1 – 3, higher scores indicate higher religiosity

<sup>6</sup> Very Short Authoritarianism Scale: 1 – 9, higher scores indicate higher authoritarianism

<sup>7</sup> Attribution Questionnaire: 1 – 9, higher scores indicate greater endorsement of the trait

<sup>8</sup> Social Distance Scale: 1 – 4, higher scores indicate greater desire for social distance

Table 4. Standardized and unstandardized factor loadings in the measurement model

	Unstandardized factor loading (standard error)	Standardized factor loading
Blame		
AQ 10	1.00 (.00)	.93 (.02)
AQ 11	.61 (.06)	.58 (.04)
AQ 23	.82 (.06)	.74 (.03)
Anger		
AQ 1	1.00 (.00)	.87 (.02)
AQ 4	.99 (.04)	.89 (.01)
AQ 12	.99 (.04)	.92 (.01)
Pity		
AQ 9	1.00 (.00)	.64 (.04)
AQ 22	1.36 (.12)	.92 (.03)
AQ 27	.93 (.09)	.69 (.04)
Help		
AQ 8	1.00 (.00)	.75 (.03)
AQ 20	1.12 (.09)	.77 (.03)
AQ 21	1.16 (.09)	.82 (.03)
Danger/Fear		
AQ 2	1.00 (.00)	.91 (.01)
AQ 13	.93 (.03)	.91 (.01)
AQ 18	.96 (.03)	.94 (.01)
AQ 3	.95 (.04)	.88 (.01)
AQ 19	.96 (.03)	.93 (.01)
AQ 24	.93 (.04)	.87 (.01)
AQ 6	.94 (.04)	.89 (.01)
Avoidance		
AQ 7	1.00 (.00)	.69 (.04)
AQ 16	1.09 (.11)	.75 (.04)
AQ 26	1.00 (.09)	.73 (.04)
Segregation		
AQ 15	1.00 (.00)	.92 (.01)
AQ 17	.95 (.04)	.91 (.01)
Coercion		
AQ 5	1.00 (.00)	.25 (.05)
AQ 14	2.14 (.44)	.53 (.04)
AQ 25	3.11 (.71)	.89 (.03)

Table 5. Differences in stigma by diagnosis

	Schizophrenia (N = 114)		Anorexia nervosa (N = 110)		Depression (N = 110)		<i>f</i>	<i>df</i>	<i>p</i>	Partial <i>η</i> <sup>2</sup>
	M	SD	M	SD	M	SD				
Blame <sup>1</sup>	9.1	0.5	13.2**	0.6	10.6	0.6	14.3	2, 328	.00	.08
Anger <sup>1</sup>	8.1	0.6	8.7	0.6	8.5	0.6	0.3	2, 328	.72	.00
Pity <sup>1</sup>	20.7	0.5	20.6	0.5	19.7	0.5	1.2	2, 329	.29	.01
Help <sup>1</sup>	18.8	0.5	20.2	0.5	19.3	0.5	1.8	2, 331	.16	.01
Danger/Fear <sup>2</sup>	25.0**	1.3	16.0	1.4	17.9	1.4	12.5	2, 321	.00	.07
Avoidance <sup>1</sup>	13.9**	0.5	10.5	0.5	12.9**	0.5	10.9	2, 330	.00	.06
Segregation <sup>3</sup>	6.5**	0.4	4.8	0.4	5.3	0.4	4.8	2, 331	.01	.03
Coercion <sup>1</sup>	15.1**	0.5	12.0	0.6	12.6	0.5	9.4	2, 330	.00	.06
Total <sup>4</sup>	109.5*	3.2	95.4	3.3	97.9	3.3	5.4	2, 313	.01	.03
Social Distance <sup>5</sup>	2.4	0.1	2.3	0.1	2.3	0.1	0.8	2, 328	.49	.00

Note: Covariates included in the models were race, gender, familiarity with mental illness, and authoritarianism.

<sup>1</sup> Attribution Questionnaire subscale: sum of 3 items scored 1-9, higher scores indicate greater endorsement of the trait

<sup>2</sup> Attribution Questionnaire subscale: sum of 7 items, ranging from 7 to 63

<sup>3</sup> Attribution Questionnaire subscale: sum of 2 items, ranging from 2 to 18

<sup>4</sup> Sum score of all 27 items from the Attribution Questionnaire, ranging from 27 to 243

<sup>5</sup> Social Distance Scale: 1 – 4, higher scores indicate greater desire for social distance

Table 6. Mental Illness stigma predicted from diagnosis and extrinsic religiosity

	Diagnosis			Schizophrenia →	Schizophrenia →
	Schizophrenia	→ Schizophrenia	→ Extrinsic	Anorexia X Extrinsic	Depression X
	Anorexia	Depression	religiosity	religiosity	Extrinsic religiosity
<b>Blame<sup>1</sup></b>					
b	4.4	1.7	3.7	-1.2	0.4
t	5.9	2.3	4.0	-0.9	0.3
P	.00	.02	.00	.35	.75
<b>Anger<sup>1</sup></b>					
b	0.9	0.5	1.9	2.8	2.3
t	1.2	0.7	2.1	2.1	1.7
P	.22	.49	.04	.03	.08
<b>Pity<sup>1</sup></b>					
b	-0.3	-1.1	0.2	-0.1	-0.9
t	-0.4	-1.8	0.3	-0.1	-0.8
P	.68	.09	.79	.95	.41
<b>Help<sup>1</sup></b>					
b	1.3	0.4	0.3	-0.9	-0.2
t	1.8	0.6	0.3	-0.7	-0.2
P	.08	.56	.76	.46	.86
<b>Danger/fear<sup>2</sup></b>					
b	-8.6	-6.9	2.8	7.0	7.9
t	-4.7	-3.8	1.3	2.2	2.6
P	.00	.00	.20	.03	.01
<b>Avoidance<sup>1</sup></b>					
b	-3.5	-1.1	-1.4	1.7	2.7
t	-4.7	-1.5	-1.5	1.3	2.1
P	.00	.13	.12	.19	.04
<b>Segregation<sup>3</sup></b>					
b	-1.6	-1.1	2.3	0.6	-0.1
t	-2.9	-2.1	3.5	0.7	-3.4
P	.00	.04	.00	.49	.00
<b>Coercion<sup>1</sup></b>					
b	-3.1	-2.6	1.1	1.7	3.4
t	-4.1	-3.5	1.2	1.3	2.7
P	.00	.00	.23	.19	.01
<b>Total stigma<sup>4</sup></b>					
b	-13.1	-11.2	9.8	12.1	16.5
t	-2.9	-2.6	1.8	1.6	2.2
P	.00	.01	.07	.11	.03
<b>Social</b>					
b	-0.1	-0.1	-0.1	0.1	0.4
t	-0.9	-1.2	-0.5	0.8	2.4
P	.32	.23	.60	.42	.02

Note: the independent variable (diagnosis) has been mean-centered. Covariates included in the models were race, gender, familiarity with mental illness, and authoritarianism.

<sup>1</sup>Attribution Questionnaire subscale: sum of 3 items scored 1-9, higher scores indicate greater endorsement

<sup>2</sup> Attribution Questionnaire subscale: sum of 7 items; <sup>3</sup> Attribution Questionnaire subscale: sum of 2 items

<sup>4</sup> Sum score of all 27 items from the Attribution Questionnaire

<sup>5</sup> Social Distance Scale: 1 – 4, higher scores indicate greater desire for social distance

Table 7. Conditional effects of extrinsic religiosity on mental illness stigma

	Schizophrenia → Anorexia nervosa			Schizophrenia → Depression		
	b	t	P	b	t	P
<b>Blame<sup>1</sup></b>						
1 SD below	5.1	4.9	.00	1.4	1.4	.18
Mean	4.4	5.9	.00	1.6	2.3	.02
1 SD above	3.7	3.5	.00	1.9	1.8	.07
<b>Anger<sup>1</sup></b>						
1 SD below	-0.7	-0.6	.52	-0.8	-0.7	.47
Mean	0.9	1.2	.21	0.5	0.7	.49
1 SD above	2.6	1.4	.02	1.9	1.7	.08
<b>Pity<sup>1</sup></b>						
1 SD below	-0.2	-0.2	.81	-0.6	-0.6	.56
Mean	-0.3	-0.4	.68	-1.1	-1.7	.09
1 SD above	-0.3	-0.3	.74	-1.7	-1.8	.07
<b>Help<sup>1</sup></b>						
1 SD below	1.8	1.8	.08	0.6	0.5	.59
Mean	1.3	1.8	.08	0.4	0.6	.57
1 SD above	0.8	0.7	.47	0.3	0.3	.76
<b>Danger/fear<sup>2</sup></b>						
1 SD below	-12.7	-4.9	.00	-11.5	-4.4	.00
Mean	-8.6	-4.7	.00	-6.9	-3.8	.00
1 SD above	-4.5	-1.8	.08	2.3	-0.9	.36
<b>Avoidance<sup>1</sup></b>						
1 SD below	-4.5	-4.2	.00	-2.7	-2.5	.01
Mean	-3.5	-4.7	.00	-1.1	-1.5	.13
1 SD above	-2.5	-2.4	.02	.44	.42	.68
<b>Segregation<sup>3</sup></b>						
1 SD below	-1.9	-2.6	.01	-1.1	-1.4	.17
Mean	-1.6	-2.9	.00	-1.1	-2.1	.04
1 SD above	-1.2	-1.6	.11	-1.2	-1.6	.11
<b>Coercion<sup>1</sup></b>						
1 SD below	-4.0	-3.9	.00	-4.6	-4.4	.00
Mean	-3.1	-4.1	.00	-2.6	-3.5	.00
1 SD above	-2.1	-1.9	.05	-0.6	-0.6	.55
<b>Total stigma<sup>4</sup></b>						
1 SD below	-20.1	-3.2	.00	-20.7	-3.3	.00
Mean	-13.1	-2.9	.00	-11.2	-2.6	.01
1 SD above	-6.1	-0.9	.33	-1.6	-0.3	.79
<b>Social distance<sup>5</sup></b>						
1 SD below	-0.2	-1.3	.20	-0.3	-2.5	.01
Mean	-0.1	-0.9	.32	-0.1	-1.2	.22
1 SD above	-0.0	-0.1	.89	0.1	0.9	.39

Note: the independent variable (diagnosis) has been mean-centered. Covariates included in the models were race, gender, familiarity with mental illness, and authoritarianism.

<sup>1</sup>Attribution Questionnaire subscale: sum of 3 items scored 1-9, higher scores indicate greater endorsement

<sup>2</sup>Attribution Questionnaire subscale: sum of 7 items;<sup>3</sup> Attribution Questionnaire subscale: sum of 2 items

<sup>4</sup>Sum score of all 27 items from the Attribution Questionnaire

<sup>5</sup> Social Distance Scale: 1 – 4, higher scores indicate greater desire for social distance

Table 8. Differences between religious and non-religious participants

	Religious (N = 182)		Non- Religious (N = 151)		<i>f</i>	<i>df</i>	<i>p</i>	Partial $\eta^2$
	M	SD	M	SD				
Blame <sup>1</sup>	12.4**	0.4	9.1	0.5	24.6	1, 327	0.00	.07
Anger <sup>1</sup>	10.1**	0.4	6.4	0.5	31.5	1, 327	0.00	.09
Pity <sup>1</sup>	20.5	0.4	20.2	0.4	0.4	1, 328	0.54	.00
Help <sup>1</sup>	19.4	0.4	19.4	0.6	0.0	1, 330	0.97	.00
Danger/Fear <sup>2</sup>	23.1**	1.1	15.8	1.2	20.6	1, 320	0.00	.06
Avoidance <sup>1</sup>	12.7	0.4	12.2	0.5	0.6	1, 329	0.43	.00
Segregation <sup>3</sup>	6.5**	0.3	4.3	0.3	23.1	1, 331	0.00	.07
Coercion <sup>1</sup>	15.0**	0.4	11.1	0.6	39.7	1, 329	0.00	.11
Total <sup>4</sup>	110.8*	2.5	89.9	2.7	31.7	1, 312	0.00	.09
	*							
Social distance <sup>5</sup>	2.4	0.1	2.2	0.1	6.0	1, 322	0.02	.02
Intrinsic religiosity <sup>6</sup>	2.3	0.0	1.2	0.0	243.9	1, 322	0.00	.43
Extrinsic religiosity	1.9	0.0	1.2	0.0	170.4	1, 321	0.00	.35

Note: Covariates included in the model were race, gender, familiarity with mental illness, and authoritarianism

<sup>1</sup> Attribution Questionnaire subscale: sum of 3 items scored 1-9, higher scores indicate greater endorsement of the trait

<sup>2</sup> Attribution Questionnaire subscale: sum of 7 items scored 1-9

<sup>3</sup> Attribution Questionnaire subscale: sum of 2 items scored 1-9

<sup>4</sup> Sum score of all 27 items from the Attribution Questionnaire

<sup>5</sup> Social Distance Scale: 1 – 4, higher scores indicate greater desire for social distance

<sup>6</sup> Age Universal I-E Scale-12: 1 – 3, higher scores indicate higher religiosity

<sup>7</sup> Age Universal I-E Scale-12: 1 – 3, higher scores indicate higher religiosity

### FIGURES

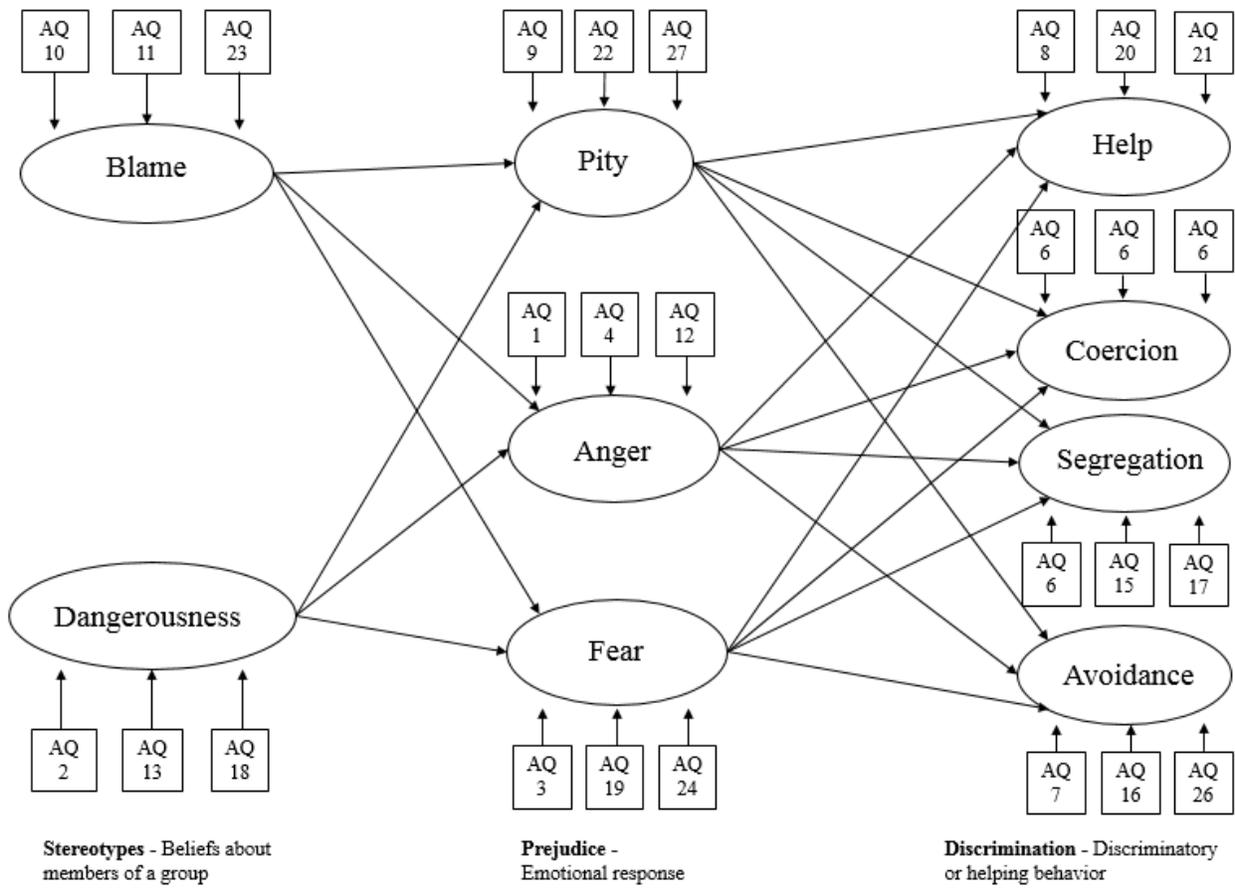


Figure 1. Hypothesized relationships in the Attribution Model

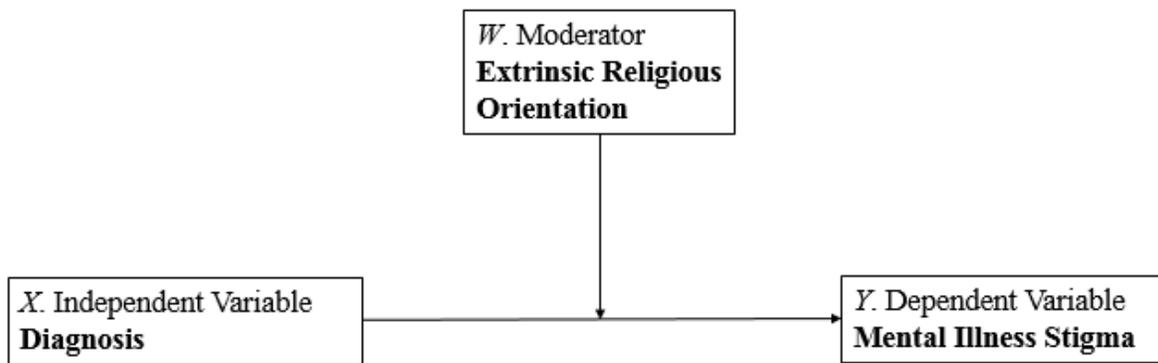


Figure 2. PROCESS model of moderation

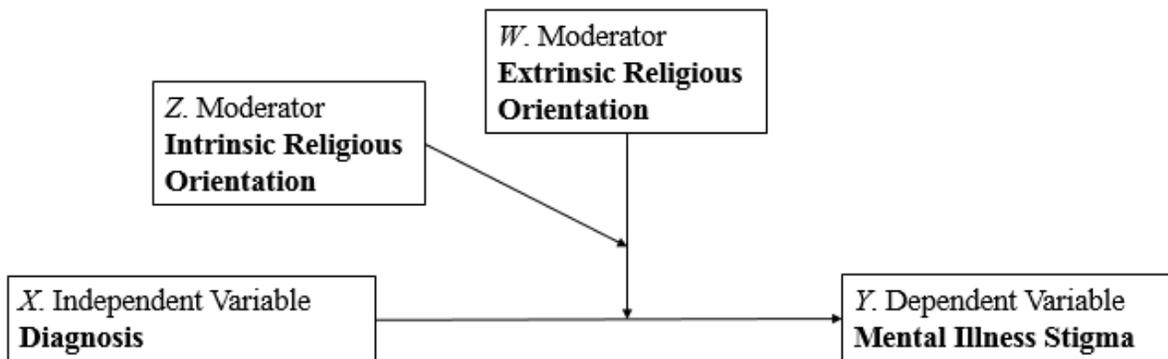


Figure 3. PROCESS model of moderated moderation

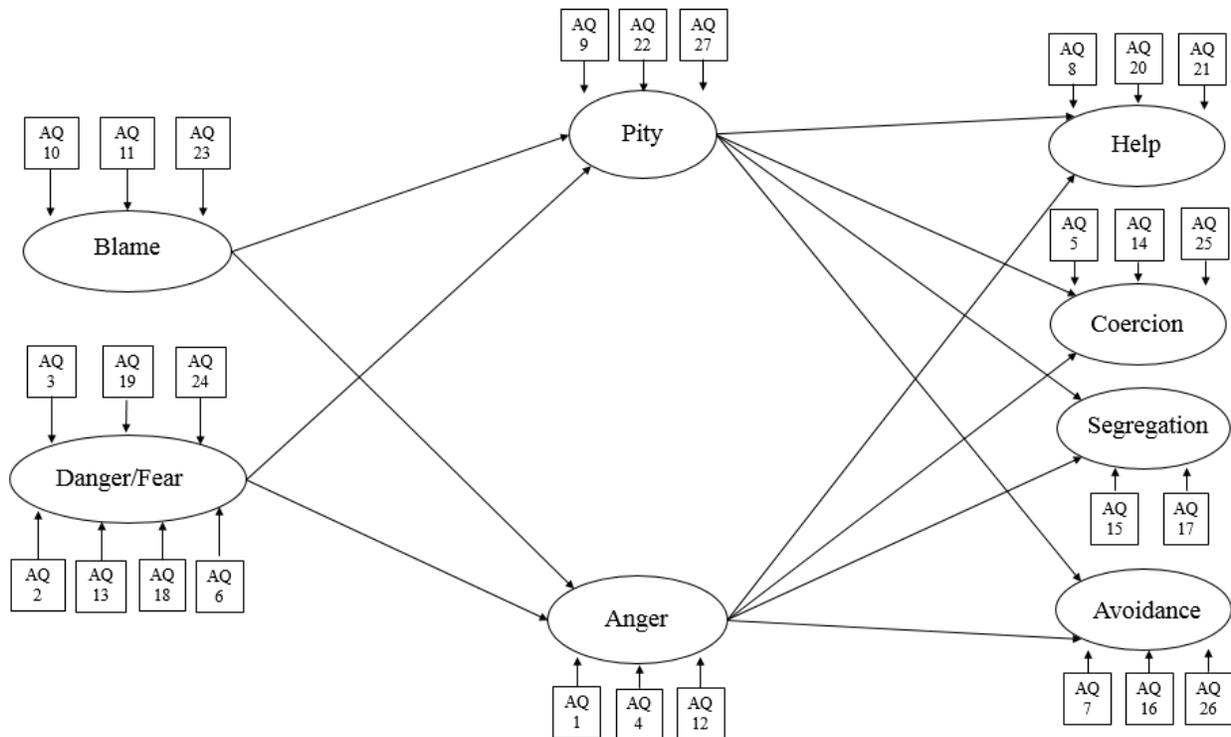


Figure 4. Final measurement model

Note: See Table 3 for final factor loadings. AQ stands for Attribution Questionnaire, the scale I have used to measure different aspects of stigma.

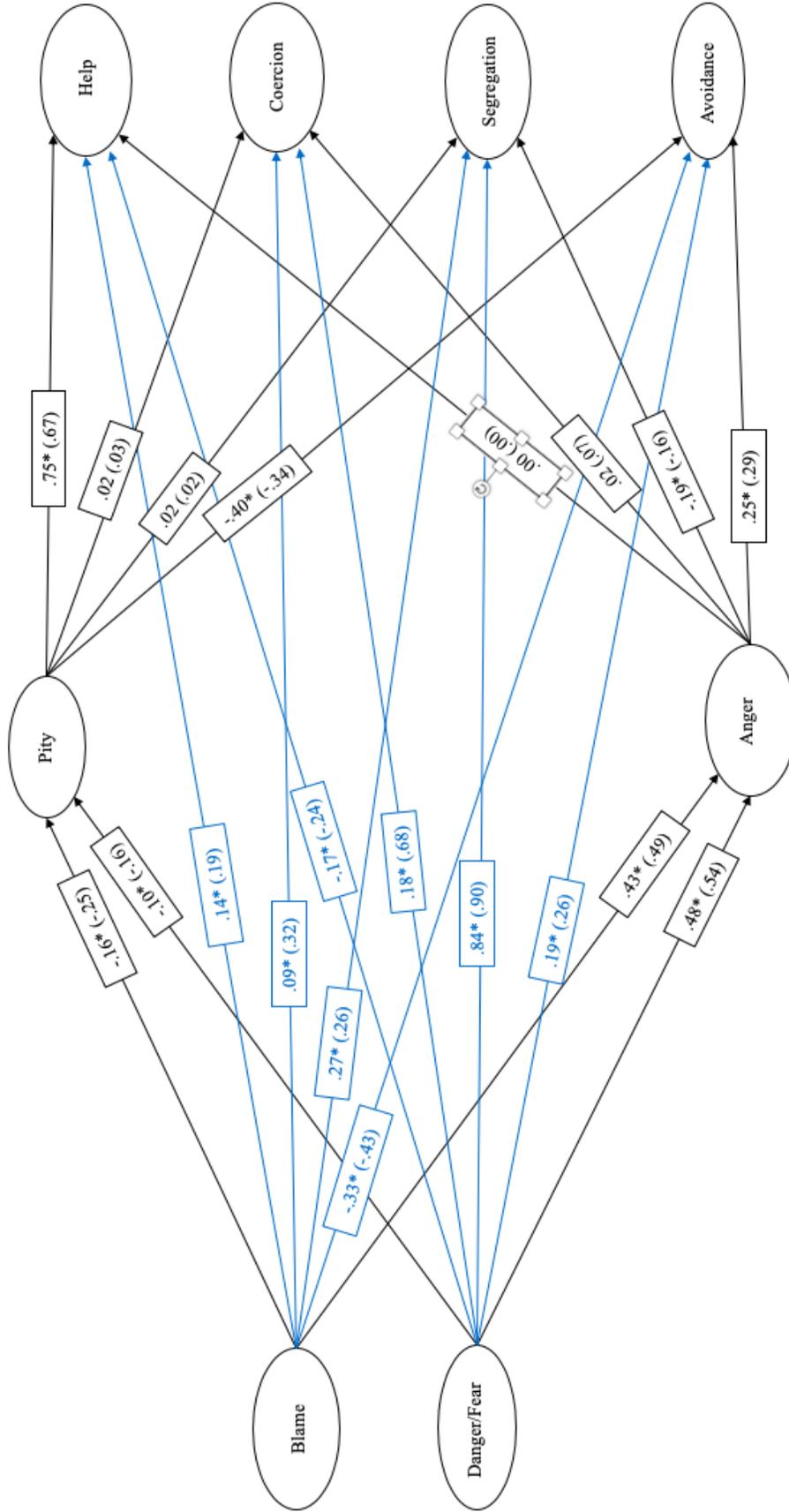


Figure 5. Paths in the Attribution Model

\* $\alpha < 0.05$

Note: Standardized path coefficients are shown in parentheses.

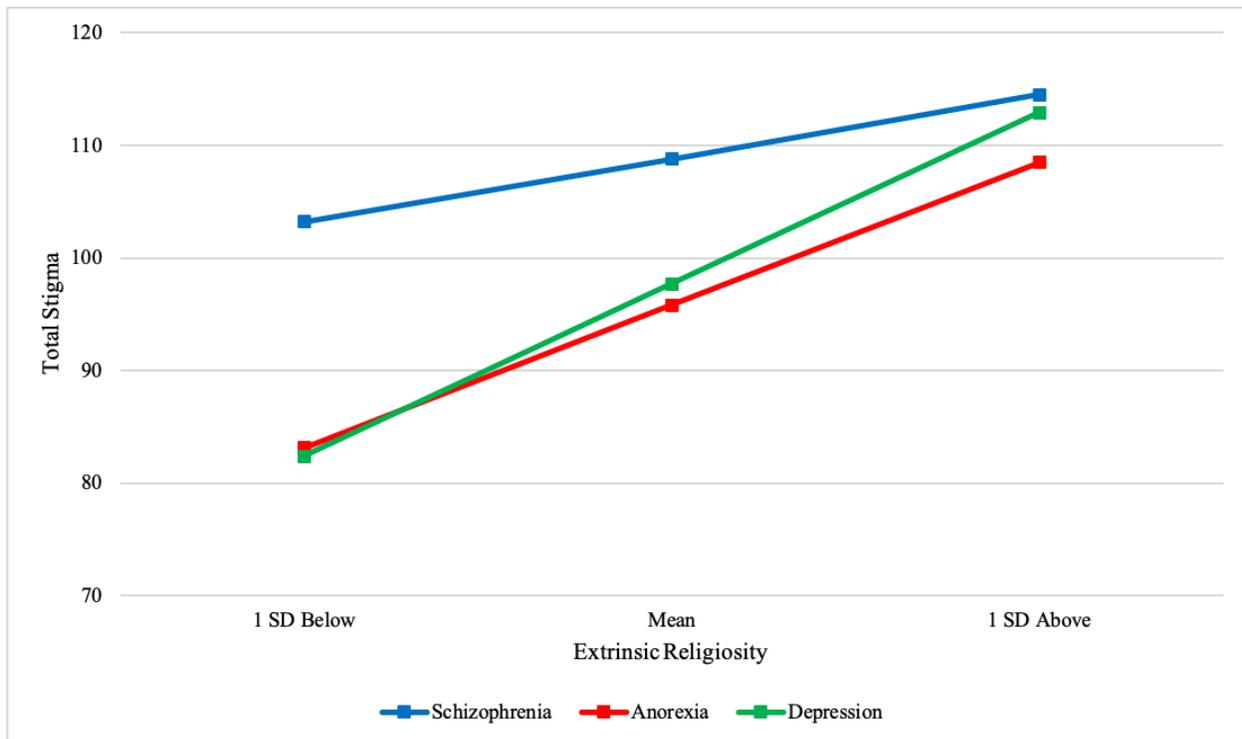


Figure 6. Total stigma at values of extrinsic religiosity

Note: Possible values for total stigma range from 27 – 243.

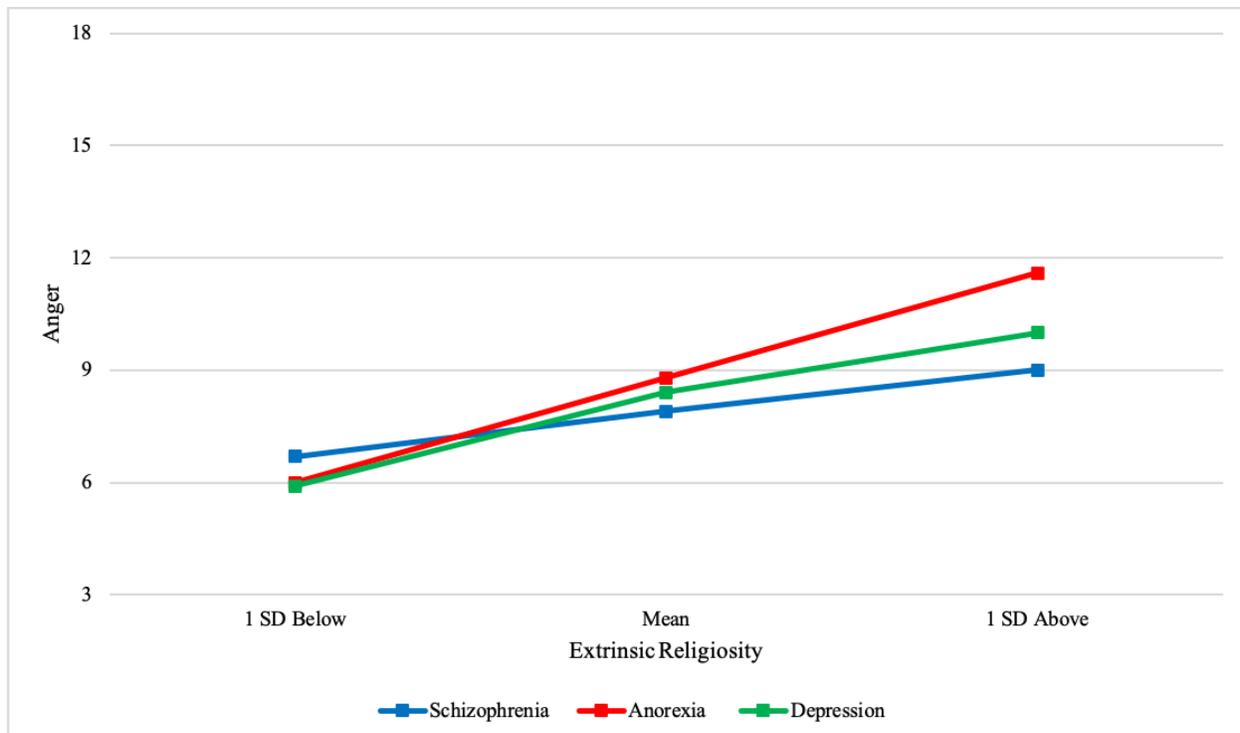


Figure 7. Anger at values of extrinsic religiosity

Note: Possible values for anger range from 3 – 27.

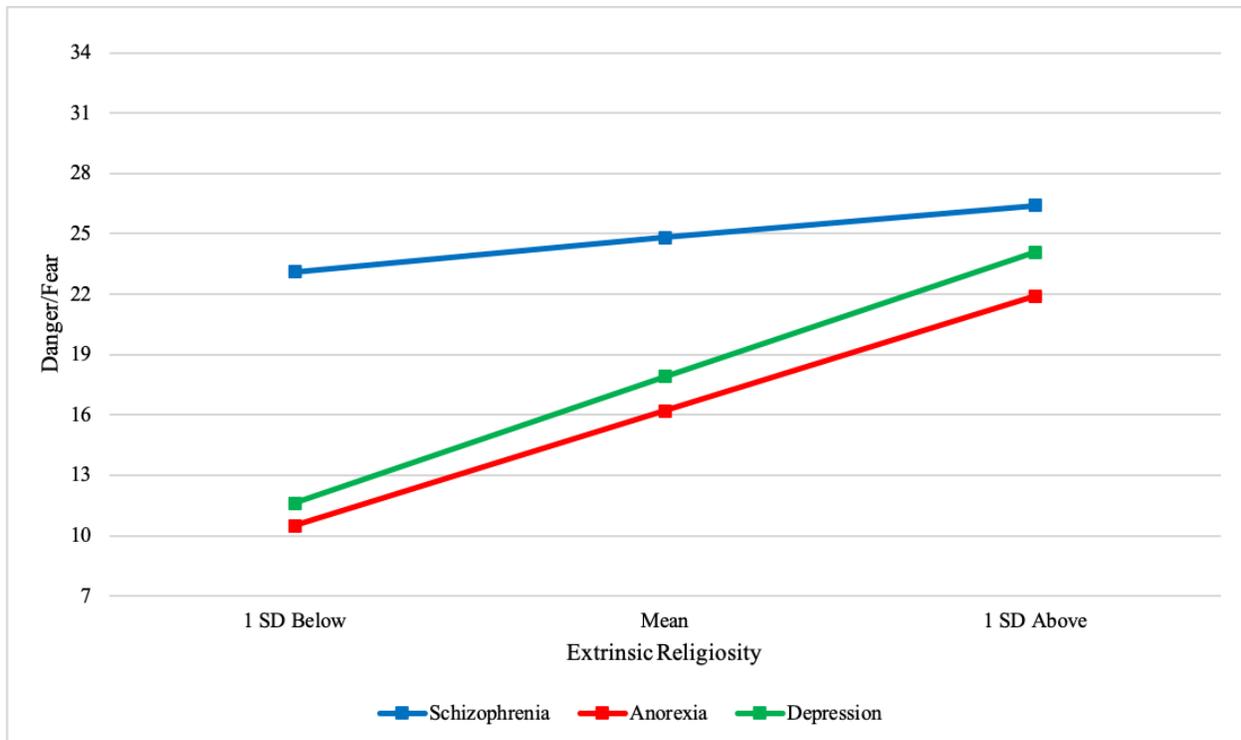


Figure 8. Danger/fear at values of extrinsic religiosity

Note: Possible values for danger/fear range from 7 – 63.

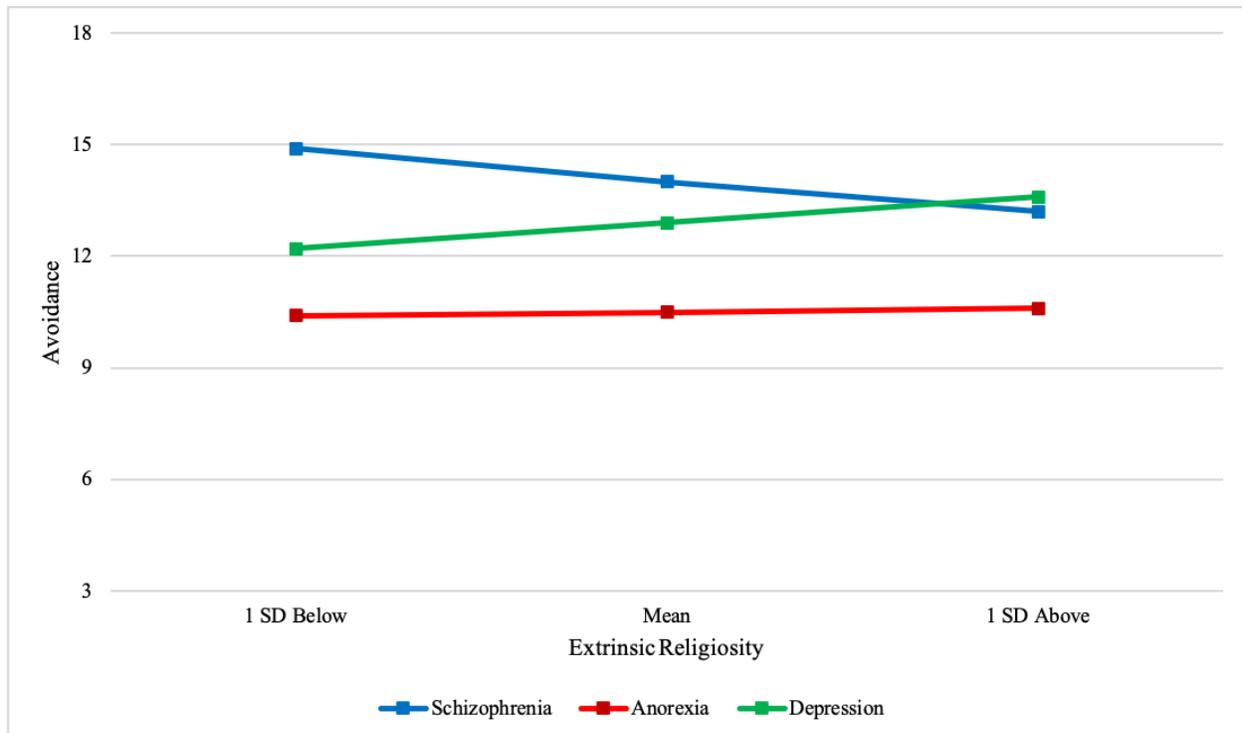


Figure 9. Avoidance at values of extrinsic religiosity

Note: Possible values range from 3 – 27.

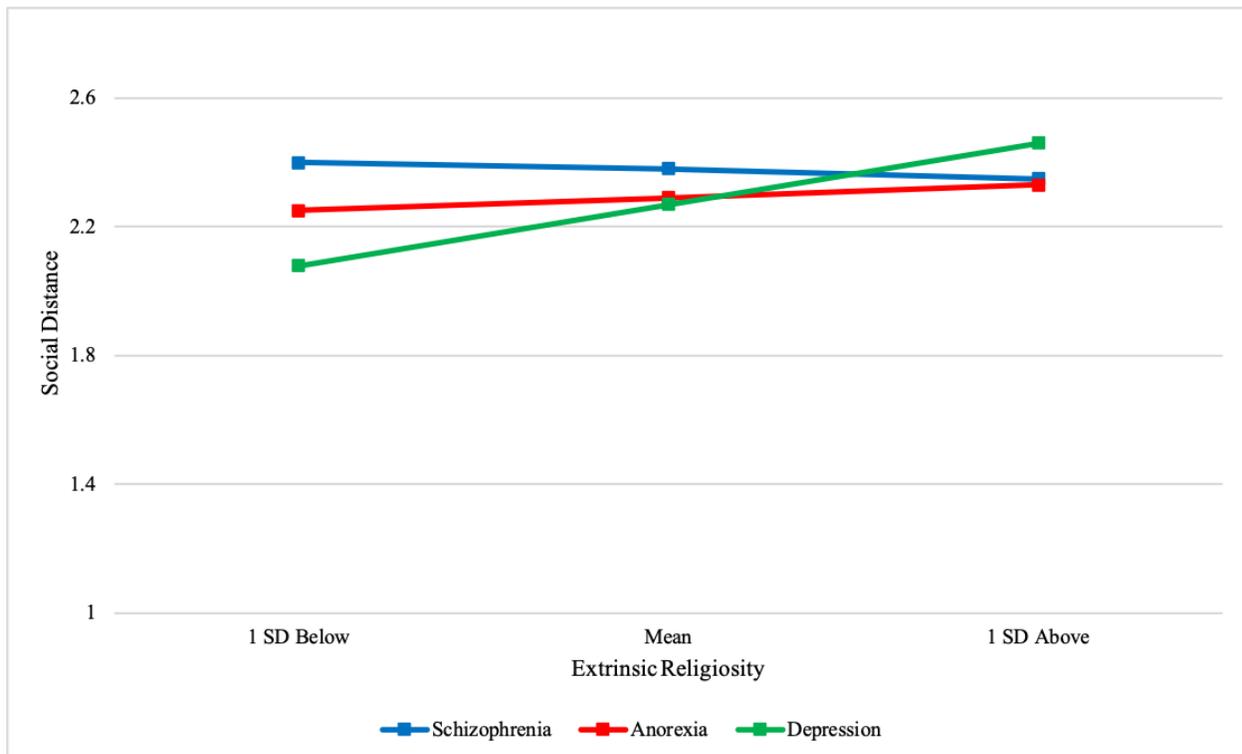


Figure 10. Social distance at values of extrinsic religiosity

Note: Possible values for social distance range from 1 – 4.

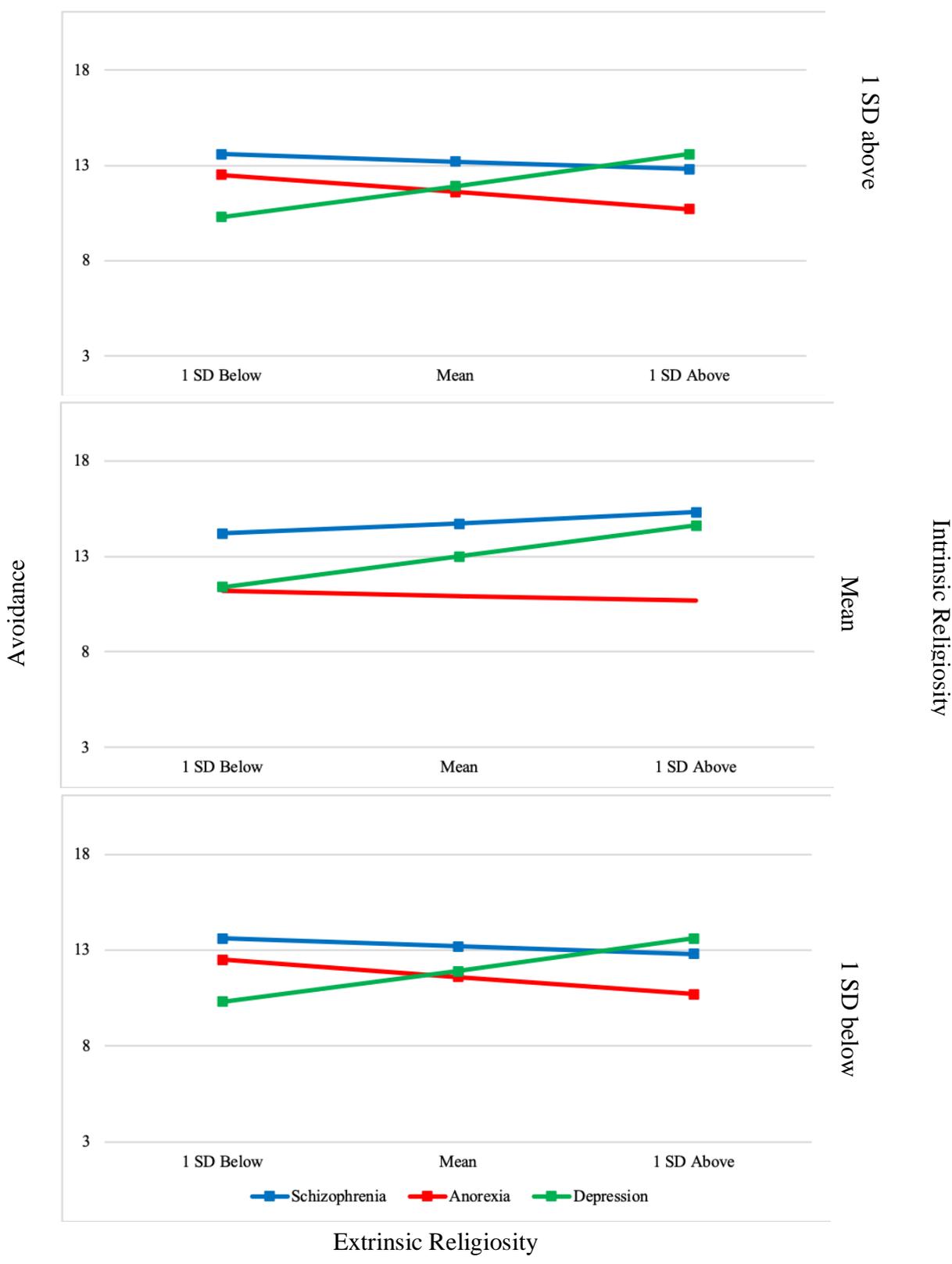


Figure 11. Avoidance at values of extrinsic and intrinsic religiosity  
Note: Possible values for avoidance range from 3 – 27.







## The AQ-27 Score Sheet

Name or ID Number \_\_\_\_\_ Date \_\_\_\_\_

The AQ-27 consists of 9 stereotype factors; scores for each factor are determined by summing the items as outlined below: Note: items are reversed score prior to summing up for the Avoidance scale.

\_\_\_\_\_ Blame = AQ10+ AQ11 +AQ23

\_\_\_\_\_ Anger = AQ1 + AQ4 + AQ12

\_\_\_\_\_ Pity = AQ9 + AQ22 + AQ27

\_\_\_\_\_ Help = AQ8 + AQ20 + AQ21 (Reverse score all three questions)

\_\_\_\_\_ Dangerousness = AQ2 + AQ13 + AQ18

\_\_\_\_\_ Fear = AQ3 + AQ19 + AQ24

\_\_\_\_\_ Avoidance = AQ7 + AQ16 + AQ26 (Reverse score all three questions)

\_\_\_\_\_ Segregation = AQ6 + AQ15 + AQ17

\_\_\_\_\_ Coercion = AQ5 + AQ14 + AQ25

The higher the score, the more that factor is being endorsed by the subject.

**Social Distance Scale (SDS)**

Please answer the questions below, indicating the extent of your willingness or unwillingness to engage in the scenarios described, using the following scale:

- 1 Definitely Unwilling
- 2 Probably Unwilling
- 3 Probably Willing
- 4 Definitely Willing

1. How would you feel about renting a room in your home to someone with a mental illness?

1      2      3      4

2. How would you feel about working with someone with a mental illness?

1      2      3      4

3. How would you feel about having someone with a mental illness as your neighbor?

1      2      3      4

4. How would you feel about having someone with a mental illness as the caretaker of your children?

1      2      3      4

5. How would you feel about having your children marry someone with a mental illness?

1      2      3      4

6. How would you feel about introducing someone with a mental illness to your friends?

1      2      3      4

7. How would you feel about recommending someone with a mental illness for a job working with someone you know?

1      2      3      4

### **The Level of Contact Report**

Each item below has been coded in the level of intimacy: 11= most intimate contact with a person with mental illness, 7= medium intimacy, 1= little intimacy.

The index for this contact was the rank score of the most intimate situation indicated. If a person checks more than one item, rank their **HIGHEST** level of intimacy.

3 - I have watched a movie or television show in which a character depicted a person with mental illness.

7 - My job involves providing services/treatment for persons with a severe mental illness.

2 - I have observed, in passing, a person I believe may have had a severe mental illness.

5 - I have observed persons with a severe mental illness on a frequent basis.

11 - I have a severe mental illness.

6 - I have worked with a person who had a severe mental illness at my place of employment.

1 - I have never observed a person that I was aware had a severe mental illness.

8 - A friend of the family has a severe mental illness.

9 - I have a relative who has a severe mental illness.

4 - I have watched a documentary on television about severe mental illness.

10 - I live with a person who has a severe mental illness.

**Age-Universal IE scale - 12**

Think about each item carefully. Does the attitude or behavior described in the statement apply to me?

1 – No

2 – Not certain

3 – Yes

1. I enjoy reading about my religion.

1      2      3

2. I attend religious services because it helps me make friends.

1      2      3

3. It is important to me to spend time in private thought and prayer.

1      2      3

4. I have often had a strong sense of God's presence.

1      2      3

5. I pray mainly to gain relief and protection.

1      2      3

6. I try hard to live all my life according to my religious beliefs.

1      2      3

7. What religion offers me most is comfort in times of trouble and sorrow.

1      2      3

8. My religion is important because it answers many questions about the meaning of life.

1      2      3

9. Prayer is for peace and happiness.

1      2      3

10. I attend religious services mostly to spend time with my friends.

1      2      3

11. My whole approach to life is based on my religion.

1      2      3

12. I attend religious services mainly because I enjoy seeing people I know there.

1      2      3

Intrinsic items – 6, 4, 11, 8, 1, 3

Extrinsic items – 2, 5, 7, 9, 10, 12

**Religious Affiliation**

1. What is your present religion, if any?

Protestant

Roman Catholic

Mormon

Orthodox Christian

Jewish

Muslim

Buddhist

Hindu

Other: \_\_\_\_\_

Atheist

Agnostic

1a. [If participant selects Protestant or Roman Catholic...]

Would you describe yourself as a “born-again” or evangelical Christian, or not?

Yes, would

No, would not

Don't know

2. Aside from weddings and funerals, how often do you attend religious services?

More than once a week

Once a week

Once or twice a month

A few times a year

Seldom

Never

Don't know

3. Are you personally a member of a local synagogue, mosque, temple, church, or other house of worship?

Yes

No

Don't know