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# Development and Preliminary Validation of a Comprehensive, International Measure of Beliefs about the Causes of Mental Illness: The Mental Illness Attribution Questionnaire

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Development and Preliminary Validation of a Comprehensive, International Measure of Beliefs  
about the Causes of Mental Illness: The Mental Illness Attribution Questionnaire

by

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Presented to the Graduate and Research Committee

of Lehigh University

in Candidacy for the Degree of

Doctor of Philosophy

in

Counseling Psychology

Lehigh University

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July 2015

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## Abstract

The study of mental illness attributions, or beliefs about the causes of mental illness, is well-documented and ongoing in the academic literature. Attributions have traditionally been dichotomized along four dimensions based on their locus, controllability, specificity, and stability and have been associated with a wide variety of thoughts, emotions, beliefs, and actions related to mental illness. However, more recent studies have introduced a new cross-cultural model incorporating lay beliefs about the specific biological, emotional, social, and spiritual causes of mental health problems. The present research outlines the design and initial validation of a comprehensive, international measure of causal beliefs using this new model, the Mental Illness Attribution Questionnaire (MIAQ). The four-stage research project included item formulation, piloting, identification of factor structure, qualitative rating tasks, and initial validation with a sample of 680 international students representing 94 nations. Factors captured causes related to supernatural forces, social/stress, lifestyle, physical health, substance use, heredity/biology, and personal weakness. This structure was tested for model fit using confirmatory factor analysis across three vignette conditions – one each describing a man with schizophrenia, depression, or alcoholism – with further examination yielding strong test-retest reliability and promising convergent, discriminant, and cultural validity data. Taken together, these results provide tentative support for the reliability and validity of the MIAQ as a comprehensive measure of seven categories of mental illness attribution. The measure was validated using existing standards for international scale development and has strong potential for understanding attribution and stigmatizing behavior across cultures.



## CHAPTER I

### **Introduction**

Attribution theory is a subfield within psychology aimed at studying the ways in which a person's beliefs about the causes and explanations (or "attributions") of a specific event influence responses to that event (Petty & Cacioppo, 1996). For example, beliefs about the causes of mental illness have been shown to predict attitudes and stigmatizing behavior toward people with mental illnesses (Corrigan, Markowitz, Watson, Rowan, & Kubiak, 2003). Attempts to measure such attributional beliefs about mental illness have largely aligned with locus of control theory in dichotomizing the variable along a single dichotomous variable: internal (within the person) or external (outside of the person; Heider, 1958; Hill & Bale, 1980; Rotter, 1966). However, more recent studies have shown that beliefs related to the causes of mental illness are likely to be much more complex, with variation on several theoretical, etiological, and cultural factors (Breheny, 2007; Markowitz, 1998; Weiner, 1995). The goal of the present research was to further explore and quantify this complexity by examining the psychometric properties and providing initial validation of a new, comprehensive measure of beliefs about the causes of mental illness in diverse international samples, the Mental Illness Attribution Questionnaire (MIAQ).

Beliefs related to heredity, social strife, religion, supernatural powers, fate, and chance have been associated with attributions of mental illness in a variety of studies, both in the United States (Klonoff & Landrine, 1994; Landrine & Klonoff, 1994) and abroad (Chen & Bond, 2012; Edman & Koon, 2000; Pfeifer, 2000). Such alternative models of attribution (i.e., outside of the original dichotomous model of internal and external causality) have also been examined alongside a variety of health related behaviors. For example, researchers have sought to identify

whether specific causal attributions might be associated with attitudes toward and willingness to seek medical and mental health treatment (Cinnirella & Loewenthal, 1999; Farmer, Robin, Ramilus & Kim, 1991; Klonoff & Landrine, 1996). Although alternative attributions have been identified as an important direction for future study, few measures are available to quantify attributions beyond internal and external causes (Corrigan, 2005; Furnham & Wong, 2007; Landrine & Klonoff, 1994). The current study utilized a variety of methodologies in instrument development to create a measure incorporating diverse causes of mental illness, including biological, social, personal, and supernatural aspects. A mixed-methods pilot study was conducted by Knettel (2013) to develop items, examine the initial factor structure of the measure, and create the preliminary version of the MIAQ. A second study then tested the preliminary items with a sample of international university students in the United States, revised the initial version, examined the psychometric properties of the measure, and provided preliminary validation of the MIAQ.

### **The Origins of Attribution Theory and a More Complex View of Attributional Beliefs**

The study of attributions of events and behaviors has a long and complex history in the field of psychology. Initially, Heider (1958) and Rotter (1966) proposed simple continua of internal versus external causation and locus of control, but these models have grown to encompass a much broader range of human attitudes. Early research by Weiner (1980) and Peterson and Seligman (1987) redefined attribution theory as multidimensional, incorporating beliefs about not only the locus of causality, but also their controllability, stability over time, and whether they are specific to a situation or have broader (i.e. “global”) implications. This line of research was formalized with the “explanatory style” studies of Peterson and Seligman (1987) and Cheng and Furnham (2001; 2003), which observed relationships between a “pessimistic

attributional style” (made up of internal, stable, and global explanations) and a variety of health- and happiness-related variables.

While the explanatory style model gained momentum, a separate study by Marsh and Richards (1987) marked the introduction of a second theoretical paradigm. The authors identified 12 empirical investigations that supported models of attribution using specific causal beliefs, and not binary dimensions, to examine attribution styles. The resulting, expanded set of factors revealed a variety of relevant personality and social variables that made up causal beliefs, including spirituality, beliefs about authority, the mental health system, mental illness, medication, media portrayals, personal experience, upbringing, perceptions of dangerousness, personal responsibility, morality, and individualism/collectivism.

Klonoff and Landrine (1994, 1996) expanded the examination of attributions as specific causal beliefs into the realm of healthcare and beyond the assumption that social and biological knowledge were central to most individuals’ beliefs. Klonoff and Landrine found that a variety of “alternative” attributions, including beliefs about spiritual and supernatural powers, fate, luck, lifestyle choices, and personal health were not only present, but were powerful indicators of causal attributions for a variety of physical ailments and illnesses. These early findings were supported by a qualitative study by Cinnirella and Loewenthal (1999) indicating that religious beliefs and attributions falling outside of dominant cultural norms have a strong but often hidden impact on health related attitudes and behaviors.

Klonoff and Landrine’s (1994) publications marked a shift in the attribution literature beyond dichotomous representations of attribution (e.g., internal-external, biological-social, within-beyond control) to examining specific attributions for mental illness (e.g., spirituality, retribution for wrongdoing; Furnham & Chan, 2004; Furnham & Igboaka, 2007; Furnham &

Wong, 2007; Olafsdottir & Pescosolido, 2011). Furnham and Chan (2004) described the necessity of the more inclusive model by describing the dimensions of attribution as “inter-related, inter-dependent, and not mutually exclusive” (p. 544). In other words, a single person may simultaneously endorse beliefs about causes that are within a person’s control (e.g., substance use) and outside of a person’s control (e.g., heredity) as contributing to mental illness.

Recent literature in the field has also reflected an increased emphasis on international psychology (Gerstein, Heppner, Aegisdottir, Leung, & Norsworthy, 2009), resulting in a distinct shift in the paradigm of attribution research. As a result, attribution studies have been conducted both within and outside the United States with more diverse racial, ethnic, and geographical samples (Chen & Bond, 2012; Choi, Nisbett, & Norenzayan, 1999; Edman & Koon, 2000; Furnham & Wong, 2007; Olafsdottir & Pescosolido, 2011; Weisman et al., 1998). Once rare cross-cultural comparisons of attributions have now become commonplace. These are important steps forward, as the concept of mental illness is indigenously variable and innately complex (Kleinman, 1980; Kleinman, Eisenberg, & Good, 1978). Furnham and Chan (2004) cite multiple studies showing relationships between national culture and “how people respond to an illness, as well as how they perceive the illness and what they think would constitute the illness” (p. 544), as well as factors which are associated with help-seeking behavior, stigma, treatment compliance, and other key determinants of health (Olafsdottir & Pescosolido, 2011).

### **The Convergence of Attribution Theory and the Study of Mental Illness Stigma**

With the advancement of more complex and comprehensive views of attribution, researchers are also exploring the influences of attributional beliefs on attitudes towards people and problems. One active area of attribution research is seeking to understand associations between attributions and stigma toward people with mental illness (Corrigan, 2005). The

existence of mental illness stigma, defined as the negative differential treatment of people with mental illness, is a well-established phenomenon (Corrigan et al., 2003; Corrigan & Lee, 2013; Hinshaw & Cicchetti, 2000; Link, Cullen, Struening, Shrout, & Dohrenwend, 1989; Martin, Pescosolido, & Tuch, 2000). Further, commonly held misconceptions that people with mental illness are more likely to commit acts of violence have led to increased stigma in the general public (Stangor & Crandall, 2000; Corrigan et al., 2002). Stigma takes on many forms, including the way we feel about and treat others. For example, someone who holds stigmatizing attitudes about mental illness may display emotional reactions to a mentally ill person such as fear and pity, or may change his or her behavior in order to reject, avoid, or discriminate against that person (Corrigan & Kleinlein, 2005; Corrigan & Watson, 2002; King, Hebl, & Heatherton, 2005; Link et al., 1989).

Corrigan and Watson (2002) reasoned that the challenges facing people with serious mental illness contained three major components. First, the individual must struggle with the symptoms of the disorder. Second, the individual must deal with the stereotypes and prejudices that result from the stigmatization and misunderstanding of mental illness by others (i.e., “public stigma”). Finally, the experience of these external problems often leads persons with mental illness to adopt negative perceptions of themselves, known as “self-stigma,” which is marked by feelings of shame and inadequacy, denial or hiding of symptoms, and the avoidance of seeking help for fear of further discrimination. Taken together, these three concerns contribute to multiple inequalities faced by people with mental illness (e.g., difficulties with social support, unemployment or underemployment, a lack of safe and suitable housing, and barriers to quality health care and mental health care; Corrigan & Watson, 2002; Mak & Wu, 2006).

Recognizing that stigma is a major problem preventing people from receiving appropriate care, researchers continue to work to identify its origins and processes (Corrigan, 2005; Corrigan & Lee, 2013; Link et al., 1989). Such research is generally aimed at reducing the occurrence and impact of stigmatizing behavior (King, Hebl, & Heatherton, 2005). For example, Weiner, Perry, and Magnusson (1988) identified attributions for another person's behavior as influencing an observer's emotional reactions and willingness to help that person. The authors measured participants' reactions to ten different types of stigmas, half relating to physical causes (e.g., cancer, blindness) and half relating to "mental-behavioral" causes (e.g., drug abuse, being a victim of child abuse). Weiner et al. found that conditions with physical origins were commonly attributed as being beyond a person's control, produced little anger, and elicited pity and a desire to help. Concerns with mental-behavioral origins, on the other hand, elicited beliefs that the problem was within the person's control, did not incite pity, and led to feelings of anger and a willingness to neglect (Weiner et al., 1988). The results were notable, both in arguing for the legitimate consequences of mental illness stigma, and for their incorporation of a complex model of attributions which included emotional responses, deeply-held beliefs, and behavioral reactions. Perhaps most importantly, this early line of research led to the eventual convergence of attribution theory with explorations of mental illness stigma that continue to inform the field of psychology today (Corrigan, 2005).

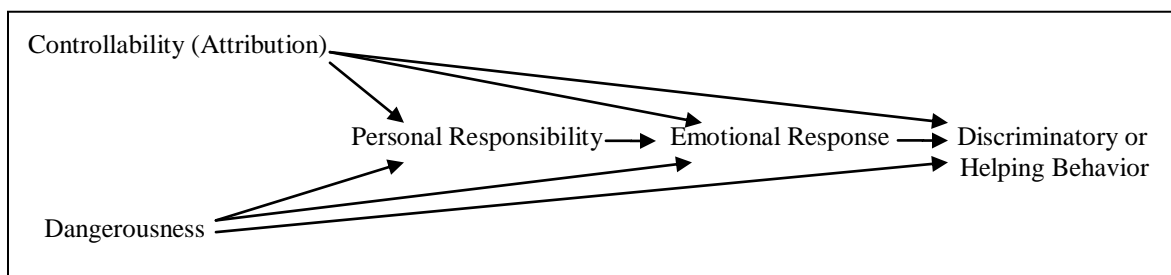
### **Toward a Comprehensive Model of Attribution and Stigma**

To date, attempts to capture the complexity of modern attribution have largely relied on qualitative data (Choi et al., 1999; Weisman et al., 1998), which is a strong modality for exploring new theoretical models. However, a weakness of qualitative research is the challenge it presents for examining relationships between variables. The few quantitative measures that have



been developed to measure categories of attribution have typically focused on a limited range of attributions using an amalgam of items from previous studies rather than a complete, cohesive measure. As a result, these instruments appear not to have been subjected to thorough scale development procedures or validation (Chen & Bond, 2012; Furnham & Wong, 2007; Edman & Koon, 2000). Certainly, none have attempted to capture the full complexity of the original Landrine and Klonoff (1994) factor structure.

Based on the attribution theory and research of Weiner (1980; Weiner et al., 1988), Corrigan and colleagues (1999, 2002, 2003) sought to expand the literature by formulating a comprehensive model of stigma explaining the ways in which various beliefs and attitudes interact and lead to negative treatment of the mentally ill. The immediate precursors to this model were a pair of studies conducted by Corrigan and colleagues examining two potential pathways to stigmatizing behavior, one linking beliefs about the controllability of the illness to stigmatizing responses and the other inspecting beliefs about dangerousness (Corrigan et al., 2002). Ultimately, both pathways were supported by the data and the two were combined to form a single conceptual model (see Figure 1).



*Figure 1.* Corrigan et al.'s (2003) model of attribution and stigma.

The model in Figure 1 depicts how an observer who encounters a mentally ill person makes inferences about the cause of the problem (e.g., whether the problem is within the

person's control), and whether the person may be dangerous. These beliefs about controllability and dangerousness then successively lead to stereotyped thoughts about personal responsibility, emotional reactions, and changes in behavior directed toward that person (Corrigan et al., 2002; 2003; Stangor & Crandall, 2000). For example, an encounter with a person on the street who is actively psychotic may activate stereotypes and beliefs including perceptions of whether the person is a threat or has control over his or her actions. These beliefs may activate emotional responses such as fear, guilt, or anger, which inform behavior, such as avoiding the person or calling for help. In many ways this process mirrors the classic cognitive-behavioral "ABC" concept, wherein: a) an activating event, b) triggers a set of beliefs, and c) leads to consequences in behavior (Beck, Rush, Shaw, & Emery, 1987; Corrigan et al., 2003; Corrigan, 2005).

Historically, the Corrigan et al. (2003) model has been supported by a variety of studies exploring its variables. These have included studies of social situations (Reisenzein, 1986; Weiner, 1980), perceptions of physical illness (Peterson & Seligman, 1987; Weiner et al., 1988), and perceptions of mental illness (Corrigan et al., 2002; Link, Phelan, Bresnahan, Stueve, & Pescosolido, 1999; Martin et al., 2000; Weiner et al., 1988). Each of these studies supported a common pathway between an observer's attribution of the cause of the event or illness, his or her emotional response, and the resulting change in behavior toward the person. More specifically, events that were perceived to be within a person's control or capacity to change were often found to activate negative emotions in the observer and lead to stigmatizing behavior. Attributions believed to be outside of the person's control or capacity to change was likely to spark positive emotions and led to more helping behavior.

Because of its careful construction and empirical support, the Corrigan et al. (2003) model is a promising step forward in the study of attribution and stigma. However, attempting to

explain such a complex process in a single model is not without its challenges. The large scale of the model may fail to capture the individual complexities of the variables being measured. For example, in the Corrigan et al. (2003) model, each variable is dichotomized, with beliefs about attribution reverting to Heider's (1958) and Rotter's (1966) original internal (within control) versus external (outside control) continuum. Although Corrigan and colleagues (2003) acknowledge the complexity of attribution and discuss the implications of genetic, social, and religious beliefs in shaping causal beliefs, they do not incorporate these variables into the model.

The lack of specificity in the Corrigan et al. (2003) model regarding the directions of the relationships between its variables leads to inconsistent findings. For example, as mentioned previously, the model was informed by research showing that external attributions, or the beliefs that an event was beyond a person's control, led to increased sympathy and helping behavior whereas internal attributions led to anger and a decreased willingness to help (Corrigan et al., 2000; Link et al., 1999; Martin et al., 2000; Reizenstein, 1986; Weiner, 1980; Weiner et al., 1988). However, studies by Rusch, Todd, Bodenhausen, and Corrigan (2010) and Breheny (2007) presented different results. The authors found that biological and hereditary causes of mental illness were clearly perceived as being outside of a person's control (i.e., external attributions). However, the authors also found that this type of attribution was associated with greater social distancing from people with mental illness. In the same study, individuals who had been diagnosed with a mental illness and who endorsed an external attribution also reported increased self-stigma marked by fear and guilt regarding their illness. These findings directly contradicted previous research linking perceived responsibility with increased stigma. Similarly, Breheny (2007) found that although the link between perceived responsibility for one's illness and an increase in stigmatizing behavior was supported for schizophrenia, the same was not true

for depression. It appears that the interactions between the variables in Corrigan et al.'s (2003) model may not be consistent across situations, attributions, or illnesses. Potential causes for this variation are explored in greater detail in the present study.

A second important area of concern related to the Corrigan et al. (2003) model is that it was entirely validated with non-clinical samples of undergraduate university students within the United States (Corrigan et al., 2002; 2003). Researchers have presented data showing that such samples may not be representative of broader populations, particularly in terms of racial/ethnic makeup, education, regional variation in attitudes, socioeconomic status, and belief systems (Arnett, 2008; Henrich, Heine, & Norenzayan, 2010; Heppner, Wampold, & Kivlighan, 2008). Corrigan and colleagues (2002) did recognize the implications of non-representative sampling. However, concerns regarding sampling are magnified when attempting to generalize to other countries, with substantial differences on multiple attitudes and beliefs being observed both among developed nations and between Western and non-Western societies (Henrich et al., 2010). Previous cross-cultural attribution research conducted in the U.S. (Edman & Kameoka, 1997; Klonoff & Landrine, 1994; 1996) and the U.K. (Cinnirella & Loewenthal, 1999) have shown notable differences in systems of attribution between different racial and ethnic groups. Similarly, surveys of attributional beliefs in non-Western cultures (Chen & Bond, 2012; Edman & Koon, 2000; Knettel, 2013) have yielded vastly different results than those conducted in the U.S. For these reasons, future efforts to validate the Corrigan et al. (2003) model should emphasize the importance of sampling diverse populations, both within the United States and abroad.

## **The Present Study**

The Corrigan et al. (2003) model of stigma has been partially supported and validated in Western settings (Boysen & Vogel, 2008; Menec & Perry, 1998; Rusch et al., 2010). A variety of studies have also investigated relationships between variables within the model (Breheny, 2007; Read & Law, 1999; Rusch et al., 2010) and the model's generalizability to new settings and populations (Cinnirella & Loewenthal, 1999; Knettel, 2013). However, no known research on this model has incorporated a comprehensive measure of attribution, nor has the model been examined with non-Western participants. Additionally, the research conducted by Corrigan et al. has typically used the Attribution Questionnaire (AQ; 2002) or the Psychiatric Disability Attribution Questionnaire (PDAQ; 2000), each of which contains only three items related to causality. The AQ contains only one item each for fault, controllability, and responsibility while the PDAQ asks only the likelihood of the target to improve with counseling, to improve with medication, and to recover in general. These measures have been used in conjunction with vignettes describing a person who has a mental health problem caused by controllable or uncontrollable causes (Corrigan et al., 2003). The present study outlines the formulation and initial validation of an expanded and culturally robust measure of attribution, rather than the brief, culture-specific, and/or uni-dimensional measures found in previous studies. Future studies using this more robust measure of attribution may provide a clearer picture of the attitudes and emotional responses being activated by culturally diverse samples in a variety of situations, including personal choices about help seeking and stigmatizing responses to people struggling with mental illness.

As mentioned previously, Landrine and Klonoff (1994) effectively argued for the importance of alternative beliefs about the causes of mental illness in a U.S. sample. More

recently, several studies using samples outside of the United States supported this more complex conceptualization (Chen & Bond, 2012; Edman & Koon, 2000; Furnam & Wong, 2007; Knettel, 2013). In each of these studies, diverse attributions, including beliefs about the influence of spiritual and supernatural powers, fate, lifestyle choices, and personal health were not only present, but were powerful indicators of attitudes related to physical or mental health. In order to measure the true validity of current models of mental illness attribution and stigma, researchers must incorporate these complex viewpoints. Therefore, the current study aimed to examine the characteristics and provide initial validation for a new, comprehensive, and culturally-sensitive measure of diverse attributions of mental illness.

**Measurement models and instrument validation.** The development of any psychological instrument requires attention to two primary factors: reliability and validity. Reliability is often determined by measuring the temporal stability of the test over repeated administrations, known as test-retest reliability, and its internal cohesion or internal consistency. Validity is a complex characteristic to define and measure, historically consisting of three components: content, criterion, and construct validity (Gregory, 2010; Messick, 1995). More recently, this model has been supplemented by a fourth consideration, the cultural validity of the test, which seeks to ensure that the original three areas of validity remain consistent across cultural groups (Bartram, 2001; Marsella, Dubanoski, Hamada, & Morse, 2000). Additionally, Messick (1989, 1995) argued that the original content, criterion, construct model of validity is deficient and proposed a more unified model that encompasses each of these factors as natural consequences of sound construct validity. The current study utilized the Messick model to ensure that six aspects of construct validity were incorporated into the design and initial validation of

the MIAQ: content, substantive, structural, generalizability, external, and consequential (Messick, 1989; 1995).

**Research questions and hypotheses.** The research questions and hypotheses for this preliminary validation study were as follows:

- RQ<sub>1</sub>: Is the Mental Illness Attribution Questionnaire (MIAQ) a reliable and valid measure of diverse causes of mental illness that incorporates a multidimensional understanding of attribution theory? To what extent will the factor structure of the MIAQ confirm theorized scales when administered to a sample of international students at U.S. colleges and universities?
- h0<sub>1a</sub>: Using data from the preliminary validation study, confirmatory factor analysis (CFA) will confirm the proposed factor structure of the MIAQ for each of the three vignettes as well as the combined data (i.e., number of factors, factor loading, fit of data).
- h0<sub>1b</sub>: The MIAQ will demonstrate acceptable internal consistency of scales through item-scale correlations greater than .40 (Pett, Lackey, & Sullivan, 2003) and strong internal reliability with Cronbach alphas for each scale in the three vignette conditions between .70 and .80 (Kline, 1999).
- h0<sub>1c</sub>: On a repeated administration of the measure to approximately 20 participants for each of the three vignettes after two weeks, all scales of the MIAQ will demonstrate an acceptable test-retest reliability coefficient of .70 or higher (Strauss, Sherman, & Spreen, 2006).
- h0<sub>1d</sub>: The MIAQ will show content validity, with empirical support for the selection of items, qualitative and quantitative support for the final factor structure, and

confirmation of the appropriateness of the items for their assigned scales and for the measure as a whole by a group of qualified raters.

$h_{0_{1e}}$ : The MIAQ will demonstrate concurrent, criterion-related validity, with significant correlations between scales ranked high in internal attribution and the responsibility subscale of the Attribution Questionnaire (AQ).

$h_{0_{1f}}$ : The MIAQ will demonstrate discriminant validity with statistically significant MANCOVA showing differing responses by participants from different nations, vignette conditions, and time spent in the U.S.



## CHAPTER II

### **Literature Review**

Within the field of psychology, Heider (1958) and Rotter's (1954) work on locus of control is well-known. These authors introduced a simple continuum of causality or attribution for many of the events people face on a daily basis: internal, or within the person's control, versus external, or beyond the person's control. In the last half-century, locus of control theory has grown to encompass a much broader range of human attitudes. The complex factors that contributed to constructs such as mental illness cannot easily be separated into a single, uni-dimensional model. Whereas hereditary diseases are most often identified as having external causes (i.e., beyond the person's control), other variables such as poor social support, challenging personality characteristics, or beliefs in the influence of a divine power cannot be categorized so easily. Are these causes the result of unfortunate circumstances, or of poor choices by the individual? The study of attribution has tapped into one of the greatest debates in the history of psychology - that of nature versus nurture – and it has become clear that a more complex conceptualization of mental illness is necessary, particularly one that goes beyond internal and external causes.

In response to the concerns outlined above, early research by Weiner (1980), Peterson and Seligman (1987), and Marsh and Richards (1987) has helped to redefine attribution theory, incorporating beliefs about not only the controllability of a variety of events, but also their stability over time, and whether they are specific to a situation or have broader implications. Weiner (1980) developed and validated a comprehensive model with six experiments involving hypothetical situations such as a classmate asking to borrow class notes or a stranger collapsing on the subway. The research supported Weiner's (1979) tripartite model of attribution consisting

of locus (internal versus external), stability over time (stable versus unstable), and control (within or outside the person's control). Additionally, Weiner's (1980) experiments were the first to identify a "sequential organization" (p. 186) linking this model of attribution to subsequent emotions and behavior. Put another way, the attributions that observers made of the event were found to influence the way they felt and behaved toward the person being observed (Weiner, 1980). In these hypothetical situations, people who were perceived to be responsible for and in control of their own misfortune were more likely to incite a negative emotional response and less likely to receive assistance.

Peterson and Seligman (1987) presented a similar view to Weiner (1980), supporting the tripartite model of attribution. However, the authors narrowed their approach to assess beliefs people had about themselves, with a specific focus on people who were suffering from a physical health concern or who had experienced a major negative life event. Additionally, Peterson and Seligman (1987) introduced the concept of "explanatory style" (p. 237) a belief that attributions are not merely case-by-case judgments, but that individuals adopt stable patterns of attribution that tend to hold true across challenging situations. The authors identified two primary explanatory styles, one positive and one negative. The first style is marked by a tendency to perceive challenging events as having an internal cause (i.e., that it is one's own fault), stable (unlikely to change), and global (representative of a larger theme related to life or the world we live in). The second, positive style is just the opposite and is defined by external, unstable, and specific attributions. Peterson and Seligman (1987) argued that, in keeping with learned helplessness theory, someone holding the former, negative explanatory style is likely to be at increased risk for a variety of consequences and poor outcomes in the face of life's challenges.

The expansion of attribution theory was further documented by Marsh and Richards (1987), who examined 20 studies and identified 12 factor analyses that yielded multiple models of explanation for Rotter's (1966) Internal-External (I-E) scale beyond the original unidimensional conceptualization. These far-ranging models were defined and influenced by nearly every aspect of the personality and social world including spirituality, beliefs about authority, the mental health system, mental illness, medication, media portrayals, personal experience, upbringing, and perceptions of dangerousness, personal responsibility, morality, individualism/collectivism and many more. Additionally, the authors conducted their own factor analysis of data from 361 young adults judging their own character after completing an Outward Bound program. The study found that although a single factor related to internal-external attribution explained a large proportion of the variance in the model, a more complex five-factor model incorporating luck, fate, the environment, and the control of others ultimately provided the best fit to the data.

Atkinson, Worthington, Dana, and Good (1991), Klonoff and Landrine (1994) and Landrine and Klonoff (1994) addressed the increasing complexity of the attribution literature by conducting studies examining the perceived causes of physical illness. In the first of these, Atkinson et al. (1991) surveyed 232 clients at a U.S. university's counseling center regarding their beliefs about the causes of psychological problems. Results indicated that clients ranked irrational concerns and unresolved feelings as the most important cause of problems, followed by stressful circumstances, physical problems, social concerns, biological imbalances, and finally, bad luck. Interestingly, similarity on beliefs about the causes of problems between the client and counselor were not found to predict ratings of the counselor's credibility or satisfaction with counseling.

The study by Klonoff and Landrine (1994) involved 178 university student participants and measured their attribution beliefs regarding six diseases/conditions: AIDS, the common cold, diabetes, hypertension, lung cancer, and headaches (Klonoff & Landrine, 1994). The authors then completed a principle-components analysis of the responses, yielding four factors of attribution with wide variation between illnesses. These four factors were, 1) emotional, including interpersonal stress, 2) punitive, including punishment for wrongdoing, 3) natural, including biological processes, and 4) mystical retribution, including spiritual and supernatural forces.

The second study by Landrine and Klonoff (1994) surveyed 149 undergraduates, but in this case the authors intentionally recruited larger proportions of non-traditional aged students (i.e., more than 23 years old;  $n = 89$ ) and people of color ( $n = 35$  Black, 23 Latino, and 12 Asian/Pacific Islander participant as compared to 79 White participants). In this study, subjects were asked to first “list the things that they personally believe cause illness (cause people to get sick) and then rate each of these causes in terms of its importance” (Landrine & Klonoff, 1994, p. 183) on a 7-point Likert scale. Next, participants were provided with 37 additional potential causes of illness that had been formulated by the researchers and were asked to rate these on the same 7-point scale. Participants’ freely generated causes were coded via qualitative analysis and the experimenter-provided causes were analyzed using principal-components analysis. The resulting seven-factor model revealed even more diversity than Klonoff and Landrine’s (1994) previous results, incorporating supernatural causes, interpersonal stress, lifestyle, personality, chance, substance use, natural/biological factors, and weather-related causes. Supernatural causes and interpersonal stress accounted for the largest proportions of the variance in the model at 26.67% and 13.84%, respectively.

The resulting model of attribution from Atkinson et al. (1991) and the two studies by Klonoff and Landrine (1994) and Landrine and Klonoff (1994) did not serve to replace Weiner's (1980) or Peterson and Seligman's (1987) tripartite models in the academic literature. Instead, this new direction represented a different perspective and provided new clarity to an old problem. Rather than focusing only on the processes defining attribution (locus, stability, control, or specificity), Klonoff and Landrine (1994) and Landrine and Klonoff (1994) instead chose to take an ethnographic approach. The resulting model explored the content of the attributions and the social and cultural factors that informed them. Today, the two models run parallel; we understand attribution to be a complex, multidimensional interplay of many factors, including personal decision making processes, explanatory style, genetic makeup, social pressures, and cultural background.

### **The Convergence of Attribution Theory and the Study of Mental Illness Stigma**

In addition to research seeking to understand the complexity of attributional beliefs, a variety of studies have been conducted examining whether these beliefs are related to a variety of stigmatizing attitudes and behaviors toward people with a mental illness (Corrigan et al., 2003; Link et al., 1999; Martin et al., 2000; Weiner et al., 1988). For the purpose of this research, mental illness stigma will be defined as the negative differential treatment of people with mental illness. Stigma may take on many forms, including physical and verbal abuse, active discrimination such as being denied employment, forced treatment, social avoidance, and limiting access to resources such as social support, housing, adequate health care, and mental health treatment (Corrigan, 2005).

The convergence of attribution theory and stigma research is well-documented in the literature, with observed statistical connections occurring more than 50 years ago. In a landmark

study by Cohen and Struening (1962), 1194 staff members in various positions were recruited from two large neuropsychiatric hospitals and surveyed on a variety of topics including their beliefs about the causes of mental illness, beliefs about treatment, and their perceptions of patients' problems. The resulting factor analysis revealed five factors indicating prevailing beliefs among the hospital staff that the most salient cause of mental illness was negative interpersonal relationships, that they felt morally obligated to help patients, and that patients could improve with treatment. However, the two factors accounting for the most variance in the model indicated beliefs that people suffering from mental illness were inferior and that the rights of mentally ill people should be restricted. Through this study, the empirical connection between attribution and stigma was established.

Many of the early studies attempting to measure both attributions and stigma were focused on physical illness and social problems rather than mental illness (Marsh & Richards, 1987; Peterson & Seligman, 1987; Reizenzein, 1986; Weiner, 1980). By contrast, Weiner et al. (1988) were among the first to compare and contrast public perceptions of physical ailments with conditions that had psychological or behavioral origins. The researchers surveyed 59 undergraduate university students. Participants were provided with a list of ten different conditions, five which were deemed to have physical origins (e.g., Alzheimer's disease, blindness) and five of which were deemed to have mental or behavioral elements (e.g., obesity, drug addiction). The participants then answered 13 questions examining their perceptions of people suffering from each condition including responsibility, blame, emotional response, willingness to help, stability, and potential responsiveness to treatment. Weiner et al. (1988) determined that participants were more likely to judge people with mental-behavioral conditions

as inciting more anger and being responsible for their ailment, less likeable, less pitied, and less worthy of assistance than people with physical ailments.

In addition to advancing the general body of knowledge related to attribution theory and stigma, Weiner et al.'s (1988) study showed that conditions that were deemed to have a psychological or behavioral component were judged more harshly and stigmatized more intensely than ailments that were considered to have physical origins, a result that has been supported by similar studies in the years since (Breheny, 2007; Corrigan, 2005). Additionally, the Weiner et al. (1988) study was the first to hypothesize a pathway where mental illness attribution influenced an emotional response which induced stigmatizing behavior. These results have been supported by multiple studies and formed the basis for much of the stigma research conducted in the years since (Corrigan, 2005; Corrigan et al., 2000; 2003). More recently, Corrigan et al. (2000; 2002) have maintained that beliefs about the stability and controllability of mental illness are primary determinants of stigmatizing attitudes and behaviors.

Two studies that continued Weiner et al.'s (1988) line of research were conducted by Link et al. (1999) and Martin et al. (2000) using a single set of national survey results from 1444 U.S. participants in non-institutional settings. The two studies examined public perceptions of people with schizophrenia, major depressive disorder, alcohol dependence, cocaine dependence, and a "troubled" person with subclinical concerns. They also explored the impact of causal attributions on emotions, attitudes, and behavior toward people with mental illness. The researchers presented participants with six potential causes of the mental health problems being studied: bad character, a chemical imbalance, upbringing, stressful life circumstances, genetics, and God's will. For each of the five conditions studied, stressful life circumstances were judged among the top two causes of the mental health problem, leading the authors to conclude that "the

American public has become convinced of the importance of stressful circumstances in bringing about mental disorders of very different types” (Link et al., 1999, p. 1330). Beyond this primary attribution of stress, however, there was variation between secondary causes of the conditions. For schizophrenia and major depression, chemical imbalance in the brain was judged to be an important cause. By contrast, for alcohol abuse and cocaine abuse, bad character was the second most endorsed cause (Martin et al., 2000).

In the Link et al. (1999) study, participants also varied on their judgments of dangerousness, with 87% believing the cocaine abuser to be capable of violence, 61% for the person with schizophrenia, and only 33% for the depressed person. However, people with all five disorders were considered significantly more likely than the “troubled” person (17%) to be capable of violence. Finally, similar results were found for social distance, with 90% of participants desiring to maintain their distance from the drug dependent person, 63% from the person with schizophrenia, and 47% from the depressed person, all of which were significantly higher than the “troubled” person (29%). The aforementioned studies were important in detailing the parallel processes of attributing responsibility and dangerousness to certain individuals with mental illness, with each process leading to an increase in negative emotions and stigmatizing behavior from the observer.

Furthermore, Martin et al. (2000) performed a regression to measure whether responses on the six types of attribution predicted social distance from people with mental health problems. This analysis yielded results that participants who endorsed the “extra-individual attributions” of genetics and stressful life circumstances were significantly less likely to desire social distance from people with mental illness as compared to participants who endorsed “individual-level” characterological flaws, where participants were significantly more likely to desire social



distance. In this large, “representative” U.S. sample of 1444 participants, the belief that having a mental illness was God’s will was rather uncommon, being endorsed by between 1.9% and 8.0% of participants, but the researchers did not speculate about the weight of these responses on overall attitudes. Taken together, these results support previous findings that attributions placing responsibility on the individual generally produced more negative responses toward that person, both in terms of affect and stigmatizing behavior.

Much like the explorations of physical illness (Klonoff & Landrine, 1994; Landrine & Klonoff, 1994) and physical versus mental-behavioral illness before them (Weiner et al., 1988), Link et al.’s (1999) and Martin et al.’s (2000) results also showed that U.S. participants held more complex views about the causes of mental illness than had been previously observed. Participants did not generally rely on a single explanation for the causes of mental illness (e.g., “this issue is mostly caused by genetics”), but instead understood that multiple factors could weigh into the appearance and maintenance of mental health problems. Distinctions were also made in beliefs about the causes of different mental illnesses, indicating that participants in this sample possessed a more advanced understanding of the causes of mental illness than previous studies had shown. In fact, their reported beliefs closely reflected the modern scientific understanding of such problems (i.e., containing biological, genetic, psychological, and social components that differ depending on the type of problem and may shift over time).

### **The Corrigan Model of Attribution and Stigma**

The work of Corrigan and colleagues (2002; 2003) appears to reflect these complex viewpoints and has provided additional support in identifying the influence of differing attributional beliefs. Namely, these researchers have further explored beliefs about the controllability of symptoms as vital elements in a chain of events leading to stigmatizing

behavior. For example, in a pair of analyses from 2002, Corrigan et al. examined two competing pathways attempting to explain the link between beliefs and behavior. The first proposed pathway, described in detail in the introduction above, stated that beliefs about control and personal responsibility (i.e., attribution) led to emotional responses and influenced helping or discriminatory behavior. The second proposed model was centered on the hypothesis that beliefs about a mentally ill person being potentially dangerous led to feelings of fear and behavioral avoidance. The theory of dangerousness shared similar roots with historical attribution theory (Cohen & Struening, 1962; Stangor & Crandall, 2000) and the two models were largely complementary rather than mutually exclusive (Corrigan et al., 2003), leading Corrigan and colleagues (2002) to examine them in parallel.

For their paired analyses, Corrigan et al. (2002) surveyed a culturally diverse sample of 213 community college students regarding their beliefs about “a person with mental illness (Corrigan et al., 2002, p. 296). The authors then used structural equation modeling to examine the fit of the data to the two proposed models: the responsibility-anger-discrimination model and the dangerousness-fear-avoidance model. After removing a single problematic variable from the first attribution/responsibility hypothesis, the model was found to provide acceptable fit for the data. The results for the second model examining dangerousness and fear were more promising, offering a strong fit for the data well above pre-identified thresholds on three separate fit indicators. The results of Corrigan et al.’s (2002) study indicate a strong and direct pathway between perceptions of dangerousness, the experience of fear, and the tendency to distance oneself from a person with mental illness. The relationship between attribution and stigma was found to be less clearly defined, but was also supported, leading the authors to conclude that a

model incorporating both explanations might provide a more complete representation of the factors contributing to stigma (Corrigan et al., 2003).

In a subsequent study by Corrigan et al. (2003), the authors developed the combined attribution/fear model suggested from the 2002 study and evaluated the validity of this new conceptual model of stigma (Figure 1 above) with a sample of 542 students at an urban community college. Similar to the 2002 study, participants were surveyed about their beliefs about mental illness, including perceptions of the person's responsibility for the condition, whether they were dangerous, the participant's emotional responses to the person, and their inclination to discriminate against or help the person. Unlike the 2002 study, participants were not asked about mental illness in general, but were instead presented with one of three vignettes about "Harry," a 30-year-old man diagnosed with schizophrenia – one vignette where the causes of Harry's illness was illegal drug use, one where the cause was an injury from an accident, and one where the cause was not provided. The authors also manipulated the variable of dangerousness, with some vignettes indicating that Harry had been violent in the past and others stating that Harry had never been violent. Results showed that participants who believed Harry was responsible for his illness were more likely to endorse feelings of fear and anger, and also less likely to show pity for Harry, supporting previous findings on the topic (Menec & Perry, 1998; Reizenzein, 1986; Weiner, 1980; Weiner et al., 1988). Perceptions that Harry was dangerous also led to increased anger, fear, and pity, providing support for the authors' decision to combine the dangerousness/fear and attribution/responsibility pathways into a single model. Both attributions and perceptions of dangerousness were found to produce emotional responses that were directly related to behavioral consequences. People who believed that Harry was dangerous and that the mental illness was within his control were more likely to endorse

avoidance, coercive treatments, and withholding help (Corrigan et al., 2003). Taken together, these results indicate promising progress in understanding the underlying processes and mechanisms of mental illness stigma.

### **Potential Limitations of the Corrigan et al. (2003) Model**

In the years since the publication of Corrigan et al.'s (2003) conceptual model of stigma, the understanding of the factors contributing to mental illness stigma have continued to develop. It should be noted that the Corrigan et al. model was formulated to understand the perceptions of an observer toward a mentally ill person. The studies used either a general prompt indicating "a person with mental illness" or a vignette of a person with schizophrenia, utilized a unidimensional "internal versus external" measure of attribution, and was validated entirely among university students in the United States. Each of these constrictions served to limit the scale of Corrigan and colleagues' (2003) study and improve internal validity, but also limited the generalizability of the results. Therefore, it may be valuable for future research to examine the applicability of the model to more diverse circumstances and samples. These may include potential variation in the model due to the study of self-stigma versus public stigma (Corrigan & Watson, 2002; Mak & Wu, 2006; Markowitz, 1998; Rusch et al., 2010), complex attributions beyond internal-external (Read & Law, 1999; Rusch et al., 2010), different forms of mental illness (Breheny, 2007; Link et al., 1999), and more culturally diverse samples (Cinnirella & Loewenthal, 1999). Although measuring each of these variables in turn represents a large undertaking, it is this author's belief that this will be a necessary step in capturing the complexity of the models being studied.

The self-stigmatizing of people with mental illness has received increased attention in recent years (Corrigan & Watson, 2002; Mak & Wu, 2006; Markowitz, 1998; Rusch et al.,

2010). Although causes perceived to be out of a person's control are often associated with reduced stigma from others (Link et al., 1999; Martin et al., 2000; Weiner et al., 1988), the same may not be true regarding beliefs about oneself. Rusch and colleagues (2010) chose to examine one specific attribution – the belief that mental illness is caused by biological and genetic factors - which is clearly perceived as being outside of a person's control. Contrary to findings where an observer's perception of low control and low responsibility led to decreased anger and stigma (Corrigan et al., 2003), Rusch et al. (2010) found that a biogenetic attribution of one's own illness led to self-stigma in the form of increased fear and guilt. Similar results were observed by Klonoff and Landrine (1994), who found that people who believed in external causes of physical illness were less likely to seek medical treatment. With these examples in mind, it may be important for future studies to compare observers' experience of mental illness stigma with the experiences of people who struggle with symptoms of mental illness.

The results obtained by Rusch et al. (2010) were notable not only for their examination of self-stigma, but also for their focus on biogenetic attributions. The literature has shown that there this is an attribution that consistently contradicts the oft-supported correlation between perceived control over one's illness and increased stigma. To explain this difference, the authors hypothesized that their data reflected beliefs in "genetic essentialism," which draw on the more complex multidimensional locus-stability-control views of attribution presented by Weiner (1980) and Peterson and Seligman (1987). More specifically, Rusch et al. (2010) found that participants who endorsed biogenetic/hereditary causes of mental illness did in fact believe people with mental illness were less responsible for their problems, a factor generally associated with more tolerant views of others. However, a biogenetic attribution is also considered extremely stable, a factor that is associated with increased stigma and likely contributed to the

increased endorsement of social distance observed in participants of this study (Rusch et al., 2010). In a similar study conducted in New Zealand, Read and Law (1999) observed that beliefs about the biological bases of mental illness, which would be assumed to be both outside of a person's control and stable over time, were also significantly related to negative attitudes. These results would support previous research by Weiner (1980) and Marsh and Richards (1987) indicating that the construct of attribution is more complex than the historical, unidimensional continuum of internal versus external locus. Unfortunately, Corrigan and colleagues' (2003) landmark validation study contained only one item each to measure personal responsibility and controllability. Perhaps more importantly, each variable in the model was dichotomized, effectively reverting to Rotter's (1960) unidimensional model.

As another source of variation in the Corrigan et al. model, multiple studies have suggested that attribution-stigma relationships vary based on the type of problem or mental illness being observed (Breheny, 2007; Link et al., 1999; Weiner et al., 1988). These investigations have most often used vignettes describing an individual suffering from certain symptoms and measuring stigmatizing beliefs between and across disorders (Boysen & Vogel, 2008; Cinnirella & Loewenthal, 1999; Corrigan et al., 2003; Link et al., 1999; Luty, Fekadu, Umoh, & Gallagher, 2006). For example, a person with schizophrenia may be more likely to be perceived by an observer as being unpredictable and potentially dangerous than a person with depression (Link et al., 1999; Weiner et al., 1988). As a result, an encounter with a person who appears to be psychotic may activate stereotypes of dangerousness and overwhelm the attribution pathway as a primary predictor of stigmatizing behavior (Corrigan et al., 2002; Stangor & Crandall, 2000). A New Zealand-based study by Breheny (2007) showed an interaction between attributional beliefs and illness type, where a genetic attribution of schizophrenia was associated

with an increased willingness to interact with people diagnosed with the illness, while a genetic attribution of depression was associated with a decreased willingness to interact. Breheny's (2007) results are an indication of the complexity of social attitudes toward the mentally ill, wherein each illness may be associated with a different set of beliefs about those who suffer from it, including their level of responsibility, control, and dangerousness. This inconsistent fit of the data to Corrigan and colleagues' (2003) model of stigma may also be a product of overlying cultural schemas about different types of mental illness. Beliefs about attribution may activate alternate pathways to stigma, overwhelm the deeper processing of stimuli, and lead to responses that are not in keeping with Corrigan et al's (2002) attribution-emotion-behavior model.

### **Alternative Attributions of Mental Illness in the U.S. and Abroad**

In discussing the relationship between biogenetic attributions and increased stigma in the United States (Read & Law, 1999; Rusch et al., 2010), past research indicates that a unidimensional conceptualization of attribution placed on an internal versus external continuum is unlikely to be sufficient in explaining stigmatizing beliefs and behaviors. Models derived from social psychology (Peterson & Seligman, 1987; Weiner, 1980) have expanded the understanding of attribution beyond locus of origin to include aspects of stability over time, controllability, and specificity to a given situation. Additionally, Klonoff and Landrine (1994) presented an alternative, ethnographic model that was less interested in the mechanism of stigma and more focused on the specific beliefs contributing to stigma. Klonoff and Landrine used a mixed-methods design to formulate a diverse model of perceived causes for physical illnesses. Their model consists of seven categories of causality: supernatural causes, interpersonal stress, lifestyle, personality, chance, substance use, natural/biological factors, and weather-related causes. These categories were largely replicated by Knettel (2013) in a similar study of 160

scholars in international psychology from countries around the world, and in cross-cultural or international studies by Mallinckrodt, Shigeoka, and Suzuki (2005), Furnham and Wong (2007), and Chen and Bond (2010), among others, the results which are discussed in greater detail below.

Among the more culturally inclusive studies of attributions, Landrine and Klonoff (1994) provided a strong starting point. The authors used Chi-square and MANOVA analyses to explore potential differences in causal beliefs between White participants and those from other ethnic backgrounds in the United States. Landrine and Klonoff (1994) found that people of color were significantly more likely to endorse supernatural causes and ranked these causes as significantly more important than White participants. According to the authors, a substantial prevalence among all participants (both White and people of color) in endorsing supernatural causes was among the most notable results of the study. For example, 30.9% of all participants ranked “sinful acts” as an important cause of illness (rating of 4 or higher on a scale of 7) and 22.8% considered “lack of faith” an important cause. Unfortunately, detailed results for the additional “alternative” attributions of illness beyond spiritual causes and Weiner’s (1980) traditional locus-stability-control framework were not included.

Additionally, similar studies seeking to understand cultural conceptions of mental illness have been undertaken in the United States (Mallinckrodt et al., 2005). The authors performed a study with 93 U.S. university students who identified as Asian American or Pacific Islander, along with 27 therapists. The study found that students who reported higher levels of acculturation to “Western culture” provided attributions that were more closely related to those provided by the therapists. Attributions where students and therapists provided the most agreement were interpersonal problems and life stress while attributions that were most



frequently disagreed upon included a weak mind, demons/spirits, punishment for sin, God, and a brain disorder. Problems where students and therapists provided the most agreement were social problems, anxiety, and adjustment issues, while the most disagreement occurred in relation to drug and alcohol problems and depression. It appears from these data that therapists and their Asian American/Pacific Islander clients faced widespread differences in the way they conceptualized mental illness, which supports previous research implicating such cultural factors as having a substantial impact on clients' willingness to seek counseling (Solberg, Choi, Ritsma, & Jolly, 1994; Atkinson, Wampold, Lowe, Matthews, & Ahn, 1998) as well as their satisfaction with counseling (Atkinson et al., 1991; Fischer, Jome, Atkinson, Frank, & Frank, 1998).

Studies have also been conducted in countries outside of the U.S. seeking to explore diverse beliefs about the causes of mental illness, including the Philippines (Edman & Kameoka, 1997), China (Chen & Bond, 2012; Furnham & Wong, 2007), Malaysia (Edman & Koon, 2000), and the U.K. (Cinnirella & Loewenthal, 1999). One such study by Edman and Kameoka (1997) compared causal beliefs of physical illness between women in the United States to women in the Philippines and found that both groups commonly endorsed physical and psychological causes of illness, although Filipino women were more likely to endorse spiritual and social causes. Similarly, Chen and Bond (2012) recruited 216 secondary school students in China (mean age = 15.9) and randomly assigned each student to complete a questionnaire about one of four problems: agoraphobia, schizophrenia, perpetrating child abuse, and engaging in corruption. Interestingly, results indicated that participants did not significantly favor a single type of treatment for any these problems over any other. However, beliefs in social/environmental causes and heredity significantly predicted endorsement of clinical/medical treatments whereas social and personal causes were associated with endorsements of seeking help from a social

support or family member. In attempting to identify structural equation models explaining the attribution to treatment link for each problem, the authors noted that each problem required a distinct model to accurately fit the data, supporting the previously stated view that systems of attribution vary substantially between different problems and disorders.

Furnham and Wong (2007), by contrast, sought to examine cross-cultural differences in attributions of schizophrenia and developed a measure for this purpose which was administered to 200 Chinese and British undergraduate students. The study results supported hypotheses that Chinese participants would be more likely to endorse religious and superstitious causes of schizophrenia while British participants would emphasize biological, psychological, and social causes. The authors also found that Chinese participants were more likely than British participants to endorse negative attitudes and stigmatizing beliefs.

In a similar international study, Edman and Koon (2000) conducted a survey of 74 ethnic Malay and 82 ethnic Chinese women in Malaysia. Each participant was asked to read two vignettes describing someone acting strangely in a social situation and displaying symptoms of a mental illness. They were then provided with 16 different illness attributions and asked to rate each attribution as “never a cause” to “always a cause” on a 5-point Likert scale. Finally, participants were asked to rate 11 different help seeking behaviors on a 5-point scale ranging from “not helpful” to “certainly helpful” for the issue described. Results showed that there were significant differences between ethnic Malay and ethnic Chinese participants’ responses on both attributions and help seeking. Both Malay and Chinese participants chose stress, social problems, and personal/emotional factors as the most frequent causes of mental illness symptoms, but Malay participants were significantly more likely to endorse destiny and God as causes. In terms of help seeking, there were more pronounced differences between Malay and Chinese

participants, with Malay participants more likely to endorse prayer and self-treatment while Chinese participants were most likely to endorse consulting a doctor or pharmacist. Although both the Furnham and Wong (2007) and Edman and Koon (2000) studies represented important steps forward in the cross-cultural examination of attribution and the use of more far-reaching measures, both measures were designed to capture the attributions of specific cultural groups and are therefore not generalizable to larger, more diverse samples.

Finally, Cinnirella and Loewenthal (1999) completed qualitative interviews with 52 adult females representing five diverse ethnic and religious groups in the U.K.: Pakistani Muslim, Indian Hindu, Orthodox Jewish, Afro-Caribbean Christian, and White Christian. Interviews addressed participants' views about the causes and treatments of depression and schizophrenia. The authors reported similarity among respondents in attributions of depression, with women across all groups frequently citing personal disposition, stressful life circumstances, the weather, and poor sleep as important causes. There was similar agreement on proposed treatments for depression, with most groups endorsing support from family and friends and limiting stress. Beliefs that religious practices could aid in treatment were also common, but varied greatly between groups. Beliefs about schizophrenia were found to differ more substantially than views about depression from modern diagnostic criteria for these illnesses. However, participants were more likely to report that schizophrenia had biological and hereditary causes, was less controllable by the patient (i.e., external locus), and required professional help (Cinnirella & Loewenthal, 1999). In this study, 34.62% of participants indicated that religious factors could play a causal role in depression and 15.38% indicated a possible religious cause for schizophrenia.

It should be noted that beliefs that illness is at least partially related to fate, divine retribution or supernatural forces has been found in many cultures, both within the United States and abroad. These beliefs have been found among African-Americans, Mexican-Americans, Asian-Americans, and Native Americans (Klonoff & Landrine, 1994), Germans (Pfeifer, 2000), Malaysians and Chinese (Edman & Koon, 2000), West Indian and African emigrants to the U.K. (Ndeti, 1986), and Pakistani Muslim and Afro-Caribbean Christian emigrants to the U.K. (Cinnerella & Loewenthal, 1999). At the same time, studies conducted with religious samples have produced compelling results regarding the importance of spiritual attributions in decision making. A study of Christian church members by Pargament et al. (1990) found more positive mental health outcomes among participants who attributed the event to God's will. In the same study, God's will was endorsed as the cause of negative events more commonly than any other factor. Additionally, like other types of attribution, spiritual and supernatural beliefs have been found to differ between members of the general public and mental health patients, particularly those with specific categories of illness. In the U.S., African Americans have been shown to make more spiritual attributions of illness than other ethnic groups (Klonoff & Landrine, 1996). Landrine and Klonoff (1994) also explored cultural beliefs that illness may be a result of retribution or punishment for offending God, karma, "bad blood," the "evil eye," or interpersonal conflict and found these causes to be endorsed more by people of color, though frequencies for all participants were found to be significant.

Similar results indicating substantial spiritual components to attribution have also been observed in studies conducted outside of the United States. Ndeti (1986) found that among 37 African immigrants suffering from paranoia in a London hospital, more than half attributed their illness to evil spirits, witchcraft, or magic. In the previously mentioned study by Edman and

Koon (2000) of Malaysian and Chinese college students, destiny and God were rated as by far the most likely causes for mental illness, significantly higher than either social/stress or biological explanations. Moreover, a study of German mental health patients who self-identified as religious found that 37.6% supported a supernatural explanation for their illness (Pfeifer, 2000). These apparent differences in attribution are likely to have a significant influence on cultural variation in beliefs and behaviors related to seeking treatment for mental illness, an important factor in ensuring adequate and effective care for people of all cultures.

It seems that, similar to biogenetic causes which tend to run counter to predicted views of locus and responsibility, spiritual and supernatural attributions do not fit particularly well into either an internal or external explanation of mental illness (Pfeifer, 2000). Lupfer, Brock, and DePaola (1992) argue for the definition of spirituality as a separate explanatory system, an alternate attribution that varies in strength and function for each individual. Lupfer, DePaola, Brock, and Clement (1994) found that individuals who make primarily spiritual attributions of mental illness make up a small percentage of the population in the United States, but within that segment spiritual beliefs are a strong indicator of coping and attitudes toward treatment. These same studies found that dispositional and situational factors accounted for 89%-90% of attributions while God accounted for only 6-7%, Satan 2%, and chance 1-2% (Lupfer, Brock, & Depaola, 1992; Lupfer et al., 1994). Finally, when participants are provided with an opportunity to report beliefs on multiple attributions and more diverse aspects of supernatural causality, often open-ended or qualitative prompts, factor analyses show that spirituality consistently emerges as the factor accounting for the largest percentage of variance (Klonoff & Landrine, 1994; Knettel, 2013; Landrine & Klonoff, 1994).

Studies on the help seeking patterns of people who endorse alternative attributions have generally shown negative attitudes toward traditional mental health treatment. In a nationwide survey of 1010 U.S. participants, Kuppin and Carpiano (2006) found that attributions related to a chemical imbalance in the brain or heredity were associated with an increased willingness to endorse taking prescription medication, seeing a psychiatrist, or inpatient hospitalization as viable treatment options. Participants who believed mental illness was more likely to be a result of a negative upbringing, on the other hand, were more likely to endorse seeking help by talking to a clergy member (Kuppin & Carpiano, 2006). Similarly, a qualitative study by Cinnirella and Loewenthal (1999) with multiple ethnic groups in the U.K. found that those who provided spiritual attributions for mental illness were less likely to endorse psychotherapy and psychiatric care as potential cures for both depression and schizophrenia. A study by Klonoff and Landrine (1996) also found that U.S. participants with stronger beliefs in the curative power of prayer were less likely to exercise and be actively involved in their health care. Additionally, a study of Korean-American clergymen by Kim-Goh (1993) showed that those who reported a belief in spiritual attributions of mental illness were less likely to refer a symptomatic person for mental health treatment. Within religious communities, spirituality has also been shown to be multidimensional and serves differing purposes in the lives of believers, including support from other believers, support from God, a moral framework, appreciation for religious rites, and desire for an external target for love or anger (Pargament et al., 1990). These results may have important implications for mental health providers, who are often interested in studying the barriers for people who are seeking care.

## **Changing Stigmatizing Attitudes**

Armed with the knowledge that people who hold alternative attributions about the causes of mental may be less likely to seek out psychiatric care and psychotherapy, researchers in these fields are working to break down potential barriers. A series of studies has shown that it is possible to influence attributions leading to negative beliefs about mental health care. Often, such interventions are aimed at providing education and exposing individuals to differing viewpoints (Corrigan et al., 2001; Esters, Cooker, & Ittenbach, 1998; Holmes, Corrigan, Williams, Canar, & Kubiak, 1999). For example, Corrigan and Penn (1999) outlined three distinct strategies which may influence beliefs and reduce the burden of stigma in the general public. These are “protest,” which appeals to moral beliefs about equality and protecting the rights of all individuals, “education,” which seeks to replace misconceptions about stigma with more accurate knowledge, and “contact,” which reduces stigma by facilitating positive interactions with people who have been diagnosed with a mental health disorder.

In a 2002 study, Corrigan and colleagues (2002) compared two of these approaches by randomly assigning 213 U.S. community college students to one of two interventions or a control group. After completing a preliminary questionnaire, participants attended either an “education” intervention where they were presented information aimed at dispelling myths about mental illness or a “contact” intervention where a person diagnosed with a mental illness discussed his or her experiences and progress toward recovery. For both interventions, Corrigan et al. (2002) observed significant reductions in stigmatizing beliefs as compared to a control group, although participants in the “contact” group displayed the greatest change and their change was more likely to be maintained after a one-week follow up. Further research is needed to determine if the positive gains from such interventions are maintained over a longer time period, whether they

influence the expression of stigma in participants (i.e., future behavior toward people with mental illness) and whether gains from such interventions generalize to stigma reduction programs in the public sector.

### **Measurement Models and Instrument Validation**

The Mental Illness Attribution Questionnaire (MIAQ; Knettel, 2013), as refined and examined for the dissertation, will serve as a comprehensive measure of attributions of mental illness. It was designed to be sensitive to a broad range of cultural beliefs within the United States and abroad. The scale was developed using the attribution theory of Weiner (1980, 1995) as expanded by Peterson and Seligman (1987), Landrine and Klonoff (1994), and Corrigan et al. (1999, 2001, 2002, 2005) with the assistance of current faculty and advanced students in counseling psychology, a sample of scholars in international psychology, and a sample of the international students in the United States. The development of the MIAQ was also informed by guidelines for best practices in scale development outlined by Clark and Watson (1995), DeVellis (2011), Gregory (2010), Jackson (1977), and Messick (1989; 1995) in an ongoing process of making changes based on feedback from multiple stakeholders who were assigned specialized areas of emphasis.

Marsella et al. (2000) and Bartram's (2001) standards of creating culturally sensitive tests was used as guidelines for item and scale development. These steps included ensuring that the scale contained conceptual equivalence (i.e., the constructs of the test were not operationalized based on the experiences of a single cultural group) as well as cultural equivalence (i.e., the constructs incorporated the unique perspectives of members of the cultural groups being represented). One of the primary advantages of creating a new measure, rather than seeking to adapt or revise an existing measure, was that this approach allowed the researcher to tailor the



instrument to reflect a specific purpose or emphasis (Gregory, 2010). As I intend to use the MIAQ in a variety of cultural settings both in the United States and abroad, cross-cultural validity was a core focus of the development and validation of this measure. Therefore, steps were taken to minimize ethnocentrism by including members of diverse ethnic groups not only as participants, but also as collaborators who contributed to the planning and implementation of the research and analysis of the data (Marsella et al., 2000). As with nearly any cross-cultural study, lingering concerns with cultural sensitivity were identified, such as the decisions to conduct the research entirely in English and to use self-report measures, and the implications of such decisions are discussed.

Messick (1989; 1995) developed a widely implemented model for scale development centered on the importance of reliability and construct validity. This model consists of six aspects, each of which was incorporated throughout the design and initial validation of the MIAQ:

- 1) **Content:** The content aspect of Messick's (1995) model can be addressed by using multiple methods of inquiry to ensure that the proposed measure effectively and relevantly encapsulates the concept of interest (in this case, differential attributions of the causes of mental illness). For the current project, the content aspect was addressed via a thorough review of the existing literature to inform the development of the items, cross checking these items with an independent, open-ended qualitative analysis, and implementing sorting and rating tasks to examine the relevance of scale items, which were conducted by qualified raters.
- 2) **Substantive:** The substantive aspect refers to "theoretical rationales for the observed consistencies in test responses" (Messick, 1995, p. 745) and was sought through the

careful, empirically-informed creation of vignettes and measure items. Because attribution has rarely been measured outside of the historical internal versus external dimension and there are very few precedents, this aspect of validity did present challenges. However, the previous work from Klonoff and Landrine (1994), Furnham and Wong (2007), and Corrigan et al. (2002) provided valuable frameworks. Additionally, hypotheses for regional variation in attributions from Knettel (2013) were supported by the results of that study, lending support for the substantive validity of the initial version of the MIAQ.

- 3) **Structural:** The structural aspect of construct validity is aimed at ensuring that the resulting scores of an instrument accurately represent the construct being studied. This issue was addressed by using both exploratory and confirmatory factor analysis techniques and repeated reevaluation of the appropriateness and fit of scale items for their respective scales and for the measure as a whole.
- 4) **Generalizability:** This is a measure of whether interpretations remain consistent when applied to different populations. The generalizability of the MIAQ was examined by using two separate samples for its preliminary validation, a heterogeneous sample of international scholars in psychology and a more homogenous sample of international university students in the United States. Additionally, the cultural variation in attribution that had the potential to influence the validity of the results was considered. This cultural utility was achieved by taking precautions to ensure that the measure will retain its psychometric properties when administered to members of diverse cultural groups (i.e., gender, age, race/ethnicity, country of origin, and many more; Marsella et al., 2000). Further, the current study

was intended to be a preliminary validation and it was intended that the measure produced here would continue to be assessed and examined with new samples.

- 5) **External:** This aspect of validity is achieved through convergent and discriminant evidence from more established measures that examine similar constructs.

Convergent evidence was sought through administering an existing measure of blame and responsibility for mental illness. Discriminant validity was examined by testing for expected variation based on nation of origin, vignette condition, and time spent in the U.S.

- 6) **Consequential:** The consequential aspect, more often referred to as predictive validity, seeks to measure the implications of certain test scores on future actions or behavior. Unfortunately, this aspect was beyond the scope of the current project. However, opportunities to measure the predictive validity of the MIAQ may abound in the future. This could include the examination of relationships with a multitude of variables (e.g., help seeking, attitudes toward treatment, stigma, self-stigma).

## CHAPTER III

### Method

The goal of the current study was to create and provide preliminary validation for a comprehensive and culturally inclusive measure of beliefs about the causes of mental illness, including biological, social, personal, and supernatural aspects. The resulting measure may provide important information about cultural differences related to beliefs about mental illness and has the potential for widespread applicability in testing current models of attitudes and stigma toward the mentally ill, both within the United States and abroad.

#### **Development of the Mental Illness Attribution Questionnaire (MIAQ)**

The development and initial analysis of the characteristics of the MIAQ were completed in four stages. In Stages 1 and 2, which were completed as part of a doctoral qualification research project by Knettel (2013), a pool of 52 items was developed using the existing literature and items from previous measures of attributions. In a mixed-methods (qualitative and quantitative) pilot study (Appendix A), this initial version of the MIAQ was sent to a group of international scholars in psychology from 65 different countries with the goal of understanding the specific and distinctive attributional beliefs of people from a variety of cultural groups throughout the world. For stage 2, the scholars' responses were analyzed using consensual qualitative research (CQR; Hill, Thompson, & Williams, 1997) and exploratory factor analysis (EFA) to identify, label, and define the measure's scales, add, revise, or delete several items, and formulate the 62-item preliminary version of the MIAQ (Appendix B; Knettel, 2013).

In Stage 3, a team of three international doctoral students in counseling psychology, one Master's level counselor, and one doctoral student auditor, all of whom had lived or practiced counseling outside of the United States, completed a validation task to provide content validity

evidence to the initial version of the MIAQ. The collaborators first received the 62 proposed items for the MIAQ (Appendix B) and descriptions of the seven categories of attribution that were derived from the EFA and then revised, confirmed, labeled, and defined by the qualitative research team (Appendix C). Raters were asked to score each item on a 7-point scale with regard to its appropriateness for a scale of attribution, appropriateness for its assigned scale, and ease of understanding. Additional qualitative feedback was sought with regard to the clarity of the measure's instructions, the time it took to complete, and the measure's formatting. Responses were used to revise or remove items, evaluate the factor structure identified by the previous EFA, and obtain the final items for the initial MIAQ piloted in Stage 4.

In Stage 4, the initial version of the MIAQ was administered to a sample of 680 international students at U.S. colleges and universities. Respondents were randomly assigned to respond to one of three vignettes describing a person suffering from a mental illness: 1. schizophrenia, 2. depression, or 3. alcoholism. Results from the validation study of the MIAQ were used to examine the following psychometric characteristics from the international students' responses: internal consistency of scales through item-scale correlations, test-retest reliability by asking a subset of the sample to retake the measure, convergent validity by comparing results with a related measure, discriminant validity by examining potential differences in responses by nation of origin, vignette condition, and time spent in the U.S., and construct validity (more specifically, construct-irrelevant test variance) by examining the potential impact of social desirability. The four stages of the study and the findings are described in greater detail below.

As the MIAQ is intended to be used to explore differences both among and between cultures and both in the United States and abroad, considerable attention was paid to issues of cross-cultural sensitivity and applicability throughout its formation. Perspectives were sought

from stakeholders and participants of diverse, international backgrounds and experts in multicultural counseling during the processes of item development, item refinement, and scale development.

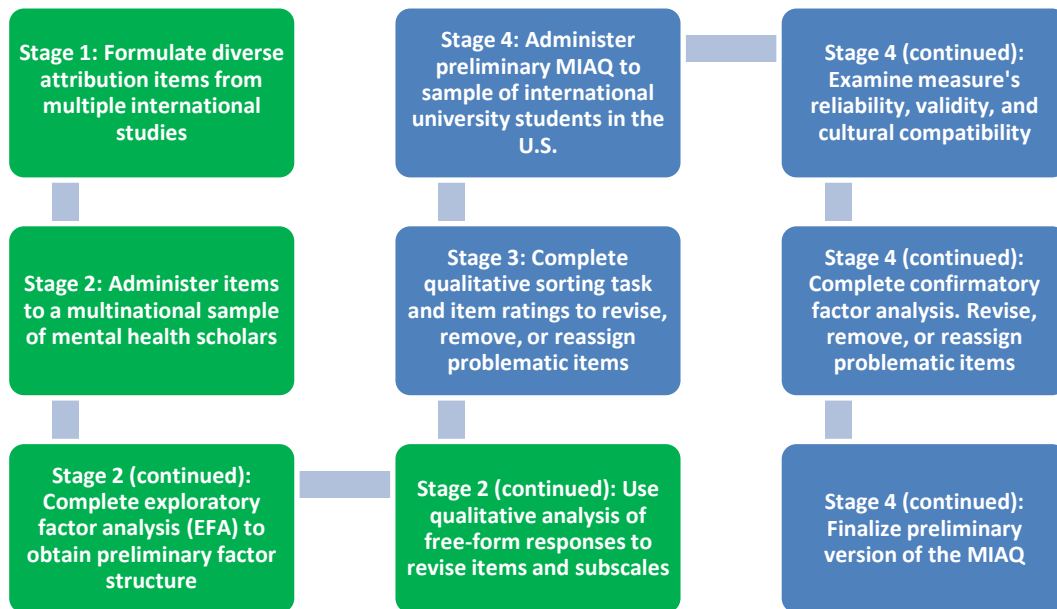


Figure 2. Flow chart of initial validation for the MIAQ

*Note.* Steps which were completed as part of a previous study by Knettel (2013) are shown in green. Steps completed for the dissertation are shown in blue.

### Stage 1: Item Development

The purpose of this first stage, which was conducted by Knettel (2013), was to identify potential items of attribution using existing literature and theory. A pool of 52 items was generated and preliminary scales were constructed using the rich and diverse existing literature related to locus of control (Hill & Bale, 1980; Rotter, 1966), explanatory style (Peterson & Seligman, 1987), labeling theory (Link et al., 1989), attribution theory (Weiner, 1980, 1995), mental health stigma (Corrigan et al., 1999, 2001, 2002, 2005), and cultural variation in mental health attribution (Chen & Bond, 2012; Choi, Nisbett, & Norenzayan, 1999; Edman & Koon,

2000; Furnham & Chan, 2004; Furnham & Wong, 2007; Landrine & Klonoff, 1994; Olafsdottir & Pescosolido, 2011; Weisman et al., 1998). As outlined previously, this stage presumed that a uni-dimensional, internal-external conceptualization of attribution would be dated and incomplete. Therefore, additional item sources and themes were identified that, when included in the item pool, expanded the theoretical scale structure and factor structure to include alternative attributions beyond the internal-external framework (Chen & Bond, 2012; Edman & Koon, 2000; Furnham & Wong, 2007; Landrine & Klonoff, 1992; 1994). These studies emphasized the importance of additional attributions beyond internal-external that could be assigned as the cause of mental health problems, including but not limited to spirituality, ideas about health and wellness, beliefs about chance and fate, and endorsement (or rejection) of a biogenetic view of illness. Each additional aspect of the cross-cultural literature was considered in the creation of items and their tentative scale categories. To maintain cultural compatibility, diagnostic words such as schizophrenia, words that may have no counterpart in another language, and colloquial terms such as “feeling blue” were avoided when writing the items.

## **Stage 2: Pilot Study of Initial MIAQ Items**

**Participants.** For this portion of the research, Knettel (2013) recruited 158 English-speaking scholars in international psychology who contributed to the pilot study. All 158 participants completed the qualitative portion of the survey while only 144 completed the 52-item initial version of the MIAQ developed in Stage 1. All participants held an advanced degree in a mental health related field, had lived outside of the United States for more than three years, and had published a mental health related research study in an international, peer-reviewed journal in the past five years. Participants were recruited by reviewing international journals and contacting the primary authors via email. Recruitment was conducted in this manner as it

allowed convenient access to a very geographically diverse, highly educated sample with expertise in understanding mental illness. Additionally, as sampling progressed, this recruitment method allowed for a specific focus on seeking participants from specific regions of the world to ensure there was adequate representation from all major geographical regions. After the first round of recruitment, participants from underrepresented regions were targeted by completing specific PsycInfo searches for studies in those countries and inviting the authors to participate.

Geographical regions were created based on designations from the United Nations Millennium Development Indicators (2014). However, the broad designation of “developed countries” was also split by continent. Further, challenges in recruiting participants from Oceania, Central Asia, and Northern Africa led us to combine these categories with their closest regional neighbors, resulting in the following nine regions: 1) Latin America and the Caribbean 2) Canada and the United States, 3) Sub-Saharan Africa, 4) North Africa and the Middle East, 5) Europe, Central Asia and Russia, 6) South Asia, 7) East Asia, 8) Southeast Asia and Oceania, and 9) Australia and New Zealand.

The participants hailed from 65 different countries from around the world. They were nearly split by gender (85 female, 73 male) and 108 held a doctoral degree or higher. Participants reported a mean age of 42.4 years. As predicted, the decision to conduct the survey only in English appeared to have a notable influence on participation as 77 of the 158 participants identified as White/Caucasian. The perceived implications of this decision were examined by measuring relationships with English-language acculturation and are discussed in detail below.

**Procedure and Measures.** After completing several items related to demographics, participants were encouraged to choose and provide responses pertaining to a single country for the remainder of the survey. This could be any country (including their home country) in which



they had lived or practiced as a researcher or professional for at least three years. Participants were encouraged to “only choose a country if you feel confident in your ability to represent diverse views about the causes of mental illness among the various people who live there.” A total of 33 participants (17.3%) who had provided informed consent to participate chose to discontinue the study at this point.

***Free-form question exploring causal attributions of mental illness.*** Once a participant had chosen a country, he or she was asked, “What beliefs do people from this country hold about the causes of mental illness?” Participants responded to the question in paragraph form. This free-form format was intended to prevent the expectations of the researcher from influencing responses (Landrine & Klonoff, 1994). Like previous qualitative studies, this approach was also aimed at learning about new explanations of behavior that exist beyond current frameworks (Choi et al., 1999). The convention of grouping all mental illness into a single category was deliberate for this early stage of the research, as the purpose of this question was to create an inclusive and far-reaching list of attributions (Olafsdottir & Pescosolido, 2011).

***Experimenter-provided causal attributions of mental illness.*** Following the format of Landrine and Klonoff (1994), participants were presented with the 52 items of attribution developed in Stage 1, which represented diverse causes of illness across nine categories including supernatural causes, interpersonal stress, chance, fate, and substance abuse. For each item, participants were asked to score its importance in the country they had selected using a 7-point Likert-type scale ranging from 1 (“Not at all important”) to 7 (“Very important”). Cronbach alphas for the nine categories of attribution ranged from poor (.595 for the “Personality” scale) to excellent (.961 for the “Supernatural Causes” scale) with an average scale alpha of .716.

***Measure of multicultural competence.*** Participants also completed a brief measure of multicultural competence, which was included to evaluate the potential impact of bias and sampling procedures on the results of the study. This measure, along with a measure of acculturation, was used to explore potential variation in attribution responses as a result of one's level of multicultural proficiency or his/her contact with the ideals of English-speakers. To assess multicultural competence (the skills, knowledge and awareness of the influence of culture in professional relationships), three subscales of the California Brief Multicultural Competence Scale (CBMCS; Gamst et al., 2004) were used. The CBMCS was chosen as it had demonstrated strong reliability and criterion-related validity in previous studies. For the current sample, subscale alphas were more problematic, but the total scale alpha remained strong (.815) with no problematic items identified in terms of corrected item-total correlations. Therefore, only the total scale score was used for analyses in the current study.

***Measure of acculturation.*** Finally, participants were administered the English-language subscale of the General Ethnicity Questionnaire (GEQ; Tsai, Ying, & Lee, 2000), a measure of language acculturation for diverse racial and ethnic groups. The subscale is composed of 13 items exploring language preference and self-rated fluency. In a prior study by Tsai, Ying, and Lee (2000), the measure demonstrated excellent internal reliability (Cronbach alpha = .920) but less desirable test-retest reliability (.570, SD = .16). However, in comparing the GEQ with key demographics known to predict acculturation (age of arrival, generational status, and years spent in the United States) the authors found strong correlations ( $p < .001$ ) with each. The strong Cronbach alpha was also replicated in the present research ( $\alpha = .928$ ).

**Data Analyses.** For the qualitative component of the pilot study, the author recruited expert coders to conduct consensual qualitative research (CQR) analysis of the single qualitative

question, “What beliefs do people from this country hold about the causes of mental illness?”

These qualitative results were used to create additional items incorporating causes that were not already accounted for in the preliminary measure. As an additional validity check, qualitative responses of the five U.S. participants were compared against non-U.S. participants with the hypothesis that these responses would not be indicative of the larger sample, and thus reflecting expected cultural differences in responses.

Next, the 52 items of experimenter-provided attributions in the pilot study were analyzed using exploratory factor analysis (EFA) to identify the structure of the items making up the larger categories of attribution in the initial MIAQ. The two distinct scale structures (qualitative and EFA) were examined in parallel by expert raters and integrated to team consensus to incorporate both sets of data. Analyses were conducted in this two-pronged manner in an effort to maintain the independence of the two analytical strategies, ultimately producing a triangulated, integrative model that was equally informed by both the qualitative and the quantitative data. The team then collaborated to create labels and definitions for the factors by inspecting the content of the items that correlated with each factor (Appendix C). Finally, a multivariate analysis of covariance (MANCOVA) was used to evaluate the potential variance in each of the seven factors of attribution identified in the EFA as predicted by geographical region with English language acculturation and multicultural competence included as covariates.

### **Stage 3: Item Raters**

In the third stage of the development of the MIAQ, commonly applied guidelines for scale development (Ancis et al., 2008; Gregory, 2010; Isenberg, 2012; Klinger, 2012) were used to conduct a rater task and finalize the initial version of the MIAQ. This task was used to assess the substantive validity of the scale and ensure the factor structure reflected the theoretical

construct of attribution (Messick, 1989). The rater task also improved the content validity of the scale by examining the clarity, representativeness, and cultural relevancy of the items. A research team of five doctoral students in counseling psychology (one each from China, India, Nicaragua, Ukraine, and the U.S.) were asked to serve as raters for the proposed items of attribution and their broader categories. Raters were provided with the proposed MIAQ items, the full results of the CQR from Stage 2, and the titles and definitions of the proposed scales of attribution: (1) *supernatural forces*, including punishment from God, curses, fate, and payback for wrongdoing, (2) *social/stress*, including negative emotions, problems in relationships, and low self-esteem, (3) *lifestyle*, including an improper diet, lack of physical activity, and exposure to germs, (4) *physical health*, including bad hygiene, irresponsible sexual practices, and contagion, (5) *substance use*, including use of drugs and alcohol, (6) *chance/luck/personal choice*, including bad luck or personal choices, and finally (7) *hereditary and biological*, incorporating the disease model and genetics. Next, team members rated each proposed item of the MIAQ on a 7-point Likert scale in three areas: its appropriateness for the construct of mental illness attribution, its appropriateness for its assigned scale, and its ease of response (Appendix D). Items deemed redundant or confusing were revised or removed to make the MIAQ as succinct as possible while retaining its construct validity. Finally, after all revisions were made, a readability estimate was completed to determine the reading level required to read and understand the MIAQ.

Throughout the rater tasks described above, information and qualitative discussion were considered and applied to identify potential problems in the scale and make revisions until consensus was reached. In this way, the rater information was used to retain, revise, or delete problematic items. More specifically, any item that received a combined rating (mean of the five raters' scores) of less than 5.0 out of 7.0 on raters' judgments of relevance to the measure,

relevance to the scale, or ease of response were brought back to the research team for qualitative reconsideration until consensus was reached. First priority was made to revise the items in an effort to retain the overall factor structure, but in cases where no sufficient revision could be made, items were deleted. Five proposed items were deleted in this manner, resulting in a 57-item version encompassing the seven factor scales. Finally, additional qualitative feedback was obtained on the adequacy and readability of the measure's instructions and formatting prior to the validation study.

#### **Stage 4: Preliminary Validation Study**

The fourth stage of the study involved the psychometric examination of the revised 57-item form of the MIAQ derived from stages one through three.

**Participants.** The revised measure was administered by online questionnaire to a sample of 680 international students from colleges and universities throughout the United States. Previous studies have observed that students of two-year universities may reflect the demographics of the broader population better than students of four-year universities (Corrigan et al., 2001; 2002); therefore, we placed particular emphasis on recruiting students from two-year universities. Based on Kenny's (2012) recommendation for a sample size of at least 200 participants in structural equation models and the results of an a priori power analysis conducted using G\*Power software (Faul, Erdfelder, Lang, & Buchner, 2007), we targeted a sample of 225 participants for each of the three conditions (vignettes) used in this stage of the research. In total, 1090 students provided their informed consent to participate but 410 were excluded from the study after dropping out, providing insufficient data, or failing one of the two validation check items that were included in the MIAQ. Additionally, we tracked the response rate in a subset of approximately 4249 listserv recipients at three major universities. Of these recipients, 271

(6.38%) followed the web link and provided informed consent to participate in the validation study. Of those who provided informed consent, 190 (4.47% of all email recipients) completed the survey.

Participants (see Appendix E) were 58.1% ( $n = 395$ ) female and 41.6% male ( $n = 283$ ) with two participants declining to respond to this item. The final sample of 680 participants represented 94 countries around the globe, with the most heavily represented being China ( $n = 139$ , 20.4%), India ( $n = 82$ , 12.1%), Brazil ( $n = 48$ , 7.1%), South Korea ( $n = 21$ , 3.1%), Iran ( $n = 19$ , 2.8%), and Germany ( $n = 16$ , 2.4%). Participants ranged from 18 to 58 years old with a mean age of 25.09 years. The mean length of time that the participants had spent in the United States was 26.87 months; however, after utilizing a modified outlier labeling rule to identify and remove 21 cases of individuals who had spent greater than seven years in the U.S., the average was 23.10 months (Iglewicz & Banerjee, 2001).

With regard to racial and ethnic diversity, a total of 242 participants (35.6%) identified as Asian, 164 (24.1%) as White/Caucasian/European Origin, 99 (14.6%) as South Asian or Indian, 59 (8.7%) as Hispanic/Latino, 36 (5.3%) as Black/Caribbean/African Origin, 29 (4.3%) as Middle Eastern/Arab, and 20 (2.9%) as Mixed Race/Multiracial/Biracial, with 31 participants declining to respond to this item. The most represented “first language” among the sample was Mandarin/Chinese ( $n = 156$ , 22.9%), followed by English ( $n = 98$ , 14.4%), Spanish ( $n = 67$ , 9.9%), and Portuguese ( $n = 50$ , 7.4%). Participants were nearly equally represented by doctoral students ( $n = 234$ , 34.4%), Master’s students ( $n = 175$ , 25.7%), and Bachelor’s students ( $n = 212$ , 31.2%), with a much smaller number pursuing two-year degrees ( $n = 29$ , 4.3%) despite deliberate efforts to recruit these participants. The largest number of participants indicated having no religious affiliation ( $n = 184$ , 27.1%), with Christian/Protestant ( $n = 99$ , 14.6%),

Catholic ( $n = 90$ , 13.2%), Hindu ( $n = 73$ , 10.7%), and Muslim ( $n = 71$ , 10.4%) being the next highest totals.

**Procedures.** Students were recruited via introductory emails (Appendix F) sent to college administrators who worked with international students, asking them to pass the information on to those students via international student listservs and newsletters. Interested students clicked a link in the email which brought them to an online survey tool where they were informed about the study, provided their informed consent to participate (Appendix G), and completed the revised MIAQ and the other measures outlined below. All participants were given the option to enter a drawing for one of two \$50 dollar gift cards. During the initial data collection, participants were asked if they were interested in completing a follow-up survey and asked to provide an email address. These respondents were randomly selected and contacted exactly fourteen days after their initial participation to ask them to re-take the MIAQ until 25 repeat participants had been recruited for each vignette to measure test-retest reliability.

**Introductory vignette.** After providing basic demographic information (Appendix H), each participant was randomly assigned to one of three brief vignettes (Appendix I) adapted from Corrigan et al. (2003) and Luty et al. (2006). Each vignette presented a different person struggling with symptoms of a mental illness: schizophrenia, depression, or alcoholism. These vignettes were chosen because results from a variety of past studies have demonstrated clear differences in participants' attributions and tendencies to stigmatize people struggling with these three categories of mental illness (Breheny, 2007; Cinnirella & Loewenthal, 1999; Luty et al., 2006; Mallinckrodt et al., 2005). Therefore, these three vignettes were deemed more likely to draw out potential differences in attributions across illnesses and also cover a wider range of attributions that might be present for mental illness as a whole. As an example, the vignette for

schizophrenia is “Harry is a 30-year-old single man with schizophrenia. Sometimes he hears voices and has strange beliefs that make him upset. He lives alone in an apartment and works as a store clerk. He has been hospitalized because of his illness in the past.” The participants were asked to consider their assigned vignette in responding to each of the remaining measures. In future studies using the MIAQ, these vignettes may be used to capture differences in attribution across illnesses, but are not required to be included in any way.

*The preliminary Mental Illness Attribution Questionnaire (MIAQ).* The preliminary Mental Illness Attribution Questionnaire (MIAQ; Appendix J) was developed by Knettel (2013) and in the current dissertation through a process described in detail above (see Figure 2). For this measure, after reading an assigned vignette, each participant received the following prompt: “Below is a list of possible causes for Harry’s mental illness. Please rank each of the following causes of mental illness from “not at all important” to “very important” in explaining the problem described in the vignette above.” Items on the MIAQ were created in a 7-point Likert scale format, with lower ratings indicating that the cause is less important in explaining the cause of the mental illness described in the vignette. In its preliminary form, the MIAQ consisted of 57 items making up seven scales. Items included “Problems in relationships,” which belonged to the Social/Stress scale, “Punishment from God” in the Supernatural Forces scale, and “Lack of physical activity” in the Lifestyle scale. To control for response bias, the items were presented in randomized order without the scale headings. Two additional validity check items were also included in the MIAQ (e.g., “Please select “2” for this item”) and participants who did not select the appropriate response on one or both of these items were excluded from the study. Because of the large number of initial participants who failed one or both of these validity check items ( $n =$



84), we retained these items on the final MIAQ and suggest that they be used in a similar manner in future administrations of the MIAQ instrument.

***The Marlowe-Crowne Social Desirability Scale, Reynolds Short Form A (RSF-A).*** The Reynolds (1982) short form A (RSF-A; Appendix K) of the Marlowe-Crowne Social Desirability Scale is an 11-item, true-false measure of social desirability. The scale is intended to measure the participant's tendency to respond in a way that may be perceived positively or considered socially appropriate. The original scale by Crowne and Marlowe (1960) was developed using the "lie" scale of the Minnesota Multiphasic Personality Inventory (MMPI) as a guideline and is made up of items that may appear desirable but are in fact "improbable of occurrence" (Crowne & Marlowe, 1960, p.350). It includes items such as, "I'm always willing to admit it when I make a mistake" and "I am sometimes irritated by people who ask favors of me."

Interestingly, the briefer RSF-A form has been found to show better fit than the original version using a two-factor model of social desirability consisting of denial and attribution. The measure has also demonstrated acceptable internal consistency ( $\alpha = .59$ , K-R = .74 - .88; Loo & Thorpe, 2000) and displayed convergent validity via a significant correlation with the Edwards Social Desirability Scale ( $p < .01$ ; Reynolds, 1982). For the current study, the RSF-A was used to determine whether variation in social desirability was related to the endorsement of certain categories of attribution. The Cronbach alpha for the RSF-A with the current sample was .617.

***The "Responsibility" subscale of the Attribution Questionnaire (AQ-27).*** In developing their comprehensive model of mental illness attribution and stigma, Corrigan and colleagues (2003) developed and provided preliminary psychometric support for the Attribution Questionnaire (AQ-27) to assess nine stereotypes about people with mental illness: responsibility/blame, anger, pity, willingness to help, dangerousness, fear, avoidance,

segregation, and coercion. In a later validation study of the AQ-27 utilizing exploratory factor analysis, Brown (2008) offered support for the validity of a subscale consisting of three items related to fault, level of control, and level of responsibility (e.g., “How responsible, do you think, is Harry for his present condition?”).

For the current study, we used Brown’s (2008) three-item responsibility subscale (Appendix I) to obtain a preliminary understanding of the concurrent criterion validity of the MIAQ by observing whether these two measures correlated in an expected manner based on previous literature. Participants responded to the three AQ items about the subject of the assigned vignette. Responses were rated on a scale ranging from 1 (Not at All) to 9 (Very Much). In past studies, the responsibility subscale of the AQ-27 demonstrated good test-retest reliability (ICC = .80 after one week) and was observed to explain 7.54% of the overall variance in stigmatizing beliefs in Brown’s (2008) model. In the current study, Cronbach alphas for the AQ-27’s Responsibility subscale ranged from .741 for the alcoholism vignette to .807 for the schizophrenia vignette with a cumulative alpha of .823.

**Data Analyses.** Once the preliminary validation study with international students was completed, we used SPSS statistical software to compute Cronbach alpha and corrected item-scale correlations for the MIAQ responses for each of the three vignette conditions, with a criterion for an acceptable item-scale alpha of .40 or higher (Pett et al., 2003), to indicate whether items consistently received responses similar to other items in the same scale for each of the three vignette conditions. In this manner, items with strong, negative corrected item correlations were identified and removed in order to achieve greater internal consistency.

Once problematic scale items had been identified and removed, Analysis of Moment Structures (AMOS) software was used to perform confirmatory factor analysis (CFA) to examine

the fit of the proposed factor structure to the data and assess the loading of the various items to their proposed factors for each of the three vignettes as well as the combined data. CFA was appropriate for the current study because it is commonly used for this type of hypothesis testing, particularly “when the analyst has sufficiently strong rationale regarding what factors should be in the data and what variables should define each factor” (Henson & Roberts, 2006, p. 395). The first three stages of the current study provided that strong rationale via exploratory factor analysis and confirmation of the proposed structure by a qualitative research team.

Determination of model-data fit was based on four fit indices: the chi-square, comparative fit index (*CFI*), root mean square error of approximation (*RMSEA*), and Tucker-Lewis index (*TLI*). These were chosen based on the suggestion of Kenny and McCoach (2003) to use a diverse mix of the three primary types of fit indices. For the chi-square, the standard cutoff for significance of  $p < .05$  was used. For *CFI* and *TLI*, Weston and Gore’s (2006) suggested cutoff for acceptable fit of .90 was used. Finally, for the *RMSEA*, Browne and Cudeck’s (1993) suggested cutoff of .08 was used.

Once the items and scales of the MIAQ had been finalized through the correlation and CFA procedures, means and standard deviations were calculated for demographic variables and MIAQ scales. Cronbach alphas were also recalculated for this sample using the revised scales. Additionally, a subset of 56 participants completed the MIAQ for a second time fourteen days after the initial testing and these data were used to calculate the test-retest reliability of the final measure.

The external structure of the final MIAQ was assessed in three ways, examining: convergent validity, discriminant validity, and construct-irrelevant test variance. To assess convergent validity, the rating team from Stage 3 was asked to rate each of the seven scales of

the MIAQ on the amount of control a person has for the causes listed in that scale. The rating team's scores were used as a control coefficient for each scale, whereby a participant's score on each scale was multiplied that scale's control coefficient and all of these scores were summed to create an cumulative control score. A correlation was then computed to compare participants' control scores with responses for the responsibility subscale of the AQ to measure convergent validity.

To measure discriminant validity (determining whether groups that are expected to differ in their responses on the MIAQ do actually differ), a multivariate analysis of covariance (MANCOVA) was used to measure potential differences in scale scores based two predictors - region of origin and vignette assigned - with time spent in the U.S. included as a covariate. The hypothesis for this test was that participants' MIAQ scores would be significantly predicted by vignette assigned, time in the United States, and region of origin, using the same regional categories as Knettel (2013). Further, simple correlations were calculated to determine whether participants' ratings of the importance of religion in their lives were positively correlated with scores on the supernatural forces scale of the MIAQ, which would further support the convergent validity of the measure.

Next, we used the RSF-A to measure construct-irrelevant test variance (identifying a variable other than the desired construct that may be influencing test results) with regard to social desirability. For this analysis, we used simple correlations to examine potential relationships between social desirability and MIAQ responses.

## CHAPTER IV

### Results

#### **Stage 1: Item Development**

The complete preliminary pool of 52 items and 9 categories developed in Stage 1 can be viewed in Appendix A.

#### **Stage 2: Pilot Study of Initial MIAQ Items**

**Qualitative analyses.** For the qualitative component of the pilot study, the author worked with four expert coders to conduct consensual qualitative research (CQR) analysis of the single qualitative question.<sup>1</sup> This team consisted of three international counseling psychology doctoral students (one each from India, China, and Ukraine), one U.S. Master's level counselor, and one U.S. doctoral student who acted as an auditor to evaluate results and provide feedback to the team. Each of the raters and the auditor were identified as having lived, practiced, or travelled extensively outside of the United States. Once the research team was chosen, members completed two hours of training on attribution theory, the purpose of the current study, and the qualitative technique, including examples from previous studies.

As suggested by Hill, Thompson, and Williams (1997), prior to the analysis, team members were asked to participate in a discussion about their perceived biases in relation to the research topic. More specifically, team members were encouraged to reflect on their cultural background and personal belief systems as potential influences upon the results. During this stage, several researchers commented that their background in more collectivistic cultures, along with their experiences living in more individualistic nations such as the United States, might

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<sup>1</sup> The CQR methodology was developed by Hill, Thompson, and Williams (1997) as a more standardized and replicable approach to qualitative research that would meet a higher standard of "rigor of scientific inquiry" (p. 519). This includes a thorough and self-reflective approach to choosing team members.

serve to assist them in understanding diverse international perspectives. Additionally, research team members shared some of their own beliefs related to the causes of mental illness, many of which they recognized as being influenced by their culture of origin, and agreed to consider how these might be influencing their decisions throughout the data analysis.

The analysis component of CQR was completed using an inductive, team approach whereby responses were first separated into larger domains, and then described by developing common “core ideas” present in the data. Upon independently reviewing the open-ended qualitative responses to the question, “What beliefs do people from this country hold about the causes of mental illness?” for 144 participants (14 were withheld for a stability check), each member of the research team independently created a list of domains representing the responses. The initial domain lists ranged from eight to twelve domains. The team members then came together and worked to reach consensus by referring back to the data to reevaluate their respective models, ultimately agreeing on an eight-domain model in this stage. The final qualitative domains were Biological, Personal Weakness, Systemic/Cultural, Social, Developmental/Family, Supernatural/Spiritual/Fate, Drugs/Alcohol, and Stress/Psychological. The raters used the research data to label and define each domain.

Once the domains had been finalized, the research coders returned to the data to identify specific core ideas that represented each domain and coded each participant’s response into its respective domains. The group then reconvened to discuss and finalize the core ideas and coding of each response. Once consensus had been reached, the coders reviewed the core ideas and identified categories that captured the content of each domain. These ranged from five categories in the Drugs/Alcohol domain to sixteen in the Supernatural/Spiritual/Fate domain.

Table 1.

*Most Common Categories, Their Frequencies, and Assigned Domains*

<b>Category</b>	<b>Frequency</b>	<b>Domain</b>
Genetic, genetic factors, genetic predisposition, inherited, heredity.	62	Biological
Biological, biologically-based, scientific explanation, neurobiological.	41	Biological
Stress, work stress, stressors, family stress, life stress.	36	Stress
Environmental, circumstances, lifestyle, living conditions, health problems.	25	Social
Familial, family functioning, family problems, family relationships, family history, family environment, family conflict, poor family support.	23	Family/Developmental
Social status, social, sociological, psychosocial.	22	Social
Supernatural agents, supernatural factors, supernatural forces, supernatural beings, religious beliefs, bad forces.	20	Supernatural/Spiritual/Fate
Spirits, punishment from spirits, demons, spirit possession, ancestral spirits, evil spirits, bad spirits, evil demons.	20	Supernatural/Spiritual/Fate
Disease, organic disease, illness, medical disorder, medically-based, medical illness, psychiatric illness, health-related problem.	20	Biological
Lack of community, relationship problems, relationships, social support, interpersonal relationships, social rejection, interpersonal conflict, social isolation, cast out, alienated.	18	Social
Low incomes, loss of employment, financial problems, poverty, economic.	16	Social
Early development, experiences during childhood, adversity, problems from childhood, developmental difficulties, personal history, upbringing.	15	Family/Developmental
Magic curse, bewitchment, curses, spells, hexes, magic.	15	Supernatural/Spiritual/Fate

*Note.* Hill et al. (2005) suggest using categories (e.g., general, typical, variant, or rare) to describe the frequencies of responses in a dataset. However, because of the large size of the current sample, nearly all of our categories would fall in the “Variant” category. For this reason, the actual frequencies of the responses have been used.

The most common categories, along with their frequencies and assigned domains, can be seen in Table 1. Throughout the analysis, resulting categories were continually reviewed and the auditor provided feedback, which the coders incorporated to consensus.

As an additional validity check, the responses of the five U.S. participants were compared against the responses of the rest of the sample. All five U.S. respondents discussed biological aspects of illness while two discussed social attributions, one discussed personal weakness, one discussed stress, and one discussed family and developmental challenges. Notably, none of the U.S. participants discussed substance use, systemic/cultural, or supernatural attributions despite these categories being present in 13.7%, 24.6%, and 44.2% of all responses, respectively. Finally, the 14 cases that had been initially withheld were returned to the dataset to assess the stability of the results. Although the addition of these cases motivated the coders to slightly alter the wording on several categories, this did not alter the results meaningfully, and thus the findings were deemed stable.

**Quantitative analyses.** Promax rotation was used for the exploratory factor analyses (EFA) of the pilot study results. Missing data were excluded pairwise to maintain a sufficient sample size, leading to an exclusion of 0 to 6 cases per item. Using the Kaiser-Guttman criterion (retaining factors with eigenvalues greater than 1), the initial analysis yielded ten factors accounting for 67.07% of the overall variance in attribution, exceeding the pre-identified standard of 50% (Stevens, 2009). Three of the fifty-two original items did not reach Stevens' (2009) critical loading value of .434 based on the sample size in this study, two additional items did not reach the preset minimum mean of 2.0, and two items were found to be redundant. Therefore, these seven items were excluded in the final analysis. A second (trimmed) analysis with the seven items removed resulted in nine factors accounting for 67.588% of the total



variance in attribution. However, a scree plot of the components (see Figure 3) showed a potential for more parsimonious three- or seven-factor solutions.

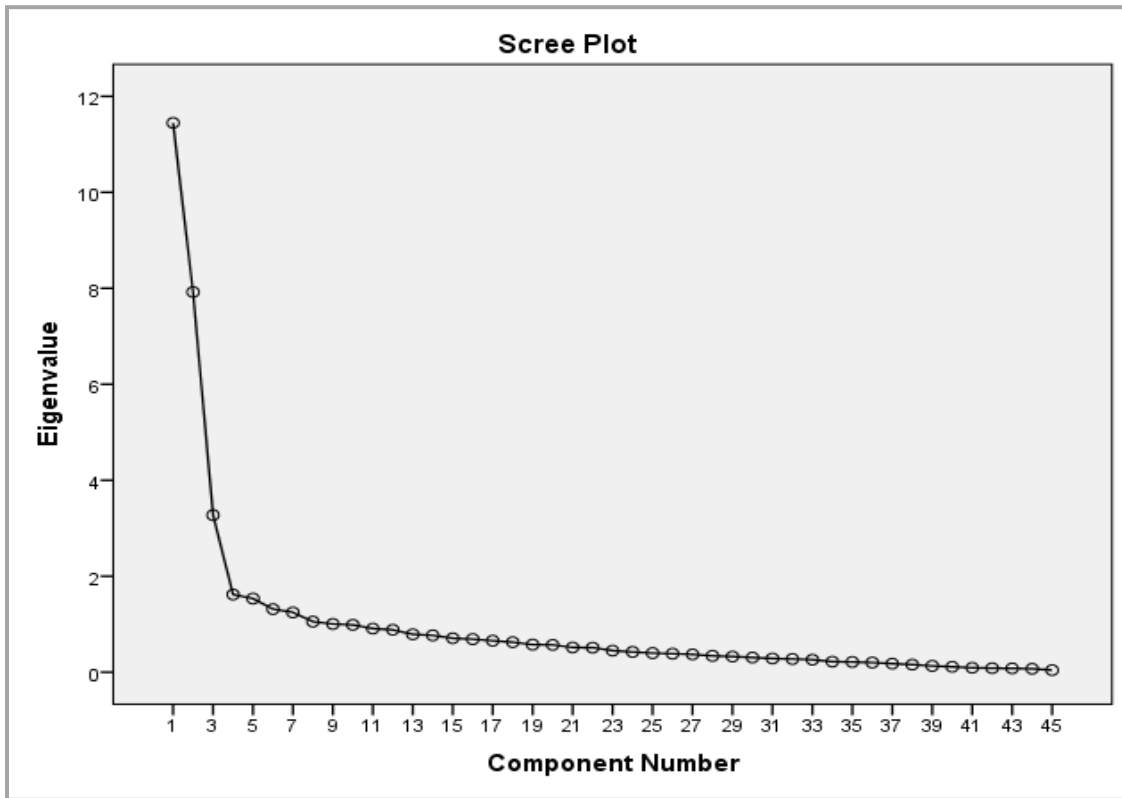


Figure 3. Scree plot of exploratory factor analysis.

Analyses were conducted and the pattern and structure matrices were examined for the nine-, seven-, and three-factor solutions. The nine-factor solution appeared to describe a theoretically unexplainable level of specificity from the data. The three-factor solution, on the other hand, sacrificed a substantial portion of the total variance accounted for and the much-valued diversity of the original factors. The seven-factor solution (see Table 2) ultimately provided a strong middle ground while still accounting for 65.477% of the total variance in attribution (Knettel, 2013). Cronbach alpha coefficient values measuring the internal consistency for the final factors yielded mixed results, ranging from .642 to .968. Once this structure was

chosen, preliminary labels were assigned to the seven factors by inspecting the factor loadings and identifying the defining characteristics of each factor.

Table 2.

*Total Variance Explained by the Final Seven-Factor Model*

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1 Supernatural Forces	11.169	27.242	27.242
2 Social/Stress	7.166	17.479	44.721
3 Lifestyle	3.031	7.393	52.114
4 Physical Health	1.502	3.662	55.777
5 Substance Use	1.491	3.636	59.413
6 Chance, Luck, and Personal Choice	1.299	3.169	62.582
7 Hereditary and Biological	1.187	2.895	65.477

**Integrating the qualitative and quantitative models.** As mentioned previously, the CQR and EFA analyses were run in parallel (and not sequentially) to ensure that each method was given full and equal consideration in formulating the final model. Once the EFA results were finalized, the qualitative coders worked to integrate the two factor structures into a single cohesive model. First, each team member independently reviewed the two lists and combined them to form a tentative integrated list. The team then reconvened to compare these initial lists and make changes until a group consensus was reached. After several iterations and extensive discussion, the team agreed on a seven-factor, integrated model which was to be analyzed in Stages 3 and 4. Upon finalizing the factor structure of the measure, the qualitative team members then returned to the item level data to independently examine items for clarity, redundancy, and coverage of important themes within their broader factors. Each member’s concerns and

suggestions were brought back to the team and discussed until consensus was reached on desired changes. In this manner, 15 items were revised or reworded, 21 new items were added to improve coverage and more closely reflect the factor definitions, and 2 items were deleted for redundancy, yielding 62 items across the seven proposed scales (Appendix B).

**Language acculturation and multicultural competence.** Next, a multivariate analysis of covariance (MANCOVA) was used to evaluate the potential variance in each of the seven factors of attribution as predicted by geographical region with English language acculturation and multicultural competence included as covariates. A test of homogeneity of the regression proved significant (Wilks' lambda = .486,  $F(63, 620.002) = 1.347, p = .044$ ), indicating that the covariate English language acculturation did not relate consistently to the categories of attribution. For that reason, the variable was nominalized around its quartiles and included as an independent variable in the MANCOVA, which created a homogenous model. In testing the significance of the regression, neither English language acculturation (Wilks' lambda = .705,  $F(28, 361.977) = 1.314, p = .136$ ) nor multicultural competence (Wilks' lambda = .956,  $F(7, 100) = .655, p = .710$ ) was found to relate significantly to attributions. This lack of significance supported the multicultural validity of the pilot study, as it indicated that differences in self-rated English language acculturation and multicultural competence did not predict differences in responses to the attribution items. In other words, the potential bias of inviting only English-speakers to participate in the pilot study appears not to have jeopardized the validity of the results.

### **Stage 3: Item Raters**

In Stage 3, expert raters analyzed the proposed items of the MIAQ identified in the pilot study and rated them on several important characteristic. These included evaluating the

applicability to the scale, applicability to assigned scale, and ease of understanding. Using this method, concerns were identified in 11 of the 62 proposed items, two for applicability to the measure as a whole, two for applicability to the assigned scale, and ten for ease of understanding (three of the items were flagged for multiple concerns). During the review by the qualitative team, the concerns for three of the items were resolved by revising the wording, one item was removed from the scale for redundancy with other items, one was discarded as overly confusing, one was discarded for not fitting adequately into any scale, and two were discarded for being overly vague. Additionally, two items were combined to make them more succinct and one item was split to better capture the complexity of their topic (stress and pressure). The specific concerns identified and the actions taken to resolve them can be seen in more detail Appendix L. Upon completion of the rating task, the initial 57-item version of the MIAQ was finalized and formatted for the pilot study (Appendix J).

Prior to the pilot study, the Flesch-Kincaid Grade Level formula (Kincaid, Fishburne, Rogers, & Chissom, 1975) was utilized to examine the reading level necessary to understand the measure. The Flesch-Kincaid formula predicts the approximate U.S. grade level required to read and comprehend a passage using both the number of syllables per word and the number of words per item. This analysis was conducted with all of the MIAQ items and each of the three vignettes being used in the study, yielding reading level scores of 6.3 for the schizophrenia vignette, 6.4 for the depression vignette, and 6.3 for the alcoholism vignette. These results indicated that the measure should be used only with individuals who read the English language at higher than a 6<sup>th</sup> grade reading level. Therefore, the readability of the measure was deemed unlikely to present challenges for the university student sample in Stage 4.

#### **Stage 4: Preliminary Validation Study**

The analysis of the data from the preliminary validation study began with an examination of the reliability the MIAQ via Cronbach alphas and partial item analysis. Intercorrelations of the seven scales with the full sample, the stability of the proposed factor structure via confirmatory factor analysis, and test-retest reliability were examined by asking a sub-sample of participants to retake the MIAQ fourteen days after their initial participation. Finally, convergent validity, discriminant validity, and construct validity were examined via correlations with related variables and measures to determine whether these items were related to the MIAQ in predicted ways.

**Reliability and Internal Consistency.** In examining the reliability and internal consistency of the MIAQ, item analysis was conducted for all corrected item-scale correlations for each of the seven scales in all three vignette conditions. Item analysis examines the internal consistency of a scale when each item is either retained or removed. In addition to factor analysis and exploring the measure's validity, item analysis was used in the present study as a tool for decision-making in determining which items to retain in the final version of the MIAQ. Pett et al.'s (2003) criterion of .40 was deemed an acceptable alpha to indicate whether item responses were consistent with those of other items in the same scale. In this manner, five items of concern were identified, four of which were problematic across vignettes and one of which was problematic for the Alcoholism vignette only (see Table 3). The first four items of concern, which pertained to using prescription medications, bad luck, chance, and jealousy/envy, were found to have responses inconsistent with other items in their respective scales and/or conflicting with the results of the EFA in Stage 2 for all three vignette conditions. Therefore, these items were removed to achieve greater internal consistency.

Table 3.

*Concerns Identified in Item-Scale Correlations for the MIAQ and Actions Taken*

<b>Item</b>	<b>Scale</b>	<b>Item-Scale Correlation</b>	<b>Scale Alpha</b>	<b>Action Taken</b>	<b>New Alpha</b>
4. Prescription Medications	Physical Health	.364	.823	Item Discarded	.837
5. Bad Luck	Chance/Luck/ Personal Weakness	.225	.807	Item Discarded	.885
12. Chance	Chance/Luck/ Personal Weakness	.244	.807	Item Discarded	.885
19. Drinking Alcohol	Substance Use	.256	.721	Item Excluded from Alcoholism Vignette Only	.735
40. Jealousy or envy	Supernatural	.344	.867	Item Discarded	.874

As a result of these changes, no items related to luck or chance remained in the measure and the scale name of the “Chance/Luck/Personal Weakness” scale was revised to simply “Personal Weakness.” Lastly, an item listing “Drinking Alcohol” as a cause for alcoholism created confounding data in the Substance Use scale only and was therefore removed from the analysis of the alcoholism vignette only.

Next, we conducted a similar examination of all corrected item-scale correlations for our additional measures, the Responsibility subscale of the AQ-27 and the RSF-A. In these analyses, all items of the Responsibility subscale were found to exceed the .40 alpha criterion for all three vignettes, indicating that each of the three items in this subscale correlated sufficiently with one another. The RSF-A, however, was much more problematic in this regard, with corrected item-total correlations for all of the items ranging between .164 and .348. None of the eleven RSF-A items exceeded the desired alpha of .40 (Pett et al., 2003) and therefore this measure was interpreted with these substantial limitations in mind.

Once the item-scale correlations had been completed and the necessary changes made, we determined the internal consistency of the MIAQ by calculating Cronbach alphas for each scale in each of the three vignette conditions (see Table 4). Kline (1999) suggests that ideal scale alphas in psychological testing lie between .70 and .80, although alphas between .60 and .70 or above .80 are also acceptable in most circumstances. Cronbach alphas for the MIAQ with the current sample ranged between .812 and .954 for the Schizophrenia vignette, .730 and .922 for the Depression vignette, and .685 and .931 for the Alcoholism vignette, largely falling within the desired range. This is an indication of strong internal consistency for the measure.

Table 4.

*Cronbach Alpha Values for the Seven Final Scales of the MIAQ*

	<b>Supernatural Forces</b>	<b>Social/ Stress</b>	<b>Lifestyle</b>	<b>Physical Health</b>	<b>Substance Use</b>	<b>Personal Weakness</b>	<b>Hereditary/ Biological</b>
Schizophrenia	0.869	0.954	0.874	0.812	0.827	0.906	0.830
Depression	0.879	0.922	0.780	0.785	0.730	0.859	0.880
Alcoholism	0.877	0.931	0.878	0.871	0.685	0.825	0.878
<b>Total</b>	<b>0.874</b>	<b>0.948</b>	<b>0.863</b>	<b>0.837</b>	<b>0.735</b>	<b>0.885</b>	<b>0.878</b>

Next, means and standard deviations were calculated for all measure responses and the data were assessed for multivariate normality (see Appendix M). This included an examination of univariate normality using the Weston and Gore (2006) criteria for acceptable skewness (-3 to +3) and kurtosis (-10 to +10), with all of the measures and variables in the study falling within the desired ranges. Additionally, we assessed bivariate normality through the review of normal probability scatterplots of variable pairs, which without exception showed strong elliptical patterns (Stevens, 2009). Together, these results support the assumption of sufficient multivariate normality for the data.

In the last step before conducting confirmatory factor analysis to examine the appropriateness of the MIAQ's seven-factor structure, we calculated Pearson correlations between the scales for each of the three vignettes, as well as the combined data (Appendix N). These analyses showed strong, significant, positive correlations for nearly all of the scales and each of the three vignettes at the  $p < .001$  level. A small number of analyses showed weaker, but still significant correlations, while only 7 of the 84 correlations were not significant. These non-significant correlations were often found with the Hereditary/Biological scale, indicating that participants often provided responses on this scale that were distinctive from other scales. The large number of correlated scales was also an indication that a combined factor model might be appropriate for the MIAQ. Therefore, a combined model was designed and tested during the CFA.

**Confirmatory Factor Analysis (CFA).** A confirmatory factor analysis was conducted separately for each of the MIAQ scales for each of the three vignette conditions (schizophrenia, depression, and alcoholism), and also for an aggregate model using the data of all three conditions (see Figure 4). The number of sample moments well exceeded the number of parameters in all of the models (i.e., the models were over-identified) except the Substance Use scale, which had too few items. For this reason, the Substance Use scale was analyzed only in the combined models. In exploring missing data, no clear patterns were identified, which would suggest that they were missing at random. Therefore, multiple imputation was used to replace missing values in the AMOS software. Unfortunately, this method eliminates modification indices in the output, necessitating more personal discretion in the modification process. The CFA analyses ultimately produced mixed results for all three vignette conditions and also the combined ("all participants") model (see Table 5).



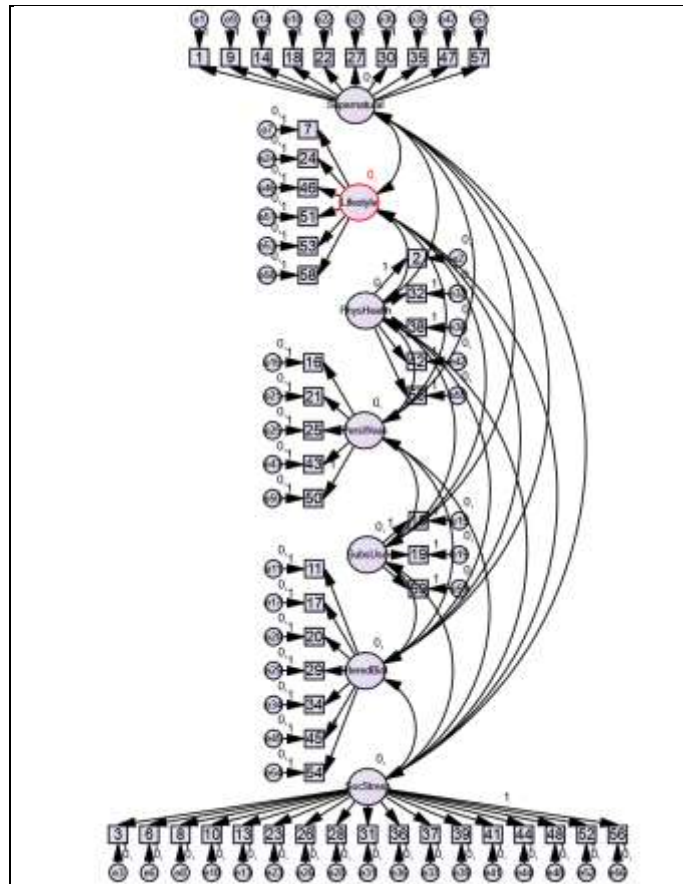


Figure 4. Aggregate model for the seven MIAQ scales.

For the schizophrenia vignette ( $X^2(1304) = 2841.1, p < .001$ ; TLI = .795; CFI = .813; RMSEA = .071), depression vignette ( $X^2(1304) = 2758.3, p < .001$ , TLI = .746, CFI = .768, RMSEA = .071), alcoholism vignette ( $X^2(1253) = 2825.2, p < .001$ , TLI = .763, CFI = .784, RMSEA = .075), and combined/all participants analyses ( $X^2(1304) = 5436.9, p < .001$ , TLI = .802, CFI = .819, RMSEA = .068), only the RMSEA indicated adequate fit of the aggregate model for each vignette based on pre-determined thresholds of  $< .05$  for Chi-square,  $> .90$  for CFI and TLI, and  $< .08$  for RMSEA. However, it should be noted that in separate scale analyses that did not utilize factor covariances, multiple scales in each vignette condition also demonstrated adequate fit on both the TLI and CFI. The Lifestyle, Physical Health, and Personal Weakness factors in particular showed promising fit on multiple indicators.

Table 5.

*Confirmatory Factor Analysis Results*

<b>Vignette A: Schizophrenia</b>					
<b>Model</b>	<b>Chi-Square</b>	<b>TLI</b>	<b>CFI</b>	<b>RMSEA</b>	
Supernatural	.000	.803	.875	.119	
Social/Stress	.000	.886	.911*	.096	
Lifestyle	.001	.924*	.967*	.095	
Physical Health	.028	.961*	.981*	.081	
Substance Use	N/A	N/A	N/A	N/A	
Personal Weakness	.016	.964*	.988*	.088	
Hereditary Biological	.000	.748	.874	.145	
<b>Aggregate Model</b>	<b>.000</b>	<b>.795</b>	<b>.813</b>	<b>.071*</b>	
<b>Vignette B: Depression</b>					
<b>Model</b>	<b>Chi-Square</b>	<b>TLI</b>	<b>CFI</b>	<b>RMSEA</b>	
Supernatural	.000	.759	.846	.144	
Social/Stress	.000	.867	.897	.081	
Lifestyle	.000	.779	.905*	.120	
Physical Health	.000	.851	.950*	.122	
Substance Use	N/A	N/A	N/A	N/A	
Personal Weakness	.000	.918*	.973*	.107	
Hereditary Biological	.000	.782	.891	.158	
<b>Aggregate Model</b>	<b>.000</b>	<b>.746</b>	<b>.768</b>	<b>.071*</b>	
<b>Vignette C: Alcoholism</b>					
<b>Model</b>	<b>Chi-Square</b>	<b>TLI</b>	<b>CFI</b>	<b>RMSEA</b>	
Supernatural	.000	.704	.812	0.167	
Social/Stress	.000	.838	.874	0.099	
Lifestyle	.000	.902*	.958*	0.115	
Physical Health	.019	.953*	.984*	0.087	
Substance Use	N/A	N/A	N/A	N/A	
Personal Weakness	.010	.916*	.972*	0.095	
Hereditary Biological	.000	.798	.899	0.154	
<b>Aggregate Model</b>	<b>.000</b>	<b>.763</b>	<b>.784</b>	<b>0.075*</b>	
<b>All Participants</b>					
<b>Model</b>	<b>Chi-Square</b>	<b>TLI</b>	<b>CFI</b>	<b>RMSEA</b>	
Supernatural	.000	.772	.855	.136	
Social/Stress	.000	.891	.916*	.088	
Lifestyle	.000	.866	.943*	.125	
Physical Health	.000	.894	.965*	.118	
Substance Use	N/A	N/A	N/A	N/A	
Personal Weakness	.000	.935*	.978*	.107	
Hereditary Biological	.000	.801	.901*	.153	
<b>Aggregate Model</b>	<b>.000</b>	<b>.802</b>	<b>.819</b>	<b>.068*</b>	

\* Significant value based on pre-determined criterion for each fit index:  $p < .05$  for Chi-Square and values greater than .90 for TLI and CFI, and less than .08 for RMSEA.

In sum, several of the models of attribution adequately fit the data for the seven scales of the MIAQ (eight for schizophrenia, five for depression, and seven for alcoholism) while the model fit for many other scales approached significance on multiple indices. All of the MIAQ items were consistently and significantly correlated with their respective scales in each of the models and no problematic scale covariances emerged during the CFA analyses. Ultimately, based on the CFA, there seemed to be a preponderance of “good enough” items in the MIAQ but not the consistently strong correlations necessary to produce a very strong model fit. For this reason, it was not possible to identify or implement modifications that would substantially improve the model and therefore we did not attempt to make any such modifications. As a result, the 53-item, 7 factor scale format of the MIAQ was retained for our final validation studies. The evolution of the item structure of the measure is outlined in detail in Figure 5.

**Test-Retest Reliability.** A subset of 56 participants retook the MIAQ, RSF-A, and the responsibility subscale of the AQ fourteen days after their initial participation. Responses for all seven subscales in all three vignette conditions of the MIAQ correlated significantly with retest responses, with all but one correlation meeting Strauss et al.’s (2006) criterion of .70 (see Appendix O). The single correlation falling under .70 was the Substance Use scale on the alcoholism vignette, which is understandable seeing as the prospect of substances being a *cause* of substance addiction would likely confuse many participants. The RSF-A and AQ also showed significant correlations above .70 for all three vignettes. These results would indicate that participants can be expected to respond consistently to the MIAQ over repeated administrations, an indication that the test is in fact a measure of stable beliefs.

Evolution of the Item Structure of the MIAQ	
Stage 1: Formulated list of 52 items derived from existing literature.	
Stage 2a (Quantitative): Pilot study and exploratory factor analysis	
7 items dropped for failing to meet critical loading value, 2 items dropped for failing to meet desired mean	
<b>Result: 42 items</b>	
Stage 2b (Qualitative): Consensual qualitative research analysis and item-level revision	
2 items deleted for redundancy, 15 items revised or reworded, 21 items added to ensure coverage of constructs	
<b>Result: 62 items</b>	
Stage 3: Item sorting and rating tasks (Appendix L)	
11 items flagged for lack of applicability for measure, lack of applicability for scale, or poor ease of understanding. 3 reworded, 5 discarded	
<b>Result: 57 items</b>	
Stage 4: Internal consistency analysis and confirmatory factor analysis (see Table 3)	
4 items discarded for insufficient item-scale correlation	
<b>Result: Final 53-item version of MIAQ (Appendix Q)</b>	

Figure 5. Evolution of the item structures of the MIAQ.

**Convergent Validity.** Convergent validity was measured by analyzing correlations between a MIAQ control score (calculated by using control coefficients for each scale created by the Stage 3 raters) and the responsibility scale of the AQ for each of the three vignette conditions. These analyses yielded significant correlations for the schizophrenia ( $r = .504, p < .001$ ), depression ( $r = .228, p = .001$ ), and alcoholism ( $r = .190, p = .004$ ) vignettes for a cumulative correlation of .351 ( $p < .001$ ). This would indicate strong relationships among the

MIAQ scales rated high in control and a previously validated measure of stigma, supporting the convergent validity of the measure.

It was briefly considered whether to include this control score as part of the MIAQ scoring template, but it was determined that a second variable – a participant’s tendency to score all items highly – could erroneously inflate scores. It is possible to standardize the control scores (and thus control for a tendency to rank all items higher or lower), but this scoring would not be possible by hand; therefore, we chose not to include the control variable as part of the standard MIAQ scoring template, though it may be included in future studies. It should be noted that four of the MIAQ scales (Lifestyle, Physical Health, Substance Use, and Personal Weakness) were rated high in control, two scales (Supernatural Forces and Heredity/Biology) were rated low in control, and the Social/Stress scale was in the moderate range.

**Discriminant Validity.** A multivariate analysis of covariance (MANCOVA) was used to measure potential differences in scale scores based on nation of origin and vignette assigned with time spent in the U.S. included as a covariate. The hypothesis for this test was that participants MIAQ scale scores would differ significantly based on the vignette assigned, the participant’s region of origin, and time in the United States. We began this analysis by testing homogeneity of regression. The tests of the interaction terms for these variables were not significant, so the variables were deemed to relate to one another in a consistent manner and the assumption of homogeneity of regression was met.

Next, we tested both the significance of regression for the MANCOVA model and equality of the adjusted means. The test of significance of regression for the covariate of length of time in the United States was significant (Wilks’ lambda = .949,  $p < .001$ ). The null hypothesis of equality of adjusted means was also rejected for both predictors - vignette

condition (Wilks' lambda = .658,  $p < .001$ ) and region of origin (Wilks' lambda = .539,  $p < .001$ ) – confirming that each of these variables significantly predicted differences in MIAQ scale scores. In univariate follow up tests, time in the U.S. was the only variable significantly predicting increased scores on the Heredity/Biology scale ( $F(1, 36) = 20.211, p < .001$ ), indicating this is the factor most strongly influenced by acculturation. All of the scales except Spiritual Forces varied by vignette group, indicating that this scale was the only one to remain consistent across vignettes ( $F(2, 36) = 2.550, p = .079$ ). Similarly, only the Heredity/Biology did not vary significantly by participants' region of origin ( $F(11, 36) = .888, p = .552$ ), indicating that this scale was the most consistent geographically. Taken together, these results support the discriminant validity of the MIAQ by demonstrating expected differences in MIAQ scores based on the predictors measured.

Simple correlations were conducted to determine whether participants' rankings of the importance of religion were positively correlated with the supernatural forces scale for each of the three vignette conditions. This correlation was not significant for the schizophrenia vignette ( $r = .118, p = .078$ ), depression vignette ( $r = .112, p = .104$ ), or alcoholism vignette ( $r = .119, p = .080$ ), but was significant for the complete dataset ( $r = .117, p = .003$ ), indicating that MIAQ responses related to spiritual causes of mental illness may be independent of personal religious beliefs.

**Social Desirability.** To determine the potential impact of social desirability on MIAQ responses, we computed simple correlations between the RSF-A and the seven scales of the MIAQ. The results of these correlations (Appendix P) were somewhat inconsistent based on the vignette being studied, but did show positive correlations between socially desirable responses and scales related to lifestyle choices ( $r = .152, p = .022$  for the schizophrenia vignette),

substance use ( $r = .161, p = .015$  for the schizophrenia vignette), and personal weakness ( $r = .170, p = .010$  for the schizophrenia vignette), as well as significant negative correlations with scales of stress ( $r = -.166, p = .015$  for the depression vignette), poor physical health ( $r = -.139, p = .042$  for the depression vignette), and biological causes ( $r = -.131, p = .048$  for the schizophrenia vignette and  $r = -.149, p = .029$  for the depression vignette). These results may indicate that participants who are concerned about being perceived in a positive light may be more likely to endorse certain causes of mental illness. However, recall that the overall Cronbach alpha and item-scale correlations for the RSF-A in the current study were determined to be problematic, which indicates that these results should be interpreted with caution. Further, the overall weak correlations between social desirability and scales scores (7 of 21 significant with highest  $r = 1.70$ ) minimize the importance of this variable as a source of error.

## CHAPTER V

### Discussion

The present study drew upon research and theory in the areas of attribution (Heider, 1958; Weiner, 1995), mental illness stigma (Corrigan et al., 2002; 2003), and the cultural variation in these variables (Chen & Bond, 2012; Furnham & Wong, 2007; Landrine & Klonoff, 1994; Knettel, 2013) to construct and evaluate the psychometric properties for a new measure of causal attributions of mental illness with diverse international samples, the Mental Illness Attribution Questionnaire (MIAQ). Historically, measures of attribution were based on a simple continuum of being within a person's control or outside a person's control (Corrigan et al., 2002). The current research sought to determine whether the MIAQ was a valid and reliable measure of attribution beyond the internal versus external framework, using lay persons beliefs about the specific causes of mental illness, with two separate international samples.

Original analyses for the current research were conducted in a previous study by Knettel (2013) to investigate the MIAQ's factor structure via exploratory factor analysis and cross-validate these results with a set of related qualitative data. Fifty-two initial items were created based on existing theory and attribution measures, encompassing a variety of explanations for the potential causes of mental illness derived from studies conducted in multiple nations around the world (Chen & Bond, 2012; Edman & Koon, 2000; Landrine & Klonoff, 1994). The 52 items were administered to a sample of 144 highly educated international scholars in psychology representing 65 nations who responded based on the beliefs present in a nation where they had lived and worked. The respondents also provided qualitative data in response to a single question: "What beliefs do people from this country hold about the causes of mental illness?" In



this manner, Knettel (2013) received quantitative feedback about the importance of the items and also identified additional areas that were present but not accounted for in the existing items.

A team of qualified raters analyzed the qualitative responses using Consensual Qualitative Research methodology (Knettel, 2013). These results were used to add or modify items to the scales to account for causes not present in the initial measure. Responses of U.S. participants were compared to responses from non-U.S. participants and differed in predicted ways, supporting the cultural validity of this methodology. The qualitative team then labeled and defined the scales of the measure based on the items correlating with each factor, which yielded the initial MIAQ.

The current dissertation extended the work of Knettel (2013) by examining the reliability (internal consistency, test-retest) and convergent, discriminant, and content validity of the initial MIAQ, in addition to reexamining its factor structure using confirmatory factor analysis. First, a team of qualified raters were asked to judge the appropriateness of each MIAQ item for the overall measure, its appropriateness for its assigned scale, and its ease of response. These responses assisted the author in further revising the MIAQ items and in removing a small number of items that were judged to be inappropriate for the scale or difficult to understand. The result of this process was a 57-item preliminary version of the MIAQ with strong quantitative and qualitative support.

In the final stage of the research, the 57-item preliminary version of the MIAQ was administered to 680 international students from universities in the United States originating from 94 countries around the globe. The participants were randomly assigned to one of three vignette conditions, describing a man with (a) schizophrenia, (b) depression, or (c) alcoholism, and were asked to respond to the MIAQ items based on their beliefs about the causes of the illness

described in this vignette. Lastly, approximately 10% of the initial participants were invited to retake MIAQ for the same vignette exactly fourteen days after their initial participation and these data were used to measure test-retest reliability.

Participants' responses were used to reexamine the factor structure of the measure using confirmatory factor analysis (CFA) and to examine the validity and reliability of the measure. After a small number of items were removed due to problematic item-scale correlations, the MIAQ demonstrated very strong internal consistency for all three vignette conditions, an indication that the items in each scale strongly and reliably correlated with one another. Further, in examining scale correlations, many of the scales were significantly and positively correlated with one another, which supported the creation of a combined model incorporating scale covariances.

CFA results yielded mixed results for the individual scales as well as the combined model for each of the three vignette conditions. Although four fit indices were used to examine the fit of the data to the models, only one consistently showed adequate fit of the model to the international student data. As a result, it was determined that the MIAQ items were consistently strong, but not excellent enough to produce the desired model fit. As no apparent problematic items were identified, we did not attempt to make modifications of the model but instead chose to retain a 53-item, 7 factor scale format of the MIAQ (see Appendix Q).

In further examining the psychometric properties of this final version of the MIAQ, test-retest reliability proved to be particularly strong for the validation sample. Responses for all seven subscales in all three vignette conditions of the MIAQ correlated significantly with retest responses, indicating that participants can be expected to respond consistently to the MIAQ over repeated administrations. These findings also support the hypothesis that the MIAQ is a measure

of stable beliefs about the causes of several types of mental illness and not state-specific reactions that could change over a period of days or weeks.

Examinations of convergent and discriminant validity data proved equally promising. This included strong, positive correlations between MIAQ scales rated high in control and the responsibility scale of the AQ for each of the three vignette conditions. Additionally, a multivariate analysis of covariance (MANCOVA) was used to measure potential differences in scale scores based on nation of origin, vignette assigned, and time spent in the U.S. In this analysis, all three variables significantly predicted differences in MIAQ scale scores. Taken together, these results support the validity of the MIAQ by demonstrating expected differences in MIAQ scores based on multiple predictors. This lends support to the assumption that the MIAQ effectively measures attributions of mental illness as defined for the current study and relates to other variables in a predictable manner.

To determine the potential impact of social desirability on MIAQ responses, we computed simple correlations between the RSF-A and the seven scales of the MIAQ. The results of these correlations were somewhat inconsistent across vignettes, but did show positive correlations between socially desirable responses and scales related to lifestyle choices, substance use, and personal weakness, as well as significant negative correlations with scales of stress, poor physical health, and biological causes. These results may indicate that participants who are concerned about being perceived in a positive light may be more likely to endorse certain causes of mental illness. However, due to concerns with the Cronbach alpha and item-scale correlations for the RSF-A with this sample, these results should be interpreted with caution.

## **Limitations and Threats to Validity**

It is a hallmark of modern research, and particularly cross-cultural research, that one must take steps to avoid error as well as recognize and minimize factors that will negatively influence the validity of the results (Heppner et al., 2008). These steps include ensuring that predicted relationships between variables are accurate, that any statements of causality are well-supported, that variables are strongly representative of the constructs being measured, and that results are only generalized beyond the study's sample when specific criteria are met (Heppner et al., 2008). Of these types of validity, Clark and Watson (1995) emphasize the importance of construct validity in scale development. The authors cite Cronbach and Meehl (1955) in identifying construct validity (multi-trait-multimethod matrices) as the foundation upon which any new scale must be built. To establish construct validity, the authors identified three necessary steps: (1) identifying and consolidating theoretical literature to define constructs, (2) designing ways of measuring the hypothesized constructs, and (3) empirically testing hypothesized relationships between constructs (Clark & Watson, 1995). It is important to note that "without an articulated theory (which Cronbach and Meehl termed "the nomological net"), there is no construct validity (Clark & Watson, 1995, p. 311).

The concern of construct validity has been addressed in the current study by completing an extensive and far-reaching review of the available literature and clearly defining and delineating the constructs to be measured. One threat to the construct validity of the study was the decision to include culturally diverse viewpoints in the validation of the measure. For example, a construct such as "sinful acts" could have very different implications for a participant based on his or her geographic location or cultural background. To address this concern, I attempted to write the items as simply and straightforwardly as possible to minimize confusion,

included qualitative questions to provide further clarity on the attributions being shared and the cultural context of the participants, and included measures of acculturation and cultural competency to examine the potential impact of these variables on responses. We suggest that future studies continue to utilize these or similar steps to further examine the cultural compatibility of the measure. Specifically, we encourage the inclusion of open-ended questions and measures that will capture the cultural context of the participants, which will minimize mono-method bias and may serve to clarify differences in understanding of the experimenter-provided items of the MIAQ. Additionally, it is advised that researchers who choose to use the MIAQ will first conduct a thorough examination of attributional attitudes present in the population being studied by examining existing research and collaborating with professionals who are very familiar with the sample populations (Heppner et al., 2008). This will assist the researchers in determining the extent to which the MIAQ will capture the variables they wish to measure, the need for additional measures to triangulate results, and the further steps necessary to conduct research sensitively and accurately in a new cultural context.

Additional facets of psychometric evaluation (beyond construct validity) also hold substantial relevance for the process of scale development. In considering statistical conclusion validity, for example, the issue of statistical power was addressed via a priori power analysis (which was incorporated in determining the sample sizes for the current study), testing assumptions of statistical tests such as univariate normality, and utilizing only reliable measures to examine relationships with the MIAQ. Internal validity concerns were further addressed in the present research by standardizing the presentation and administration of the questionnaire across all participants. Practice effects in the test-retest portion of the study were considered, but were

assumed to affect all participants equally. Additionally, as a measure of beliefs with no “correct” answers, the influence of practice effects was less of a concern.

External validity concerns in this context were predominantly related to “context-dependent mediation” (Heppner et al., 2008, p. 105), which questions whether a measure developed in one context (or, in this case, one nation) should be recommended for use in another. Cultural validity in scale development also includes the implementation of “a cogent reasoned argument, falsifiable research hypotheses, a priori statistical power analysis, relatively large and diverse sample from more than one culture, comparison groups, controlled Type I and II error rates, and optimal statistical procedures” (Falender, Burnes, & Ellis, 2013, p. 17). In working to achieve these criteria, we recruited diverse, multinational samples for both the pilot and initial validation studies of the MIAQ. We also developed specific research questions, conducted power analyses both a priori and post hoc, developed the MIAQ using mixed-methods and international samples, and used a well-defined validation procedure. We were unable to incorporate a control/comparison group in the present research. Nevertheless, using the aforementioned methods, we captured diverse viewpoints about the causes of mental illness and provided strong psychometric support for any future efforts to translate the measure. Finally, following the recommendation of Heppner and colleagues (2008), it must be noted that this measure may be subject to further validation, translation, and revision in the future as new information becomes available. This is a hallmark of the best assessments: recognition that measures must evolve and expand in an ongoing manner to effectively capture changes in populations as well as improved clarity and scientific understanding of topics being studied.

It should be noted that all participants in both samples were English-speakers due to the logistical impossibility of translating the survey and any responses obtained into more than 50

languages. This decision limited the participants to a small segment of the populations being studied and introduced the potential for sampling bias. However, a validity check comparing U.S. participants' responses to others showed expected differences, which may support the assertion that sampling decisions did not adversely impact the validity of the study. Nevertheless, we encourage that results be interpreted with the understanding that the responses of English-speakers are likely to differ from those of their non-English-speaking peers.

Additionally, the second validation study was conducted with international students currently living in the United States, who represent a specific subset of individuals from their countries of origin. A large percentage of the participants (39.6%) also hailed from three highly represented countries, which may cause the results to disproportionately reflect the views of students from these nations. Further, the sample for the validation study was highly educated (409 of the 680 participants had already earned a Bachelor's degree). As a result, because of these nuances in the samples used in the current validation studies, it is recommended that any future translations of the measure or use outside of the United States be subject to further examination of its psychometric properties with the new sample.

Another component of the recruitment process in the current research was that both the pilot and initial validation studies were conducted with volunteer participants, which is likely to be a source of sampling bias. In a classic study, Rosenthal and Rosnow (1975) identified that research volunteers are likely to be more highly educated, intelligent, social, approval-motivated, and belong to a higher socioeconomic class than individuals who decline to participate. Therefore, the participants in the present study may be more likely to fit these characteristics and may not be representative of larger populations. As with any study utilizing a subsample of a population, great care should be taken before attempting to generalize these results.

Lastly, we acknowledge that the current research relied entirely on self-report data, which may have introduced bias related to social desirability and construct validity. For example, on a self-report measure of multicultural competence such as the one used in the current research, participants might be inclined to present themselves as more competent than they actually are. For this reason, this measure is more accurately a measure of one's confidence in the area of multicultural competency and therefore we used the phrase "self-rated multicultural competence" to describe this measure. We also sought to counteract the potential influence of social desirability by emphasizing the strict confidentiality of participants and incorporating open-ended qualitative items in the research (i.e., avoiding mono-method bias). However, future studies using these measures may also choose to include a measure of social desirability to explore this potential confound.

### **Strengths and Contributions**

The two research questions for the current research were as follows:

1. Is the Mental Illness Attribution Questionnaire (MIAQ) a reliable and valid measure of diverse causes of mental illness that incorporates a multidimensional understanding of attribution theory?
2. To what extent will the factor structure of the MIAQ be supported when administered to a sample of international students at U.S. colleges and universities?"

In summary, the items of the MIAQ were developed by Knettel (2013) with extensive review of the existing literature and successfully separated into their initial factors using qualitative and exploratory factor analyses. In the current dissertation, the preliminary scale was administered to 680 international students and extensively reviewed, demonstrating strong internal reliability, internal consistency, test-retest reliability, and both convergent and



discriminant validity. As a result, the MIAQ, on the basis of this preliminary investigation, appears to be reasonably valid, reliable, and parsimonious as a culturally-inclusive measure of attributions for a variety of mental health concerns.

The creation and testing of the MIAQ followed rigorous scale development standards in the field of psychology (Clark & Watson, 1995; DeVellis, 2011; Gregory, 2010; Jackson, 1977; Messick, 1989; 1995). In fact, the methods were perhaps innovative in (a) incorporating qualitative responses and analysis in the formation of the items and scales, and (b) using exploratory factor analysis to form the original scales, then testing the stability of these scales with a second, larger sample using confirmatory factor analysis. As a result, the development of the MIAQ may serve as an example of thorough and conservative scale development in the empirical literature.

In addition to following strict standards in developing the scale, the MIAQ was created with the intention of capturing attributions of the causes of mental illness on a global scale, a very large undertaking. Of course, attempting to perfectly capture the beliefs of more than seven billion people is an impossible endeavor, and the interpretations of items by people of vastly different cultural backgrounds (i.e., their cultural equivalence) is certain to vary widely. Despite this concession of some of the cultural specificity that might come with a scale designed for a specific cultural group, the creation of a more universal instrument has clear value. A culturally inclusive scale allows for larger-scale comparisons between cultural groups where the participants may hold very different beliefs. Such an approach would appear more advisable than attempting to narrow the scale later to fit specific cultural contexts, a process which would require a re-validation and reexamination of the test's psychometric properties (Ægisdottir, Gerstein, & Cinarbas, 2008; Bartram, 2001; Marsella et al., 2000; Triandis, 2000). The MIAQ

will not perfectly capture all beliefs about the causes of mental illness among all participants in all cultural groups, but it is a strong starting point for these examinations and even stronger when paired with open-ended, qualitative inquiries, as it was in the present research.

### **Implications for Training and Practice**

The findings of the current research and the resulting instrument may have widespread applicability for training programs and mental health practice. With regard to training, raising awareness of one's own background and any accompanying biases and assumptions is a hallmark of competence in working with diverse cultural groups (Arredondo et al., 1996). This would most certainly include beliefs about the causes of mental illness, where mental health professionals and their clients may demonstrate important differences. There is minimal research available in this area, but differences in assumptions about the nature of mental illness might have important implications for clinical practice. By exploring these differences, trainees in mental health professions might improve in their ability to recognize areas of disconnect, misunderstanding, or disruption in the therapeutic alliance based on culturally informed differences in attribution. They might also assist clients in recognizing and reconciling these differences in other relationships, including possible inter-cultural or inter-generational conflict related to beliefs about the causes of mental health concerns.

### **Implications for Future Research**

The field of attribution theory and the study of stigma have converged in the literature as a variety of researchers have endeavored to examine relationships between beliefs about the causes of mental illness and the resulting attributes and behaviors toward mentally ill people. A comprehensive instrument of the causes of mental illness, such as the MIAQ, creates multiple opportunities for both new research and enhancement of current models. Most notably, Corrigan

and colleagues (2002; 2003) have created and tested a pathway of stigma whereby beliefs about the controllability of the illness and the perceived dangerousness of the mentally ill person invoke emotional responses and stigmatizing behavior. However, this pathway was tested entirely within the United States using a single, three-item measure of control and responsibility. Following a lay belief model introduced by Klonoff and Landrine (1994), the present research sought to expand the conceptualization of attribution to incorporate diverse beliefs about the causes of mental illness beyond a simple dichotomy and beyond the United States. The resulting measure, the MIAQ, is a valid and reliable instrument that achieves this task. In future research, the MIAQ may first be used to examine the stability and validity of the Corrigan (2002; 2003) model when paired with a more complex understanding of attribution beyond internal or external locus of control. This may include validation of the Corrigan model in international samples or cross-cultural studies within the United States while using the MIAQ to examine the variable of controllability. Positive results in such studies would lend support to the validity of the model under these conditions.

The MIAQ could also be used in similar ways as previous measures of locus of control (Rotter, 1966) or locus of origin (Hill & Bale, 1980) to examine relationships between styles of attribution and a variety of attitudes or behaviors, including stigmatizing, discrimination, help-seeking, or caretaking. For example, a researcher might explore whether specific styles of attribution correlate with increased stigma and discrimination toward a person with mental illness. This could create opportunities for education aimed at stigma reduction. Additionally, because it was developed with international samples, the MIAQ may provide unique opportunities to measure differences in these variables across national borders or across cultural groups. Lastly, it may be interesting to examine patterns of participant responses either within or

across cultural groups to determine whether distinct patterns of responses emerge. For example, it may be possible to determine that one group of participants favors more biological and social responses while another group is more inclined to endorse responses related to spirituality and personal weakness. Such research would provide interesting insights into the ways different people perceive mental illness and how these perceptions may impact the ways they interact with mentally ill people in their societies.

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Appendix A: Pilot Study Questionnaire from Knettel (2013)

Qualitative Questionnaire

1. Are you? Male Female Other \_\_\_\_\_
2. How old are you? \_\_\_\_\_
3. What is your nationality? \_\_\_\_\_
4. What is your race/ethnicity? \_\_\_\_\_
5. In what subject did you earn your highest degree? \_\_\_\_\_
6. What is your highest degree? \_\_\_\_\_
7. How many years of experience do you have as a researcher or professional in mental health related fields? \_\_\_\_\_
8. How many years of experience do you have as a researcher or professional in mental health related fields outside of your country of origin? \_\_\_\_\_
9. Have you completed a graduate level course, workshop or other training focused on multiculturalism (working with culturally diverse populations)? Yes No

**Before continuing the questionnaire, please review the questions below. In answering this question and others related to the causes of mental illness, please focus on one country. This may be your country of origin or any country where you have lived or practiced as a professional for at least three years. Please only choose a country if you feel confident in your ability to represent diverse views about the causes of mental illness among the various people who live there.)**

10. What country will you be writing about? \_\_\_\_\_

## Beliefs about the Causes of Mental Illness

11. We are interested in studying beliefs about the causes of mental illness. What beliefs do people from this country hold about the causes of mental illness?

### Experimenter-Provided Causal Attributions

Below is a list of possible causes of mental illness. Please rank each of the following causes of mental illness from “not at all important” to “very important” to people in the country you are writing about.

	Not at all Important						Very Important	
<b>Supernatural causes</b>								
1. Sinful thoughts	1	2	3	4	5	6	7	
2. Punishment from God	1	2	3	4	5	6	7	
3. The Evil Eye	1	2	3	4	5	6	7	
4. Sinful acts	1	2	3	4	5	6	7	
5. Lack of faith	1	2	3	4	5	6	7	
6. Hexes or curses	1	2	3	4	5	6	7	
7. Spirits of the dead	1	2	3	4	5	6	7	
8. Payback for wrongdoing	1	2	3	4	5	6	7	
9. A genie (jinn) or demon	1	2	3	4	5	6	7	
10. Thin blood	1	2	3	4	5	6	7	
11. A weakened spirit	1	2	3	4	5	6	7	
12. Harmful or “black” magic	1	2	3	4	5	6	7	

Not at all Important

Very Important

**Interpersonal stress**

13. Negative emotions	1	2	3	4	5	6	7
14. Problems in relationships	1	2	3	4	5	6	7
15. Anxiety or worry	1	2	3	4	5	6	7
16. Problems with job or school	1	2	3	4	5	6	7
17. Lack of harmony with nature	1	2	3	4	5	6	7
18. Traumatic experiences	1	2	3	4	5	6	7
19. Lack of harmony with others	1	2	3	4	5	6	7
20. Envy	1	2	3	4	5	6	7
21. Loneliness	1	2	3	4	5	6	7

**Lifestyle**

22. Diet	1	2	3	4	5	6	7
23. Vitamin deficiency	1	2	3	4	5	6	7
24. Poverty or homelessness	1	2	3	4	5	6	7
25. Bad hygiene	1	2	3	4	5	6	7
26. Lack of physical activity	1	2	3	4	5	6	7
27. Lack of rest or sleep	1	2	3	4	5	6	7
28. Exhaustion or fatigue	1	2	3	4	5	6	7
29. Stress or pressure	1	2	3	4	5	6	7
30. Unsafe sex	1	2	3	4	5	6	7

**Personality**

31. Ambition	1	2	3	4	5	6	7
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	Not at all Important				Very Important			
32. Anger	1	2	3	4	5	6	7	
33. Low self-esteem	1	2	3	4	5	6	7	
34. A bad attitude	1	2	3	4	5	6	7	
<b>Chance/Fate/Luck</b>								
35. Chance	1	2	3	4	5	6	7	
36. Bad luck	1	2	3	4	5	6	7	
37. Fate or destiny	1	2	3	4	5	6	7	
<b>Substance Use</b>								
38. Drug use	1	2	3	4	5	6	7	
39. Drinking alcohol	1	2	3	4	5	6	7	
40. Smoking	1	2	3	4	5	6	7	
41. Prescription medications	1	2	3	4	5	6	7	
<b>Biology</b>								
42. Genes or heredity	1	2	3	4	5	6	7	
43. Sex	1	2	3	4	5	6	7	
44. Contagion, contact with illness	1	2	3	4	5	6	7	
45. Germs, viruses or bacteria	1	2	3	4	5	6	7	
46. Accidents or injuries	1	2	3	4	5	6	7	
47. Bad immune system	1	2	3	4	5	6	7	
<b>Exposure to weather</b>								
48. Body temperature	1	2	3	4	5	6	7	
49. Exposure to weather/wind	1	2	3	4	5	6	7	

Not at all Important

Very Important

**Environmental**

50. Pollution or smog	1	2	3	4	5	6	7
51. Exposure to chemicals	1	2	3	4	5	6	7
52. Contaminated food	1	2	3	4	5	6	7

If there are additional causes that are important in this country but were not listed above, please list them and rank the importance of each.

1. Other _____	1	2	3	4	5	6	7
2. Other _____	1	2	3	4	5	6	7
3. Other _____	1	2	3	4	5	6	7
4. Other _____	1	2	3	4	5	6	7
5. Other _____	1	2	3	4	5	6	7

\*\*\*Category domains (in **Bold**) did not appear in actual scale and item order was randomized before administration to control for response bias. The scale is presented in this manner here to show the proposed domains and the tentative attributions within each category.

## Appendix B: Proposed Items and Scales from Knettel (2013)

For the purposes of this study, **categories of attribution** are defined as broader factors describing a person's beliefs about the causes of mental illness, each of which will make up a scale of the final measure. The list below shows the 62 tentative items from Knettel (2013) under their proposed categories of attribution.

### **Scale: Supernatural Forces**

1. Sinful thoughts
2. Punishment from God
3. The Evil Eye
4. Consequence for sinful acts
5. Lack of faith
6. Cursed, hexed, or bewitched
7. Angered spirits of the dead
8. Payback for wrongdoing
9. A genie (jinn), devil, or demon
10. A weakened spirit
11. Harmful spells, sorcery, or black magic
12. Jealousy or envy of another person
13. Fate or destiny

### **Scale: Social/Stress**

14. Negative life events
15. Problems in relationships
16. Anxiety or worry

17. Problems with work or school
18. Traumatic experiences
19. Loneliness
20. Poverty or homelessness
21. Exhaustion or fatigue
22. Stress or pressure
23. Anger about life circumstances
24. Low self-esteem
25. A bad childhood
26. Worry over finances or employment
27. Death or loss of a loved one
28. Troubles in family life
29. Lack of support from family and friends
30. Exposure to war, conflict, or violence
31. Social injustice or oppression
32. Cultural inequality or conflict

**Scale: Lifestyle**

33. Improper diet
34. Vitamin deficiency
35. Lack of physical activity
36. Exposure to germs, viruses, or bacteria
37. A bad immune system
38. Unhealthy living conditions



**Scale: Physical Health**

- 39. Bad hygiene
- 40. Irresponsible sexual practices
- 41. Prescription medications
- 42. Contagion, contact with illness
- 43. Contaminated food or water
- 44. Contact with toxins or pollution

**Scale: Substance Use**

- 45. Drug use
- 46. Drinking alcohol
- 47. Smoking marijuana

**Scale: Chance/Luck/Personal Choice**

- 48. A bad attitude
- 49. Chance
- 50. Bad luck
- 51. Normal differences between people
- 52. Personal weakness, weakness of character
- 53. A flawed personality, poor constitution
- 54. Lack of will or self-control
- 55. Personal choice, don't want to improve

**Scale: Hereditary and Biological**

- 56. Genes or heredity
- 57. Accidental brain injury

- 58. Biological or medical disorder
- 59. Problems with brain function
- 60. Chemical imbalance in the brain
- 61. Problem before birth (in the womb)
- 62. Disturbed from birth

## Appendix C: Attribution Category Definitions

The Mental Illness Attribution Questionnaire (MIAQ) is being designed to measure diverse beliefs about the causes of mental illness. The definitions below describe the scales of the measure and the many beliefs that make up each scale. A high score on a given scale reflects endorsement of those beliefs, but does not indicate that a person endorses *all* of the beliefs within that scale.

**Supernatural Forces:** These are beliefs that a spiritual force or higher power is largely responsible for a person's mental health or the occurrence of mental illness. A person who leads a healthy spiritual life is less likely to experience a mental illness than a nonbeliever. Mental illness is a test of faith and a supernatural power can give mental illness or take it away. A person's actions lead to spiritual retribution. A virtuous person will be rewarded with good mental health while a person who is immoral is more likely to be unhealthy. Witchcraft, sorcery, and supernatural forces may influence the mental health of another person. Mental illness may be due to the affliction of an evil spirit or malicious magic. Fate and/or destiny are the driving forces behind mental illness. The problems a person faces in life are predestined before we are ever born and out of our control as humans. We must accept the fate we are given.

**Social/Stress:** These are beliefs that stressful life circumstances and poor coping lead to emotional problems and symptoms of mental illness. Mental illness can result from poor interpersonal relationships and poor social support. People who have experienced difficult or traumatic events in their lives are more likely to experience symptoms of mental illness. A person who has experienced abuse, neglect, or a traumatic childhood event will be more likely to have a mental illness than someone with a healthy childhood. People who feel overwhelmed and

“stressed out” in their daily lives are more likely to suffer from mental health problems. Poverty and other difficult life situations that are beyond a person’s ability to cope will lead to mental illness.

**Lifestyle:** These are beliefs that a poor lifestyle leads to poor mental health. A poor diet and other nutritional problems may contribute to symptoms of mental illness. People who do not get enough physical activity are more likely to experience mental health problems than people who exercise regularly. Frequent exposure to germs or a bad immune system may lead to mental health problems.

**Physical Health:** These are beliefs that there is a direct link between poor physical health and poor mental health. People who do not care for themselves physically are more likely to experience mental health symptoms. Poor personal hygiene and irresponsible sexual practices may cause mental health problems. People who are exposed to illness or contaminated food or water may experience consequences in their mental wellbeing.

**Substance Use:** These are beliefs that abusing drugs or alcohol can cause mental illness. People who overuse these substances are more likely to experience symptoms and suffer from mental health disorders.

**Chance/Luck/Personal Choice:** These are beliefs that mental illness is difficult to understand and predict. Mental problems may be an indicator of personal weakness or characterological shortcomings and a result of the natural differences between people. Being stricken with a mental illness may also be a matter of blind luck or chance.

**Hereditary/Biological:** These are beliefs in keeping with a “disease model,” which states that mental illness is a disease like any other, resulting from physical and chemical changes that cause biological dysfunction. Biological problems leading to mental illness are caused by genetic information passed down from one’s parents. Some people are born with a biological or genetic predisposition that greatly increases their chances of experiencing a disorder.

Appendix D: Sample Page of Questionnaire for Item Raters

**Scale Controllability Ratings**

For the purposes of this study, **categories of attribution** are defined as broader factors describing a person's beliefs about the causes of mental illness. **Controllability:** Refers to the level of control a person has over the cause. Is a person able to control and change causes in this category? Please rank each category of attribution on its level of controllability.

**Supernatural Forces**

Not at all Controllable				Very Controllable		
-3	-2	-1	0	1	2	3

**Social/Stress**

Not at all Controllable				Very Controllable		
-3	-2	-1	0	1	2	3

**Lifestyle**

Not at all Controllable				Very Controllable		
-3	-2	-1	0	1	2	3

**Physical Health**

Not at all Controllable				Very Controllable		
-3	-2	-1	0	1	2	3

**Substance Use**

Not at all Controllable				Very Controllable		
-3	-2	-1	0	1	2	3

**Chance/Luck/Personal Choice**

Not at all Controllable

Very Controllable

-3    -2    -1    0    1    2    3

**Hereditary/Biological**

Not at all Controllable

Very Controllable

-3    -2    -1    0    1    2    3

**Item Ratings**

**Item 1:** Sinful Thoughts

**Category:** Supernatural Forces

**1. How appropriate would it be to include this item in a list of potential causes of mental illness in diverse cultural contexts?**

Not at all Appropriate

Very Appropriate

1    2    3    4    5    6    7

**2. How appropriate is this item for its assigned category of attribution?**

Not at all Appropriate

Very Appropriate

1    2    3    4    5    6    7

**3. Please rate this item on its ease of understanding:**

Very Difficult to Understand

Very Easy to Understand

1    2    3    4    5    6    7

## Appendix E: Participant Demographics

	Stage 2	Stage 3	Stage 3 Re-test
Total Participants	158	680	56
Gender			
Women	85	395	39
Men	73	283	17
Unknown	0	2	0
Mean Age	42.40	25.09	27.36
Race/Ethnicity			
White/Caucasian/European	77	164	18
Asian	20	242	8
Black/Caribbean/African	10	36	5
South Asian	9	99	14
Middle Eastern/Arab	6	29	1
Biracial/Multiracial/Mixed	5	20	1
Hispanic/Latino	4	59	9
Unknown	27	31	0
Nation (Top 5 Listed)	65 Nations Represented	94 Nations Represented	32 Nations Represented
U.S.	13		
India	11	82	11
Australia	10		
Germany	9		4
Canada	8		
China		139	4
Brazil		48	
South Korea		21	
Iran		19	
Mean Months in U.S.	N/A	26.87	44.63
After Removing Outliers	N/A	23.10	29.78
Highest Degree Earned			
High School	N/A	241	13
Bachelor's	N/A	175	16
Master's	50	234	26
Doctorate	108	N/A	N/A
Religion (Top 5 Listed)			
None	N/A	184	7
Christian/Protestant	N/A	99	11
Catholic	N/A	90	14
Hindu	N/A	73	7
Muslim	N/A	71	3



## Appendix F: Letters of Introduction to Administrators and Students

Dear Colleague,

We are researchers from Lehigh University and we are working to create a measure of beliefs about the causes of mental illness in the United States and abroad. For the current study, we are seeking **international college students** to take the measure so that we can evaluate it and improve upon it. Because of your role within the college, we hope that you will be able to help us. We would greatly appreciate if you would forward the following invitation to your college's international students, perhaps through an international student listserv.

Although we are not able to compensate students for their participation, we will provide them with the option to see our final research article and this may be a nice opportunity for them to learn more about academic research. Additionally, we would be happy to answer any questions they may have about the research process.

If you do choose to forward this email to your college's international students, we would greatly appreciate if you could respond to this email ([Bak310@Lehigh.edu](mailto:Bak310@Lehigh.edu)) with an approximate number of international students who are on your list. This will help us to obtain a rough estimate of our response rate.

Thank you very much for your consideration.

Sincerely,  
Doctoral Student Investigator: Brandon A. Knettel, M.A.  
Bak310@lehigh.edu  
Principal Investigator: Professor Arnold Spokane, Ph.D.  
Ars1@lehigh.edu  
Lehigh University College of Education

Dear Students,

We are researchers from Lehigh University and we are working to create a measure of beliefs about the causes of mental illness in the United States and abroad. We are seeking a group of international college students to take the measure so that we can evaluate it and improve upon it. If you are an international student, we would greatly appreciate if you take the time to participate. The online questionnaire should take 15-20 minutes to complete.

Requirement for participation:

1. Must be at least 18 years of age.
2. Must currently be enrolled as a student at an American college or university.
3. Must have been born or lived for at least ten years in a country outside of the United States.

If you are interested in participating, please visit the following secure website. On this website you will find questions about your beliefs related to the causes of mental illness.

*Link here.*

Thank you very much for your consideration.

Doctoral Student Investigator: Brandon A. Knettel, M.A.

Bak310@lehigh.edu

Principal Investigator: Professor Arnold Spokane, Ph.D.

Ars1@lehigh.edu

Lehigh University College of Education

## Appendix G: Informed Consent Form

**Study Title:** Development and Preliminary Validation of a Comprehensive, International Measure of Beliefs about the Causes of Mental Illness: The Mental Illness Attribution Questionnaire

**Researcher:** Brandon A. Knettel, Department of Education and Human Services, Lehigh University

You are invited to participate in a research study being conducted by a doctoral student from Lehigh University under the direction of Professor Arnold Spokane, Ph.D. Before agreeing to participate in this research, we strongly encourage you to read the following description of the purpose and procedures of the study. This study has been approved by the Institutional Review Board of Lehigh University.

### **Explanation of Procedures**

This study is designed to explore diverse beliefs about the causes of mental illness in the United States and abroad. You were chosen for this study because you are an international student currently enrolled at a college or university in the United States. Participation in the study involves completion of an approximately 30 minute online survey that will ask about your beliefs related to the causes of mental illness.

### **Risks and Benefits of Being in the Study**

You should expect minimal discomfort from your participation in this study. Should you feel significant discomfort, we encourage you to withdraw from the study. If you have any lasting emotional distress related to your participation, we recommend that you seek a professional counselor for help. Although you will not be personally compensated for your participation, the knowledge obtained from this study will be of great value in understanding cultural beliefs about mental health.

### **Confidentiality**

At no point will you be asked to provide identifying data; therefore, your responses will remain completely confidential. All information gathered during this study will remain in secure premises and only the researchers will have access to the study data. The results of the research will be presented in the form of a research paper and may be published or presented at professional conferences.

### **Withdrawal without Prejudice**

Participation in this study is completely voluntary. You are free to discontinue participation or choose not to answer a question at any time without penalty.

If you have other questions or concerns about the study **you are encouraged** to contact the researchers, whose contact information is listed below. If you would like to talk to someone other than the researchers, **you are encouraged** to contact Troy Boni at (610) 758-3021 (email: [inors@lehigh.edu](mailto:inors@lehigh.edu)) of Lehigh University's Office of Research and Sponsored Programs. All reports or correspondence will be kept confidential.

***You may print a copy of this information to keep for your records.***

Researcher contact information:

1. Brandon A. Knettel: brandon.knettel@gmail.com or call +1 320 247 3100
2. Dr. Arnold Spokane: ars1@lehigh.edu

By clicking the button below, I agree that I have read and understand the above information. I meet the requirements of the study and freely agree to participate. I understand that I am free to choose not to answer any question and to withdraw from the study at any time. I understand that my responses will be kept anonymous and confidential.

*I Agree.*

## Appendix H: Demographic Questionnaire

1. Please select: Female    Male    Other \_\_\_\_\_
2. What is your age? \_\_\_\_\_
3. What is your nationality? \_\_\_\_\_
4. What is your race/ethnicity? \_\_\_\_\_
5. What is your primary language? \_\_\_\_\_
6. How long have you been living in the United States? \_\_\_\_\_
7. In what U.S. state is your university located? \_\_\_\_\_
8. What is your religion? \_\_\_\_\_
9. How important is your religion to you?
  - a. Very Important
  - b. Important
  - c. Somewhat Important
  - d. Somewhat Unimportant
  - e. Unimportant
  - f. Very Unimportant
10. What option best describes your financial status?
  - a. Upper Class
  - b. Upper-Middle Class
  - c. Middle Class
  - d. Lower-Middle Class
  - e. Lower Class

Appendix I: Vignettes and Responsibility Subscale of the Attribution Questionnaire (AQ-27)

Each participant will be presented one of the following vignettes with the prompt, “Please read the short description below about a man named Harry.”

- Harry is a 30-year-old single man with schizophrenia. Sometimes he hears voices and has strange beliefs that make him upset. He lives alone in an apartment and works as a store clerk. He has been hospitalized because of his illness in the past.
- Harry is a 30-year-old single man with depression. He often feels very unhappy and sometimes has thoughts about killing himself. He lives alone in an apartment and works as a store clerk. He has been hospitalized because of his illness in the past.
- Harry is a 30-year-old single man with alcoholism. He has been drinking heavily almost every day for the past five years. He lives alone in an apartment and works as a store clerk. He has been hospitalized because of his illness in the past.

For each of the following questions, please choose the number that best describes how you feel about Harry’s condition.

1. I would think that it was Harry’s own fault that he is in the present condition.

**1          2          3          4          5          6          7          8          9**

not at all his fault very much his fault

2. How controllable, do you think, is the cause of Harry’s present condition?

**1          2          3          4          5          6          7          8          9**

not at all under personal control completely under personal control

3. How responsible, do you think, is Harry for his present condition?

**1          2          3          4          5          6          7          8          9**

not at all responsible very much responsible

Appendix J: Preliminary Version of the MIAQ

Below is a list of possible causes for Harry’s illness. Please rate each of the following items from “not at all important” to “very important” as causes for Harry’s illness.

	This Cause is Not at all Important				This Cause is Very Important		
	1	2	3	4	5	6	7
1. Consequence for sinful thoughts	1	2	3	4	5	6	7
2. Contagion, contact with illness	1	2	3	4	5	6	7
3. Troubles in family life	1	2	3	4	5	6	7
4. Prescription medications	1	2	3	4	5	6	7
5. Bad luck	1	2	3	4	5	6	7
6. Social injustice or discrimination	1	2	3	4	5	6	7
7. Improper diet	1	2	3	4	5	6	7
8. Lack of support from loved ones	1	2	3	4	5	6	7
9. A genie (jinn), devil, or demon	1	2	3	4	5	6	7
10. Poverty or homelessness	1	2	3	4	5	6	7
11. Genes or heredity	1	2	3	4	5	6	7
12. Chance	1	2	3	4	5	6	7
13. Stressful life circumstances	1	2	3	4	5	6	7
14. Consequence for lack of faith	1	2	3	4	5	6	7
15. Smoking marijuana	1	2	3	4	5	6	7
16. A negative attitude	1	2	3	4	5	6	7
17. Problem from birth, born that way	1	2	3	4	5	6	7
18. Punishment from God	1	2	3	4	5	6	7
19. Drinking alcohol	1	2	3	4	5	6	7

	This Cause is Not at all Important				This Cause is Very Important		
	1	2	3	4	5	6	7
20. It is a biological or medical disorder	1	2	3	4	5	6	7
21. A flawed personality	1	2	3	4	5	6	7
22. The Evil Eye	1	2	3	4	5	6	7
23. Loneliness	1	2	3	4	5	6	7
24. A bad immune system	1	2	3	4	5	6	7
25. Personal weakness, weakness of character	1	2	3	4	5	6	7
26. Traumatic experiences	1	2	3	4	5	6	7
27. Consequence for sinful acts	1	2	3	4	5	6	7
28. Pressure, high expectations from others	1	2	3	4	5	6	7
29. Accidental brain injury	1	2	3	4	5	6	7
30. Fate or destiny	1	2	3	4	5	6	7
31. Anger about life circumstances	1	2	3	4	5	6	7
32. Irresponsible sexual practices	1	2	3	4	5	6	7
33. Please select "2" for this item	1	2	3	4	5	6	7
34. Problem before birth (in the womb)	1	2	3	4	5	6	7
35. Harmful spells, sorcery, or black magic	1	2	3	4	5	6	7
36. Worry over finances or employment	1	2	3	4	5	6	7
37. Problems in relationships	1	2	3	4	5	6	7
38. Bad hygiene	1	2	3	4	5	6	7
39. Exposure to war, conflict, or violence	1	2	3	4	5	6	7
40. Jealousy or envy of another person	1	2	3	4	5	6	7
41. Exhaustion or fatigue	1	2	3	4	5	6	7



	This Cause is Not at all Important				This Cause is Very Important		
	1	2	3	4	5	6	7
42. Contaminated food or water	1	2	3	4	5	6	7
43. Lack of will or self-control	1	2	3	4	5	6	7
44. A bad childhood	1	2	3	4	5	6	7
45. Chemical imbalance in the brain	1	2	3	4	5	6	7
46. Unhealthy living conditions	1	2	3	4	5	6	7
47. Angered spirits of the dead	1	2	3	4	5	6	7
48. Death or loss of a loved one	1	2	3	4	5	6	7
49. Please select "5" for this item	1	2	3	4	5	6	7
50. Personal choice, don't want to improve	1	2	3	4	5	6	7
51. Exposure to germs, viruses, or bacteria	1	2	3	4	5	6	7
52. Problems with work or school	1	2	3	4	5	6	7
53. Lack of physical activity	1	2	3	4	5	6	7
54. Problems with brain function	1	2	3	4	5	6	7
55. Contact with toxins or pollution	1	2	3	4	5	6	7
56. Negative life events	1	2	3	4	5	6	7
57. Cursed, hexed, or bewitched	1	2	3	4	5	6	7
58. Vitamin deficiency	1	2	3	4	5	6	7
59. Drug use	1	2	3	4	5	6	7

Appendix K: The Marlowe-Crowne Social Desirability Scale, Reynolds Short Form A (RSF-A)

Please answer the following questions about yourself.

1. It is sometimes hard for me to go on with my work if I am not encouraged  
True False
2. I sometimes feel resentful when I don't get my way  
True False
3. No matter who I am talking to, I'm always a good listener  
True False
4. There have been occasions when I took advantage of someone  
True False
5. I'm always willing to admit it when I make a mistake  
True False
6. I sometimes try to get even rather than forgive and forget  
True False
7. I am always courteous, even to people who are disagreeable  
True False
8. I have never been irked when people expressed ideas very different from my own  
True False
9. There have been times when I was quite jealous of the good fortune of others  
True False
10. I am sometimes irritated by people who ask favors of me  
True False
11. I have never deliberately said something that hurt someone's feelings  
True False

## Appendix L: Results of Rating Tasks

The results of the research team’s rating tasks are summarized below. The first column lists the proposed items for the MIAQ, the second column lists any concerns identified for each item (rating of less than 5.0 on appropriateness for scale, appropriateness for assigned scale, or ease of understanding) including its rating on those concerns in parentheses, and the third column lists the action agreed upon by the research team and used to address any identified problems.

<b><u>Scale: Supernatural Forces</u></b>	<b><u>Concerns Identified (Rating)</u></b>	<b><u>Action Taken</u></b>
1. Sinful thoughts	Ease of understanding (4.6)	Item reworded
2. Punishment from God	None	-
3. The Evil Eye	None	-
4. Consequence for sinful acts	None	-
5. Consequence for lack of faith	None	-
6. Cursed, hexed, or bewitched	None	-
7. Angered spirits of the dead	None	-
8. Payback for wrongdoing	Ease of understanding (4.8)	Item discarded (Deemed redundant)
9. A genie (jinn), devil, or demon	None	-
10. A weakened spirit	Appropriateness for category (4.4), Ease of understanding (2.8)	Item discarded (Deemed too vague)
11. Harmful spells, sorcery, or black magic	None	-
12. Jealousy or envy of another person	None	-
13. Fate or destiny	None	-

<b><u>Scale: Social/ Stress</u></b>	<b><u>Concerns Identified (Rating)</u></b>	<b><u>Action Taken</u></b>
14. Negative life events	None	-
15. Problems in relationships	None	-
16. Anxiety or worry	Appropriateness for scale (4.8), Ease of understanding (4.6)	Item discarded (Deemed confusing)
17. Problems with work or school	None	-
18. Traumatic experiences	None	-
19. Loneliness	None	-
20. Poverty or homelessness	None	-
21. Exhaustion or fatigue	None	-
22. Stress or pressure	Ease of understanding (4.6)	Item revised (Split into two items to capture complexity)
23. Anger about life circumstances	None	-
24. Low self-esteem	Appropriateness for category (3.6)	Item discarded (No category considered a good fit)
25. A bad childhood	None	-
26. Worry over finances or employment	None	-
27. Death or loss of a loved one	None	-
28. Troubles in family life	None	-
29. Lack of support from family and friends	None	-
30. Exposure to war, conflict, or violence	None	-

	<b><u>Concerns Identified (Rating)</u></b>	<b><u>Action Taken</u></b>
31. Social injustice or oppression	Ease of understanding (4.8)	Combined with next item
32. Cultural inequality or conflict	Ease of understanding (4.4)	Combined with previous item
<b><u>Scale: Lifestyle</u></b>		
33. Improper diet	None	-
34. Vitamin deficiency	None	-
35. Lack of physical activity	None	-
36. Exposure to germs, viruses, or bacteria	None	-
37. A bad immune system	None	-
38. Unhealthy living conditions	None	-
<b><u>Scale: Physical Health</u></b>		
39. Bad hygiene	None	-
40. Irresponsible sexual practices	None	-
41. Prescription medications	None	-
42. Contagion, contact with illness	None	-
43. Contaminated food or water	None	-
44. Contact with toxins or pollution	None	-
<b><u>Scale: Substance Use</u></b>		
45. Drug use	None	-
46. Drinking alcohol	None	-
47. Smoking marijuana	None	-

<b><u>Scale: Chance/Luck/ Personal Choice</u></b>	<b><u>Concerns Identified (Rating)</u></b>	<b><u>Action Taken</u></b>
48. A bad attitude	Ease of understanding (4.8)	Item reworded
49. Chance	None	-
50. Bad luck	None	-
51. Normal differences between people	Appropriateness for scale (4.4), Ease of understanding (3.6)	Item discarded (Deemed too vague)
52. Personal weakness, weakness of character	None	-
53. A flawed personality	None	-
54. Lack of will or self-control	None	-
55. Personal choice, don't want to improve	None	-
<b><u>Scale: Hereditary and Biological</u></b>		
56. Genes or heredity	None	-
57. Accidental brain injury	None	-
58. Biological or medical disorder	None	-
59. Problems with brain function	None	-
60. Chemical imbalance in the brain	None	-
61. Problem before birth (in the womb)	None	-
62. Disturbed from birth	Ease of understanding (3.2)	Item reworded

Appendix M: Means and Standard Deviations of Measures

**Preliminary Mental Illness Attribution Questionnaire (MIAQ)**

	<b>Category of Attribution</b>						
	<b>Supernatural Forces</b>	<b>Social/ Stress</b>	<b>Lifestyle</b>	<b>Physical Health</b>	<b>Substance Use</b>	<b>Personal Weakness</b>	<b>Hereditary/ Biological</b>
	<b>Schizophrenia</b>						
<b>Mean</b>	1.99	4.36	3.01	2.52	3.81	3.25	4.72
<b>Standard Deviation</b>	1.08	1.47	1.45	1.33	1.75	1.73	1.32
<b>Skewness</b>	1.23	-.599	.254	.615	-.059	.232	-.509
<b>Kurtosis</b>	.969	-.622	-1.04	-.689	-1.17	-1.26	-.239
<b>N</b>	233						
	<b>Depression</b>						
<b>Mean</b>	2.23	5.46	4.07	3.41	4.60	4.47	4.14
<b>Standard Deviation</b>	1.10	.961	1.17	1.36	1.40	1.44	1.43
<b>Skewness</b>	.872	-.601	-.079	.076	-.349	-.410	-.105
<b>Kurtosis</b>	.248	.042	-.364	-.810	-.581	-.748	-.643
<b>N</b>	222						
	<b>Alcoholism</b>						
<b>Mean</b>	2.18	5.10	3.73	3.20	4.46	4.55	3.46
<b>Standard Deviation</b>	1.12	1.13	1.53	1.65	1.77	1.27	1.46
<b>Skewness</b>	.872	-.932	.007	.373	-.339	-.467	.096
<b>Kurtosis</b>	.248	.754	-.804	-.802	-.903	-.279	-.869
<b>N</b>	225						
	<b>Cumulative</b>						
<b>Mean</b>	2.13	4.96	3.59	3.03	4.29	4.27	4.11
<b>Standard Deviation</b>	1.10	1.29	1.46	1.50	1.69	1.39	1.49
<b>Skewness</b>	1.01	-.932	-.035	.373	-.291	-.253	-.198
<b>Kurtosis</b>	.408	.496	-.795	-.767	-.888	-.839	-.750
<b>N</b>	680						

**“Responsibility” Subscale of the Attribution Questionnaire (AQ-27)**

	<b>Fault</b>	<b>Control</b>	<b>Responsibility</b>	<b>Total</b>
<b>Mean</b>	4.15	4.66	5.01	13.82
<b>Standard Deviation</b>	2.46	2.27	2.5	6.22
<b>Skewness</b>				0.063
<b>Kurtosis</b>				-0.880
<b>N</b>	680			

**The Marlowe-Crowne Social Desirability Scale, Reynolds Short Form A (RSF-A)**

<b>Mean</b>	5.48
<b>Standard Deviation</b>	2.43
<b>Skewness</b>	-0.044
<b>Kurtosis</b>	-0.587
<b>N</b>	661



Appendix N: Correlation Tables for Vignette Conditions and Total Model

**Schizophrenia**

		<b>Supernatural Forces</b>	<b>Social/Stress</b>	<b>Lifestyle</b>	<b>Physical Health</b>	<b>Substance Use</b>	<b>Personal Weakness</b>
<b>Social/Stress</b>	Correlation	.406***					
	Significance	<.001					
<b>Lifestyle</b>	Correlation	.470***	.665***				
	Significance	<.001	<.001				
<b>Physical Health</b>	Correlation	.564***	.561***	.817***			
	Significance	<.001	<.001	<.001			
<b>Substance Use</b>	Correlation	.353***	.618***	.614***	.563***		
	Significance	<.001	<.001	<.001	<.001		
<b>Personal Weakness</b>	Correlation	.626***	.708***	.704***	.679***	.580***	
	Significance	<.001	<.001	<.001	<.001	<.001	
<b>Hereditary/Biological</b>	Correlation	-.105	-.021	-.157*	.122	.263***	-.058
	Significance	.111	.755	.017	.063	<.001	.382

*n* = 233

\*\*\*Pearson correlation is significant at the <.001 level (2-tailed).

\* Pearson correlation is significant at the <.05 level (2-tailed).

**Depression**

		<b>Supernatural Forces</b>	<b>Social/Stress</b>	<b>Lifestyle</b>	<b>Physical Health</b>	<b>Substance Use</b>	<b>Personal Weakness</b>
<b>Social/Stress</b>	Correlation	.108					
	Significance	.108					
<b>Lifestyle</b>	Correlation	.242***	.393***				
	Significance	<.001	<.001				
<b>Physical Health</b>	Correlation	.451***	.316***	.772***			
	Significance	<.001	<.001	<.001			
<b>Substance Use</b>	Correlation	.282***	.445***	.481***	.508***		
	Significance	<.001	<.001	<.001	<.001		
<b>Personal Weakness</b>	Correlation	.461***	.314***	.365***	.463***	.406***	
	Significance	<.001	<.001	<.001	<.001	<.001	
<b>Hereditary/Biological</b>	Correlation	-.111	.391***	.500***	.372***	.410***	-.015
	Significance	.100	<.001	<.001	<.001	<.001	.822

*n* = 222

\*\*\*Pearson correlation is significant at the <.001 level (2-tailed).

## Alcoholism

		Supernatural Forces	Social/Stress	Lifestyle	Physical Health	Substance Use	Personal Weakness
<b>Social/Stress</b>	Correlation	.199**					
	Significance	.003					
<b>Lifestyle</b>	Correlation	.360***	.304***				
	Significance	<.001	<.001				
<b>Physical Health</b>	Correlation	.478***	.281***	.856***			
	Significance	<.001	<.001	<.001			
<b>Substance Use</b>	Correlation	.471***	.404***	.539***	.535***		
	Significance	<.001	<.001	<.001	<.001		
<b>Personal Weakness</b>	Correlation	.436***	.489***	.534***	.488***	.592***	
	Significance	<.001	<.001	<.001	<.001	<.001	
<b>Hereditary/Biological</b>	Correlation	.326***	.359***	.562***	.558***	.373***	.466***
	Significance	<.001	<.001	<.001	<.001	<.001	<.001

*n* = 225

\*\*\*Pearson correlation is significant at the <.001 level (2-tailed).

\*\* Pearson correlation is significant at the <.01 level (2-tailed).

## Combined

		Supernatural Forces	Social/Stress	Lifestyle	Physical Health	Substance Use	Personal Weakness
<b>Social/Stress</b>	Correlation	.273***					
	Significance	<.001					
<b>Lifestyle</b>	Correlation	.374***	.532***				
	Significance	<.001	<.001				
<b>Physical Health</b>	Correlation	.500***	.442***	.831***			
	Significance	<.001	<.001	<.001			
<b>Substance Use</b>	Correlation	.384***	.534***	.578***	.558***		
	Significance	<.001	<.001	<.001	<.001		
<b>Personal Weakness</b>	Correlation	.500***	.599***	.605***	.578***	.596***	
	Significance	<.001	<.001	<.001	<.001	<.001	
<b>Hereditary/Biological</b>	Correlation	.087*	.107**	.295***	.273***	.262***	.170***
	Significance	.024	.005	<.001	<.001	<.001	<.001

*N* = 680

\*\*\*Pearson correlation is significant at the <.001 level (2-tailed).

\*\* Pearson correlation is significant at the <.01 level (2-tailed).

\* Pearson correlation is significant at the <.05 level (2-tailed).

## Appendix O: Test-Retest Reliability Analysis

### MIAQ

	Supernatural Forces	Social/ Stress	Lifestyle	Physical Health	Substance Use	Personal Weakness	Hereditary /Biological
<b>Schizophrenia (n = 19)</b>							
<i>r</i> Value	.796***	.901***	.967***	.856***	.924***	.909***	.860***
Significance	< .001	< .001	< .001	< .001	< .001	< .001	< .001
<b>Depression (n = 18)</b>							
<i>r</i> Value	.851***	.743***	.704**	.707**	.759***	.843***	.774***
Significance	< .001	< .001	.001	.001	< .001	< .001	< .001
<b>Alcoholism (n = 19)</b>							
<i>r</i> Value	.876***	.949***	.948***	.938***	.560*	.901***	.787***
Significance	< .001	< .001	< .001	< .001	.013	< .001	< .001
<b>Total (n = 56)</b>							
<i>r</i> Value	.872***	.899***	.908***	.867***	.766***	.918***	.838***
Significance	< .001	< .001	< .001	< .001	< .001	< .001	< .001

### Responsibility Subscale of AQ

Schizophrenia <i>r</i> Value	.708**
Significance	0.001
Depression <i>r</i> Value	.833***
Significance	< .001
Alcoholism <i>r</i> Value	.757***
Significance	< .001
<b>Total <i>r</i> Value</b>	<b>.793***</b>
Significance	< .001

### RSF-A (Social Desirability)

Schizophrenia <i>r</i> Value	.703**
Significance	0.001
Depression <i>r</i> Value	.799***
Significance	< .001
Alcoholism <i>r</i> Value	.847***
Significance	< .001
<b>Total <i>r</i> Value</b>	<b>.776***</b>
Significance	< .001

*n* = 56

\*\*\*Pearson correlation is significant at the <.001 level (2-tailed).

\*\* Pearson correlation is significant at the <.01 level (2-tailed).

\* Pearson correlation is significant at the <.05 level (2-tailed).

## Appendix P: Correlations for RSF-A (Social Desirability) and MIAQ Scales

Vignette Condition		Supernatural Forces	Social/Stress	Lifestyle	Physical Health	Substance Use	Personal Weakness	Heredity/Biology
RSF-A for Schizophrenia	Correlation	.063	.130	.152*	.111	.161*	.170*	-.131*
	Significance	.343	.050	.022	.096	.015	.010	.048
RSF-A for Depression	Correlation	.023	-.166*	-.104	-.139*	.091	-.032	-.149*
	Significance	.742	.015	.130	.042	.182	.636	.029
RSF-A for Alcoholism	Correlation	.075	-.130	-.044	-.048	.132	-.046	-.026
	Significance	.271	.054	.515	.481	.051	.494	.696
<b>All Participants</b>	<b>Correlation</b>	<b>.052</b>	<b>-.035</b>	<b>.002</b>	<b>-.030</b>	<b>.122**</b>	<b>.007</b>	<b>-.088*</b>
	<b>Significance</b>	<b>.185</b>	<b>.364</b>	<b>.960</b>	<b>.443</b>	<b>.002</b>	<b>.848</b>	<b>.023</b>

*N* = 661

\*\* Pearson correlation is significant at the <.01 level (2-tailed).

\* Pearson correlation is significant at the <.05 level (2-tailed).

Appendix Q: Final Version and Scoring Template of the MIAQ

Below is a list of possible causes for Harry’s illness. Please rate each of the following items from “not at all important” to “very important” as causes for Harry’s illness.

	This Cause is Not at all Important				This Cause is Very Important			
	1	2	3	4	5	6	7	
1. Consequence for sinful thoughts	1	2	3	4	5	6	7	
2. Contagion, contact with illness	1	2	3	4	5	6	7	
3. Troubles in family life	1	2	3	4	5	6	7	
4. Social injustice or discrimination	1	2	3	4	5	6	7	
5. Improper diet	1	2	3	4	5	6	7	
6. Lack of support from loved ones	1	2	3	4	5	6	7	
7. A genie (jinn), devil, or demon	1	2	3	4	5	6	7	
8. Poverty or homelessness	1	2	3	4	5	6	7	
9. Genes or heredity	1	2	3	4	5	6	7	
10. Stressful life circumstances	1	2	3	4	5	6	7	
11. Consequence for lack of faith	1	2	3	4	5	6	7	
12. Smoking marijuana	1	2	3	4	5	6	7	
13. A negative attitude	1	2	3	4	5	6	7	
14. Problem from birth, born that way	1	2	3	4	5	6	7	
15. Punishment from God	1	2	3	4	5	6	7	
16. Drinking alcohol	1	2	3	4	5	6	7	
17. It is a biological or medical disorder	1	2	3	4	5	6	7	
18. A flawed personality	1	2	3	4	5	6	7	
19. The Evil Eye	1	2	3	4	5	6	7	
20. Loneliness	1	2	3	4	5	6	7	

	This Cause is Not at all Important				This Cause is Very Important		
	1	2	3	4	5	6	7
21. A bad immune system							
22. Personal weakness, weakness of character	1	2	3	4	5	6	7
23. Traumatic experiences	1	2	3	4	5	6	7
24. Consequence for sinful acts	1	2	3	4	5	6	7
25. Pressure, high expectations from others	1	2	3	4	5	6	7
26. Accidental brain injury	1	2	3	4	5	6	7
27. Fate or destiny	1	2	3	4	5	6	7
28. Anger about life circumstances	1	2	3	4	5	6	7
29. Irresponsible sexual practices	1	2	3	4	5	6	7
30. Please select "2" for this item	1	2	3	4	5	6	7
31. Problem before birth (in the womb)	1	2	3	4	5	6	7
32. Harmful spells, sorcery, or black magic	1	2	3	4	5	6	7
33. Worry over finances or employment	1	2	3	4	5	6	7
34. Problems in relationships	1	2	3	4	5	6	7
35. Bad hygiene	1	2	3	4	5	6	7
36. Exposure to war, conflict, or violence	1	2	3	4	5	6	7
37. Exhaustion or fatigue	1	2	3	4	5	6	7
38. Contaminated food or water	1	2	3	4	5	6	7
39. Lack of will or self-control	1	2	3	4	5	6	7
40. A bad childhood	1	2	3	4	5	6	7
41. Chemical imbalance in the brain	1	2	3	4	5	6	7
42. Unhealthy living conditions	1	2	3	4	5	6	7

	This Cause is Not at all Important				This Cause is Very Important		
	1	2	3	4	5	6	7
43. Angered spirits of the dead	1	2	3	4	5	6	7
44. Death or loss of a loved one	1	2	3	4	5	6	7
45. Please select "5" for this item	1	2	3	4	5	6	7
46. Personal choice, don't want to improve	1	2	3	4	5	6	7
47. Exposure to germs, viruses, or bacteria	1	2	3	4	5	6	7
48. Problems with work or school	1	2	3	4	5	6	7
49. Lack of physical activity	1	2	3	4	5	6	7
50. Problems with brain function	1	2	3	4	5	6	7
51. Contact with toxins or pollution	1	2	3	4	5	6	7
52. Negative life events	1	2	3	4	5	6	7
53. Cursed, hexed, or bewitched	1	2	3	4	5	6	7
54. Vitamin deficiency	1	2	3	4	5	6	7
55. Drug use	1	2	3	4	5	6	7

## **Scoring**

Supernatural forces: Mean of the responses for items 1, 7, 11, 15, 19, 24, 27, 32, 43, and 53.

Social/Stress: Mean of the responses for items 3, 4, 6, 8, 10, 20, 23, 25, 28, 33, 34, 36, 37, 40, 44, 48, and 52.

Lifestyle: Mean of the responses for items 5, 21, 42, 47, 49, and 54.

Physical Health: Mean of the responses for items 2, 29, 35, 38, and 51.

Substance Use: Mean of the responses for items 12, 16, and 55. Please note, this scale should not be used to measure attributions for substance use disorders.

Personal Weakness: Mean of the responses for items 13, 18, 22, 39, and 46.

Heredity/Biology: Mean of the responses for items 9, 14, 17, 26, 31, 41, and 50.

Validity Checks: If respondent provides an incorrect response for the validity check item 30 and/or item 45, this is likely an indication of a lack of attention, motivation, or understanding for the instrument and the respondent's results should be discarded.



## Vita

### BRANDON KNETTEL

2211 Hillsborough Road, Apt. 4112, Durham, NC 27705  
Phone: 320-247-3100; Email: Brandon.Knettel@gmail.com

#### EDUCATION

- Ph.D. in Counseling Psychology Expected 08/2015  
*Lehigh University - Bethlehem, PA* 3.95 GPA
  - Completed advanced coursework in counseling skills, assessment, and multicultural counseling under the advisement of Dr. Arnold Spokane.
  - Conducting ongoing research exploring attitudes toward mental health and traditional versus Western treatments in Tanzania, East Africa.
- Master of Arts in Counseling Psychology 08/2007 - 01/2009  
*The University of St. Thomas - St. Paul, MN* 3.83 GPA
- Bachelor of Arts in Psychology, Minor in English 08/2003 - 05/2005  
*The College of St. Scholastica - Duluth, MN* 3.77 GPA

#### ADMINISTRATIVE EXPERIENCE

- *Heart to Heart International – Bell-Anse, Haiti* 01/2013 – Present
  - Coordinating internship program in partnership with Lehigh University graduate students evaluating UNICEF WASH program in rural Haiti.
  - Supervising preparation and implementation of program evaluation, executive report, and research manuscript.
- *Community Voices Clinic – Bethlehem, PA* 06/2013 – 07/2014
  - Assisted in the formation of a new community clinic co-sponsored by Lehigh University and the Bethlehem Area School District.
  - Provided clinical supervision to trainees and free psychotherapy to uninsured, low-SES families from the South Bethlehem community.
- *Lehigh University College of Education – Bethlehem, PA* 08/2011 - 05/2012
  - Provided weekly clinical supervision of therapy sessions for one international and one domestic Master's student.
  - Offered feedback, reviewed counseling tapes, and implemented evaluations to assist trainees in their professional development.

#### ASSESSMENT EXPERIENCE

- *Philadelphia Refugee Mental Health Collaborative* 04/2014 – Present
  - Compiling an online toolkit of resources and writing policy guidelines for healthcare and social service providers who serve refugee families.
  - Performing institutional self-assessment for organizations that provide care for refugees, including language access and other common barriers.

- *Heart to Heart International – Cascade Pichon, Haiti* 01/2013 – Present
  - Completing ongoing, comprehensive program evaluation of corporate volunteer trips teaching public health to community leaders in rural Haiti.
  - Utilizing quantitative surveys and qualitative focus group interviews to obtain and analyze data and provide program recommendations.
- *Good Shepherd Rehabilitation Hospital – Allentown, PA* 03/2011 – 12/2012
  - Performed psychological assessments of learning disability, vocational interest, brain injury, and cognitive impairment in adults and adolescents.
  - Gained proficiency in writing assessment reports and the administration of a variety of psychological tests.

## TEACHING EXPERIENCE

- *Philadelphia Refugee Mental Health Collaborative* 01/2013 – 07/2014
  - Conducted provider education sessions for physicians in training and other healthcare providers surrounding care and screening of refugees.
  - Developed provider competency in clinical interviewing and trauma-informed care for immigrant and refugee patients.
- *Lehigh University – Bethlehem, PA* 05/2012 – 12/2012
  - Assisted in Dr. Jessecae Marsh’s introductory psychology courses for more than 200 undergraduate students, including supplementary instruction.
  - Served as Teaching Assistant to Dr. Iveta Silova’s graduate-level Diversity & Multicultural Perspectives course for the Summer session.
- *Mount Meru University - Arusha, Tanzania* 09/2009 - 08/2012
  - Taught Introduction to Clinical Psychology and Lifespan Developmental Psychology to 100 Bachelor’s students at a rural university in Tanzania.
  - Conducted and co-taught a symposium on advanced research methods for graduate students and faculty at an East African university.

## CLINICAL EXPERIENCE

- *Duke University Counseling and Psychological Services* 08/2014 – 07/2015
  - Completed doctoral internship conducting psychotherapy, outreach, and career counseling under the supervision of Dr. Gary Glass.
  - Attained additional proficiency in Acceptance and Commitment Therapy, including co-leading four-week ACT workshops for stress management.
- *Philadelphia Refugee Mental Health Collaborative* 01/2013 – 07/2014
  - Served as a therapist and supervisor to refugee clients and international case workers in refugee resettlement from Myanmar, Bhutan, and Iraq.
  - Collaborated with the Survivors of Torture and Trauma Project to provide screening and community programs for refugees with a history of trauma.
- *Belmont Comprehensive Center – Philadelphia, PA* 07/2012 – 06/2013
  - Worked as a child, family, and individual psychotherapist with a specific emphasis on serving immigrant families and underserved communities.
- *St. Joseph’s University Counseling – Philadelphia, PA* 08/2011 – 05/2012
  - Conducted individual psychotherapy sessions with students experiencing a variety of concerns, including anxiety, self-harm, and eating disorders.

- *Abbott Northwestern Hospital - Minneapolis, MN* 05/2008 - 08/2010
  - Served as an in-patient Behavioral Health Associate for the intensive locked psychiatric unit at a major Minneapolis hospital.
- *Neighborhood Involvement Program - Minneapolis, MN* 05/2008 - 02/2009
  - Completed Master's practicum conducting individual psychotherapy with adult and adolescent clients at a community mental health clinic.
- *Northway Group Home - St. Cloud, MN* 03/2007 – 03/2008
  - Acted as a Mental Health Practitioner at an Intensive Residential Treatment facility for clients with severe and persistent mental illness.

## **LEADERSHIP, VOLUNTEERISM, AND SOCIAL JUSTICE**

- *Project Labdo* 10/2013 – Present
  - Coordinating the formation and operation of a “hub” for an international nonprofit delivering recycled laptops to schools in developing nations.
- *Student Delegate to the United Nations* 05/2011 – 05/2013
  - Represented Nigerian nonprofit African Citizens Development Foundation at the United Nations Department of Public Information in New York.
- *Vice President of UN Affairs – Global Union Exec. Board* 04/2011 – 05/2012
  - Engaged students in a variety of UN programs and connected students with diplomats from around the world through university programs.
- *Community Bike Works* 09/2010 – 05/2011
  - Volunteered at an urban program aimed at teaching children mechanical and interpersonal skills through repairing and riding bicycles.
- *Speak Up, Arusha* 09/2009 – 04/2010
  - Led training sessions at Selian Lutheran Hospital, the first advocacy and medical service for survivors of rape and sexual assault in Tanzania.

## **PROFESSIONAL ASSOCIATIONS AND CERTIFICATIONS**

- *American Psychological Association* 05/2011 – Present
  - Participating member of the APA and several subgroups, including:
    - *Division 52: International*
    - *Association of Graduate Students (APAGS)*
    - *Division 17: Counseling Psychology*
- *American Public Health Association* 07/2014 - Present
  - Collaborate with likeminded professionals including presentations and contributions to international and mental health sections.
- *Triangle Global Health Consortium* 02/2015 - Present
  - Working with local professional organizations to create dialogue at intersection of mental health and global health topics.
- *Psy Chi Honors Society* 03/2004 – Present
  - Earned membership to the international academic honor society in psychology.
- *End Violence Against Women International* 09/2012
  - Completed an 8-hour workshop aimed at teaching appropriate therapeutic and interviewing techniques for victims of sexual assault.

- *University Teacher Development Program, Level 1* 10/2010-02/2011
  - Developed teaching skills through 12-week course focusing on engaging students, classroom management and effectively presenting information.
- *Gay, Lesbian, and Straight Education Network (GLSEN)* 06/2008
  - Facilitated and co-taught 16-hour “Safe Space” training programs for allies providing support and advocacy for members of the GLBT communities.

## RESEARCH MANUSCRIPTS

- Plumb, E., Fogg, M., **Knettel, B. A.**, Escuder, A., Mulholland, C., Plumb, J., & Brawer, R. (2015). Provider perceptions of mental health needs among resettled refugees in Philadelphia: A city-wide organizational self-assessment. The Philadelphia Refugee Mental Health Collaborative (Submitted for publication).
- Knettel, B. A.**, & Slifko, S. E. (2014). *Teaching prenatal health, postpartum care, and family planning in rural Haiti: Evaluation of a community health worker training program*. Becton Dickinson and Heart to Heart International (Submitted for publication).
- Knettel, B. A. (2013). *Exploring diverse mental illness attributions in a multinational sample: A mixed methods survey of experts in international psychology*. Lehigh University (Doctoral qualifying project, presented at APA 2014).
- Knettel, B. A. (2009). *The will to feel: Therapy exploring meaning and the romantic ideal* (Master’s thesis).
- Knettel, B. A. (2005). *Erikson’s concept of health: Exploring the relationship between adverse life events and adolescent individuation* (Undergraduate thesis).

## PROFESSIONAL PRESENTATIONS

- Goyeneche, C. & **Knettel, B. A.** (2015). *Detours and straight lines: Navigating evolving career goals*. Duke University Medical School Career Development Symposium. Durham, NC.
- Glass, G., & **Knettel, B.A.** (2015). *Speaking up: Strategies in effective communication for international students and scholars*. Duke University International House “Connect, Learn, and Grow” Series. Durham, NC.
- Knettel, B. A.**, & Slifko, S. E. (2014). *Teaching prenatal health, postpartum care, communicable disease prevention, and family planning in rural Haiti: Evaluation of a public health care worker training program*. The American Public Health Association Annual Meeting. New Orleans, LA.
- Knettel, B. A.**, Plumb, E., Fulda, M., & Fogg, M. (2014). *Advancing healthcare provider skills in caring for refugee communities: An online training toolkit*. North American Refugee Health Conference. Rochester, NY.
- Plumb, E., **Knettel, B.A.**, & Fulda, M. (2014). *Healthy institutions for healthy refugee families: Guidelines for practice and policy*. Delaware Health Sciences Alliance Global Health Symposium. Newark, DE.
- Knettel, B. A. (2014). *Recognition and interventions for emotional and intellectual problems in students*. Mount Meru University. Arusha, Tanzania.
- Fogg, M., & **Knettel, B. A.** (2013). *Advocacy and care in Philadelphia refugee communities*. Northeast Treatment Center Professional Development Seminar. Philadelphia, PA.

Knettel, B. A. (2013). *Building connections in refugee communities: Lessons from public health outreach in Haiti*. Philadelphia Immigrant Provider Network. Philadelphia, PA.

Inman, A. G., Calinger, A., Spektor, V., **Knettel, B. A.**, Rugira, J., Spokane, A., & Ciftci, A. (2012). *Social justice and mental health: Global perspectives*. 30<sup>th</sup> International Congress of Psychology. Cape Town, South Africa.

Knettel, B. A. (2012). *Methods and considerations for quality qualitative research*. Mount Meru University International Research Seminar. Arusha, Tanzania.

Knettel, B. A. (2010). *Advocacy and counseling: Building trust with victims of rape and sexual assault*. Special Interest Group for Mental Health. Arusha, Tanzania.

### **RESEARCH GRANTS AND SCHOLARSHIPS**

- Dean's Endowed Student Travel Scholarship, Lehigh University College of Education: \$1000
- Diversity Committee Travel Fund, Lehigh University College of Education: \$500
- Doctoral Student Travel Grant, Lehigh University Graduate Student Senate: \$300

### **ADDITIONAL SKILLS**

- Proficient in a variety of computer software programs related to the quantitative analyses and the social sciences, including SPSS/PASW, AMOS, SAS, Epic, Titanium, Microsoft Office, and various assessment scoring programs.