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Jessica S. James

*University of Southern Mississippi*

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EXPLICIT, IMPLICIT, AND BEHAVIORAL  
STIGMATIZATION OF MENTAL ILLNESS

by

Jessica Shanna James

A Dissertation  
Submitted to the Graduate School,  
the College of Education and Psychology,  
and the Department of Psychology  
at The University of Southern Mississippi  
in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Philosophy

August 2018

EXPLICIT, IMPLICIT, AND BEHAVIORAL  
STIGMATIZATION OF MENTAL ILLNESS

by Jessica Shanna James

August 2018

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## ABSTRACT

### EXPLICIT, IMPLICIT, AND BEHAVIORAL STIGMATIZATION OF MENTAL ILLNESS

by Jessica Shanna James

August 2018

Mental health concern is a public health concern that continues to be stigmatized. While the dual process model has been applied to other areas of social cognition (e.g., racism), this framework has not previously been frequently used to examine the stigmatization of mental illness. The current study sought to examine the stigmatization of mental illness within a dual process model to determine the relationship between explicit and implicit stigmatizing attitudes and behaviors. A total of 104 undergraduate students from the University of Southern Mississippi participated in this study. Participants completed multiple implicit and explicit measures of stigmatizing attitudes and behavioral intentions. First, a psychometric analysis of implicit measures found the Single-Category Implicit Association Test (SC-IAT) and the Approach/Avoidance Test (AAT) had acceptable split-half reliability while the Go/No-Go Association Task (GNAT) did not. Furthermore, the SC-IAT and GNAT had poor convergent validity. The SC-IAT was found to have poor predictive validity of the AAT. Next, the relationship between implicit and explicit measures were evaluated and found to be weak suggesting the presence of two distinct processes – one implicit, automatic process and one explicit, deliberate process. Gender and race showed some small moderating effects. Limitations, future directions, and implications are discussed.

## ACKNOWLEDGMENTS

I would like to thank my dissertation chair and advisor, Dr. Randolph C. Arnau, as well as my dissertation committee members, Dr. Joye C. Anestis, Dr. Michael C. Anestis, Dr. Bradley A. Green, and Dr. Donald F. Sacco, for their assistance and feedback throughout this project. I would also like to thank the undergraduate research assistants for assisting in data collection as well as undergraduate students from the University of Southern Mississippi for participating in this project.

## DEDICATION

I dedicate this project to all those that have supported me throughout my studies, including, but not limited to, my family, friends, colleagues, teachers, supervisors, and makers of ice cream/frozen custard.

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## LIST OF ABBREVIATIONS

<i>AAT</i>	Approach-Avoidance Task
<i>ADHD</i>	Attention-Deficit/Hyperactivity Disorder
<i>CCA</i>	Canonical Correlation Analysis
<i>GNAT</i>	Go/No Go Association Task
<i>IAT</i>	Implicit Association Test
<i>M</i>	Mean
<i>OCD</i>	Obsessive Compulsive Disorder
<i>Sem. Diff.</i>	Semantic Differential Task
<i>SC-IAT</i>	Single Category Implicit Association Test
<i>ST-IAT</i>	Single-Target Implicit Association Test
<i>SDRS</i>	Social Distance Rating Scale
<i>SD</i>	Standard Deviation

## CHAPTER I – INTRODUCTION

Mental illness is a serious health concern that affects approximately one in five adults in the United States each year (Substance Abuse and Mental Health Services Administration, 2013; 2014). Mental illness is described as “a syndrome characterized by clinically significant disturbance in an individual's cognition, emotion regulation, or behavior that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental functioning” (American Psychological Association, 2013, p. 20). Although mental illness is associated with distress and disability, only 40% of individuals afflicted with mental illness receive treatment (Substance Abuse and Mental Health Services Administration, 2013) and even those that do receive treatment sometimes do not adhere to it or continue treatment as recommended (Phelan & Basow, 2007). One reason for not seeking or adhering to treatment is stigma (Dockery et al., 2015; Fitzpatrick, 2015; Link, Monahan, Stueve, & Cullen, 1999; Mojtabai et al., 2011; Phelan & Basow, 2007). In a large, nationally representative sample of adults who have had a mental illness in their lifetime (National Comorbidity Survey Replication; Mojtabai et al., 2011), 97.4% of individuals cited attitudinal or evaluative barriers to seeking treatment and 9.1% of these specifically cited stigma. Additionally, 81.9% of individuals cited attitudinal or evaluative barriers leading to premature treatment drop-out and 21.2% of these specifically cited stigma. Thus while mental illness is harmful in and of itself, the stigma associated with mental illness further increases its harm to the individuals, their families, the treatment, and society as a whole (e.g., Feldman & Crandall, 2007; Holmes, Corrigan, Williams, Canar, & Kubiak, 1999; Link et al., 1999).

Based on the seminal work of Goffman (1963), stigma involves a social identity or attribute that is linked to stereotypes such that the attribute is considered “deeply discrediting” (p. 3), gives the individual an “undesired differentness” (p. 5) that leads to a belief that the person is “not quite human” (p. 5), and lends them to discrimination. More recently, stigma has been defined as “a mark separating individuals from one another based on a socially conferred judgment that some persons or groups are tainted and 'less than'” (Pescosolido, Medina, Martin, & Long, 2013, p. 431). Stigma involves labeling a person as “different” and treating them negatively, forming stereotypes about them based on assumed knowledge and applying those stereotypes to the social group, developing emotional reactions to these stereotypes, and potentially acting in prejudicial and discriminatory ways (Angermeyer & Matschinger, 2005; Corrigan, Edwards, Green, Diwan, & Penn, 2001; Feldman & Crandall, 2007; Penn, Guynan, Daily, Spaulding, Garbin, & Sullivan, 1994; Phelan & Basow, 2007). Stigmatizing attitudes describe negative stereotypes that are ascribed to people with mental illness and often lead to prejudice and discriminatory behavioral responses. These stereotypes are plentiful and include beliefs that people with mental illness are dangerous, fearsome, unpredictable, personally responsible and to blame for their illness, weak, incompetent, and are not likely to ever recover from their illness (Barczyk, 2015; Corrigan, 2004; Corrigan, Druss, & Perlick, 2014; Corrigan, Markowitz, Watson, Rowan, & Kubiak, 2003; Feldman & Crandall, 2007; Link et al., 1999; Penn, Kommana, Mansfield, & Link, 1999; Phelan & Basow, 2007; Wright, Jorm, & Mackinnon, 2011). These attitudes often lead to anger, avoidance, social distancing, and discrimination (Anagnostopoulos & Hantzi, 2011; Bos,



Pryor, Reeder, & Stutterheim, 2013; Brown, 2012; Corrigan et al., 2001; 2003; 2014; Feldman & Crandall, 2007; Phelan & Basow, 2007).

Stigmatizing attitudes continue to be prevalent and detrimental (Feldman & Crandall, 2007; Fitzpatrick, 2015; Holmes et al., 1999; Link et al., 1999). Individuals with mental illness may limit their social interactions, have strained and impaired interpersonal relationships, lose their social status, withdraw from others, and keep their illness a secret (Canu, Newman, Morrow, & Pope, 2008; Corrigan et al., 2014; Feldman & Crandall, 2007; Kranke, Floersch, Townsend, & Munson, 2010; Penn et al., 1999; Sickel, Seacat, & Nabors, 2014). Stigma can also be internalized such that individuals with mental illness experience shame, low self-esteem, low life-satisfaction and quality of life, and poor adjustment (Canu et al., 2008; Feldman & Crandall, 2007; Kranke et al., 2010; Penn et al., 1994; Sickel et al., 2014). Despite evidence-based treatments that have been proven to be effective for many mental illnesses, stigma can lead to reluctance to seek help, unwillingness to adhere to treatment, low self-efficacy, reduced coping ability, increased symptomatology, and relapse (Canu et al., 2008; Corrigan et al., 2014; Feldman & Crandall, 2007; Link et al., 1999; Penn et al., 1994; 1999; Sickel et al., 2014; Yap, Reavley, Mackinnon, & Jorm, 2013). Others show less willingness to hire, house, and interact with individuals with mental illness which can further increase psychological, emotional, and financial harm (Bastastini et al., 2014; Corrigan et al., 2001; Feldman & Crandall, 2007; Kranke et al., 2010; Sickel et al., 2014).

### Stigma as Social Cognition

Stigma is based on social interactions and attitudes that may be “understood as knowledge structures that develop from community experience” (Corrigan et al., 2000, p.

92; Pescosolido, Martin, Lang, & Olafsdottir, 2008). The stigmatization of mental illness has thus been considered a social-cognitive process and has been studied alongside other constructs related to social power, including racism, sexism, ageism, and classism (Adekson, 2014; Corrigan, 2000; 2004; Corrigan et al., 2000; Link & Phelan, 2001; Pescosolido et al., 2008). One theory of social cognition that may be applicable to stigma is dual process theory (Pryor, Reeder, Yeadon, & Hesson-McInnis, 2004).

Dual process models (Strack & Deutsch, 2004) suggest two complementary systems of cognition with different relations to behavior (Bohner, Siebler, Gonzalez, Haye, & Schmidt, 2008; Maas, Keijsers, Rinck, Tanis, & Becker, 2015; Zinkernagel, Hofmann, Dislich, Gschwendner, & Schmitt, 2011). One process involves reflective, effortful, controlled processes that involve planning and rational or deliberate decision making (Maas et al., 2015; Zinkernagel et al., 2011). These attitudes may be measured via explicit means and may be related to more recent, cognitive experiences (Bohner et al., 2008).

The other, complementary process involves fast, effortless, automatic cognitive processes that require little cognitive capacity (Maas et al., 2015; Zinkernagel et al., 2011). This implicit social cognition involves thoughts and feelings that influence perceptions, judgments, and evaluations without the individual's awareness, intention, or control (Dasgupta, 2010). Even without being consciously aware of them, implicit biases can influence thoughts, feelings, and behaviors (Park, Glaser, & Knowles, 2008). For example, implicit attitudes may influence automatic behaviors such as facial expressions and immediate motor reactions (Zinkernagel et al., 2011). This can be especially problematic when a situation does not allow for the effortful control necessary to control

spontaneous reactions (Park et al., 2008). Unless there is enough cognitive capacity and motivation to evoke controlled processes, behavior may be guided by automatic cognitive processes (Maas et al., 2015). These attitudes may be measured using implicit measures and may be related to early, emotional experiences (Bohner et al., 2008).

### Explicit Evaluation

Explicit evaluations are described as conscious, controllable, deliberate, reflective, and thoughtful (Monteith & Pettit, 2011; Rusch, Todd, et al., 2010a; 2010c; Rusch, Todd, Bodenhausen, & Corrigan, 2010b; Stier & Hinshaw, 2007). Explicit evaluations are based on one's subjective truth (Norman et al., 2010) and may not be accurate at assessing bias or how individuals actually respond due to reliance on introspection (Bohner et al., 2008; Martinussen, Somhovd, Moller, & Siebler, 2015; Stier & Hinshaw, 2007; Wesselmann et al., 2012).

### *Explicit Stigmatization of Mental Illness*

A majority of research concerning the stigmatization of mental illness has relied on explicit measures which have shown a preponderance of negative attitudes regarding causes, treatments, and outcomes related to mental illness (Anagnostopoulos & Hantzi, 2011; Angermeyer & Matschinger, 2005; Barczyk, 2015; Brown, 2012; Corrigan et al., 2001; 2003; Feldman & Crandall, 2007; Holmes et al., 1999; Link et al., 1999; Penn et al., 1994; 1999; Pescosolido et al., 2008 Phelan & Basow, 2007; Wright et al., 2011). Mental illness is viewed as stable, permanent, and controllable while those with mental illness are perceived as responsible for their illness and blameworthy (Corrigan, 2000; Corrigan et al., 2000; Farina et al., 1973). They are often perceived to be inadequate or worthless, incompetent, and poorly adjusted (Farina & Felner, 1973; Farina, Felner, &

Boudreau, 1973). They are perceived as dangerous and unpredictable and invoke anger, fear, avoidance, and rejection (Corrigan, 2000; Corrigan et al., 2000; Link & Phelan, 2001; Pescosolido et al., 2008). Along with the view that people with mental illness are inferior or childlike, coercion is sometimes seen as an appropriate response to people with mental illness (Corrigan, 2000; Pescosolido et al., 2008).

### *Limitations of Explicit Measures*

There are several limitations when using explicit measures (e.g., self-report) to assess attitudes such as stigmatization. First, explicit measures may be susceptible to social desirability and thus reflect how individuals think they should feel and not necessarily how they actually feel (Kopera et al., 2015; Monteith & Pettit, 2011; Rusch, Corrigan et al., 2010; Stier & Hinshaw, 2007; Wesselmann et al., 2012). This could potentially result in under-reporting of stigmatizing attitudes (Stier & Hinshaw, 2007). Second, explicit measures are limited to our awareness and consciousness and thus require a great deal of introspection and self-awareness (Kopera et al., 2014; Monteith & Pettit, 2011; Rusch, Corrigan et al., 2010). Due to these limitations, explicit measures are insufficient at providing a complete picture of stigmatization and should be complemented by more implicit measures (Stier & Hinshaw, 2007).

### **Implicit Evaluation**

Implicit evaluations are described as occurring without conscious awareness, automatic, requiring no or little control, less intentional, involuntary, intuitive, rapid, and efficient (Monteith & Pettit, 2011; Norman et al., 2010; Rusch, Todd, et al., 2010a; 2010b; 2010c; Stier & Hinshaw, 2007; Teachman et al., 2006). They may also be more persistent and less susceptible to change than explicit attitudes (Kopera et al., 2015). The

automatic nature of these associations may be especially important when considering emotional reactions such as the stigmatization of mental illness (Rusch, Todd et al., 2010c).

The advantages of measuring stigmatizing attitudes via implicit means directly addresses the limitations of using explicit means. First, implicit measures are not as influenced by social desirability as explicit measures (Norman et al., 2010; Kopera et al., 2015; Rusch, Todd et al., 2010b). Second, implicit measures can assess for biases individuals may not be fully aware of (Rusch, Todd et al., 2010b). Lastly, implicit measures can provide accurate assessments of attitudes (Rusch, Todd et al., 2010b).

#### *Measurement of Implicit Evaluations*

The implicit measurement of attitudes began with theories posed by Fazio and colleagues (1986) and Dovidio and colleagues (1986) that suggested implicit attitudes could be measured using response latency because individuals could not easily control these outcomes (cf. Dasgupta, 2010). Cognition can thus theoretically be inferred from behavioral responses using stimulus-response compatibility as individuals tend to be slower when the pair (e.g., attitude object and attribute) is incompatible (or not associated in memory) and tend to be faster when the pair is compatible (or associated in memory; Bar-Anon & Nosek, 2014; Khan & Petroczi, 2015; Rinck & Becker, 2007; Teachman, 2007). Implicit measures have shown to have predictive validity in that they have been related to behavior as well as discriminant validity in that they have been able to differentiate in-group and out-group members (Dasgupta, 2010). Notably, the attitude object being studied likely impacts results (Dasgupta, 2010). For example, greater effects

are likely seen for attitude objects that are thought of often, important to the individual, and evoke strong emotions (Dasgupta, 2010).

Although the Implicit Association Test (IAT) is one of the most commonly used methods to assess implicit attitudes (Karpinski & Steinman, 2006), the use of complementary categories may not always be ideal. For example, not all attitude objects (i.e., mental illness) have an easily identifiable complement (Karpinski & Steinman, 2006). Additionally, the complementary categories employed can lead to multiple interpretations (Karpinski & Steinman, 2006). For example, if mental illness is found to be associated with more negative attitudes compared to physical illness, one or more of the following explanations may be concluded: (1) people have many positive associations with physical illness, (2) people have many negative associations with mental illness, (3) people have few negative associations with physical illness, and/or (4) people have few positive associations with mental illness. Single-category tasks such as the Single Category Implicit Association Test (SC-IAT) and the Go/No Go Association Task (GNAT) eliminate some of this ambiguity by not requiring a complementary category (Karpinski & Steinman, 2006; Nosek & Banaji, 2001).

*Single Category Implicit Association Test.* The SC-IAT (Karpinski & Steinman, 2006) was developed based on the original Implicit Association Test. In the SC-IAT, people are asked to categorize stimuli into two categories (i.e., a category or an evaluation) which are interchanged partway through the task using two computer keys (Karpinski & Steinman, 2006). For example, for the first part of the task, one key may pair the target category “mental illness” with the evaluation “positive” while the opposite key is the evaluation “negative.” The second part of the task would then pair the category

“mental illness” with the evaluation “negative” with the opposite key being the evaluation “positive.” Results are calculated using response latency and the strength of association is determined by comparing results across compatibility tasks (Karpinski & Steinman, 2006). The SC-IAT has previously found meaningful results related to race (Bohner et al., 2008; Karpinski & Steinman, 2006), sex (Karpinski & Steinman, 2006), and self-esteem (Karpinski & Steinman, 2006). Only one study (i.e., Wang, Huang, Jackson, & Chen, 2012) has used the SC-IAT in a study of the stigmatization of mental illness. This study used names of different mental illness diagnoses (i.e., depression, obsessive-compulsive disorder, phobia disorder, schizophrenia) and found that Chinese students showed negative implicit attitudes toward mental illness (Wang et al., 2012).

*Go/No-Go Association Task.* The GNAT (Nosek & Banaji, 2001) is commonly used to assess evaluations of a single category. In the GNAT, people are asked to categorize stimuli as to whether they are or are not associated with an evaluative category and respond by pressing “go” when stimuli belong to the category or to give no response (“no go”) when stimuli do not belong to the category (Nosek & Banaji, 2001). Although there is only one response, the GNAT has been shown to be similar to two-choice tasks due to the presence of two outcomes (i.e., “go” or “no go”); Gomez, Ratcliff, & Perea, 2007). Results are calculated using response latency with the strength of association being assessed by comparing results across compatibility tasks (Nosek & Banaji, 2001). The GNAT has previously found meaningful results related to race (Nosek & Banaji, 2001; Park et al., 2008; Williams & Kaufmann, 2012), sex (Nosek & Banaji, 2001), age (Williams & Kaufmann, 2012), homosexuality (Williams & Kaufmann, 2012), fear of spiders (Teachman, 2007), and driving behavior (Martinussen et al., 2015). However, no

previous research has employed the GNAT in studies of the stigmatization of mental illness.

*Relation Between Implicit Measures.* Although the question of how implicit measures relate to one another has been implicated as important for advancement of the field, limited research has been conducted comparing implicit measures (Dasgupta, 2010). It has been noted that implicit measures may be only slightly related to each other (Nosek & Banaji, 2001). Although this may be due to lack of reliability in measures (Cunningham, Preacher, & Banaji, 2001), it may also be due to different task demands (Nosek & Banaji, 2001; Steffens, Kirschbaum, & Glados, 2008). Due to this possibility, it is important that conclusions about implicit biases be based on multiple methods (Nosek & Banaji, 2001).

There has been limited research comparing the psychometric properties and relations between multiple implicit measures (Bar-Anan & Nosek, 2014). It is thus uncertain whether implicit measures assess similar constructs, predict similar behaviors, or correlate with one another (Bar-Anan & Nosek, 2014). In a large sample, Bar-Anan and Nosek (2014) compared seven implicit measures to assess their psychometric properties, relation to each other, and relation to explicit measures. Two of these measures were the Single-Target Implicit Association Test (ST-IAT; conceptually and practically similar to the SC-IAT) and the GNAT, each of which included tasks related to political preference, race, and self-esteem. Both the ST-IAT and GNAT were noted to be categorization tasks with labeled categories and scores based on response latency. When averaging across a range of categories, both measures had moderate relations with each other ( $r = .48$ ) and with explicit attitude measures ( $r = .31$  and  $.33$ , respectively). It was



also noted that the relation between implicit and explicit measures may be dependent upon the attitude being measured as self-esteem tasks tended to yield poorer correlations compared to the race or political tasks. Overall, it is suggested that implicit measures are valid assessments of social cognition that show some intercorrelations.

### *Implicit Stigmatization of Mental Illness*

Despite the limitations of explicit measures, there has been little research on the implicit measures of stigmatization of mental illness although their value has repeatedly been noted (Monteith & Pettit, 2011; Norman et al., 2010; Stier & Hinshaw, 2007; Teachman et al., 2006). Additionally, the automatic nature of stereotypes makes the stigmatization of mental illness an ideal candidate for implicit measurement (Link & Phelan, 2001). Previous research has found that individuals implicitly endorse negative attitudes toward mental illness, including beliefs that people with mental illness are dangerous and helpless, are to blame for their illness, and have illnesses that are stable (Monteith & Pettit, 2011; Teachman et al., 2006; Wesselmann et al., 2012). Findings may also suggest that people tend to over-pathologize those with mental illness which may impact their attitudes toward them (Peris, Teachman, & Nosek, 2008).

### Dual Processes and the Stigmatization of Mental Illness

Dual process theory has not been explicitly used to examine the stigmatization of mental illness previously. However, in line with dual process theory, discrepancies between explicit and implicit measures have been repeatedly found in relation to the stigmatization of mental illness. For example, some studies have found no correlations (e.g., Monteith & Pettit, 2011; Rusch, Corrigan, Todd, & Bodenhausen, 2010; Teachman, Wilson, & Komarovskaya, 2006), while others found moderate to strong correlations

(Nosek, Banaji, & Greenwald, 2002) between explicit and implicit measures. Additionally, explicit and implicit measures may differentially predict different stigmatizing attitudes (Teachman et al., 2006). For example, both explicit and implicit measures have been found to be related to self-reported helplessness and quality of life and a belief in a psychological etiology (Monteith & Pettit, 2011; Rusch, Corrigan et al., 2010; Teachman et al., 2006). However, implicit but not explicit measures were found to be related to negative attitudes, perceived dangerousness, blaming, belief in temporal stability, and an over-diagnosis of psychopathology (Monteith & Pettit, 2011; Norman, Gawronski, Hampson, Sorrentino, Szeto, & Ye, 2010; Teachman et al., 2006; Wesselmann, Reeder, & Pryor, 2012) and explicit but not implicit measures were found to be related to negative prognosis, beliefs of controllability, and belief in the legitimacy of stigmatizing attitudes (Monteith & Pettit, 2011; Norman et al., 2010; Rusch, Todd, Bodenhausen, Olschewski, & Corrigan, 2010c). Furthermore, implicit measures tend to show stronger negative biases compared to what is explicitly endorsed (Monteith & Pettit, 2011; Teachman et al., 2006).

Overall, meta-analyses suggest a weak relationship between implicit and explicit measures of stigmatization (Hofmann, Gawronski, Gschwendner, & Schmitt, 2005; Lane, Banaji, Nosek, & Greenwald, 2007, cf. Monteith & Pettit, 2011). The reason for these discrepancies remain unclear, but possible reasons include social desirability or poor self-awareness (Monteith & Pettit, 2007; Rusch, Todd, et al., 2010c; Teachman et al., 2006; Zvonkovic & Lucas-Thompson, 2015). It is also possible that even when positive attitudes are reported explicitly, negative biases may still be present (Kopera, Suszek, Bonar, Myszka, Gmaj, Ilgen, & Wjonar, 2015; Stier & Hinshaw, 2007; Teachman et al.,

2006). Explicit and implicit measures may thus represent different constructs and/or different attitudinal components, as in dual process theory, and may thus have different consequences (Kopera et al., 2015; Monteith & Pettit, 2011; Rusch, Corrigan et al., 2010; Rusch, Todd, Bodenhausen, & Corrigan, 2010a; Rusch, Todd, et al., 2010c; Stier & Hinshaw, 2007; Teachman et al., 2006). Due to these discrepancies, it is important to assess both explicit and implicit biases in order to have a complete understanding of the stigmatization of mental illness (Rusch, Corrigan et al., 2010).

#### Attitudes and Behavioral Responses

Both explicit and implicit attitudes may influence behavior (Chen & Bargh, 1999; Martinussen et al., 2015; Norman et al., 2010; Woud, Becker, & Rinck, 2008). Explicit measures may be important for deliberate, controlled, intentional, and conscious behaviors (Chen & Bargh, 1999; Dasgupta, 2010; Norman et al., 2010; Monteith & Pettit, 2011; Stier & Hinshaw, 2007). Implicit measures, however, have been suggested to predict behavior better than explicit measures (Kopera et al., 2015; Zvonkovic & Lucas-Thompson, 2015; Stier & Hinshaw, 2007) and may be especially important for spontaneous, automatic behaviors (Norman et al., 2010; Monteith & Pettit, 2011; Rusch, Corrigan et al., 2010; Rusch, Todd et al., 2010b) including nonverbal behaviors and immediate affective responses (Monteith & Pettit, 2011; Norman et al., 2010; Rusch, Corrigan et al., 2010; Rusch, Todd et al., 2010b; Wesselmann et al., 2012). These indirect biases can influence overt behavior and may be especially problematic when there is little motivation to suppress discriminatory behavior (Stier & Hinshaw, 2007).

#### *Implicit Behavioral Responses*

While implicit measures have generally been used alongside overt behaviors, an implicit behavioral response may also be important and fundamental in understanding social distancing. One measure, the Approach-Avoidance Task (AAT), examines automatic approach and avoid tendencies.

*Approach-Avoidance Task.* The AAT (Rinck & Becker, 2007) is used to measure affective behavioral reactions to a category. In the AAT, participants must either push a joystick away from them to avoid a target if it belongs to a specified category or attribute or pull a joystick toward them to approach the target (Rinck & Becker, 2007). Similar to the SC-IAT, GNAT, and other implicit measures, results are computed using response latency and the strength of association is assessed by comparing results across compatibility tasks (Rinck & Becker, 2007). The AAT or similar joystick tasks have been previously found to be related to fear and anger facial expressions (Marsh, Ambady, Kleck, 2005), fear of spiders (Rinck & Becker, 2007), and action tendencies related to alcohol in hazardous drinkers (Wiers, Rinck, Kordts, Houben, & Strack, 2010) and smoking cues in smokers (Wiers, Kuhn, et al., 2013). However, no previous research has employed the AAT in studies of the stigmatization of mental illness.

#### *Behavioral Stigmatization of Mental Illness*

Previous research has demonstrated an association between stigmatizing attitudes and behavioral responses. Explicit stigmatizing attitudes have been found to be related to speech duration, judgment in a jury task, friendliness, verbal remarks, and physical proximity (Monteith & Pettit, 2011; Norman et al., 2010; Stier & Hinshaw, 2007; Wesselmann et al., 2012). Implicit measures have been found to related to tension in body posture, eye contact, and decreased heart rate (Monteith & Pettit, 2011; Stier &

Hinshaw, 2007). However, the relation between implicit attitudes and more overt stigmatizing behaviors, such as desire for social distance, has not been reliably demonstrated. For example, Norman and colleagues (2010) found no relation to physical proximity while Graves and colleagues (2005) suggest that the physiological reactivity invoked by implicit biases is indicative of preference for social distance. This ability of implicit measures may be especially important for stigmatization as individuals do not always get the opportunity to make deliberate decisions when interacting in the real world, forcing them to use stereotypes as heuristics to form impressions and react (Wesselmann et al., 2012).

#### Current Study & Hypotheses

The current study sought to examine the stigmatization of mental illness within a dual process model. To achieve this, relationships between implicit and explicit measures of stigmatizing attitudes and behavioral intentions were examined.

First, the study examined the psychometric properties of implicit measures of the stigmatization of mental illness. Internal consistency was assessed using split-half reliability (Nosek et al., 2005). Convergent validity was assessed by examining the relationship between two implicit measures of stigmatizing attitudes. In line with findings from Bar-Anan and Nosek (2014), it was hypothesized that these two measures would be moderately correlated. Predictive validity was also assessed by examining the relationship between the two implicit measures of stigmatizing attitudes and an implicit measure of behavioral intentions. It was hypothesized that these measures would be slightly correlated.

Next, the study sought to examine the relationship between implicit and explicit measures. In line with previous meta-analyses (e.g., Hofmann et al., 2005; Lane et al., 2007), it was hypothesized that implicit and explicit measures of stigmatizing attitudes would be weakly related to each other. It was further hypothesized that implicit and explicit measures of behavioral intentions would be weakly related to each other. Finally, the study examined the relationship between implicit and explicit attitude and behavior measures. Given the likely poor relationship between implicit and explicit measures of similar constructs (e.g., stigmatizing attitudes), it is likely that measures of different constructions (i.e., attitude and behaviors) will be unrelated. Specifically, it was hypothesized that implicit attitude measures would be unrelated to explicit behavior measures and that explicit attitude measures would be unrelated to implicit behavior measures.

## CHAPTER II – METHOD

### Pilot Study

A pilot study was conducted prior to the primary study in order to determine stimuli that individuals commonly classify as “mental illness.” Other studies have used the names of specific disorders as their target words for “mental illness.” However, different populations may have different conceptions of mental illness. Prior studies (e.g., Wang et al., 2012) have used a pilot study to determine what words/phrases are commonly thought of when considering “mental illness.” These responses are then used to determine target words to be used in the primary study that are relevant for the study population.

#### *Phase One*

Thirty undergraduate general psychology students participated in Phase One of the pilot study. A majority of participants were female (66.7%) and White (77.0%). Ages ranged from 18 to 40 ( $M = 20.5$ ;  $SD = 4.7$ ) and year in college ranged from first to fifth or more ( $M = 1.6$ ;  $SD = 1.1$ ). No participants reported majoring in psychology. Participants were asked to list ten to fifteen words or phrases that came to mind when they heard the category “mental illness” and “mental health” (presented in a randomized order). Derivatives of the same response were compiled (e.g., “depression” and “depressed”). Answers were then examined and the most common answers that fit the category were determined (see Table 1). These responses were used in Phase Two of the pilot study.

#### *Phase Two*

Thirty undergraduate general psychology students participated in Phase Two of the pilot study. A majority of participants were female (73.3%) and White (70.0%). Ages ranged from 18 to 36 ( $M = 19.8$ ;  $SD = 3.4$ ) and year in college ranged from first to fourth ( $M = 1.6$ ;  $SD = 1.0$ ). One participant reported majoring in psychology. Participants were asked to categorize the twenty words derived from phase one into the categories “mental illness” and “mental health” and then rank the strength of them in accordance with how strongly they believe the word reflects the category (1 being the strongest exemplar, 10 being the weakest exemplar). The mean rating for each response was examined and the top six answers were determined (see Table 1). The following responses were used in the primary study as stimuli for the “mental illness” category: bipolar, schizophrenia, depression, OCD, autism, and anxiety.

Table 1

*Pilot Study Results*

Response	Frequency	Mean Rating
Bipolar	14	2.94
Schizophrenia	12	3.42
Depression	22	4.60
OCD	7	5.10
Autism	10	5.23
Anxiety	11	5.84
ADHD	8	5.87
Crazy	11	6.62
Sad	8	6.87
Therapy	8	7.86

Note: Top six responses were used in the primary study.

Participants

A total of 104 undergraduate students from the University of Southern Mississippi participated in the study. Participants signed up for the study via SONA, the Psychology



Department Subject Pool’s online study scheduling website. Participants were required to be age 18 or older and be enrolled in a general psychology class. Participants signed up to complete the study in an on-campus laboratory individually or in groups of 2 to 5. They were granted partial fulfillment of course requirements or extra credit for their participation.

A majority of participants were female (79.8%) and White (51.9%) or African American (31.7%). Age ranged from 18- to 42-years-old ( $M = 19.82$ ;  $SD = 4.00$ ). Year in college ranged from first to fourth ( $M = 1.64$ ;  $SD = 0.97$ ). Most participants were not psychology majors (80.8%) and reported taking an average of 2.55 psychology courses ( $SD = 6.86$ ).

### Materials

A summary of measures used, including their intended use and internal consistency found in the current study, is presented in Table 2.

Table 2

#### *Materials*

Measure	Abbreviation	Type	Intended Use
Single Category Implicit Association Test	SC-IAT	Implicit	Attitudes
Go/No-Go Association Task	GNAT	Implicit	Attitudes
Approach-Avoidance Task	AAT	Implicit	Behavior
Semantic Differential Task	Sem. Diff.	Explicit	Attitudes
Social Desirability Rating Scale	SDRS	Explicit	Behavior
Social Distance Scale	Soc. Dist.	Explicit	Behavior

#### *Implicit Measures*

*Single Category Implicit Association Test.* The IAT (Greenwald, McGhee, & Schwartz, 1998) is the most commonly used measure of implicit associations and is renowned for its reliability, ease of use, and large effect sizes (Kapinski & Steinman,

2006). The SC-IAT (Karpinski & Steinman, 2006) is a modified version of the IAT developed in order to evaluate a single target concept without making comparative evaluations of a complementary category. The SC-IAT has been shown to be a valid measure of evaluative associations for a single category with reliability similar to that of the IAT (Spearman Brown internal consistency = .55-.85; alpha = .77; test-retest correlation = .48; Bar-Anon & Nosek, 2014; Bohnet et al., 2008; Karpinski & Steinman, 2006). A previous study has used the SC-IAT to evaluate the stigma of mental illness and found that participants demonstrated moderately negative associations with mental illness (Wang et al., 2012). The SC-IAT was thus used in this study to assess evaluations of mental illness.

*SC-IAT Procedure.* Participants completed two blocks of the SC-IAT per guidelines suggested by Karpinski and Steinman (2006). Prior to completing the Test Blocks, participants completed a Practice Block in which they classified “positive” and “negative” targets for 20 trials (10 positive and 10 negative in a randomized order). Test Blocks were then presented in a counterbalanced order. Block 1 paired the category “mental illness” with the evaluation “positive” on one key while the evaluation “negative” will be on the opposite key while Block 2 had the evaluation “positive” on one key and paired the category “mental illness” with the evaluation “negative” on the opposite key. Each block included 24 practice trials followed by 72 test trials. For all blocks, targets included words categorized as mental illness, positive, and negative presented in a random order. Target words were counterbalanced such that approximately 58% of targets were correctly categorized by the key paired with mental illness and 42% were correctly categorized by the other key. Each target word was displayed for a

maximum of 1,500 milliseconds and participants were asked to press the corresponding key. After each trial, feedback was given with a green “O” for correct categorizations or a red “X” for incorrect categorizations. Feedback was displayed for 150 milliseconds before proceeding to the next trial. Participants’ response time for pressing a key and their accuracy was recorded.

*SC-IAT Scoring.* As suggested by Karpinski and Steinman (2006), the D-score algorithm was used to compute SC-IAT scores. The D-score algorithm computes the difference between the mean response latencies between the test blocks (i.e., Block 1 – Block 2) and then divides this number by the standard deviation for all correct response times within both blocks (Wang et al., 2012). Stronger negative association scores were thus indicated with higher D-scores.

*Go/No-Go Association Task.* The GNAT (Nosek & Banaji, 2001) was used to assess evaluations of a single target category without involving a complementary category. The GNAT is similar to other measures of implicit attitudes in that it utilizes response latency to assess the strength of association (Nosek & Banaji, 2001). The strength of evaluation is assessed by comparing how sensitive individuals are in categorizing stimuli as either belonging to a specified category or evaluative attribute versus not belonging. The GNAT is often used to evaluate assessments of a single category, especially when the category has no competing category as is required in the IAT (Nosek & Banaji, 2001). Evidence suggests that the GNAT is similar to two-choice tasks (e.g., IAT) in that it requires two responses (i.e., “go” and “no go;” Gomez et al., 2007). The GNAT has demonstrated validity in that it relates to measures of attitudes and behavior (Martinussen et al., 2015; Nosek & Banaji, 2001; Teachman, 2007) and

adequate reliability (split-half reliability  $r = .46$  to  $.87$ ; alpha =  $.74$ ; test-retest reliability =  $.42$ ; Bar-Anon & Nosek, 2014; Teachman, 2007; Williams & Kaufmann, 2012).

*GNAT Procedure.* Participants completed two blocks of the GNAT. Prior to completing the Test Blocks, participants completed a Practice Block in which they classified “positive” and “negative” targets for 20 trials (10 positive and 10 negative in a randomized order). Test Blocks were then presented in a counterbalanced order. Block 1 paired the category “mental illness” with the evaluation “positive” for the “go” response and Block 2 paired the category “mental illness” with the evaluation “negative.” Each block included 24 practice trials followed by 72 test trials. For all blocks, targets included words categorized as mental illness, positive, and negative presented in a random order. Target words were counterbalanced such that approximately 58% of targets were correctly categorized by the “go” response and 42% were correctly categorized by the “no go” response. Each target word was displayed for a maximum of 1,500 milliseconds and participants were asked to press the corresponding key. After each trial, feedback was given with a green “O” for correct categorizations or a red “X” for incorrect categorizations. Feedback was displayed for 150 milliseconds before proceeding to the next trial. Participants’ response time for pressing a key and their accuracy was recorded.

*GNAT Scoring.* Scoring guidelines provided by Nosek & Banaji (2001) were used although modifications were made to match those used in the SC-IAT. Thus, the D-score algorithm was used to compute GNAT scores. The D-score algorithm computes the difference between the mean response latencies between the test blocks (i.e., Block 1 – Block 2) and then divides this number by the standard deviation for all correct response

times within both blocks (Wang et al., 2012). Stronger negative association scores were thus indicated with higher D-scores.

*Approach-Avoidance Task.* The AAT (Rinck & Becker, 2007) was used to assess behavioral tendencies in response to a category. The AAT is similar to other implicit measures in that it utilizes response times to compare compatible and incompatible tasks. The strength of behavioral tendency is assessed by comparing the difference between compatibility tasks. The AAT has demonstrated validity in that it relates to measures of attitudes and behavior (Rinck & Becker, 2007) and shows good reliability (split-half reliability  $r = .71$  to  $.80$ ; Rinck & Becker, 2007). Training on the AAT has also been found to influence subsequent behavior (Greenwald et al., 1998; Kawakami, Phillis, Steele, & Dovidio, 2007; Wiers et al., 2010, 2013).

*AAT Procedure.* Participants completed two blocks of the AAT. Prior to completing the Test Blocks, participants completed a Practice Block in which they classified “positive” and “negative” targets for 20 trials (10 positive and 10 negative in a randomized order). Positive targets were always classified with an approach response (i.e., pulling the joystick) while negative targets were classified with an avoid response (i.e., pushing the joystick). Test Blocks were then presented in a counterbalanced order. Block 1 paired the category “mental illness” with the evaluation “positive” in the approach direction and the evaluation “negative” in the avoid direction while Block 2 had the evaluation “positive” in the approach direction and the category “mental illness” paired with the evaluation “negative” in the avoid direction. Each block included 24 practice trials followed by 72 test trials. For all blocks, targets included words categorized as mental illness, positive, and negative presented in a random order. Target

words were presented with a picture of a randomly selected White woman with a neutral expression and average attractiveness selected from the Chicago Face Database (Ma et al., 2015). Target words were counterbalanced such that approximately 58% of targets were correctly categorized by the direction paired with mental illness and 42% were correctly categorized by the other direction. Each target word was displayed for a maximum of 1,500 milliseconds and participants were asked to move the joystick in the corresponding direction. After each trial, feedback was given with a green “O” for correct categorizations or a red “X” for incorrect categorizations. Feedback was displayed for 150 milliseconds before proceeding to the next trial. Participants’ response time for pressing a key and their accuracy was recorded.

*AAT Scoring.* As with the other implicit measures, the D-score algorithm was used to compute AAT scores. The D-score algorithm computes the difference between the mean response latencies between the test blocks (i.e., Block 1 – Block 2) and then divides this number by the standard deviation for all correct response times within both blocks (Wang et al., 2012). Stronger avoidance responses were thus indicated with higher D-scores.

### *Explicit Measures*

*Semantic Differential Task.* A semantic differential task is commonly used to assess individuals' explicit evaluations and has been used specifically for assessing the stigmatization of mental illness (Link, Yang, Phelan, & Collins, 2004; Monteith & Pettit, 2011; Norman et al., 2010; Stull, McGrew, Salyers, & Ashburn-Nardo, 2013; Teachman et al., 2006). This task was chosen because it can easily correspond with implicit measures by using the same target words (Stull et al., 2013; Teachman et al., 2006).

Participants evaluated “mental illness” on six 7-point semantic differential type scales. The scales were anchored using the same target words as the implicit measures (i.e., safe/dangerous, friendly/hostile, pleasant/unpleasant, nice/nasty, innocent/ blameworthy, competent/helpless) with higher ratings being assigned to the negative pole. The mean rating of the six scales was used to compute an overall explicit stigma score such that a higher score corresponded with a negative association. Previous semantic differential scales have demonstrated acceptable internal consistency (e.g., alphas = .61 to .93; Monteith & Pettit, 2011; Norman et al., 2010). The current study’s semantic differential task demonstrated good internal consistency (alpha = .88).

*Social Desirability Rating Scale.* The Social Desirability Rating Scale (SDRS; Canu et al., 2008) was used to assess behavioral intentions. The SDRS asks participants to rate the likelihood of engaging in five specific activities with someone with mental illness on a 7-point scale. The mean rating of the five items was used to compute an overall explicit social distance score such that a lower score corresponded with greater desired social distance. Scale scores have previously shown good internal consistency (alphas = .83 to .92; Canu et al., 2008; James, 2015) and test-retest reliability ( $r = .78$ ; Canu et al., 2008). The current study’s SDRS demonstrated good internal consistency (alpha = .87).

*Social Distance Scale.* A modified version of Bogardus’s Social Distance Scale (Bogardus, 1925; Szczurek et al., 2012) was used to as an explicit measure of social distance. The Social Distance Scale includes just one item that asks participants to choose the closest level of interaction they would be comfortable. The scale ranged from being comfortable if a person with mental illness was “someone living in [their] state” (1) to “a

close personal friend or romantic partner” (7). It is suggested that this scale is cumulative such that if a person accepts a high-intimacy interaction (e.g., being comfortable with a person with mental illness as a roommate), they would also be willing to accept lower-intimacy interactions (e.g., living in the same neighborhood; Wark & Galliher, 2007). Thus, the score is simply the participant’s response such that a higher score suggests low desire for social distance.

*Demographics Questionnaire.* Participants were asked to complete a demographic questionnaire to specify their age, gender, race/ethnicity, year in college, if they are currently a psychology major, and history of mental illness.

#### Procedure

This study was completed in laboratories at The University of Southern Mississippi. The study was presented as a series of categorization tasks which sought to assess how people classify different words. Participants entered the laboratory with an experimenter who first reviewed consent procedures. After providing informed consent, participants completed the study using MediaLab and DirectRT on a laptop or desktop computer. The first task asked participants to classify mental illness, mental health, positive, and negative target words in their respective categories and corrective feedback was given. Participants then completed the remainder of the study. Notably, it has been suggested that priming effects may occur if implicit and behavioral measures are used after explicit measures (Stier & Hinshaw, 2007). However, this has not been conclusively tested and the opposite may also be true. Implicit and explicit stigma measures were thus presented in a randomized order to limit potential order-effects. The demographic



questionnaire was always completed last. After the final measures were completed, the experimenter thanked participants for their participation.

### Statistical Analyses

The first goal of this study is to assess the reliability and validity of implicit measures of stigmatization (i.e., SC-IAT, GNAT, and AAT). First, internal consistency was evaluated. As was done in Nosek and colleagues (2005), internal consistency of the implicit measures was assessed by calculating split-half reliabilities. Specifically, D scores were calculated for the first and second halves of relevant blocks. Split-half reliability was then computed by correlating each half's D score and corrected using the Spearman Brown formula. Next, convergent validity of implicit attitude measures was assessed using a zero-order correlation between the SC-IAT and the GNAT. Predictive validity of the implicit attitude and implicit behavioral measures was then assessed using a zero-order correlation between the SC-IAT and GNAT and the AAT.

The second goal of this study was to assess the relationship between implicit and explicit measures. First, the relationship between attitude measures was evaluated using zero-order correlations between the SC-IAT and GNAT and the Semantic Differential Task. The relationship between behavioral measures was also evaluated using zero-order correlations between the AAT and the SDRS and Social Distance Scale.

The relationship between implicit and explicit attitude and behavior measures was assessed. Three separate linear regressions were used with the SC-IAT and GNAT predicting the AAT, Social Distance Rating Scale, Social Distance Scale. A zero-order calculation was used to assess the relationship between the Semantic Differential Task and the AAT, Social Distance Rating Scale, and Social Distance Scale. Last, a canonical

correlation analysis (CCA) was used to assess the relationship between the implicit and explicit attitude (i.e., SC-IAT, GNAT, and Semantic Differential Task) and behavioral (AAT, SDRS, and Social Distance Scale) measures. CCA is a correlational method examining “the correlation between a synthetic criterion and synthetic predictor variable that are weighted based on the relationship between the variables within the sets” (Sherry & Henson, 2005, p. 39). CCA seeks to maximize the canonical correlation, a statistic analogous to Pearson  $r$  (Sherry & Henson, 2005). CCA has several advantages including (1) limiting the probability of making a Type I error, (2) allowing for multiple causes and multiple effects, and (3) encompassing virtually all other parametric tests (Sherry & Henson, 2005). Finally, to assess if gender (female vs. male) or race (white vs. black) significantly impacted the relation between variables, moderation analyses were completed for each pair of variables separately. Moderation analyses were ran using PROCESS (Hayes, 2013) with the sample bootstrapped at 10,000.

## CHAPTER III – RESULTS

Prior to statistical analyses, data from implicit measures were screened for a high degree of inaccuracy. Previous studies have shown that the SC-IAT produces a higher error rate than IAT and higher error rates may be associated with self-presentation concerns (Karpinski & Steinman, 2006). Error rates were calculated by summing the number of incorrect responses and response latencies greater than 1,500 milliseconds divided by the total number of trials. Participants with greater than 20% error rates were excluded from analyses. Additional computer/researcher errors led to the exclusion of additional participants. Participants excluded and reasons for exclusion are presented in Table 3. See Table 4 for correlations between implicit and explicit measures, Figure 1 for the full model results, and Appendix A for moderation analyses.

Table 3

### *Implicit Data Participants*

Reason for Exclusion	SC-IAT	GNAT	AAT
High Error Rate (> 20%)	8	6	18
DirectRT Error	1	1	1
Task Not Presented	2	0	0
Total N Included	93	97	84
Percent Included (out of 104)	89.4%	93.3%	80.8%

Table 4

*Correlations*

	SC-IAT	GNAT	Sem. Diff.	AAT	SDRS
GNAT	.15				
Sem. Diff.	.16	-.09			
AAT	.12	-.05	.05		
SDRS	-.11	.05	.24*	.25*	
Soc. Dist.	.07	.07	-.16	.04	-.23*

Note: SCIAT = Single Category Implicit Association Task; GNAT = Go-No Go Association Test; Sem. Diff. = Semantic Differential Task; AAT = Approach Avoidance Task; SDRS = Social Distance Rating Scale; Soc. Dist. = social distance question. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

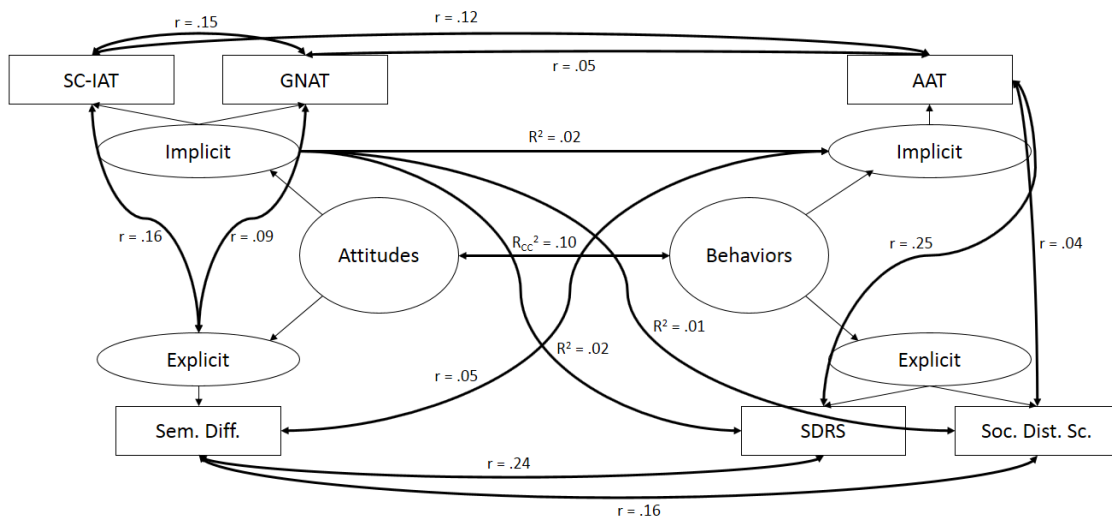


Figure 1. Model Results.

Note. SCIAT = Single Category Implicit Association Task; GNAT = Go-No Go Association Test; Sem. Diff. = Semantic Differential Task; AAT = Approach Avoidance Task; SDRS = Social Distance Rating Scale; Soc. Dist. = social distance question.

### Reliability and Validity of Implicit Measures

The reliability of implicit measures was first assessed. In regards to split-half reliability, the SC-IAT was found to have acceptable internal consistency ( $r = .61$ ). The GNAT was found to have unacceptable internal consistency ( $r = -.20$ ) given its poor

magnitude and negative direction. The AAT was found to have acceptable internal consistency ( $r = .51$ ). The SC-IAT and AAT may thus be reliable measures of implicit stigmatizing attitudes and behavioral intentions, respectively while the GNAT may not be a reliable measure of implicit stigmatizing attitudes. Results with the GNAT should thus be interpreted with extreme caution given that it may not be a viable estimate of implicit stigmatizing attitudes for mental illness.

Convergent validity of the implicit attitude measures was computed using a zero-order correlation between the SC-IAT and the GNAT. The two measures were found to have a small correlation ( $r = .15$ ;  $p = .17$ ). This relation was not moderated by gender or race. Thus, despite the SC-IAT and GNAT purporting to measure the same construct – implicit stigmatizing attitudes – they demonstrated limited convergent validity.

Predictive validity of the implicit attitude measures to an implicit behavioral measure was computed using a zero-order correlation between the SC-IAT and GNAT and the AAT. The SC-IAT and AAT were found to have a small correlation ( $r = .12$ ;  $p = .30$ ) and the GNAT and AAT were found to have no correlation ( $r = -.05$ ;  $p = .63$ ). These relations were not moderated by gender or race. While it seems logical that implicit stigmatizing attitudes should predict implicit behavioral responses, this hypothesis was not upheld.

#### Relation Between Implicit and Explicit Measures

The relationship between implicit and explicit attitude measures was then assessed. The Semantic Differential Task was found to have small and no correlations with the SC-IAT ( $r = .16$ ;  $p = .13$ ) and the GNAT ( $r = -.09$ ;  $p = .41$ ), respectively. These relations were not moderated by gender or race. The implicit and explicit measures of

stigmatizing attitudes thus seem to be unrelated despite efforts to make the procedures parallel (e.g., same words).

The relationship between implicit and explicit behavioral measures was also assessed. The SDRS was found to have a small correlation with the AAT ( $r = .25$ ;  $p = .02$ ). The Social Distance Scale was found to have no correlation with the AAT ( $r = .04$ ;  $p = .74$ ). The implicit behavioral measure appears to be related to one of the two explicit behavioral measures; however, this relation remains small. While the relation between the AAT and the Social Distance Scale was not moderated by gender or race, the relation between the AAT and SDRS was significant moderated by both gender and race. Specifically, there was a significant, positive relationship between the AAT and SDRS for females and black participants. No significant relationship emerged for males or white participants. It thus appears that the relation between implicit and explicit behavioral measures may be influenced by demographic variables.

Next, the relationship between implicit and explicit attitude and behavior measures was evaluated. In a linear regression, the SC-IAT and GNAT were used to predict the AAT and was found to account for a small proportion of the variance ( $R^2 = .02$ ;  $p = .48$ ). In a separate linear regression, the SC-IAT and GNAT were used to predict the SDRS and was also found to account for a small proportion of the variance ( $R^2 = .02$ ;  $p = .50$ ). Finally, the SC-IAT and GNAT were used to predict the Social Distance Scale and was found to account for a small proportion of the variance ( $R^2 = .01$ ;  $p = .71$ ). Additionally, the AAT and the Semantic Differential Task were found to have no correlation ( $r = .05$ ;  $p = .68$ ). Overall, implicit and explicit measures do not seem to be related across attitude and behavior domains.

Correlations between the explicit attitude and behavior measures were also evaluated. The Semantic Differential Task was found to be slightly correlated with the SDRS ( $r = .24$ ;  $p = .01$ ) and the Social Distance Scale ( $r = .16$ ;  $p = .10$ ). These relations were not moderated by gender or race. The explicit attitude measure thus appears to be related explicit behavioral measures; however, this relation remains small.

Finally, a multivariate canonical correlation analysis was used to further assess the relationship between implicit and explicit attitude measures (i.e., SC-IAT, GNAT, and Semantic Differential Task) and implicit and explicit behavior measures (i.e., AAT, SDRS, and Social Distance Scale). The model was found to be non-significant (Wilks =  $.88$ ,  $p = .34$ ) and was not evaluated further. Specifically, the squared canonical correlation (analogous to  $R^2$ ) was  $.10$  for the first function.

## CHAPTER IV – DISCUSSION

This study sought to examine the relationship between implicit and explicit measures of stigmatizing attitudes and behaviors. First, a psychometric analysis of implicit measures was conducted. In regards to internal consistency, the SC-IAT was deemed to have acceptable split-half reliability. This was generally consistent with other studies (Bohner et al., 2008; Karpinski & Steinman, 2006) and suggests that the SC-IAT is a reliable measure of implicit stigmatization of mental illness.

The AAT was also found to have acceptable split-half reliability although the current study found considerably lower reliability than that found in other studies (Rinck & Becker, 2007). The AAT also had a greater error rate than the other tasks suggesting that this task may have been more difficult for participants. Although one potential explanation of this could be fatigue effects given its calculation comparing the first-half and second-half of the tests, this explanation seems unlikely given the short duration of the tasks and the presentation of tasks in a randomized order.

Additionally, despite prior research suggesting acceptable split-half reliability (Teachman, 2007), the GNAT was found to have very poor split-half reliability. In fact, the small and negative split-half reliability found for the GNAT suggests that it has virtually no reliability and thus the scores reflect primarily error variance and little to no consistent construct-relevant variance. Notably, implicit attitudes are likely stronger for concepts that are thought of often, important to the individual, and evoke strong emotions (Dasgupta, 2010). Thus, one possible explanation for the lack of reliability is that individuals may not feel strongly enough toward the construct of “general mental illness” to evoke a strong emotional response or implicit bias. Put another way, it may be the case



that many individuals do not have a strong enough emotional response or learning history associated with “general” mental illness and this strong response or history may be required for an implicit bias to manifest one way or the other. Furthermore, while individuals may have experience and emotional reactions to one or a few of the specific mental illnesses used as exemplars, the use of multiple mental illnesses (although all were considered to be an appropriate exemplar of the category) may dilute emotional reactions and thus implicit effects. In other words, individuals may have a bias related to some mental illnesses, but no bias or even a positive bias related to other mental illnesses. If this is the case, then automatic responses to different specific mental illness stimuli within the GNAT procedure would not be expected to correlate, which would in turn result in the lack of split-half reliability found for the GNAT in the current study. Given this lack of internal consistency, it is possible that an implicit stigmatization of general mental illness may not be measurable with the GNAT.

Given that both the SC-IAT and GNAT were used to assess the same construct, it is interesting that one task demonstrated internal consistency while the other failed to do so. The difference in reliabilities between the SC-IAT and GNAT could be attributable to task design. For example, in the GNAT, mental illness always elicited a “go” response and was simply paired with either positive or negative evaluations. This task may have lacked the sensitivity necessary to evaluate implicit attitudes of mental illness, especially if individuals did not hold strong views. The SC-IAT, on the other hand, may have had the sensitivity needed to examine the relationship between mental illness and positive and negative evaluations due to the use of a two-choice task. This explanation, however, requires further research to determine if there is truly a difference in the sensitivity of

different measures based on task demands. Nevertheless, the lack of reliability of the GNAT precludes its ability to correlate with other measures. Although results are still presented for the sake of completeness, they should be interpreted with extreme caution. In other words, lack of correlations with GNAT scores should only be interpreted within the context of the GNAT procedure for the particular purpose used in the current study. The findings may or may not apply to the construct that it was intended to measure (implicit bias or stigmatization of general mental illness) or to the extent that such a construct is reliably measurable via other procedures besides the GNAT.

The SC-IAT and GNAT were found to be weakly related to each other despite both being measures of implicit attitudes. Thus the hypothesis that the measures would be moderately correlated was not upheld, suggesting the implication that findings with one implicit measure may not replicate when using another implicit measure. Although the lack of correlation in the present study is likely due to the lack of internal consistency of the GNAT, it is contrary to previous findings suggesting that implicit measures are related to each other when measuring the same topic (e.g., Bar-Anan & Nosek, 2014). However, such positive findings have not been found consistently for all constructs that have been assessed with implicit measures. For example, although Bar-Anan and Nosek (2014) found strong correlations among measures of political beliefs and racial attitudes, implicit measures were poorly related when assessing self-esteem, a finding that they attribute to poor “concept clarity.” While the authors do not define “concept clarity,” they imply that self-esteem is a less defined construct that may evoke a range of responses. Similarly, as discussed previously, it may be that mental illness is too broad a category to illicit strong, automatic associations that are consistent across specific stimuli. Given the

multidimensional nature of stigma (James, 2015), this explanation for these findings seems even more plausible. It may thus be more appropriate to assess implicit stigma by evaluating individual mental illnesses rather than assessing responses to mental illness in general.

In regards to predictive validity, the SC-IAT was found to be only weakly related to the AAT while the GNAT was found to be unrelated to the AAT. It thus appears that implicit measures of stigmatizing attitudes are not only poorly related to each other but also poorly related to an implicit measure of behavioral intentions suggesting poor predictive validity. These findings suggest that implicit measures, even when reliable, may not have strong validity as measures of stigmatization of general mental illness. However, it may also be the case that the AAT has poor validity and thus does not adequately measure implicit or automatic behaviors (e.g., nonverbal cues). While prior research suggests that the AAT can predict intentional approach and avoidance behaviors, the relation between the AAT and unintentional (presumably implicit) behaviors should be further explored in research, especially as they relate to the stigmatization of mental illness. These unintentional behaviors may include eye contact, body posture, and muscle tension, to name a few (Monteith & Pettit, 2011).

Next, the relationship between implicit and explicit measures was assessed. In regard to measures of stigmatizing attitudes, the SC-IAT was found to be weakly related to the Semantic Differential Task while the GNAT was found to be unrelated. This is consistent with prior research and confirms a potential social desirability effect or lack of awareness of automatic beliefs (e.g., Kopera et al., 2014; Monteith & Pettit, 2011; Stier & Hinshaw, 2007; Wesselmann et al., 2012). Notably, this finding does not necessarily

suggest that one method of evaluating stigmatizing attitudes is more beneficial than the other, just that they are likely distinct.

In regards to measures of behavioral intentions, the AAT was found to be weakly related to the SDRS and unrelated to the Social Distance Scale. The relation between the AAT and SDRS was moderated by demographic variables with positive relations emerging for females and black participants and no relation for males or white participants. Notably, findings from the Social Distance Scale may be adversely effected by skewness and lack of variability in responses (e.g., 33.7% indicated they would be comfortable being close friends with a person with mental illness and another 33.7% indicated they would be comfortable being roommates or neighbors with a person with mental illness). This suggests that the SDRS may be a more sensitive measure of social distancing than the Social Distance Scale given that variability is necessary to assess correlations.

Previous research has found that implicit measures might be more predictive of automatic behaviors, such as eye contact and tension, rather than deliberate behaviors such as social distance (e.g., Monteith & Pettit, 2011). The measures of behavioral intentions may thus not be equivalent in that the AAT seeks to measure automatic reactions to approach or avoid, while the SDRS may measure actual, deliberate behaviors. If the emphasis is on more deliberate, consciously-chosen behaviors (e.g., discrimination), results with the SDRS may be more meaningful.

Furthermore, implicit attitude measures were not predictive of explicit behavioral measures and the implicit behavioral measure was not predictive of the explicit attitude measure. These results suggest that the two processes proposed in the dual process theory

– a controlled, explicit process and an automatic, implicit process – are distinct and relatively unrelated. These findings are consistent with some prior research that suggests poor relations between implicit and explicit measures (e.g., Monteith & Pettit, 2011; Rusch et al., 2010; Teachman et al., 2006). For example, research suggests a dissociation between explicit (subjective truth) and implicit (affective reactions) measures (Kopera et al., 2014; Monteith & Pettit, 2011; Norman et al., 2010). Furthermore, although implicit attitudes may be associated with nonverbal responses (e.g., eye contact, physical tension), they might not have a reliable impact on consciously-chosen, deliberate behaviors. While additional research is needed to explain the lack of relation between implicit and explicit measures of the same construct, it may be that individuals do not act on their automatic responses, but instead rely on deliberate judgment. For example, it is likely that implicit biases, even when negative, do not necessarily translate to discriminatory behaviors. However, previous studies have found some relation suggesting predictive validity of implicit attitudes (e.g., Dasgupta, 2010).

Another important point to consider when evaluating the meaning of these results is that attitudes and behaviors are not equivalent. Although it seems reasonable that attitudes would influence behavior (e.g., Kawakami et al., 2007; Rinck & Becker, 2007) and this relation is emphasized and frequently found in stigma research, there are a number of variables which may influence the degree to which attitudes predict behaviors. For example, negative attitudes may not automatically lead to avoidance just as positive attitudes may not always lead to approach.

The lack of a notable correlation between the stigmatization bias and the behavioral response could thus be due, in part, to not controlling for potential moderating

variables, given that this would be a situation where stigmatization leads to greater social distance for some and less social distance for others. Nevertheless, the lack of relationship found between measures of attitudes and behaviors is problematic and should be considered in future research and use of implicit measures.

Given the relationship between a measure of social distance (a commonly used proxy for discrimination) and an explicit stigma scale, it may be that explicit measures by themselves are adequate in assessing stigma and its effects. As previous research has suggested, however, these results might be influenced by social desirability. For example, if individuals are consciously choosing their responses to appear non-prejudiced, then this might be reflected in both explicit attitude and explicit behavioral measures which might account for this correlation. While this possibility would suggest that implicit measures might still be better able to assess individual's attitudes without the influence of intentional control, there is still a need to examine what influences explicit behavioral intentions and real-life outcomes. Given that the current study did not find a relation between implicit attitude measures and explicit behavioral intentions, however, there is a need for further examination of the utility of implicit measures. Furthermore, the poor psychometric properties found for implicit measures in this study are problematic and suggest the need for further evaluation, including the potential influence of moderating variables (e.g., motivation to control prejudice). Finally, while prior research suggests that gender and race may be significant influences in stigmatizing attitudes/behaviors (e.g., Corrigan & Watson, 2007), this influence was not consistently found in the current study suggesting a need for further investigation.

## Limitations and Future Research

The sample used is a limitation to this study. The sample was a convenience sample of undergraduate students from a single Southern university. While efforts were made to ensure that the sample did not have extensive education specific to psychology, this could not be guaranteed. While the use of an undergraduate sample may be beneficial in that these participants are generally at the age where they may be just beginning to make more independent healthcare decisions, including whether or not to seek mental health services, results may not be generalizable to other age groups. Future research should thus include different and more diverse samples.

Additionally, although the IAT is a well-established implicit measure, future research should continue to examine the psychometric properties of single-category implicit measures (e.g., SC-IAT, GNAT). Given the current study's results, however, the use of implicit measures may not be reliable and valid measures of implicit stigmatization of mental illness. Any future research should thus examine the psychometric properties of measures used rather than assuming their reliability and validity. Use of such measures that potentially yield poor reliability could lead to erroneous conclusions when low or nonsignificant correlations are interpreted without regard to the reliability of the measures used, given that score reliability attenuates observed correlations and limits the maximum correlations possible even when there is a perfect relationship.

While a strength of this study was its use of multiple measures, the current study only included three implicit measures. Thus results cannot be applied to the countless other implicit measures in existence. While efforts were made to make the tasks as similar to each other as possible (e.g., the same target words), the tasks are inherently

different and require different responses (e.g., one- or two-choices, keyboard or joystick). Future research may use different implicit measures to determine if other measures demonstrate better reliability and validity and if findings are generalizable to other measures. Future research may also examine if some tasks are more sensitive to attitudes than others and, if so, if this sensitivity lends itself to better reliability or validity.

Although this study's focus was on mental illness in general rather than specific disorders, mental illnesses are diverse and different illnesses evoke different attitudes. Future research may thus examine if the pattern of results is upheld when specific exemplars of mental illness are used rather than mental illness as a general category. For example, increased reliability might be found when the focus of measurement is the stigmatization of specific mental illnesses (e.g., schizophrenia, bipolar disorder, major depressive disorder) with different scores yielded for each disorder, rather than the use of a single score for the stigmatization of mental illness in general, as was done in the current study. Additionally, more negative descriptive terms (e.g., "crazy") may be useful to elicit stronger implicit attitudes.

Future research may also examine variables that might significantly impact the relationship between implicit and explicit measures of stigmatization. One variable that might influence this relationship is motivation to control prejudice. For example, an individual that is highly motivated to control their behavioral responses may not seek social distance from people with mental illness despite their implicit, prejudicial biases. In fact, it would be reasonable to expect that some such individuals may display more social closeness-seeking as a way of reducing their cognitive dissonance, if their motivation to control prejudice is high. Motivation to control prejudice may thus serve as



an important moderator when considering the relation between explicit and implicit measures of attitudes (Akrami & Ekehammar, 2005; Ito, Friedman, Bartholow, Correll, Loersch, Altamirano, & Miyake, 2015; Park, Glaser, & Knowles, 2008; Ziegert & Hanges, 2005). Previous research has supported this claim with the suggestion that those with higher motivation to control prejudice are more likely to correct their biased judgments (Gawronski, Geschke, & Banse, 2003, Payne, 2001; Ziegert & Hanges, 2005). Specifically, those with higher motivation to control prejudice show discrepant results on explicit and implicit measures of bias (Dunton & Fazio, 1997; Gawronski et al., 2003; Payne, 2001; Payne, Cheng, Govorun, & Stewart, 2005; Ziegert & Hanges, 2005). Conversely, those with lower motivation to control prejudice show relatively more consistent results across explicit and implicit measures of bias (Dunton & Fazio, 1997; Gawronski et al., 2003; Payne, 2001; Payne et al., 2005; Ziegert & Hanges, 2005). Given the lack of research examining motivation to control prejudice in relation to the stigmatization of mental illness, however, this hypothesis needs to be empirically tested. For example, motivation to control prejudice may moderate the relation between the SC-IAT and AAT (e.g., the correlation may be stronger for those with low motivational to control prejudice and weaker for those with high motivation). If this is the case, then the SC-IAT may have predictive validity for some individuals depending on their level of motivation to control prejudice. Additionally, motivation to control prejudice may account for the relationship between explicit attitudes and behaviors given that both are subject to controlled responses. If this is the case, it may be more worthwhile to further examine the relationship between implicit attitudes and explicit behavioral intentions or real-life outcomes. In addition, it may be the case that motivation to control prejudice has

an influence not only on behavioral intentions, but on the scores of explicit measures of stigmatization as well. To the extent that some of the variance of explicit stigma scores is accounted for by motivation to control prejudice, partialing out such variance from the stigma scores would be important for better understanding the relationships between explicit and implicit measures of stigma and their associations with behaviors.

Another variable that might influence the relationship between attitudes and behaviors is sympathy. For example, even if an individual has negative attitudes toward people with mental illness (e.g., believes they are weak or incapable of succeeding), someone with a high level of sympathy might feel pity for them and try to help them because of these negative attitudes (Pryor et al., 2004). This approach tendency thus does not result from positive attitudes, but rather from a desire to help those that are less fortunate. If sympathy toward mental illness moderates the relation between the SC-IAT and AAT, then different results might emerge depending on whether the person feels sympathy toward people with mental illness or not, again possibly suggesting that implicit measures of stigmatizing attitudes toward mental illness have some predictive validity for some individuals.

Examining the variance accounted for by additional variables might yield different findings and suggest moderators for the relationship between attitudes and behavior. This research is needed prior to asserting the incremental value of implicit measures.

Other variables previously shown to be related to explicit stigma (e.g., familiarity) may also be examined in relation to implicit stigma. For example, individuals that have a closer connection to someone with mental illness are likely to have stronger implicit

biases compared to those who have little knowledge or contact with mental illness. Additionally, empathy may be related to implicit stigma. Prior research suggests a relation between empathy and more prosocial attitudes and behaviors (e.g., Batson et al., 1997; Batson, Chang, Orr, & Rowland, 2002), but this relation has not been explored with implicit measures. Overall, more research is needed to examine the psychometric properties of and influential variables related to implicit measures of the stigmatization of mental illness.

### Implications

The findings from this study support a dual process theory of the stigmatization of mental illness. While assessing both explicit and implicit attitudes and behavioral intentions may be important to a complete understanding of the stigmatization of mental illness, relationships with actual outcomes (e.g., discrimination) may yield the most impacting results. It is believed that because both explicit and implicit biases may impact behavior, it is important for research examining the effects of anti-stigma interventions to assess both types of biases (Kopera et al., 2014). The results of the current study, however, suggest that implicit measures may lack adequate reliability and validity, at least as used in the current study (i.e., stigma of mental illness in general as opposed to towards specific disorders). Therefore, implicit measures should likely not be utilized at this time pending further development. Furthermore, findings suggest that explicit attitudes – not implicit attitudes – are more likely to predict social distance, a commonly used proxy for discrimination (Angermeyer & Matschinger, 2005; Corrigan et al., 2001; Feldman & Crandall, 2007; Link et al., 1999). Anti-stigma interventions may thus

appropriately focus their efforts on explicit attitude change as these are more likely to impact observed behaviors.

In conclusion, the current study adds to the understanding of the stigmatization of mental illness as well as its measurement. It supports the dual process theory in that implicit (automatic) and explicit (controlled) methods of assessing stigma seem to be unrelated to each other and may reflect distinct processes. Furthermore, explicit stigmatizing attitudes may be key predictors of social distance and may thus be important when considering anti-stigma efforts that seek to decrease prejudice and discrimination against those with mental illness. Future research should continue to examine the reliability, validity, and utility of implicit measures of the stigmatization of mental illness prior to their use in testing stigma theories or anti-stigma efforts.

## APPENDIX A – MODERATION ANALYSES

Table A1.

*Linear Model of Predictors of GNAT with SC-IAT by Gender*

	b	SE b	t	p
Constant	-.01	.04	-.37	.71
SC-IAT	.03	.03	.86	.39
Gender	.16	.16	1.00	.32
SC-IAT x Gender	-.07	.11	-.64	.53

Note. R<sup>2</sup> = .03. GNAT = Go/No-Go Association Task; SC-IAT = Single Category Implicit Association Test.

Table A2.

*Linear Model of Predictors of AAT with SC-IAT by Gender*

	b	SE b	t	p
Constant	.09	.07	1.33	.19
SC-IAT	-.02	.06	-.32	.75
Gender	-.29	.28	-1.06	.29
SC-IAT x Gender	.29	.20	1.43	.16

Note. R<sup>2</sup> = .04. AAT = Approach/Avoidance Task; SC-IAT = Single Category Implicit Association Test.

Table A3.

*Linear Model of Predictors of AAT with GNAT by Gender*

	b	SE b	t	p
Constant	.01	.06	.11	.92
GNAT	.06	.05	1.26	.21
Gender	.91	.89	1.02	.31
GNAT x Gender	-.96	.83	-.15	.25

Note. R<sup>2</sup> = .03. AAT = Approach/Avoidance Task; GNAT = Go/No-Go Association Task.

Table A4.

*Linear Model of Predictors of Semantic Differential Task with SC-IAT by Gender*

	b	SE b	t	p
Constant	4.38	.50	8.79	< .01
SC-IAT	-.34	.41	-.83	.41
Gender	-2.41	2.11	-1.14	.26
SC-IAT x Gender	2.64	1.53	1.72	.09

Note.  $R^2 = .06$ . SC-IAT = Single Category Implicit Association Test.

Table A5.

*Linear Model of Predictors of Semantic Differential Task with GNAT by Gender*

	b	SE b	t	p
Constant	3.62	.46	7.86	< .01
GNAT	.44	.38	1.14	.26
Gender	4.86	5.66	.86	.39
GNAT x Gender	-5.61	5.08	-1.11	.27

Note.  $R^2 = .02$ . GNAT = Go/No-Go Association Task.

Table A6.

*Linear Model of Predictors of SDRS with AAT by Gender*

	b	SE b	t	p
Constant	-5.61	.46	-12.32	< .01
AAT	.08	.37	.21	.83
Gender	7.83	2.40	3.26	< .01
AAT x Gender	-4.46	1.73	-2.58	.01

Note.  $R^2 = .14$ . SDRS = Social Distance Rating Scale, AAT = Approach/Avoidance Task

Table A7.

*Linear Model of Predictors of Social Distance Scale with AAT by Gender*

	b	SE b	t	p
Constant	-5.69	.74	-7.73	< .01
AAT	.33	.60	.56	.58
Gender	2.95	3.88	.76	.45
AAT x Gender	-1.95	2.79	-.70	.49

Note.  $R^2 = .01$ . AAT = Approach/Avoidance Task.

Table A8.

*Linear Model of Predictors of SDRS with Semantic Differential Task by Gender*

	b	SE b	t	p
Constant	-6.86	1.28	-5.25	< .01
Sem. Diff.	.46	.96	.48	.63
Gender	.47	.29	1.61	.11
Sem. Diff. x Gender	-.17	.21	-.81	.42

Note.  $R^2 = .07$ . SDRS = Social Distance Rating Scale, Sem. Diff. = Semantic Differential Task.

Table A9.

*Linear Model of Predictors of Social Distance Scale with Semantic Differential Task by Gender*

	b	SE b	t	p
Constant	-3.79	2.01	-1.88	.06
Sem. Diff.	-1.70	1.50	-1.13	.26
Gender	-.30	.46	-.65	.52
Sem. Diff. x Gender	.42	.33	1.27	.21

Note.  $R^2 = .04$ . Sem. Diff. = Semantic Differential Task.

Table A10.

*Linear Model of Predictors of GNAT with SC-IAT by Gender*

	b	SE b	t	p
Constant	.04	.04	1.16	.25
SC-IAT	-.02	.03	-.91	.37
Race	.12	.19	.66	.51
SC-IAT x Race	.01	.12	.07	.95

Note.  $R^2 = .07$ . GNAT = Go/No-Go Association Task; SC-IAT = Single Category Implicit Association Test.

Table A11.

*Linear Model of Predictors of AAT with SC-IAT by Race*

	b	SE b	t	p
Constant	-.03	.06	-.59	.56
SC-IAT	.09	.04	2.12	.04
Race	.42	.29	1.45	.15
SC-IAT x Race	-.33	.19	-1.73	.09

Note.  $R^2 = .08$ . AAT = Approach/Avoidance Task; SC-IAT = Single Category Implicit Association Test.

Table A12.

*Linear Model of Predictors of AAT with GNAT by Race*

	b	SE b	t	p
Constant	< -.01	.05	-.01	.99
GNAT	.06	.04	1.52	.13
Race	-.05	.54	-.08	.93
GNAT x Race	.06	.38	.17	.87

Note.  $R^2 = .03$ . AAT = Approach/Avoidance Task; GNAT = Go/No-Go Association Task.



Table A13.

*Linear Model of Predictors of Semantic Differential Task with SC-IAT by Race*

	b	SE b	t	p
Constant	3.44	.46	7.45	< .01
SC-IAT	.35	.32	1.11	.27
Race	-3.58	2.31	-1.55	.13
SC-IAT x Race	2.50	1.52	1.65	.10

Note.  $R^2 = .09$ . SC-IAT = Single Category Implicit Association Test.

Table A14.

*Linear Model of Predictors of Semantic Differential Task with GNAT by Race*

	b	SE b	t	p
Constant	2.97	.41	7.31	< .01
GNAT	.68	.28	2.48	.02
Race	6.50	4.02	1.62	.11
GNAT x Race	-4.88	2.69	-1.82	.07

Note.  $R^2 = .09$ . GNAT = Go/No-Go Association Task.

Table A15.

*Linear Model of Predictors of SDRS with AAT by Race*

	b	SE b	t	p
Constant	-5.71	.46	-12.40	< .01
AAT	.11	.35	.32	.75
Race	-4.62	2.76	-1.68	.10
AAT x Race	5.05	1.93	.26	.01

Note.  $R^2 = .21$ . SDRS = Social Distance Rating Scale, AAT = Approach/Avoidance Task.

Table A16.

*Linear Model of Predictors of Social Distance Scale with AAT by Race*

	b	SE b	t	p
Constant	-5.16	.72	-7.18	< .01
AAT	-.08	.54	-.14	.89
Race	3.12	4.31	.72	.47
AAT x Race	-2.35	3.02	-.78	.44

Note.  $R^2 = .01$ . AAT = Approach/Avoidance Task.

Table A17.

*Linear Model of Predictors of SDRS with Semantic Differential Task by Race*

	b	SE b	t	p
Constant	-6.77	1.43	-4.73	< .01
Sem. Diff	.59	.97	.61	.55
Race	.13	.35	.38	.71
Sem. Diff. x Race	.03	.23	.12	.91

Note.  $R^2 = .11$ . SDRS = Social Distance Rating Scale, Sem. Diff. = Semantic Differential Task.

Table A18.

*Linear Model of Predictors of Social Distance Scale with Semantic Differential Task by Race*

	b	SE b	t	p
Constant	-8.00	2.13	-3.75	< .01
Sem. Diff.	1.62	1.45	1.12	.27
Race	.73	.52	1.39	.17
Sem. Diff. x Race	-.40	.34	-1.19	.24

Note.  $R^2 = .03$ . Sem. Diff. = Semantic Differential Task.

## APPENDIX B – IRB APPROVAL LETTERS



### **INSTITUTIONAL REVIEW BOARD**

118 College Drive #5147 | Hattiesburg, MS 39406-0001

Phone: 601.266.5997 | Fax: 601.266.4377 | [www.usm.edu/research/institutional.review.board](http://www.usm.edu/research/institutional.review.board)

### **NOTICE OF COMMITTEE ACTION**

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.  
Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 16032101

PROJECT TITLE: Classification of Mental Illness

PROJECT TYPE: New Project

RESEARCHER(S): Jessica James

COLLEGE/DIVISION: College of Education and Psychology

DEPARTMENT: Psychology

FUNDING AGENCY/SPONSOR: N/A

IRB COMMITTEE ACTION: Expedited Review Approval

PERIOD OF APPROVAL: 04/11/2016 to 04/10/2017

**Lawrence A. Hosman, Ph.D.**

**Institutional Review Board**



**INSTITUTIONAL REVIEW BOARD**

118 College Drive #5147 | Hattiesburg, MS 39406-0001

Phone: 601.266.5997 | Fax: 601.266.4377 | [www.usm.edu/research/institutional\\_review\\_board](http://www.usm.edu/research/institutional_review_board)

**NOTICE OF COMMITTEE ACTION**

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- The risks to subjects are minimized.
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- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.  
Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 16042505

PROJECT TITLE: Explicit, Implicit and Behavioral Stigmatization of Mental Illness

PROJECT TYPE: New Project

RESEARCHER(S): Jessica James

COLLEGE/DIVISION: College of Education and Psychology

DEPARTMENT: Psychology

FUNDING AGENCY/SPONSOR: N/A

IRB COMMITTEE ACTION: Expedited Review Approval

PERIOD OF APPROVAL: 05/03/2016 to 05/02/2017

**Lawrence A. Hosman, Ph.D.**

**Institutional Review Board**

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