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Mental Disorders as Brain Disorders: The Impact on Stigma of Neuroscience-Based Mental Health Education

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The Impact on Stigma of Neuroscience-Based Mental Health Education

By

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ABSTRACT

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Stigmatization of mental illness is undoubtedly detrimental to those with mental health concerns as it limits employment, self-esteem and social support (Markowitz, 1998). In effort to combat the issue of stigma, previous research has evaluated the effectiveness of education as a method to reduce stigma in a college sample; finding that peer-led presentations are effective in reducing stigma (Kosyluk et al., 2016). The current study sought to evaluate the effectiveness of neuroscience-oriented presentation for reducing the stigma of mental illness among college students. Researchers asked 53 Union College students to complete seven-item Social Distance Scale (SDS; Penn et al., 1994) before and after a peer-led, 30-minute neuroscience-oriented presentation. Results indicated a significant difference between the means of the pre-intervention (M = 13.70) and post-intervention (M = 11.40) scores such that SDS scores used to indicate stigma level decreased from pre to post intervention ($p < .001$). The was a moderate effect size for the sample ($d = .70$). As the current research lacked a control group, the results were compared to another study which administered the SDS to a control group and evaluated stability of scores over a two-week period and there was very little change ($d = .04$; Broussard et al., 2011). This comparison suggests that the brief intervention was able to change stigma over and above any change due to mere exposure effect and/or practice effects of serial testing. Additional research and additional stigma measures are required to understand how neuroscience-oriented education may be useful in a sample in the broader community and how enduring the effects are.

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INTRODUCTION

Stigmatization of mental illness is undoubtedly detrimental to those with mental health concerns; mentally ill persons are more likely to be unemployed, lack support systems, have lower self-esteem, and avoid seeking help (Markowitz, 1998). Research conducted by Markowitz (1998) highlights the adverse effects of stigma and labeling theory on these factors. Often times this issue seems distant from the normative individual, but in actuality, one in four adults in the USA experience mental health concerns every year, ranging from common problems such as depression, anxiety, and substance abuse to rarer problems such as schizophrenia and bipolar disorder (Mayoclinc). Shockingly though, only a quarter of those individuals feel that their illnesses are accepted and tolerated in their communities (Holmes, 2014). In recent decades, advocacy to change the stigmatization and negative portrayals of mental illness have made significant progress (Implementation of MHPAEA). Large scale government campaigns to destigmatize mental illness are in the works around the world. One of which is the Mental Health Parity and Addiction Equity Act, part of which sought to include Mental Health Coverage under Medicaid and the Children's Health Insurance Plan (Implementation of MHPAEA). Additionally, the academic literature on the topic has blossomed in recent years (Corrigan, Michaels, & Morris, 2015). While research into the best methods to reduce internalized stigma in those with mental illness is of the utmost importance, so too is the work to diminish public stigma, as that is often the root of negative internalization. Researchers have taken many different avenues to try to address this problem, one of the main strategies being educational interventions (Corrigan, 2015). The current study seeks to evaluate the effectiveness of biologically-based education in particular, on reducing the stigma of mental illness among

college students, many of whom suffer from mental health concerns themselves or know other students or family members that are affected.

The stigma surrounding mental illness is complex. There are countless societal influences that contribute to stigmatization. One of the most relevant issues is that of labeling; and throughout history there have long been debates about the pros/cons about labeling/diagnosing, from those who avoid diagnosis for fear of prejudice, to those who fear the homogenous label, often preferring a continuum (Corrigan, 2007). Receiving a formal diagnosis often means subjecting the individual to the stigma that follows it. Corrigan (2007) suggests three domains in which stigma is a detriment to individuals with mental illness: "label avoidance, blocked life goals, and self - stigma" (p. 31). Many individuals choose not to participate in or seek treatment solely because they want to avoid being labeled as a "mental patient" (Corrigan, 2007). This is a fact that is often portrayed in life experience and in the media. It is common to come across a character on a television referencing not wanting to see a "shrink." For example, the character of Will Hunting in the movie, *Good Will Hunting*, when he is required by law to attend therapy sessions. Or perhaps for someone in daily life to say, "I don't need therapy, I'm not crazy." These types of comments contribute to a larger and quite negative misperception of individuals with mental health concerns. Additional research such as that of Yuan and colleagues (2016), as well as Patalay and colleagues (2017), have all found that stigma exists in the general public. Corrigan (2015) notes that advocates often report two main ways that public stigma has a negative impact. First, public stigma leads to discrimination and prejudice in nearly every aspect of life from daily encounters to mental health care legislation; second, it often discourages people from seeking treatment (Corrigan, 2015). Both of which will be discussed among other negative impacts of stigma.

As a result of widespread stigma, individuals with mental illness are often denied job and housing opportunities (Corrigan, 2007). The existence of stigma in the community, missed opportunities, and even labeling itself all have negative consequences on the individual. Public stigma then gets internalized as feelings of self-doubt, unworthiness and poor self-esteem. This is termed self-stigma or internalized stigma (Corrigan, 2007). Research has also noted a high correlation between experiences of public stigma and symptoms of anxiety and depression (Markowitz, 1998). This suggests that if mental illness in the public can be reduced, it could perhaps improve experienced, or internal, stigma; thus effecting a variety of factors such as access to treatment, quality of life and self-esteem and result in better outcomes overall.

Treatment Seeking

The effects of stigma are pandemic, but one of the most prominent problems is internalization which leads to the failure to seek treatment. Of those experiencing mental illness symptoms, only 30-40 percent seek treatment (Boeh, 2016). Boeh (2016) examines the connection between stigma and treatment seeking using the Treatment Seeking Barriers Model (TSBM). In their study they manipulated public service announcements as the independent variable in altering feelings of personal responsibility and blame regarding mental illness to either increase or decrease public beliefs that mental illness is permanent (immutability beliefs) or that the feelings of personal responsibility and blame (responsibility beliefs). Participants completed measures of stigma and attitudes both before and after brief two-minute video exposure. The sample consisted of undergraduate college students at small Midwest university. Results indicated that immutability beliefs decreased while responsibility beliefs remained unchanged, such that the responsibility beliefs remained high. This suggests that while there are many factors that contribute to internal stigma, immutability is a large barrier which can be

reduced with the proper public service announcements and campaigns. This research also gives insight into the ways that public perception and representation of mental illness can shape an individual's experience. This research also brings to light a direction educational programs could take towards refuting the idea that people cannot get better. This is particularly important as the current research attempts to explain the biological basis of mental illness to help the community realize that mental illnesses have biological components that explain mental illness and may also provide options for treatment, and therefore mutable, through various therapies and medications. By targeting the mutability of mental illness, it is hoped that it can become more generally acceptable to seek treatment without fear of judgment.

Medication Compliance

Among those who have sought treatment, they are not only subjected to the stigma that comes with diagnosis, but also that of specifically taking psychiatric medication. This can lead to a myriad of problems, not the least of which includes medication compliance. Notably, the stigma of taking medication is the most common patient-reported barrier to medication adherence (Economou & Lazaratou, 2016). Boyd & Hashemi (2015) conducted a study at a VA medical center regarding the stigma of taking psychiatric medications among outpatient veterans. Researchers asked participants to take a survey in the outpatient clinic. The sample consisted of 200 outpatient veterans, 159 of which were taking psychiatric medication at the time. Over half reported feeling judged and uncomfortable disclosing that they take medication.

In a related study, Michaels (2016) researched the impact of stigma on taking psychotropic medications as prescribed. Over a "one-month longitudinal study, participants, with severe mental illness self-reported medication use, desire to take medication as directed, pill count use rates over a one-month period, and pharmacy" (Michaels, 2016). Despite stigma,

Michaels (2016) found that 82% of participants took their medication as directed. Nevertheless, there was a positive correlation found between "desire to take medication and self-application of negative stereotypes." Results also showed that attitudes regarding medication may be associated with self-reported use. Overall, this research indicated that while the majority of participants seem to be taking their medication in spite of existing stigma, there is still a large portion of participants who did not. This leads to the conclusion that future research is needed, targeted specifically at those individuals not taking medication as prescribed, and that intervention is likely necessary to target the stigma they are experiencing and internalizing. This study is of particular interest as it shows that self-application of negative stereotypes and desire to take medication is positively correlated. Therefore, it follows that targeting the negative stereotypes and stigma that individuals experience is a reasonable step towards better medication and overall treatment compliance.

The Role of Professionals

The role and extent to which a general practitioner (GP) or primary care provider should should be treating mental illness is debatable (Luthra, 2016). 75% of GPs however, are providing care to those seeking assistance with a mental health issue (*The Department of Health*, 2006). Of the 8 million appointments made with doctors made for depression alone, over half are with general practitioners (Luthra, 2016). This is often advantageous, as the general practitioners are necessary to act as a first line of defense, often ruling out other non-mental illness concerns (Bishop et al., 2016). Bishop and colleagues (2016) note however, it is often the case that mental health concerns are assigned a "much lower priority… than to other medical conditions in primary care" (pg. 2). Even among those that have been in treatment in either an inpatient or outpatient setting for mental health concerns, the GP remains involved in the outpatient treatment

planning. Their role becomes especially important when former inpatient patients return home, as access to psychiatrists and social workers becomes much more limited. The concern with this however, is that many GPs have not been trained in all of the treatment options, including emphasizing the "usefulness of cognitive behavioral skills for their mental health patients" (*The Department of Health*, 2006). Bishop (2016) conducted research which sought to understand how primary care doctors manage care of depression specifically, as it is treated frequently by primary care doctors. The study assessed five care management processes in the United States. Results showed that there was significantly less use of multiple treatment approaches for depression when compared to other chronic illnesses such as diabetes. This is notable as the Centers for Disease Control and Prevention report that up to 8.7% of the US population suffers from depression at any given time (Bishop, 2016). These results suggest that primary care providers are in fact are ill-equipped to deal with depression as a chronic illness, despite their large number of cases seen.

While it is debated the extent to which primary care doctors should be treating mental illness, the reality is that many of them are in fact treating mental illness, and therefore must be equipped with the tools to not only manage care, but to dispel stigma. In fact, many patients report that it is not only the difficult access to mental health care, but the stigma of seeing a psychiatrist is what has lead them to see their primary care doctor instead (Luthra, 2016). As evidenced by issues with treatment seeking, medication compliance and the controversial role of primary care doctors, the effects of stigma that exist are extremely detrimental to the care that those with mental health concerns receive. As such, it is increasingly important to lessen the internalized stigma that these individuals feel. One such way of attempting to combat this is to

focus on combatting the public stigma which is a driving factor of internalized stigma (Corrigan et al., 2016).

The issue of GP's limited treatment options for mental health is one that could easily be remedied if access to psychiatric care was as simple as accessing a GP. This simple access however, is far from the case. Stigma and misunderstandings about the origins of mental illness informs legislators and insurance companies alike. This results in vast under-coverage of mental health care. Perhaps unsurprisingly due to the vast stigma, coverage for mental health care is a relatively new idea. Until after World War II, insurance did not address or cover mental health care whatsoever. Post war, the coverage was very limited, only covering a small amount of hospital mental health care. The emergence of psychiatric units in hospitals and community mental health centers aided in developing a third party payment system. As much of their grant funding decreased in the 1980s, the need for private insurance reimbursement increased (Barry, 2006). Barry notes that though mental health coverage increased dramatically between the mid 1980s and early 2000s, the coverage is far from adequate. "By 2002, 77% had separate inpatient day limits, and 75% had outpatient visit limits, on mental health services" (Barry, 2006, 186). This creates a major problem, as the treatment that providers can give is often restricted by what they will be paid for, effectively disallowing them from providing the highest level of care possible. At the national level, there have been several attempts to create coverage for mental health, all of which have proven unpredictable to patients due to constant changes. This often leaves patients without mental health coverage, which leaves them either without treatment, or simply getting whatever treatment possible from their insurance-covered GP.

Mental Health Parity

In the 1990s, advocates for mental health coverage began to adopt a strategy focused on parity (Barry, 2006). Mental Health Parity simply refers to the requirement to provide the same level of care to mental health concerns as to 'physical' concerns ("Mental Health Benefits...", 2015). At this point in time, all states and D.C. have enacted a law concerning mental health parity, however there is a wide variety of these laws and what they require from insurers. For example, some laws only cover biologically-based, which is a debatable designation, or severe mental illnesses. Other laws do not fall in line with Parity, but rather offer mental health coverage as a premium. As the rate of mental illness in the United States increases, so too does the demand for care coverage. As previously mentioned, stigmatization is a major barrier to treatment seeking, and when those who do seek treatment find they do not have adequate care, yet another obstacle stands in their way.

Additionally, the majority of coverage that does exist for mental health care does not help with preventative measures. Without consistent care, individuals with mental health concerns often end up resorting to hospitalization or unfortunately in the legal system. This is not only detrimental to the patient, but is also ineffective financially. David (2017) makes note that at on average, weekly therapy appointments would cost around $5,720 per year. An average psychiatric hospital stay costs an average of $15,600, excluding follow-up appointments and medications. Understanding the problems associated with mental health coverage, the question remains as to how to best persuade legislators and insurance companies, and thus the public that backs them, to take action.

Mental Health Parity advocates have utilized a myriad of strategies over the years in attempt to both rectify misunderstandings about mental illness and to reduce stigma so that legislators may understand the immense need for insurance mandates. Of particular interest to

the current study is their use of biologically-based attributions to advocate for change. For many years there was a prevailing thought that mental illnesses could not be treated effectively. An influx of newer research suggests that there are evidence based treatments which lead to higher quality of life and overall improvements in functioning (Barry, 2006).

Mental Health on College Campuses

College campuses, in particular, are becoming increasingly aware of the stigma of mental illness. This is incredibly important as mental illness among college students is ever-increasing. In fact, as of 2012, 95% of college counseling center directors reported that the number of students with psychological problems is a growing concern. The most prominent concerns being anxiety and depression (Bishop et al., 2016; Kosyluk et al., 2016). Suicide is also a major driving factor for research into mental health concerns on college campuses. In 2015, the National College Health Assessment reported that suicidal ideation and attempt was a concern for over 10% of the population (Andrade, 2016). In addition to the obvious concerns about dealing with mental illness in terms of overall health, it is also of concern that these issues are affecting their education; 44% of undergraduates report that mental and/or emotional difficulty was detrimental to their ability to complete their work (Andrade, 2016).

Not only is stigma an incredibly pressing issue for college students that deal with mental health concerns, it is also especially important in terms of reducing overall public stigma. Because of their high level of education, many college graduates will go on to hold leadership roles in their communities. Many will end up treating patients, lobbying for or drafting legislature, teaching, and so forth. Since one in four adults deals with mental illness (Mayoclinc), it is actually quite unlikely that one would *not* encounter it. It is, therefore, important to target

these individuals in effort to destigmatize their own perceptions of mental illness to aid in reducing stigma for college students on campus and down the line, in the general public.

Reducing the Stigma

With a great deal of evidence indicating the need to reduce stigma, the question remains as to how to effectively reduce stigma. Patalay and colleagues (2017) conducted research aimed at evaluating a specific intervention entitled *OpenMinds* which was a mental health literacy program for secondary school students, designed and implemented by undergraduate students. The program, led by a university student, targets mental health as a component of general health, destigmatization, recognition of mental health concerns, and encouraging medical students to pursue careers in the field of mental health. This program was comprised of several sessions, termed "Crash Courses" on mental illness in adolescents in which peer-led instruction was offered for two weeks prior to the school year (Patalay et al., 2017). Pre-intervention and post-intervention surveys were completed among secondary school students and university medical students. Notably, among the university medical students, knowledge and attitudes, as well as social distance improved (Patalay et al., 2017). This research suggests that intervention, particularly by a peer can be a helpful tool in the de-stigmatization of mental illness in a college student cohort.

Further research, conducted by Kosyluk and colleagues (2016) compared two different methods for challenging stigma around mental illness. They investigated the effects of both contact-based and education-based anti-stigma educational programs; 198 college-age individuals were randomly assigned to either contact, education or control groups. Measures for "mental illness stigma, affirming attitudes, discrimination, and treatment seeking among college students" were administered both before and after the interventions. The contact-based method

consisted of college students telling their peer about their battle with mental illness. The education-based program consisted of a PowerPoint presentation presented by a peer, and focused on dispelling the myths about mental illness. All interventions were about 15 minutes long with five minutes for questions. Notably, the Social Distance Scale was utilized to measure mental health stigma. Results indicated that both the education- and contact- based programs were effective in both reducing desire for social distance and stigma. Importantly, they were both effective in increasing the belief that those with mental health concerns should be empowered. While effect sizes were small for all measures, desire for social distance showed a strong effect size (Kosyluk et al., 2016). This study demonstrates two options for peer-led programs; both suggested that learning about mental illness and others' experiences with it can be helpful in reducing desire for social distance. Additionally, the educational methods utilized in this study also provide a framework which are useful to the current study; including the PowerPoint used during the intervention.

Schlier and colleagues (2016) conducted research which sought to understand the effect of providing various types educational information on stigmatizing attitudes of schizophrenia. Researchers randomly assigned 178 participants to read one of three different psychoeducational texts about medication, Cognitive Behavioral Therapy (CBT). Stereotypical beliefs and emotional responses regarding people with schizophrenia were then tested. These were all single sessions with short passage readings. Results indicated that all three methods were successful in reducing stigmatizing beliefs, however CBT was the most successful. The research is important as it not only shows that educational methods can be successful in reducing stigma, but in fact there are many options for educational methods that have been efficacious.

Kosyluk and colleagues (2016) set forth a successful model to reduce mental health stigma which focused mainly on dispelling existing stereotypes and myths. Schlier and colleagues (2016) made it clear that there are many varying educational methods that are successful in reducing stigma without inadvertently producing it. Other research, including the current research, is particularly focused on another potential angle to reduce stigma which provides a neuroscience-based perspective; including, neuroscientific, biological and biogenetic perspectives. As Kosyluk and colleagues (2016) suggests, many individuals view those with mental health concerns or substance abuse issues to be inherently "lazy" or "crazy" (*Debunking Myths…)* The current research hopes to dispel this idea, along with other stigmatizing notions, by educating about the neuroscientific underpinnings of mental health concerns.

Angermeyer and colleagues (2015) conducted a study aimed at understanding the correlation between those individuals who attributed mental illness more heavily to biogenetic attributions and their desire for social distance, a measure for stigma. They did so by administering 204 telephone surveys in two German cities. They used audio-recorded case vignettes to describe either depression or schizophrenia based on the DSM IV criteria. Then, participants were asked about possible causes of mental illness; in particular, they were asked about causes being brain disease and genetic causes. Interestingly, results indicated a significant relationship between attributing schizophrenia to brain disease and increased desire for social distance. This relationship did not follow with major depression. Genetic attributions did not show a significant relationship with desire for social distance in either disorder. This is interesting to consider in formulating the current study as it shows that biologically-based explanations (or biogenetic causes, as this article terms it) can sometimes actually inadvertently be associated with, or perhaps even cause an increased level of stigma.

Previous research regarding biogenetic attribution, however primarily utilizes case vignettes and questionnaires about whether or not participants believe that mental illness has biogenetic attributions. These studies however, lack the educational component about these biogenetic causes. This begs the question, do all of these individuals actually understand brain disease or biogenetics? It is not unfounded to assume that the general public lacks specific knowledge about neurobiology and its relation to mental illness, since most people do not receive formal education in this area. As such, it is important to research how educating individuals about the neuroscientific basis of mental illness affects desire for social distance. This may also aid in overriding the possibility of a negative outcome of the intervention where people misunderstand neuroscience and therefore mislabel Kosyluk and colleagues (2016) established the framework for educational tools in a college cohort as an effective measure in reducing stigma. In combination with the aforementioned question, the goal of the current research becomes to integrate these ideas to utilize a neuroscience based educational intervention in attempt to reduce stigma.

Hypotheses:

1. It is expected that the desire for social distance will be reduced from pre- to post-intervention (e.g., Kosyluk et al., 2016)
2. It is expected that among those who rated having experience with someone with mental illness (either personally or a close family member) there will be a smaller effect size of the pre to post intervention desire for social distance (e.g., Bishop et al., 2016).
3. Per the neuroscience-based educational idea in the current research (see Introduction), it is expected that among those who expressed having a background in studying

neuroscience, biology or psychology. there will be a smaller effect size of the pre to post intervention desire for social distance.

METHODS

Participants

The sample (n=53) consisted of students from Union College who were recruited to participate via campus events emails, flyers, and word of mouth. They were compensated with either $8 in cash or partial course credit for 45-minute participation. Forty participants were female and 13 were male. Ages ranged from 18-22. Three group psychoeducational sessions were organized by the peer-researcher (in attendance were: 31, 7, and 15).

Procedure

The current study was approved by the Union College Human Subjects Review Committee. Those in the study participated in a group intervention which took place in a classroom on campus, consistent across all groups. Upon arrival, participants signed an informed consent form. The form indicated an interest in learning about the educational methods about mental health on the Union College Campus, but intentionally left out indicators about interest in learning about stigma, so as to avoid biasing results. From there, they were asked to complete a short version of the Social Distance Scale. This took approximately five minutes. This was followed by an intervention which was a 30-minute presentation about the brain and its relation to mental health concerns. After which time, the floor was open for 5 minutes of questions and discussion. Post-intervention, they were asked to complete the Social Distance Scale again. They also were asked to complete a brief survey asking gender, sex, college major. They were also asked to mark their experience with a variety of mental health concerns on a continuum from “I

know of anyone who has experienced this," to "I have experienced" this. Finally, three questions about the presentation were asked as a manipulation check.

Materials

Social Distance Scale (SDS): The Social Distance Scale is a tool used to measure an individual's desire for social distance from an individual with mental health concerns. This scale is utilized widely by researchers as a measure of stigma. The original Social Distance Scale was developed by the World Psychiatric Associate Programme to Reduce Stigma and Discrimination Because of Schizophrenia (2001), and has since been adapted to encompass mental illness. The scale utilized in the current study, adapted from Hackler (2010). In the current study the wording "mental illness" was altered to read "mental health concern." Mental health concern was defined on the scale for the participants' reference as: "a wide range of mental health problems including but not limited to mental illness. They range from common problems, such as depression and anxiety, to rarer problems such as schizophrenia and bipolar disorder." This distinction was made so as to clarify what is meant by the terminology for participants and avoid confusion. The scale asks questions describing various levels of intimacy with a person with a mental health concern. For example, "How would you feel about working with someone with a mental health concern?" Participants were asked to rate their willingness on a scale of 1 (Definitely willing) to 4 (definitely unwilling). Scores were calculated by adding up the numbered answers, higher scores indicating a greater desire for social distance (greater stigma), with lower scores indicating less desire for social distance (lower stigma) (See appendix B).

Questionnaire: In addition to the SDS given post intervention, participants were also given a questionnaire identifying their own experiences with mental illness. Participants were asked to check off their experiences with "ADHD," "Anxiety," "Concussion/Neurological Concern,"

"Depression," "Eating Disorder," "Substance Abuse," "Bipolar," "Schizophrenia," "Psychiatric medication," and "other unspecified MHC." They were asked to check all that apply in four columns indicating closeness to the mental health concern. For example, "I don't know of anyone who has experienced this" to "I have experienced this" (see appendix C). Participants were also asked to circle yes or no when asked if their major or minor was in biology, neuroscience or psychology.

Presentation: The current presentation was designed with the goal of increasing understanding about the relationship between the brain and mental illness. The presentation, entitled "Do You Know Your Brain?" was designed in the following sections: (1) Learning about the brain, the neuron and the synapse. (2) Discussion of common mental health concerns and their (3) Explanation of biological etiology (i.e., chemical imbalance, brain differences, genetics). (4) How people get better (i.e. treatment methods). (5) Dispelling common myths about mental illness on college campuses. Much of the presentation format was adapted from Kosyluk and colleagues (2016, see Appendix E). A 1 minute and 35 second clip of a TedxCalTech talk was shown during the presentation to demonstrate a perspective on mental disorders as brain disorders (9:40 – 11:15; Insel, 2013).

RESULTS

Reliable SDS scores were obtained for 52 of 53 participants (one participant failed to answer one question on the post-intervention scale and a prorated score was utilized). SDS scores for the whole sample ranged from 7-23 on the pre-intervention scale (M = 13.70; SD = 3.53). Post-intervention SDS scores for the whole sample ranged from 7-23 (M = 11.40; SD = 3.06).

Hypothesis 1

There was a significant difference between the means of the pre-intervention (M = 13.70) and post-intervention (M = 11.40) scores such that SDS scores used to indicate stigma level decreased from pre to post intervention ($p < .001$; see figure 1). The change over time from pre- to post-intervention yielded a moderate effect size for the sample ($d = .697$; Ellis, 2009).

Hypothesis 2

All participants reported having some experience with someone with mental illness either as a personal experience or a close family member (see Table 1). There was variability in terms of who had personally experienced mental health concerns and those who had not, thus, a two-way ANOVA was run to asses a the means from pre-intervention (M = 13.21; SD =3.47) to post-intervention (M = 10.97; SD = 2.53) for those who had personally experienced a mental illness to those who had not from pre (M =14.74; SD =3.52) to post intervention (M =12.18 ; SD =3.78). There was no significant difference between these means ($p = .60$), such that those without personal experience with mental health concerns did not have a significantly different change in stigma from those with a personal experience.

Hypothesis 3

There was no significant difference between the means of the pre-intervention (M=13.23; SD = 3.53) and post-intervention (M=13.23; SD = 2.53) scores of those who reported having a background (major) in science or psychology when compared the the pre-intervention (M=14.30; SD=3.51) and post-intervention (M=11.89; SD=3.00) means of those who did not ($p= .82$); such that the stigma level of those who did not express previous knowledge of the material did not decrease significantly more than those who did (Table 1).

DISCUSSION

As expected, desire for social distance was significantly reduced pre-intervention to post-intervention. This indicates that the biologically based educational program was effective in reducing stigma. There was a moderate effect size for the sample. The current study however, lacked a control group. In effort to determine the test-retest reliability of the social distance scale, the effect size in the current sample to was compared to another study which utilized a control group. Broussard and colleagues (2011) sought to understand desire for social distance between police officers and those with mental illness in a sample of police officers. They administered a 9-item SDS before and after a week long crisis intervention training program. They also administered the 9-item scale one week apart to a control group. The control group exhibited a very small effect size (d = .04) while the experimental group indicated a large effect size (d = 1.04). Recall, the current sample exhibited a moderate effect size (d = .697). This indicates a high test-retest reliability of the SDS, as the effect size of the control group was very small, while the experimental groups in both the current study and that of Broussard and colleagues (2011) exhibits a moderate to large effect (Ellis, 2009). The means found by Broussard and colleagues (2011) were prorated to the 7-item version of the SDS for comparison to the current sample. While the current sample had lower means overall, both the experimental groups scores clearly decrease from pre to post intervention, while the control group decreases very slightly, further supporting the test-retest reliability of the SDS (See Figure 2). This difference can likely be attributed in part to the different participant samples. It is logical to assume that those individuals who have a college level education enter the study with a lower stigma level due to their experiences in higher education. Notably and importantly though, both interventions saw decrease in stigma, speaking to the necessity for education.

Individuals with mental illness are often subject to high levels of internalized feelings of self-doubt unworthiness or poor self-esteem (Corrigan, 2007). However, it was hypothesized that those with experiences either personally or with a close family member would be more receptive to the current anti-stigma educational program, as they may have less desire for social distance based on personal experience and empathy. This however was unable to be evaluated further as every participant reported having a close experience with mental illness. However, specifically having personally experienced mental health concerns was considered. This too, however, indicated no significant difference between those with a personal experience of mental illness and those without. However, the questionnaire offered a wide range of mental health concerns for participants to check off. Analysis of 'personal experiences' did not discriminate based on which mental health concern was experienced; the severity of the mental health concern was also not asked. For example, many participants indicated 'anxiety' as a mental health concern they had experienced, but the questionnaire failed to ask about the severity. This leaves the term up for interpretation, and could range from normal anxiety to debilitating anxiety.

Although there was no significant difference between those whose major is in neuroscience, psychology, or biology when compared to other majors, it is possible that further analysis could reveal differences in other covariates. The lack of difference in this case however, is interesting at it suggests that those with previous education about the neuroscience basis of mental health, whom one would expect to have previous knowledge about the topics discussed during the intervention, did not differ from those outside of the major. This however, could be attributed to the range of ages (18 to 23), as age was not specifically asked in the questionnaire. It could also be due to the wide range of studies within the fields of 'neuroscience, biology or psychology,' as the questionnaire did not differentiate between them. For example, someone

studying cognitive neuroscience might have a previously better grasp of the material then a biology major focusing on ecology.

Limitations

One limitation that the current study faced was the wording utilized to express mental illnesses. Often times, receiving a diagnosis of a "mental illness" can trigger a number of negative reactions both internally and socially as a result of stigma (Economou & Lazaratou, 2016). Therefore, it is plausible that one may be influenced by the use of the word "mental illness" in both the SDS and subsequent questionnaires, resulting in already negatively biased responses. The current study attempted to remove this confounding factor by utilizing the terminology "Mental Health Concern," defined for the participants as "*MHCs refer to a wide range of mental health problems including but not limited to mental illness. They range from common problems, such as depression and anxiety, to other problems such as schizophrenia and bipolar disorder, personality disorders, OCD, etc*." While this was helpful in eliminating a potential confound for the current study, it also poses the risk of lacking specificity. For example, as mentioned above, the term "anxiety" as used in the questionnaire could be perceived as a normal level of anxiety, rather than a clinically significant problem. Additionally, concussions and ADHD were also grouped under "mental health concern" which arguably would not be considered "mental illness." This could have resulted in an inaccurate count of individuals' experiences with mental illness.

Another major limitation of the study is the limited sample. It is plausible and likely that the individuals that were willing to come to the study had previous interest in mental health awareness as the study was marketed to individuals as a 'talk' about the relationship between the brain and mental health. Therefore, it is plausible that those individuals were more receptive to

the intervention than the general public. Thus, the participants were not a completely random sample of Union College students, rather, those that had previous interest. The lower representativeness of the sample of all students means that the has lower generalizability to both the union college sample and the public.

Future Directions

One interesting and perhaps necessary avenue for future research would be to assess the effect of biological education about mental health on public stigma in the community other than just on a college cohort. Previous research has primarily utilized college samples for the ease of access and to gather data about effectiveness preliminarily prior to spreading into the larger public. Surveys have been effective in other populations, namely in Japan, to assess the level of mental health literacy in the community (Yuan, 2016). Additionally, larger scale interventions have been efficacious in countries outside of America, such as in England, with its Time to Change educational and support program (Henderson et al., 2016). This previous research suggests in conjunction with the current research that a biological angled mental health educational intervention could be efficacious in the community beyond the college cohort.

Another interesting area for future research to explore deals with internalized stigma, and the best way to reduce that. Understanding that biological education has produced the hypothesized reduction in desire for social distance, it is conceivable that a similar intervention could produce similar effects on internalized stigma of mental illness. One factor that would be interesting to examine is the effect of an educational intervention not only on internalized stigma levels, but to further understand the effect of an intervention on medication compliance. Previous

research has suggested that belief that mental illness is permanent is one of the largest barrier to to treatment seeking attitudes (Boeh, 2016). While it is important to combat public stigma, it is equally important to directly combat internalized stigma in those suffering from mental health concerns. Allowing those who are currently dealing with mental health concerns to better understand the brain and its relation to mental health, including psychotropic medications, could conceivably reduce internalized stigma by a significant margin.

Conclusion

Ample research exists about the significant detrimental effects of mental health stigma on both societal and individual levels. Additionally, previous research has examined methods of reducing stigma in the public in order to promote a more positive perception of mental health needs in everything from the individual to laws about mental health parity. The current study hypothesized and found that a neuroscientific angle to an educational anti-stigma public intervention would significantly reduce stigma from pre intervention to post. The findings of this study exhibit the usefulness of a neuroscience-based education about the relationship between the brain and mental illness. It also provides a successful framework for which to use in further research in the continued effort to reduce mental health stigma.

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1. Thank you to all participants.

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3. Thank you to Amanda Tommell-Sandy, M.S., NCC and everyone at the Union College Wicker Wellness Center for helping me to recruit participants and for their continuous support and ideas.

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Figure 1: Graph depicting the mean pre and post intervention SDS scores with standard error (M = 13.70, SEM = .48; M = 11.4, SEM = .42).

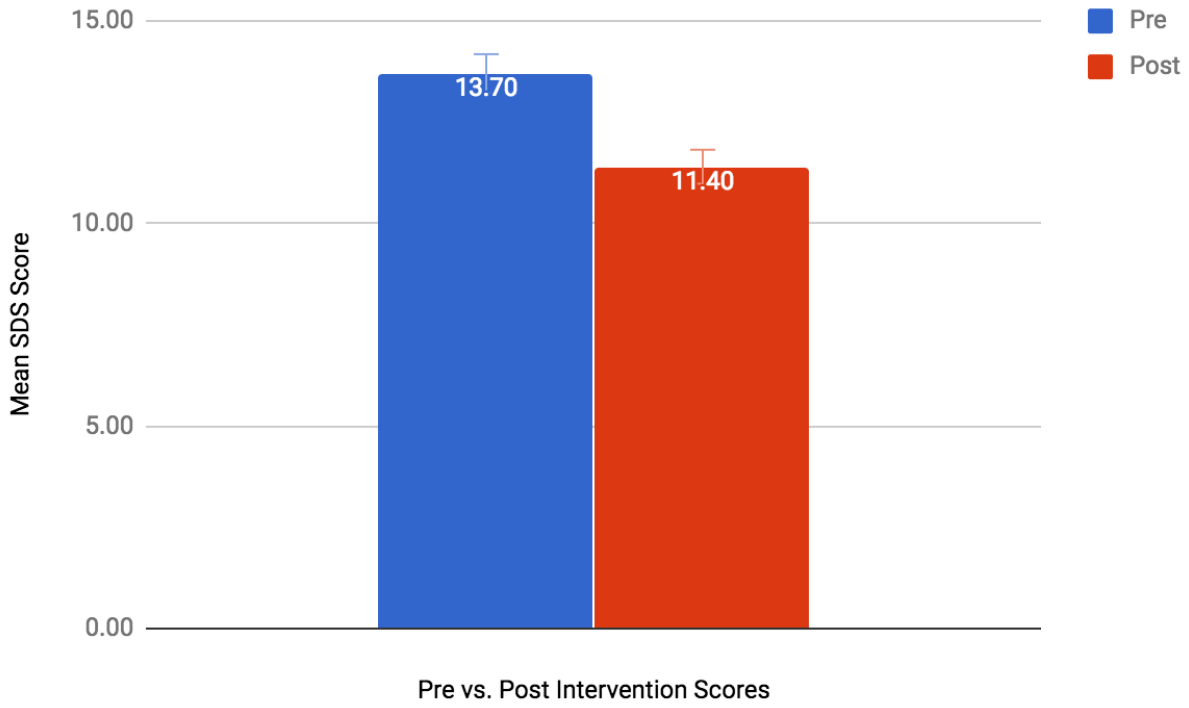
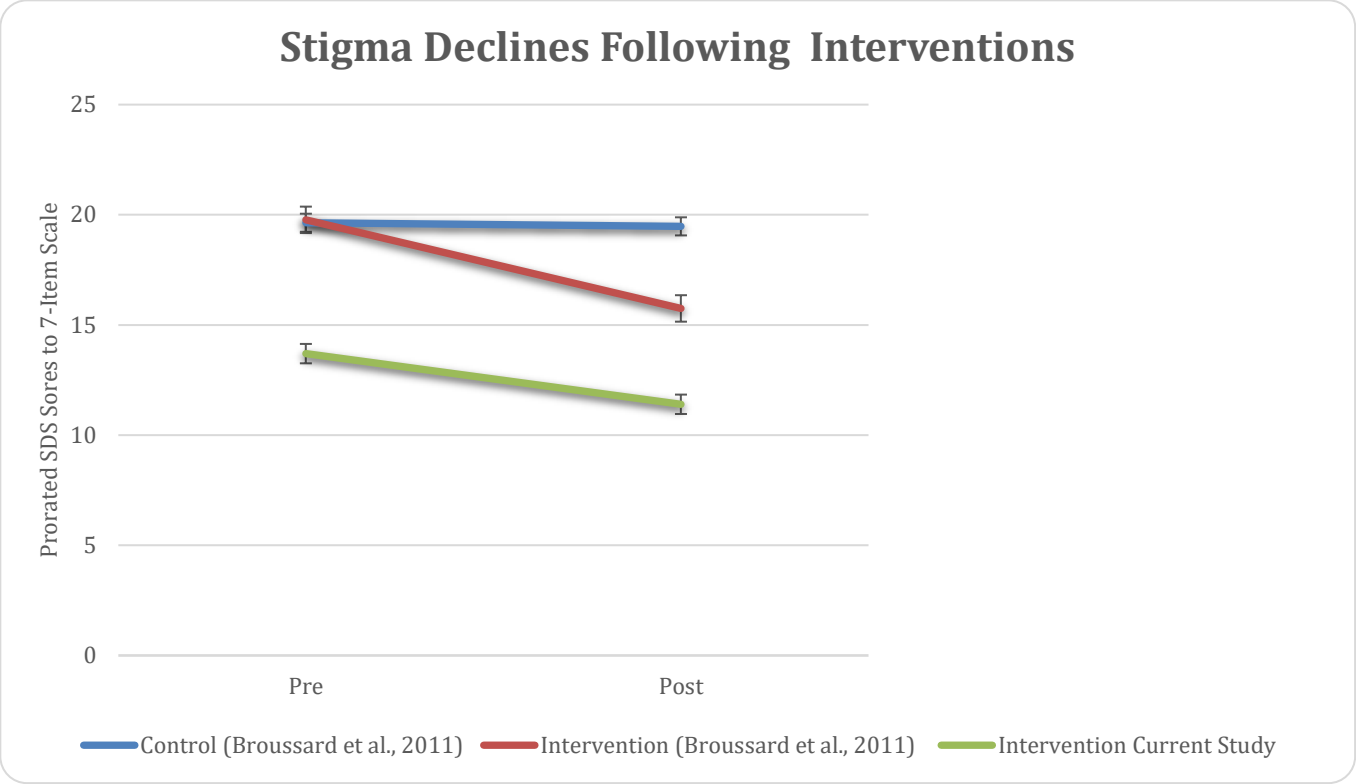


Figure 2: Stigma Declines following Interventions



Note:

1. This graph depicts the findings in the Control and Intervention groups of Broussard et al., (2011) as compared to the current study's Intervention.
2. Broussard et al., (2011) utilized a 9-item SDS. The Current study utilized a 7-item version. Therefore, the results were prorated to the 7-item scale for comparison.
3. Broussard et al., (2011) results were one-week apart while the current study was a single-bout pre to post intervention (see Methods).
4. Broussard et al., (2011) utilized a sample of Police Officers (see Discussion) while the current study was with a college student cohort.

Table 1: Table depicting the demographics and responses for the sample

		Post Score	*Pre Score*
Female	Mean	11.07	13.35
	N	42	42
	SD	2.515	3.517
Male	Mean	12.45	15.05
	N	11	11
	SD	4.390	3.380
Major/minor in field	Mean	10.95	13.23
	N	30	30
	SD	2.527	3.530
Major/minor not in field	Mean	11.89	14.30
	N	23	23
	SD	3.516	3.506
Self Experience of MHC	Mean	10.97	13.21
	N	36	36
	SD	2.527	3.471
No Self Experience of MHC	Mean	12.18	14.74
	N	17	17
	SD	3.779	3.518
Total	Mean	11.36	13.70
	N	53	53
	SD	3.002	3.526

APPENDIX A

Informed Consent

My name is Katherine Tighe and I am a student at Union College in Schenectady, NY. I am inviting you to participate in a research study. Involvement in the study is voluntary, so you may choose to participate or not. A description of the study is written below.

I am interested in learning about the educational methods about mental health on the Union College Campus. You will be asked to complete a brief survey before and after participating in a brief lecture and question/answer session about the biogenetic explanations of mental illness. This will take approximately 45 minutes. There are no foreseeable risks to taking part in this study. If you no longer wish to continue, you have the right to withdraw from the study, without penalty, at any time.

Your responses will be anonymous and confidential, such that it would be impossible to link your name with any of your responses.

Even though all aspects of the study may not be explained to you beforehand (e.g., the entire purpose of the study), during the debriefing session you will be given additional information about the study and have the opportunity to ask questions.

By signing below, you indicate that you understand the information above, and that you wish to participate in this research study.

_____ _____

Participant Signature Date

_____

Printed Name

APPENDIX B

Pre-Intervention Social Distance Scale

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

Mental Health Concern (MHC): *MHCs refer to a wide range of mental health problems including but not limited to mental illness. They range from common problems, such as depression and anxiety, to rarer problems such as schizophrenia and bipolar disorder.*

	Definitely Willing	Probably Willing	Probably Unwilling	Definitely Unwilling
1. How would you feel about renting a room in your home to someone with a mental health concern?	1	2	3	4
2. How would you feel about working with someone with a mental health concern?	1	2	3	4
3. How would you feel about having someone with a mental health concern as your neighbor?	1	2	3	4
4. How would you feel about having someone with a mental health concern as the caretaker of your children?	1	2	3	4
5. How would you feel about having your children marry someone with a mental health concern?	1	2	3	4
6. How would you feel about introducing	1	2	3	4

someone with a mental health concern to your friends?				
7. How would you feel about recommending someone with a mental health concern for a job working with someone you know?	1	2	3	4

APPENDIX C

Post-Intervention Social Distance Scale and Questionnaire

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

Mental Health Concern (MHC): *MHCs refer to a wide range of mental health problems including but not limited to mental illness. They range from common problems, such as depression and anxiety, to other problems such as schizophrenia and bipolar disorder, personality disorders, OCD, etc.*

	Definitely Willing	Probably Willing	Probably Unwilling	Definitely Unwilling
1. How would you feel about renting a room in your home to someone with a mental health concern?	1	2	3	4
2. How would you feel about working with someone with a mental health concern?	1	2	3	4
3. How would you feel about having someone with a mental health concern as your neighbor?	1	2	3	4
4. How would you feel about having someone with a mental health concern as the caretaker of your children?	1	2	3	4
5. How would you feel about having your children marry someone with a mental health concern?	1	2	3	4
6. How would you feel about introducing someone with a mental health concern to your friends?	1	2	3	4

7. How would you feel about recommending someone with a mental health concern for a job working with someone you know?	1	2	3	4

Please rate your experience with the following MHCs:

	I don't know of anyone who has experienced this	**I know someone who has experienced this**	**A friend of mine has experienced this**	**A close family member has experienced this**	**I have experienced this**
ADHD					
Anxiety					
Concussion/ Neurological concern					
Depression					
Eating Disorder					
Substance Abuse					
Bipolar					
Schizophrenia					
Taken psychiatric medication					
Other unspecified MHC					

Is your major or minor in biology, neuroscience or psychology? Yes No

What is your biological sex? **M** **F** **Prefer not to say**

Please provide a *short* answer for the questions below:

How do neurons (the brain cells) talk to each other?

What are some treatments for mental health concerns?

Can people with mental health concerns get better?

APPENDIX D

Debrief

Thank you for participating this study. The purpose of this study is to examine the impact of biologically based education about mental illness on public stigma at Union College.

This study asked participants to complete what is known as a social distance scale (SDS; Penn et al., 1994) before and after the educational intervention. The educational PowerPoint and discussion session was intended to educate the public about the biogenetic basis of mental illness. Previous research has shown that both testimonials, like those shown during the presentation as well as education from a peer can help to reduce public stigma (Kosyluk et al., 2016). This study attempted to understand if educating from a biological angle in particular is useful in reducing desire for social distance.

Please keep information about this study confidential and do not discuss this study with anyone else. In social scientific research, it is important that study participants perform study tasks similar to how they behave in everyday life. Preconceived notions about the specific study purpose may change the way in which study participants approach and complete the study and will jeopardize the validity of study results.

At this time, please feel free to ask any questions or pose any concerns you may have about the experiment. If you have any questions or concerns in the future, feel free to contact Katie Tighe at tighek@union.edu or Thesis Supervisor Professor Cay Anderson-Hanley at andersoc@union.edu. Thank you again.

Resources:

Union College Health Services

Union College Office of Religious and Spiritual Life

Campus Safety after hours: (518) 388-6911

Ellis Hospital ER, Nott Street: (518) 243-4121

Ellis Health Center ER, McClellan Street: (518) 382-2222

Urgent Care, Community Care Physicians, Niskayuna, NY: (518) 713-5341

Suicide/Crisis Hotline: 800-273-8255

APPENDIX E

PowerPoint Used during Intervention

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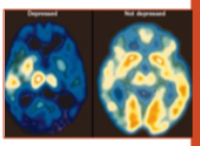
But what if something goes wrong?

- What happens when things don't work as planned? There are several explanations…the brain is complex!
- Inherent brain differences
- Genetics
  - Twin studies and adoption studies in schizophrenia
- Imbalance of neurotransmitters
  - Perhaps! Treatments to increase the connectivity of neurons using neurotransmitters have been helpful in treating individuals.
  - Example: Dopamine suppressants to treat schizophrenia
  - Example: SSRIs



Clip…

- https://www.youtube.com/watch?v=u1m65slqbhY

How do you mend a brain?

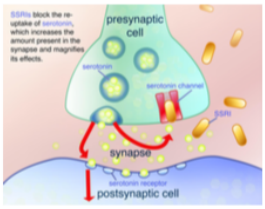
- Brain surgery?
  - Not quite…
- Do people really get better?
  - YES!
- Methods:
  - Psychotropic medications
  - Example: SSRI…

What do the drugs actually do?

Let's take a look at one common antidepressant and antianxiety medication…

SSRI

(Selective Serotonin reuptake inhibitor)



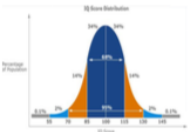
What are we dealing with here?

- One in four adults in America experience mental health concerns every year
- Only a quarter of those individuals feel that their illnesses are accepted and tolerated in their communities

Myth Busters:

BUSTED

- **College students with mental illness are dangerous:**
  - Individuals with mental illness are no more likely to be dangerous than individuals without mental illness.
  - In fact, individuals with mental illness are more likely to be the victims of crime, rather than the perpetrators.
- **College students with MHCs are less intelligent and can't handle the rigors of college:**
  - Mental illness affects people across the entire IQ spectrum.



(Kosyluk et al., 2016)

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Mental Health Resources
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Ellis Hospital ER, Nott Street: (518) 243-4121
Ellis Health Center ER, McClellan Street: (518) 382-2222
Urgent Care, Community Care Physicians, Niskayuna, NY: (518) 713-5341
Urgent Care, Surya Immediate Care, Latham, NY: (518) 867-8080
Health Services
Office of Religious and Spiritual Life
Suicide/Crisis Hotline: 800-273-8255


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