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# The influence of lay concepts and causal theories on definitions of mental illness and social outcomes

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The Influence of Lay concepts and Causal Theories on Definitions of Mental Illness and Social

Outcomes

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PUBLIC PRESENTATION

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Abstract

Lay concepts and causal attribution theories enable lay people to make sense of their social situations, more specifically, their encounters with those suffering from mental disorders by providing informational frameworks and explanations upon which to interpret their circumstances. Thus, lay concepts and causal theories about mental illness play a role in beliefs and behaviors toward those individuals. The current study surveyed 113 undergraduate students to investigate relations between knowledge of mental illness as well as causal attributions and explicit stigma associated with depression and schizophrenia, such as perceived dangerousness and desire for social distance. Scores for schizophrenia and depression were significantly correlated with one another on multiple variables, which led to the development of composite variables for knowledge, causality, familiarity, perceived, dangerousness, social distance, and benevolence. Several hierarchical regressions were performed to analyze the relationships between the variables. Knowledge and causality for mental illness were significantly correlated $(r(112)=.28, p= .002)$. Higher scores of familiarity and knowledge were both associated with lower scores of perceived dangerousness. Gender significantly predicted social distance and benevolence, such that females reported lower values on both measures. The results of this study may have important potential implications in the area of educational reform. Insight regarding perceptions of depression and schizophrenia can be utilized in informing the public about these illnesses in a way that reduces the stigma of depression and schizophrenia to facilitate social acceptance of people with mental illnesses and of them seeking treatment.

The Influence of Lay Concepts and Causal Theories on Definitions of Mental Illness and Social

Outcomes

When attempting to understand our social surroundings and context, people tend to look at

human behavior as a reference point. Human behavior serves as an example or guideline of how

others should act in uncertain situations. To process behavior, the human mind uses mental

shortcuts, or lay concepts and causal attribution theories to categorize the behavior as normal or

abnormal and to attribute the behavior to a specific cause or explanation. For instance, when an

individual is cut off by another driver, he/she may attribute the behavior to the other driver's

rude personality or attribute it a situational factor such as the other driver being late to an

important event. No matter the chosen explanation, the lay concept of that behavior or

personality trait was used to recognize the action taken and the causal theory was used to provide

a cause or explanation to make sense of that action.

Lay theories shape cognitive and behavioral functions in that they serve as foundations of

meaning that are used to understand and interpret situations as well as behavior of themselves

and others (Burton & Plaks, 2013). Lay concepts function similarly to schemas, in that they are

used to help people categorize and better understand the complex and ambiguous situations that

are faced on a daily basis.  Causal theories are used in conjunction with lay theories to explain

people, behavior, and situations. Multiple studies have shown that lay theories impact cognitive

and motivational processes because people want their behavior and their social experiences to

match the content of their theories (Burton & Plaks, 2013; Schomerus, Matschinger, &

Angermeyer, 2013; Karasz, 2005). When situations do not match an individual's lay theories,

dissonance is experienced and then they react in ways to reduce that dissonance, whether it is by

changing their behavior or their lay concepts (Burton & Plaks, 2013). Lay concepts serve as a

basis or framework of knowledge and understanding, whereas causal theories take the information and try to explain it. Some concepts and theories are more detailed than others depending on the individual's general knowledge regarding the subject of the concept.  The current study focuses on two main aspects of mental illness: 1) knowledge of mental illnesses and their characteristics and 2) the causal theories of mental illness in regards to two specific mental illnesses: schizophrenia and major depressive disorder.

**Knowledge**

Lay concepts regarding health and illness are conceptualizations, built from personal experiences and cultural values and beliefs, which are used to explain the cause of the illness (environmental, biological, etc.), the severity of the illness, and to explain health behaviors associated with specific illnesses. Lay concepts of health can dictate health behaviors. For instance, the ideal treatment for health issues in Western cultures is to seek professional and pharmaceutical aid in alleviating symptoms, whereas other cultures seek spiritual alignment and herbal remedies to relieve ailments of illness (Gurung, 2006). In comparison, lay concepts of mental health are more specific knowledge baselines regarding mental disorders. They provide a meaningful "definition" that is tailored to people, behavior, and situations specific to mental illnesses in order for people to better adapt to future encounters with people with mental illnesses. Lay concepts of mental illness are shaped in part by factors, such as culture and illness exposure/ familiarity.

**Culture.** Culture plays a role in the extent of knowledge and awareness people have of mental illnesses such as depression and schizophrenia by dictating their level of acceptance and exposure within the community. Depending on the culture, depression can be a sign of bodily

malfunction or deterioration, or a sign of emotional instability. Schizophrenia, known for

irrational thoughts and unpredictability, is often socially rejected and has reduced social

acceptance in many cultures, especially Western cultures (Schomerus, Matschinger, &

Angermeyer, 2013). When examining an illness such as schizophrenia, Western individualistic

cultures will focus more on the specific individual with schizophrenia and assess his/her

characteristics, whereas Eastern collectivist cultures will view the individual with schizophrenia

in more of a "big picture" perspective that focuses on how the schizophrenic individual is

impacting his/her relationships within the community (Gurung, 2006). The community

environment greatly impacts how its members perceive and respond to schizophrenia and other

mental disorders because knowledge and expectations regarding such mental illnesses are culture

specific (Goulding et al., 2009). For example, a study of 62 Anglo-Australians and 30 East

African individuals found drastically different concepts of depression. Anglo-Australians believe

depression to be an individual experience of adversity compared to East African individuals who

perceive depression to be a relational experience in which distress is felt by multiple individuals

(Kokanovic, Dowrick, Butler, Herrman, & Gunn, 2008).  The way a culture signifies a disease

will often dictate how individuals with the disease should seek treatment. For example, European

Americans conceptualize depression as a disease that requires professional treatment whereas the

South Asian immigrants see depression as a result of emotional, social situations (Karasz, 2005).

European Americans belong to a worldview that sees medical treatment as the optimal solution

whereas South Asians perceive personal relations as more important, specifically, emotional

support.  Illness exposure can also shape how individuals with mental illness seek treatment. If a

person suffering from depression has exposure to other people with depression and knows that

antidepressant medications work to alleviate depressive symptoms, he/she may be more inclined

to seek medical treatment. The same can be said if the depressive individual knows others suffering from depression are aided by emotional support.

**Illness exposure/ familiarity.** Illness exposure and familiarity with mental disorders could be a result of cultural beliefs regarding which mental illnesses are socially accepted. A study discovered that the concept held by South Asian lay people was based on their awareness, which in turn, was determined by social class, education, and age (Mah, Karl, & Brenda, n.d). Without awareness and exposure to people with mental illnesses, lay people are left to interpret their behavior based on stereotypes, and as a result have more stigmatizing attitudes than people who have been exposed to individuals with mental illness. Schizophrenia is a mental illness with low social acceptance due to its perceived dangerousness and unpredictability. Low acceptance of schizophrenia may reduce the exposure lay people have to that disorder, which in turn may reduce their knowledge and understanding of people with schizophrenia (Lee et al., 2014). However, increased exposure to schizophrenia could reduce the stigma and improve acceptance of the illness. Familiarity with mental illnesses is inversely related to discriminatory and stigmatizing behaviors (Lee et al., 2014). The more exposed and familiarized individuals are with schizophrenia, the less they will perceive them as dangerous or want to distance themselves from those with schizophrenia (Corrigan et al., 2003). It appears that with familiarity comes understanding about the amount of control individuals with schizophrenia have over their illness. Increasing levels of personal exposure to people with schizophrenia is linked to decreasing levels of social distance desires, and thus decreasing levels of perceived dangerousness, as dangerousness has been shown to predict the extent from which individuals want to distance themselves from those suffering from mental illnesses (Grausgruber et al., 2007).

**Casual Theory Attributions: Biological causes vs. psychosocial causes**

Etiology of mental illnesses, such as bipolar disorder and depression, has been a constant battle between biological causes and environment/psychosocial causes. For most illnesses, biological and psychosocial explanations are hard to tease apart because biology and the environment have a bidirectional relationship. However, schizophrenia has been found to be a predominantly biological disorder, in which approximately 80% of the risk of schizophrenia is biological (Lewis, 2014). Biological attribution for schizophrenia does not necessarily reduce the stigma of schizophrenia, reduce desires of social distance, or increase positive attitudes about individuals with schizophrenia (Schomerus, Matschinger, & Angermeyer, 2013). Cognitive and behavioral consequences of a biological explanation are illness specific. For instance, biological explanations for mental disorders can reduce the social acceptance for disorders such as schizophrenia and depression, but can then increase the amount of social acceptance for disorders like alcoholism/ alcohol dependence (Schnittker, 2008). More specifically, a biological etiology is associated with higher perceptions of dangerousness, which in turn increases the desire of social distance from people with schizophrenia (Lee et al., 2014).

The role of psychosocial causes differs for each individual illness as well. For instance, stress is a cause that raises social acceptance for schizophrenia by increasing the salience of individual similarities between lay persons and individuals with schizophrenia (Schomerus, Matschinger, & Angermeyer, 2013). Despite the increase in social acceptance due to stress, schizophrenia did not improve in other stigmatizing behaviors. When an environmental/psychosocial etiology was provided, schizophrenia did not significantly differ from bipolar disorder or major depression in social distance (Lee et al., 2014).

**Stigma**

Stigma is a negative, discriminatory attitude held by an individual toward another person or group of people that possess a specific attribute (Stier & Hinshaw, 2007). More knowledge regarding a disorder is associated with more positive and less stigmatizing behavior (Lee et al., 2014). Lay concepts and naïve causal theories are related to stigma, in that lay concepts and causal theories may provide insight into the amount and severity of stigmatization that disorders and people with those disorders receive (Kim & Ahn, 2002). The severity of the stigma may play a role in whether or not lay people decide to help a person with mental illness. Stigma can also be described as a lack of benevolence, or a desire to help others. A person with schizophrenia in need of help may not receive it because of the stigma regarding the perceived dangerousness of that disorder (Lee et al., 2014). Schizophrenia is one of the most stigmatized mental disorders because those with schizophrenia are portrayed as very dangerous, irrational, and unpredictable. When a person exhibits stigma toward an individual with schizophrenia, they are less likely to help a schizophrenic individual in need. On the other hand, if a person is benevolent toward an individual with schizophrenia, he/she is less likely to hold a negative, discriminatory view about the mentally ill individual.

**Current Study**

Research showed that an individual's understanding of mental disorders includes lay concepts and causal beliefs (Kim & Ahn, 2002). The current study explored lay theories held by college students, examining how they define mental illness. Lay and causal theories held by college students for depression and schizophrenia were compared with one another. The theories' role in the students' explicit stigma levels toward people with those illnesses were then

evaluated. Per previous literature results, it was anticipated that a main effect of knowledge on

the levels of explicit stigma would be present, such that the more knowledge (more correct

definitions) present about depression and schizophrenia, the less stigmatizing attitudes

demonstrated. It was also predicted that there would be a main effect of causality such that a

biological explanation would produce a more stigmatizing attitude toward individuals with

schizophrenia, but would produce a less stigmatizing attitude toward individuals with depression.

An additive interaction was hypothesized, meaning that knowledge level and causal attribution

would both be associated with the levels of stigma shown. For depression, an individual with

high knowledge and high biological attribution theory would have much lower levels of stigma

when compared to an individual with less knowledge and a low biological attribution theory. For

schizophrenia, however, a biological explanation has the opposite effect: it would increase the

stigmatization of individuals with the illness behaviors. The difference in relationships between a

biological attribution and stigmatizing attitudes was based on the role the attribution plays in

social acceptance. A biological attribution increases social acceptance for depression whereas it

decreases acceptance for schizophrenia (Lee et al., 2014; Schomerus, Matschinger, &

Angermeyer, 2013; Schnittker, 2008). An individual with high levels of knowledge regarding

schizophrenia and a low biological attribution theory would demonstrate much less stigma

toward individuals with schizophrenia compared to an individual with low levels of knowledge

and a high biological attribution theory. Therefore, it was hypothesized that high knowledge and

biological attributions would yield negative and discriminating attitudes, whereas low knowledge

and psychological attributions would result in more positive attitudes and social behaviors.

**Method**

**Participants**

This study evaluated 113 undergraduate students (62% female, 37% male) who were currently enrolled in an introductory psychology course at James Madison University. The majority of the sample was of white or Caucasian background (77.9%), followed by Asian (8.8%), Hispanic or Latino (6.2%), and Black or African American (5.3%). Both Pacific Islander and Arab ethnicities were the minorities of the sample (0.9% each). The participants were obtained via the university's participation pool and received course credit in exchange for their full participation.

**Measures**

**Lay concepts.** To determine the participants' knowledge of mental illness and their lay definition of the generalized concept of mental illness, two mental disorders (major depression and schizophrenia) were utilized to identify the participants' knowledge of the two disorders in question. For each disorder, the participants identified diagnostic criteria in an open-ended, free-recall format. The next section provided a list containing true and non-relevant symptoms and consequences obtained from the DSM-V (APA, 2013). Participants indicated which of the items provided in the list were applicable to the particular disorder. After the relevant items were chosen, the participants then rated the strength of the symptoms and consequences they chose: the stronger the rating, the more prevalent the symptom or consequence is in the disorder (Kim & Ahn, 2002). The strength rating scale, similar to in the study conducted by Kim and Ahn (2002), was a 0-4 scale. To calculate a total knowledge score, the number of correct symptoms identified in the free response format was added with the number of correct relevant and non-

relevant symptoms identified. A score for the number of incorrect symptoms listed in the free-response questions plus the number of incorrect relevant and non-relevant symptoms identified was also calculated.

**Causal theories**. A set of seven yes-or-no questions was used to assess the level of familiarity participants have with mental illnesses. The set of familiarity questions was used for schizophrenia and depression (Corrigan et al., 2003). In addition, two different scenarios describing individuals with schizophrenia and major depression in which the causal attribution theory is emphasized- (schizophrenia: biological causes vs. environmental causes, depression: biological vs. environmental) were used. The participants then rated how much they believed the illness was caused by biological or environmental factors (Lee et al., 2014). The scenarios were used to determine how the causal attributions were related to how the participants viewed the level of responsibility and control one has over their mental illness. The participants were given both scenarios and their overall score was the sum of their ratings the scales. Thus, the overall score was out of a total of 12 points.

**Social outcomes.**  Multiple scales were utilized to evaluate the role the participants' lay concepts play in their social behaviors and on their levels of explicit stigma. The Perceived Dangerousness Scale is a 10-item survey using a six-point differential scale in which a high score indicates high perceived danger (Teachman, Wilson, & Komarovskaya, 2006). The Social Distance Scale is a five-item scale that evaluates a participant's willingness to interact with someone with a mental illness. Each item is rated on a four-point scale ranging from definitely willing to definitely unwilling (Cheon & Chiao, 2012; Link, Cullen, Frank, & Wozniak, 1987). Lastly, the benevolence subscale of the Community Attitudes toward the Mentally Ill Scale

(Taylor & Dear, 1981) will be used. Each of the three scales was provided for each disorder, and the questions of each scale were tailored to fit the corresponding disorder.

**Demographics.** Personal information regarding participants' age, gender, ethnicity, major, University College, class year, high school and college GPAs, and number of psychology classes completed was recorded.

**Procedure**

After completing the informed consent form, the participants completed the survey comprised of the four scales previously mentioned. The participants began by listing diagnostic criteria for the disorders: major depression and schizophrenia. Next, they completed the section in which they chose items they perceived as prevalent in each of the three disorders from a list of relevant and non-relevant symptoms and consequences. Then the participants strength-rated their choices (higher strength rating indicates the item is more prevalent in the disorder). After the participants completed the survey, they filled out a sheet regarding personal demographics.

**Results**

The current study investigated the effects of knowledge and causal attribution of schizophrenia and depression on social outcomes of explicit stigma: perceived dangerousness, social distance, and benevolence. The analysis plan included three parts. The first part examined means and standard deviations of the primary variables (see Table 1). In the next part, the correlations among the predictor variables were evaluated. In the third part, hierarchical multiple regressions were conducted to explore factors associated with perceived dangerousness, social distance, and benevolence.

Based on previous literature, it was predicted that the participants would have more knowledge for depression than for schizophrenia, as it is a more common and discussed illness ($t(112)= 10.136$, $p< .001$). This was supported in that average knowledge scores for depression were higher than those for schizophrenia (see Table 1). It was also expected that participants' with high knowledge of one illness would have high knowledge of the other. Knowledge scores for schizophrenia and depression yielded a moderate, positive correlation, which indicated that participants with a higher knowledge regarding depression also had a higher knowledge for schizophrenia ($r(112)= .41$, $p< .001$). It was hypothesized that for the causality scenario measure, schizophrenia would be given an environmental explanation whereas major depression would receive a biological explanation. Causal attributions for mental illness showed that biological endorsement was higher for schizophrenia than for major depression ($t(111)= -7.51$, $p< .001$; see Table 1). The two were of the same direction and were moderately correlated, which was not expected ($r= .34$, $p< .001$). Analyses examining familiarity found a decrease in negative reports on stigma scales with an increase in exposure to people with each mental illness. Similarly to knowledge and causal attributions, mental illness familiarity scores revealed that participants

were more familiar with depression than with schizophrenia (t(112)= -17.9, p< .001; see Table 1.) Also, the values showed that those with familiarity for depression also had familiarity with schizophrenia (r= .28, p= .003).

The association between the composite variables of knowledge, causality, and familiarity were analyzed (see Table 3). The relationship between knowledge and familiarity and that between causality and familiarity were both positive. However, neither correlation was significant. Knowledge and causality were significantly positively and moderately related at the .01 level (r= .28, p< .002). This means that participants with higher knowledge scores were more likely to report higher scores on the causality scale which endorsed a biological explanation for mental illness.

The moderate correlations of the causal attribution measures and the knowledge scores led to evaluation of the primary social outcomes to determine if similar results were found. Schizophrenia and major depression values were significantly and highly correlated for each of the three measures: perceived dangerousness (r= .64, p< .001), social distance (r= .49, p< .001), and benevolence (r= .85, p< .001). Due to the strong correlation between schizophrenia and depression in knowledge, causality, familiarity, and all three social outcome measures, the values for schizophrenia and depression were combined to create composite variables comprised of the data from both illnesses. Based on the findings from Bynum and Reis-Bergan (2014) that found differences between the predictors, the three composite stigma variables were not combined into one overall composite stigma variable. Thus, the social outcome variables were analyzed individually.

**Perceived Dangerousness**

Hierarchical multiple regressions were performed for each stigma variable (see Table 4). In the first step, college, gender, and mental illness familiarity were used as predictors of the composite outcome measure. In the second step, composite variables of knowledge and causality were added as predictors.  Higher scores on perceived dangerousness indicated the participant perceived the individual with mental illness to be dangerous. In the final step, mental illness familiarity was significantly associated with perceived danger such that higher scores on familiarity predicted lower scores on perceived danger ($\beta$= -.214, t(110)=-2.376, p=.019). Total knowledge was also significantly associated  with perceived danger, such that higher knowledge scores predicted lower scores on perceived danger ($\beta$=-.269, t(110)= 2.888, p=.005). In the final step, causality was not a significant predictor at the alpha level of .05 but it was close (p< .07).

**Social Distance**

In the first step in the regression, gender significantly predicted social distance, such that females were more likely to provide lower values for social distance than males ($\beta$=.193, t(110)= 2.036, p= .044). Similarly to perceived dangerousness, higher scores on social distance scales indicated the participant did not want to be near an individual with mental illness.  In the final step, none of the predictors were significant (see Table 5).

**Benevolence**

Regarding participants' level of benevolence toward the mentally ill, gender was a significant predictor in steps one and two such that females reported lower scores on benevolence (see Table 6). Low benevolence scores indicate more willingness to help the

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mentally ill and high scores indicated a lack of willingness to help. In the final step of the

regression, causality was also a significantly and highly associated with benevolence, such that

biological attributions for mental illness predicted low scores on benevolence ($\beta$= -.221, t(110)=

-2.368, p=.020). Individuals attributing mental illness to biological factors reported more

willingness to help.

Table 1

*Means and standard deviations of the composite variables. Reliabilities included for social outcome measures*

| Composite Variables | Mean | Standard Deviation | Reliability ($\alpha$=.05) |
|---|---|---|---|
| Knowledge | 2.37 | 3.88 | - |
| Causality | 4.89 | 1.04 | - |
| Mental Illness Familiarity | 2.57 | 1.05 | - |
| Perceived Dangerousness | 3.53 | 0.81 | 0.84 |
| Social Distance | 2.39 | 0.58 | 0.88 |
| Benevolence | 2.10 | 0.49 | 0.90 |

Table 2

*Comparison of means and standard deviations between schizophrenia and depression across various measures*

| Variable | Schizophrenia | | Depression | |
|---|---|---|---|---|
| | M | SD | M | SD |
| Knowledge | -.04 | 4.51 | 4.78 | 4.74 |
| Causality | 5.41 | 1.14 | 4.37 | 1.39 |
| Mental Illness Familiarity | 1.22 | 1.08 | 3.92 | 1.52 |
| Perceived Dangerousness | 20.13 | 4.59 | 15.15 | 4.33 |
| Social Distance | 11.23 | 2.90 | 7.87 | 2.41 |
| Benevolence | 21.35 | 5.34 | 20.57 | 4.84 |

Table 3

*Correlations between composite variables of knowledge, causality, familiarity*

| Composite Variables | Pearson Correlation (r) |
|---|---|
| Knowledge - Causality | .28** |
| Knowledge- Familiarity | .03 |
| Causal- Familiarity | .13 |

*Note.* **$p < .01$

Table 4

*Hierarchical regression predicting social distance*

| Variable | $\beta$ | $SE(\beta)$ | $t$ | $p$ | $R^2$ change |
|---|---|---|---|---|---|
| Step 1 | | | | | |
| College | .09 | .16 | .60 | .55 | |
| Gender | .13 | .16 | .84 | .41 | .06 |
| Familiarity | -.18 | .07 | -2.40 | .02* | |
| Step 2 | | | | | |
| College | .18 | .15 | 1.18 | .24 | |
| Gender | .04 | .15 | .29 | .77 | |
| Familiarity | -.17 | .07 | -2.38 | .02* | .18* |
| Knowledge | -.06 | .02 | -2.89 | .01* | |
| Causality | -.13 | .07 | -1.82 | .07 | |
| Total $R^2$= .24 | | | | | |

*Note.* *p< .05

Table 5

*Hierarchical regression predicting social distance*

| Variable | β | SE(β) | t | p | $R^2$ change |
|---|---|---|---|---|---|
| Step 1 | | | | | |
| College | -.07 | .11 | -.67 | .51 | |
| Gender | .23 | .11 | 2.04 | .04* | .07 |
| Familiarity | -.07 | .05 | -1.26 | .21 | |
| Step 2 | | | | | |
| College | -.04 | .11 | -.32 | .75 | |
| Gender | .19 | .11 | 1.67 | .10 | |
| Familiarity | -.06 | .05 | -1.12 | .26 | .12* |
| Knowledge | -.02 | .01 | -1.49 | .14 | |
| Causality | -.09 | .05 | -1.66 | .10 | |

Total $R^2$= .19

*Note.* *p< .05

Table 6

*Hierarchical regression predicting level of benevolence*

| Variable | β | SE(β) | t | p | $R^2$ change |
|---|---|---|---|---|---|
| Step 1 | | | | | |
| College | -.04 | .09 | -.47 | .64 | |
| Gender | .28 | .09 | 3.06 | .00* | .10* |
| Familiarity | -.05 | .04 | -1.04 | .30 | |
| Step 2 | | | | | |
| College | -.01 | .09 | -.07 | .94 | |
| Gender | .24 | .09 | 2.69 | .01* | |
| Familiarity | -.04 | .04 | -.83 | .41 | .18* |
| Knowledge | -.02 | .01 | -1.39 | .17 | |
| Causality | -.10 | .04 | -2.37 | .02* | |
| Total $R^2$= .28 | | | | | |

*Note.* *p< .05

**Discussion**

The current study investigated the association between knowledge and causal attributions of mental illness, specifically schizophrenia and depression, and participants' perceptions of stigma. The results for both mental illnesses were strongly correlated with one another. This led to the combination of schizophrenia scores with depression scores into composite variables for causality, knowledge, illness familiarity, and the three stigma outcome measures.

**Knowledge**

In regards to knowledge, it was hypothesized that the participants would have higher knowledge of depression compared to knowledge of schizophrenia. This hypothesis was supported as most participants more accurately identified relevant and non-relevant diagnostic criteria from a list of signs and symptoms for depression than schizophrenia. With that said, participants with a higher knowledge of depression also had a higher knowledge of schizophrenia. The knowledge composite variable indicated an overall mental health understanding.

**Causality**

A positive correlation between causality perceptions of schizophrenia and depression was unexpected. The association between the two mental illnesses could stem from the tendency to understand any illness by placing it in the medical model. By treating mental illnesses in a similar way to physical illnesses, people attribute the etiology to a physical source. The significant association between the two causalities resulted in the formation of a composite causality variable, and thus the predictions originally made regarding causality were no longer relevant.

**Familiarity**

The relationship between knowledge, causal attributions, and measures of explicit stigma were also evaluated. Based on previous literature, an influential aspect of knowledge was familiarity with the mental illness in question. More exposure to individuals with a particular mental illness increases acceptance and understanding as it gives more tangible references for illness characteristics and increased the overall knowledge regarding the illness (Lee et al., 2014). With increased exposure and understanding, previous studies revealed that participants reported lower scores on stigma measures. More familiarity with schizophrenia and depression were associated with lower scores on measures such as perceived dangerousness and social distance (Lee et al., 2014; Grausgruber et al., 2007; Corrigan et al., 2003). The results of the current study supported the findings from the previous research as mental illness familiarity was negatively associated with each stigma measure. However, it was only significantly associated with perceived dangerousness (see Table 3). This may be because dangerousness is a characteristic that the participants viewed as one that could more personally affect them compared to social distance and benevolence. Therefore, more exposure to individuals with schizophrenia or depression would make the lack of dangerousness present in those affected with mental illness more apparent.

**Stigma Measures**

For the perceived dangerousness scale, high scores indicated that the participants perceived the individual with mental illness to be dangerous. Familiarity was a significant predictor for perceived dangerousness, such that less familiarity increased the level of perceived dangerousness. This supported the findings from previous studies (Lee et al., 2014; Grausgruber

et al., 2007; Corrigan et al., 2003). As previously stated, perceived dangerousness may be a variable that has more of a personal impact on the participants than the other two measures, and thus the participants reported higher values suggesting their hesitation about individuals with mental illness. Knowledge was a significant predictor of dangerousness in the final step of the hierarchical regression. Higher knowledge scores predicted lower scores on perceived danger. Discovering that perceived dangerousness can be reduced by more education and more exposure to the mentally ill can greatly help to reform the stigma currently held regarding those affected. Organizations such as university housing, employment recruiters, license distributers (gun, hunting, fishing, etc.), law enforcement, and health care employees can utilize the information regarding the benefit of education and exposure to the mentally ill to reduce the stigma surrounding mental illness and to better the behavior of those encountering such individuals.

The social distance measure did not yield significant results in its two-step regression. Gender, in step one, was the only significant predictor in the regression, such that females reported higher scores of social distance. It was hypothesized that participants would report higher scores on all three social outcome variables for schizophrenia than depression due to the higher level of stigma associated with schizophrenia. Specifically, it was predicted that participants would report higher benevolence scores for schizophrenia, indicating a lack of willingness to help, because of the danger and unpredictability associated with schizophrenia (Lee et. al, 2014). However, it was found that the values for schizophrenia and depression more strongly correlated on all of the measures. In both steps of the regression on benevolence, gender was a significant predictor, such that females reported lower scores. This result supported the findings from Bynum and Reis-Bergan (2014), which found a gender difference on the benevolence scale, such that females reported lower values than males, indicating that females

are more willing to help. Causality was also a significant predictor in the final step of the regression, such that biological etiology for mental illness was associated with lower scores of benevolence. This meant that those who attributed mental illnesses to a biological cause were more likely to help those affected with a mental illness.

**Limitations**

Participant recruitment was a particular difficulty for the current study. Future research could benefit from a more representative sample (e.g. gender, age, and ethnicity) from which to collect data. A more diverse sample would provide research data that would encompass more variety in perceptions regarding mental illnesses as well as the stigma attached to them.

The composite variables of the current study were calculated from only two variables, those of schizophrenia and depression. Future research can further expand on the data by incorporating knowledge and causality scores for at least one or two more illnesses in addition to schizophrenia and depression. For instance, antisocial personality disorder and/or an anxiety disorder could be included in order to obtain a wider knowledge foundation upon which to examine stigma measures. Future research could expand on the evaluation of explicit stigma by following questionnaire scaled with a behavioral situation in which the explicit stigma may be acted upon. For instance, the participants could be placed in a situation in which they would have to decide whether or not to give money to a mentally ill individual, or to share a dorm room with them, or to go on a road trip with an individual with a mental illness. Forcing the individual to interact with an individual with mental illness after responding to stigma outcome measures could provide a more realistic idea regarding the true level of stigma held by the participants.

**Implications and Future Research**

The overall results of the current study highlight, at least in terms of perceived dangerousness, that knowledge plays a role in beliefs. Education about mental illness as a whole, as well as about each individual illness is needed to help change the perceptions that are currently held regarding mental illnesses. More education needs to be provided to reduce the perceived dangerousness surrounding mental illnesses. As previously stated, mental illnesses are currently viewed through the framework of the medical model in which a physical cause and thus a physical/chemical treatment is possible to "fix" the illness, just as we do to heal a broken bone. Mental illnesses need to be understood within a different frame work that provides mental illnesses with the depth of understanding and respect that physical illnesses receive. To improve on the current study, the questionnaire could be given before and after the participants are given educational material about schizophrenia, depression, and mental illnesses in general that describes the illnesses in a format outside of the medical model. Including an educational aspect in the experiment enables the data to be analyzed to determine if knowledge reduces the amount of high scores reported in the current study.

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