

EDUCATION AND MENTAL HEALTH STIGMA: THE EFFECTS OF ATTRIBUTION, BIASED ASSIMILATION, AND ATTITUDE POLARIZATION

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Educational interventions to reduce stigmatizing attitudes about mental illness have not been compared to evaluate their effectiveness. To systematically compare educational interventions college students ($N = 232$) were presented with high and low control explanations (psychosocial vs. biological) of high and low control disorders (addiction vs. schizophrenia), and the effects on the stigmatizing attitudes of blame and social distancing were measured. Perceptions of how persuasive the information was and its impact on attitudes were predicted by preexisting attitudes about mental illness. However, perceptions of the persuasiveness of the educational information were also consistent with attribution theory such that low control (i.e., biological causes and schizophrenia) was associated with less blame. These results illustrate the complexity of attitudes about mental illness and a potential difficulty in changing them.

Stigma can be defined as a social mark that leads to discrediting of members of a group such as people with mental illness (Major & O'Brien, 2005). Stigmatization of mental illness consists of stereotyped attitudes and prejudices held by the public, health care providers, and people with mental illness themselves (Rüsch, Angermeyer, & Corrigan, 2005). The negative effects of this stigma among individuals with mental illness include reduced self-esteem and health care utilization, the perception of public devaluation, and

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discrimination (Corrigan, 2004; Corrigan & Penn, 1999; Corrigan, Watson, & Barr, 2006; Rüsç et al., 2005). Therefore, understanding the causes of stigmatizing attitudes and effective methods of reducing them has wide ranging potential for improving the lives of people with mental illness.

Education is a generally accepted method for reducing stigmatizing attitudes, which has lead many researchers to examine the effects of various educational interventions on mental illness stigma (Griffiths, Christensen, Jorm, Evens, & Groves, 2004; Holmes, Corrigan, Williams, Canar, & Kubiak, 1999; Keane, 1990, 1991; Pinfold et al., 2003; Read & Law, 1999; Walker & Read, 2002; Watson et al., 2004). Although the results of these studies have been valuable, they are not without limitations. For example, the effect of preexisting attitudes on the processing of intervention content has been ignored. In addition, almost no study has experimentally manipulated the content of educational interventions to determine relative efficacy. Finally, little attention has been paid to whether or not interventions have the same effect across different disorders. The purpose of the current study is to address these limitations in order to clarify how type of educational information, type of mental illness, and preexisting attitudes impact stigmatizing attitudes.

ATTRIBUTION THEORY AND STIGMA

Attribution theory deals with how behaviors are explained and the impact of those explanations on the perception of people. Research on stigmas has benefited greatly from the influence of attribution theory. Generally, attribution theory predicts that uncontrollable behaviors are less likely to be stigmatized than controllable behaviors. For example, people have more positive attitudes toward individuals with problems that are biologically caused than those that are behaviorally caused (Dijker & Kooman, 2003; Weiner, Perry, & Magnusson, 1988). Weiner and colleagues demonstrated this effect by comparing attitudes about AIDS, child abuse, drug abuse, and obesity, which are behaviorally caused, and Alzheimer's Disease, blindness, cancer, heart disease, and paraplegia, which are biologically caused. They found that behavioral causes led to less assistance, pity, liking, and more anger than the biological causes. The difference appears to be explained by the relative lack of personal respon-

sibility and control associated biological causes (Dijker & Kooman, 2003; Weiner et al., 1988), and this helps to explain why the label of mental illness may carry more stigmatizing weight than the label of physical illness.

Attribution theory has also been specifically applied to mental illness stigma. Corrigan (2000) theorized that attribution theory partially explains people's reactions to individuals with mental illness. When symptoms are seen as uncontrollable the person with mental illness is deemed not responsible, thus, leading to more helping behaviors and less punishing behaviors. In contrast, when the symptoms are seen as controllable, the person is deemed responsible, which leads to less helping behaviors and more punishing behaviors. Corrigan's theory is supported by research indicating that a person with schizophrenia described as being caused by an accident (i.e., uncontrollable) is responded to with more helping and less punishment than when the cause is described as a result of drug use (i.e., controllable; Corrigan, Markowitz, Watson, Rowan, & Kubiak, 2003). The implication of this research and attribution theory more generally seems to be that depicting mental illness as uncontrollable in anti-stigma interventions should reduce stigmatizing attitudes. Consistent with attribution theory, efforts to battle stigma by professionals (Baker & Menken, 2001; Baker, Kale, & Menken, 2002) and groups such as the National Alliance on Mental Illness have embraced this approach with their portrayal of mental illness as biologically caused medical illnesses of the brain (National Alliance on Mental Illness, 2007).

BIOLOGICAL ATTITUDES AND MENTAL ILLNESS STIGMA

Despite the adoption of a biological approach by groups trying to end mental illness stigma, it is not yet clear that using biological explanations as tools for reducing stigma is always appropriate (Angermeyer & Matschinger, 2005; Corrigan & Watson, 2004). Stigma consists of a multidimensional set of attitudes, emotions, and behaviors. Mental illness stigma can include beliefs that individuals with mental illness are weak or dangerous, emotional reactions such as fear and anger, and behaviors such as avoidance and withholding help (Corrigan & Penn, 1999; Rüsçh et al., 2005). Because of these varying dimensions it may be inaccurate to assume that biological

explanations will have consistent effects across all stigmatizing attitudes.

Findings from correlational research offer some indication that the effect of biological explanations may in fact vary depending on the stigmatizing attitude being measured. Believing that mental illness is biologically caused is related to assigning less responsibility for the illness and less punishment for problems stemming from the illness (Phelan, 2005; Phelan, Cruz-Rojas, & Reiff, 2002). However, believing that mental illness is biologically caused also is related to social distancing (Angermeyer & Matschinger, 2005; Dietrich et al., 2004; Dietrich, Matschinger, & Angermeyer, 2006; Read & Harré, 2001) as well as greater perceptions of dangerousness (Dietrich et al., 2006; Read & Harré, 2001), unpredictability (Read & Harré, 2001), poor prognosis (Phelan et al., 2002; Phelan, Yang, & Cruz-Rojas, 2006), and family risk (Phelan et al., 2002). Therefore, research shows that believing mental illness is the result of biological causes can be related to both positive and negative attitudes; however, these correlational studies may not generalize to actual educational interventions that use biological information in an attempt to reduce stigma.

As a result, there is a need to systematically compare the effects of educational intervention content. Studies have shown that general education about mental illness seems to reduce stigmatizing attitudes (Holmes et al., 1999; Keane, 1990, 1991; Schulze, Richter-Werling, Matschinger, & Angermeyer, 2003). However, the effect of a biological explanation on stigma has been directly examined in only one study (Walker & Read, 2002). Walker and Read found that presenting participants with a biological explanation of schizophrenia increased beliefs that the people with mental illness are dangerous and unpredictable. However the researchers did not assess attitudes, such as blame for the illness, that might have been positively impacted by the biological intervention. As noted above, mental health stigma is a multidimensional concept, and it is necessary to measure multiple outcomes because the same intervention could increase one stigmatizing attitude while reducing another. Walker and Read also only assessed attitudes towards schizophrenia, but causal beliefs may have varying effects based on disorder. For instance, biological beliefs are associated with perceiving people with schizophrenia as dangerous (Read & Harré, 2001), but the same does not

hold true for depression (Goldstein & Rosselli, 2003). Furthermore, one study that directly compared schizophrenia and depression found that biological beliefs were strongly related to desire for social distance with schizophrenia but less so for depression (Dietrich et al., 2004). Thus, the relative contribution of different intervention content towards disorders that may be seen as less controllable (i.e., schizophrenia) versus those that may be seen as more controllable (i.e., addiction) should be explored. In summary, the effects of specific intervention content on various stigmatizing attitudes about disorders that have, comparatively, low and high controllability is a topic that requires more systematic research in order to better understand how to reduce mental health stigma.

BIASED ASSIMILATION AND ATTITUDE POLARIZATION

In addition to the content of the intervention utilized, anti-stigma research thus far has also failed to take into account the influence of preexisting attitudes about mental illness. An unstated assumption seems to be that ignorance about mental illnesses is the cause of stigma, and the most efficient route to ending stigma is to end ignorance. Such logic fails to take into account patterns of information processing, however. Simply providing education about mental illness might be an effective intervention if people were unbiased in how they integrated new information into their preexisting attitudes, but research indicates that such fairness cannot be assumed.

Social psychology research has a long history of demonstrating that individuals do not process information fairly, and attitude polarization is one of the most well-known mechanisms by which this occurs. Attitude polarization is the tendency for individuals to perceive that an attitude has become even stronger after evaluating supportive and contradictory evidence related to that attitude (Lord, Ross, & Lepper, 1979). The underlying cause of attitude polarization is said to be biased assimilation of information. Biased assimilation occurs when supportive evidence is seen as more persuasive than contradictory evidence even when they are of the same quality.

The biased assimilation and attitude polarization phenomena have amassed a small but consistent research literature since the concepts were first introduced. Participants in the original attitude polarization study were selected for their extreme views on capital

punishment (Lord et al., 1979). During the experimental procedure participants read summaries of fictional studies about the effects of capital punishment that were manipulated so that the results either supported or refuted its effectiveness. After completing the readings, participants rated the quality of the studies and the perceived amount of attitude change they experienced after reading about them. Studies that were consistent with participants' preexisting attitudes were rated as more persuasive than studies inconsistent with their preexisting attitudes. Participants also reported perceiving that their attitudes actually became stronger after reading the conflicting evidence. Subsequent research has replicated Lord and colleagues' results with attitudes about capital punishment (Lord, Lepper, & Preston, 1984; Miller, McHoskey, Bane, & Dowd, 1993; Pomerantz, Chaiken, & Tordesillas, 1995), abortion (Pomerantz et al., 1995), environmental issues (Pomerantz et al., 1995), the John F. Kennedy assassination (McHoskey, 1995), presidential debates (Munro et al., 2002), technology failures (Plous, 1991), and homosexuality (Boysen & Vogel, 2008; Munro & Ditto, 1997; Munro, Leary, & Lasane, 2004). To be clear, measuring attitude polarization is not the same as measuring pre post attitude change. Attitude polarization is measured by having individuals rate how much they believe their attitudes have changed. Therefore, the value of attitude polarization is as a measure of information processing and not attitude change per se; nonetheless, attitude polarization does correlate with pre post attitude change and other measures of attitude strength (Miller et al., 1993).

Assessing biased assimilation and attitude polarization has some interesting advantages for understanding efforts to reduce stigmatizing attitudes about mental illness through education. The impact of learning about mental illness is likely to have varying effects based on preexisting attitudes. Educational interventions should be effective among people who have preexisting positive attitude about mental illness; in contrast, they are less likely to be effective among people with preexisting negative attitude about mental illness. Both groups might perceive the same information presented as part of an educational intervention as supportive of their preexisting attitudes. Therefore, the advantage that attitude polarization offers over measurement of pre post attitude change is this insight into how individuals may differentially process information. Perceived attitude

change (i.e., attitude polarization) measures individuals' perceptions of how information has affected them and represents how attitude change occurs and not just the end product. In addition, demonstration of biased assimilation could alter the unstated assumptions about participants in anti-stigma campaigns. Instead of viewing them as passive recipients of stigma reducing facts, participants in educational interventions might be conceptualized as active processors of information who are motivated to maintain consistency with their preexisting positive or negative attitudes. Furthermore, biased assimilation is measured by having participants rate how persuasive information in the intervention is in supporting or refuting their initial attitude and would allow for a better understanding of the weight and impact of individual anti-stigma components. For example, are biological explanations perceived as more persuasive in showing that mental illness should not be stigmatized or are psychosocial explanations perceived as more persuasive?

THE CURRENT STUDY

The current study will attempt to improve on past investigations of mental health stigma by systematically varying causal information about two types of disorders and by measuring the relative impact of this information on two different types of stigma. In addition, we will assess for biases in how individuals process the educational information. This procedure will allow for better understanding of effective methods of reducing stigmatizing attitudes through education. In order to achieve this goal, the current study is an evaluation of a brief educational intervention designed according to attribution theory. Participants will read information about mental illness that suggests either low control (i.e., biological explanations) or high control (i.e., psychosocial explanations). In addition, we will vary the controllability of the mental illnesses. Substance disorders are seen as controllable in comparison to schizophrenia (Schomerus, Matschinger, & Angermeyer, 2005); therefore, participants will read information about schizophrenia (low control) or addiction (high control). We will measure the impact of these experimental conditions on two different types of stigma: blame for the illness and social distance. Finally, by examining biased assimilation and attitude polarization we will be able to determine the extent to which preexisting attitudes in-

fluence anti-stigma interventions. Specifically, we will determine what information individuals perceive as persuasive and its perceived impact on attitude strength.

Based on previous research (Lord et al., 1979; Weiner et al., 1988) we have several hypotheses for the current study. We hypothesize that direction of initial stigmatizing attitudes will lead to biased assimilation and attitude polarization. Individuals with preexisting positive attitudes will perceive the educational information as a significantly more persuasive reason not to stigmatize mental illness than individuals with preexisting negative attitudes; this is the process of biased assimilation. In addition, after the educational intervention individuals with preexisting positive attitudes will perceive their attitudes as becoming significantly more positive toward mental illness than individuals with negative attitudes; this is the process of attitude polarization.

Consistent with attribution theory we hypothesize that disorders perceived as being uncontrollable will elicit significantly more positive attitudes toward mental illness than disorders perceived as being controllable. Specifically, schizophrenia will elicit less blame for the illness and social distancing than addiction. However, the effect of biological explanations and psychosocial explanations will be more complex. Consistent with past research relating biological explanations for mental illness with lowered perceptions of responsibility and increased perceptions of dangerousness (Phelan et al., 2002), we believe that biological explanations will elicit less blame for the illness but will elicit more desire for social distance.

METHOD

Participants

Participants consisted of 232 (male = 88; female = 139; 5 not reporting a sex) undergraduates at a large Midwestern university and a medium sized Northeastern college. Participants volunteered in exchange for credit in psychology courses. The ethnic makeup of the sample was 85% European American, 7% Asian American, 3% African American, 3% Latino/a, 1% Native American, and 2% of other ethnicity. The average participant was 19 years old ($SD = 2$) and had completed 2 semesters of college ($SD = 3$).

Measures

Stigmatizing Attitudes About Mental Illness and Addiction. Following the research procedure set forth in the literature (Lord et al., 1979; Miller et al., 1993) stigmatizing attitudes about *blame* for the illness (from here out referred to as blame) in the schizophrenia condition were measured by having participants rate their agreement with the statements "Mental illness is a sign of weakness" and "Mental illness is the fault of the person who has the illness" on a scale from -4 (extreme disagreement) to 4 (extreme agreement) with 0 being neutral. It should be noted that we used the term mental illness rather than schizophrenia in the surveys because of possible unfamiliarity with the term schizophrenia among participants. In turn, stigmatizing attitudes about *social distance* were measured by having participants rate their agreement with the statements "I would avoid living in a neighborhood with a mental illness treatment center" and "I would date someone who formerly had a mental illness" on the same scale. In the addiction condition, attitudes were measured using the same items with the words "mental illness" replaced with the word "addiction."

Persuasiveness of Educational Information. Consistent with past measurement of biased assimilation (Lord et al., 1979; Miller et al., 1993), participants rated the persuasiveness of four items related to blame ("How persuasive was the reading in showing that mental illness is [is not] a sign of weakness" and "How persuasive was the reading in showing that mental illness is [is not] the fault of the person with the illness") and four items related to social distance ("How persuasive was the reading in showing that dating people who formerly had a mental illness is [is not] OK" and "How persuasive was the reading in showing that it is OK to [you should not] live in a neighborhood with a mental illness treatment center"). The items were rated on a scale ranging from -8 (extremely unpersuasive and unconvincing) to 8 (extremely persuasive and convincing) with 0 being a neutral response. In the addiction condition, attitudes were measured using the same items with the words "mental illness" replaced with the word "addiction." Ratings of persuasiveness make up the assessment of biased assimilation.

Perceived Stigmatizing Attitude Change. Consistent with past measurement of attitude polarization (Lord et al., 1979; Miller et al., 1993) participants reported their perceived attitude change for the two

blame items and the two social distance items by rating how much their attitudes had changed because of the educational information. For example, participants responded to the question "How would you rate your current attitude about mental illness as a sign of weakness compared to your attitude at the start of this experiment?" using a scale from -8 (much less strongly believe that mental illness is a sign of weakness) to 8 (much more strongly believe that mental illness is a sign of weakness) with 0 representing no change. Ratings of perceived stigmatizing attitude change make up the assessment of attitude polarization.

Attention Measures. Participants completed a 5-item quiz on the educational information to assess comprehension and attention. In addition, one item in the biased assimilation and attitude polarization survey asked participants to make a specific response on the scale in order to identify random response patterns. Participants correctly answering fewer than 3 out of 5 questions or not choosing the specified item were eliminated from the analyses. A total of 18 individuals were eliminated from the analysis due to lack of attention.

Educational Information

The educational information consisted of two to three page selections from psychology textbooks. Both the schizophrenia and addiction information followed the same format. The readings began with a description of the disorder and continued with a discussion of either biological or psychosocial causes. In the schizophrenia condition the reading first outlined the symptoms of schizophrenia and then presented evidence for either biological causes such as heredity, brain structure, and neurotransmission or evidence for psychosocial causes such as stress and expressed emotion in families. In the addiction condition the reading first outlined the symptoms of addiction focusing on alcoholism and then presented either evidence for biological causes such as heredity and brain chemistry or evidence for psychosocial causes such as culture, laws, and motivation for taking drugs. No language in the text indicated a positive or negative view of the behaviors.

Procedure

The procedures were completed in small groups. After reading and signing an informed consent document participants were randomly assigned into experimental conditions. Then they completed a de-

mographic survey and the measures of their stigmatizing attitudes (i.e., blame and social distance). Participants were informed that they would be reading a selection from an introduction to psychology textbook and that they would be tested on the material. The experimenter asked them to read the selection as they would if they were studying for an exam and to feel free to take notes or write on the readings, highlight, or take notes. After completing the reading, participants completed the measures of attention, persuasiveness, and perceived attitude change.

RESULTS

Preliminary Attitudes

We first explored individuals' preliminary attitudes about the mental disorders in question. The participants' mean preexisting attitudes fell on positive side of the rating scale. The means of the blame items indicated disagreement with the statements that mental illness is a sign of weakness ($M = -1.40$, $SD = 2.38$) and the person's fault ($M = -1.17$, $SD = 2.66$). Examination of the social distance items indicated that participants were willing to live in a neighborhood with a treatment center ($M = -.63$, $SD = 2.23$) and would date a person who formerly had a mental illness ($M = .20$, $SD = 1.91$).

We also examined if preliminary attitudes supported the contention that the relatively low control disorder of schizophrenia would be perceived more positively than the relatively high control disorder of addiction. All of the preexisting attitudes served as dependant variables for independent samples t tests with disorder condition (Schizophrenia vs. Addiction) serving as the independent variable. With the exception of the attitude about dating a person who formerly had a disorder, $t(211) = .15$, $p = .52$, all of the means were significantly different with schizophrenia being perceived significantly more positively than addiction, all t s > 4.52 , all p s $< .001$. The t test results generally support the validity of our experimental manipulation.

Biased Assimilation and Attitude Polarization

To better understand how individuals process information during anti-stigma interventions we examined whether participants exhibited biased assimilation and attitude polarization. We first hypothesized that biased assimilation would occur. Individuals with

positive attitudes should perceive the readings as significantly more persuasive evidence not to blame and not to keep a social distance than individuals with negative attitudes. In contrast, individuals with negative attitudes should perceive the readings as significantly more persuasive evidence to assign blame and to keep a social distance than individuals with negative attitudes. In order to conduct these analyses we coded participants' initial blame and social distance attitudes as binary variables representing positive or negative attitudes (see Plous, 1991). Then, individuals with preexisting positive attitudes were compared to individuals with preexisting negative attitudes in terms of responses on the persuasiveness items. Specifically, we conducted a separate *t* test for each of the persuasiveness items (i.e., the four blame items: fault, not fault, weakness, and not weakness; the four social distance items: would date, would not date, would live close, and would not live close). We analyzed the individual items rather than a combined scale in order to clearly determine if the educational information could be perceived as a persuasive reason not to hold stigmatizing attitudes and a persuasive reason to hold stigmatizing attitudes. To correct for the number of *t* tests in the analysis, we used a Bonferroni correction on the *p* value ($.05/8 = .006$). Results are presented in Table 1. All but one of the tests was significant, and all differences were in the expected direction. This indicates that biased assimilation took place, which confirms our hypothesis.

Next, we examined if participants exhibited attitude polarization. We hypothesized that the preexisting attitude about the disorders would affect the perceived attitude change items after reading the educational information. Individuals with preexisting positive attitudes should report significantly more positive attitude change than individuals with preexisting negative attitudes. We utilized the previously described binary variables representing initial positive or negative attitudes in these analyses. Individuals with preexisting positive attitudes were compared to individuals with preexisting negative attitudes in terms of responses on the perceived attitude change items using *t* tests. To correct for the number of *t* tests in the analysis, we used a Bonferroni correction on the *p* value ($.05/4 = .0125$). Results are presented in Table 1. All comparisons were significant. This indicates that the direction of initial attitudes lead to significantly different perceived attitude change in the same direction,

TABLE 1. Biased Assimilation and Attitude Polarization Based on Direction of Initial Stigmatizing Attitude Toward Schizophrenia and Addiction

	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i> <
	Negative (n = 64)		Positive (n = 132)			
Biased Assimilation						
Is their fault	-1.05	4.36	-3.87	3.99	4.37	.001
Is not their fault	1.34	4.41	3.80	3.90	3.79	.001
Attitude Polarization						
Fault change	-0.27	3.48	2.13	3.43	4.54	.001
	Negative (n = 54)		Positive (n = 135)			
Biased Assimilation						
Is weakness	0.46	4.05	-3.16	4.06	5.56	.001
Is not weakness	-0.35	3.80	2.15	4.19	3.97	.001
Attitude Polarization						
Weakness change	-1.06	2.84	1.27	3.46	4.78	.001
	Negative (n = 77)		Positive (n = 57)			
Biased Assimilation						
Dating acceptable	-2.75	3.69	-0.48	3.57	3.57	.001
Dating not acceptable	-0.16	4.22	-1.19	3.55	1.50	.125
Attitude Polarization						
Dating change	-1.53	3.17	0.26	2.23	3.34	.001
	Negative (n = 65)		Positive (n = 104)			
Biased Assimilation						
Living acceptable	-1.14	3.22	1.00	3.57	4.03	.001
Living not acceptable	0.03	3.78	-2.51	3.05	4.48	.001
Attitude Polarization						
Living change	-0.81	2.83	1.02	2.45	4.28	.001

Note. All polarization means were transformed so that negative attitudes toward mental illness are represented by negative numbers. All other negative scores represent disagreement with the item.

which confirms our hypothesis. Furthermore, it should be noted that the mean perceived attitude changes in the positive and negative preexisting attitude groups fell on the opposite sides of the neutral point of the scale. Therefore, the same information actually led to perceived attitude change in opposite directions among people with divergent preexisting attitudes.

The Effects of Explanatory Cause and Type of Disorder on Persuasiveness

In order to test the effects of the experimental manipulation on biased assimilation we next examined if the *cause of disorder* and *type of disorder* influenced ratings of the persuasiveness of the educational information. We conducted a multivariate analysis of covariance (MANCOVA) on each of the persuasiveness items with Cause (Bio-

logical vs. Psychosocial) and Disorder (Schizophrenia vs. Addiction) serving as independent variables and the initial corresponding blame or social distance attitude serving as the covariates. We hypothesized that both causal explanations would be perceived as more persuasive reasons not to stigmatize schizophrenia compared to addiction. We also hypothesized that biological explanations, as compared to psychosocial explanations, would be perceived as less persuasive reasons for blame. In contrast, biological explanations, as compared to psychosocial explanations, should be viewed as more persuasive reasons for keeping social distance.

Blame Attitudes. Persuasiveness of the information regarding blame was measured by having participants rate how persuasive the reading was in showing that the disorder is a sign of weakness, is not a sign of weakness, is the person's fault, and is not the person's fault. The two weakness items were used as the dependent variables in one MANCOVA, and the two fault items were used as the dependent variables in another MANCOVA. Results can be seen in Table 2. The main effects of disorder and cause were both significant for the fault items, but only cause was significant for the weakness items. No interactions were significant, all F s < 2.05, all p s > .13, all η_p^2 s < .02. As expected, participants saw biological causes as more persuasive than psychosocial causes in indicating that schizophrenia and addiction are not signs of weakness or the fault of the person with the disorders (i.e., main effect of cause). In addition, information about cause was perceived as more persuasive in showing that schizophrenia is not the fault of the person than showing that addiction is not the fault of the person, but there was no effect on weakness. It should be noted, however, that when the covariate was removed from the analysis the main effect of cause was significant for weakness, $F(1, 207) = 3.98, p < .02, \eta_p^2 = .04$. These results partially support the hypothesis.

Social Distance Attitudes. Persuasiveness of the information on social distance was measured by having participants rate how persuasive the reading was in showing that it is acceptable to date a person or not acceptable to date a person who was diagnosed with one of the disorders and how persuasive the reading was in showing that is acceptable or is not acceptable to live in a neighborhood with a treatment center for one of the disorders. The two dating items were the dependent variables in one MANCOVA, and the two living in the same neighborhood items were the dependent variables in another

TABLE 2. Means, Standard Deviation, and Multivariate Analysis of Covariance Results for Ratings of Persuasiveness of the Educational Information.

Item	Biology n = 105		Psychosocial n = 108		F	p <	η_p^2
	M	SD	M	SD			
Is their fault	-3.76	3.90	-1.80	4.53	9.44	.001	.10
Is not their fault	3.92	3.77	1.83	4.37			
Is weakness	-2.79	3.71	-1.11	4.70	7.33	.001	.07
Is not weakness	2.14	3.87	0.31	4.24			
Dating acceptable	-0.99	3.39	-1.22	3.74	0.08	.93	.00
Dating not acceptable	-0.80	3.45	-0.64	3.95			
Living acceptable	0.43	3.20	0.00	3.84	0.98	.38	.01
Living not acceptable	-1.65	3.33	-1.31	3.60			
	Schizophrenia n = 106		Addiction n = 107				
Is their fault	-4.65	3.68	-0.92	4.13	11.21	.001	.09
Is not their fault	4.30	3.88	1.46	4.05			
Is weakness	-2.66	4.22	-1.21	4.31	.26	.77	.00
Is not weakness	1.87	4.07	0.55	4.16			
Dating acceptable	-0.43	3.83	-1.77	3.17	11.53	.001	.10
Dating not acceptable	-1.70	3.48	0.24	3.68			
Living acceptable	0.58	3.71	-0.16	3.34	3.09	.05	.03
Living not acceptable	-2.38	3.59	-.58	3.38			

MANCOVA. Results can be seen in Table 2. The same pattern of results occurred in both analyses. Only the main effects of disorder were significant. The main effects of cause and the interactions (all F 's < .68, all ps > .51, all η_p^2 's < .02) were not significant. Thus, information about schizophrenia was perceived as more persuasive than information about addiction in showing that social distance should not occur (main effect of disorder). In contrast, the causes of the disorders were perceived as similarly persuasive (no main effect of cause). These results partially support our hypothesis.

The Effects Explanatory Cause and Type of Disorder on Perceived Attitude Change

Next, we examined if type of disorder and the cause of disorder influenced ratings of perceived attitude change due to the educational information presented. We conducted analysis of covariance (ANCOVA) on the four attitude change items with Cause (Biological

vs. Psychosocial) and Disorder (Schizophrenia vs. Addiction) serving as independent variables and the initial corresponding blame or social distance attitude serving as the covariates. We hypothesized that schizophrenia would elicit more perceived positive change in blame and social distancing than addiction. In contrast, we hypothesized that biological explanations would elicit more perceived positive changes for blame than psychosocial explanations, but would elicit more perceived negative change for social distance than psychosocial explanations. However, the only significant result was a main effect of cause on the item asking if schizophrenia or addiction are signs of weakness, $F(1, 208) = 8.35, p < .004, \eta_p^2 = .04$. Compared to the psychosocial condition, the biological condition led to significantly more perceived reduction in the belief that schizophrenia and addiction are signs of weakness. No other main effects or interactions reached significance, all $F_s < 2.54$, all $p_s > .11$, all $\eta_p^2_s < .01$. Although the one significant result was in the expected direction, the lack of consistent significance across the attitude change items leads to a general lack of support for the hypothesis.

DISCUSSION

The purpose of the current study was to systematically examine the processing of information about mental illness. Of special interest were the processes of biased assimilation and attitude polarization, which generally state that individuals do not process information in an unbiased manner; rather, information is seen as supportive of pre-existing attitudes and individuals actually report being more sure of their initial attitude after processing conflicting information. Both biased assimilation and attitude polarization were clearly demonstrated in this study across attitudes related to blaming people with mental illness for their disorders and socially distancing them, which is consistent with previous research (Boysen & Vogel, 2008; Lord et al., 1979; Lord et al., 1984; McHoskey, 1995; Miller et al., 1993; Munro & Ditto, 1997; Munro et al., 2002; Munro et al., 2004; Plous, 1991; Pomerantz et al., 1995). Compared to individuals with negative attitudes, individuals with positive attitudes toward mental illness tended to perceive the educational information as more persuasive evidence not to stigmatize the people with mental illness. Furthermore, people with positive attitudes perceived their attitudes as

more positive after the educational intervention, while people with negative attitudes perceived their attitudes as more negative. Thus, the exact same information had opposite effects on individuals based on the attitude with which they entered the intervention.

Information may have been processed through the filter of preexisting attitudes, but attribution theory partially accounted for the results as well. Attribution theory generally predicts that as responsibility and control are decreased for a behavior, stigmatizing attitudes about responsibility, punishment, and helping should be reduced as well. Thus, less stigmatizing attitudes should be associated with disorders that are perceived as uncontrollable as opposed to controllable. This study's results partially supported this application of attribution theory for ratings of the persuasiveness of the educational information. When controlling for preexisting attitudes, educational information was generally perceived as more persuasive in showing that blame and social distancing should not occur for people with the relatively uncontrollable disorder schizophrenia compared to the relatively controllable disorder of addiction. Similarly, a biological cause was seen as a more persuasive reason not to put personal blame on a person with schizophrenia compared to a person with an addiction. In contrast, application of attribution theory was not supported for perceived attitude change. When controlling for preexisting attitudes, perceived attitude change after the educational intervention was almost completely unaffected by type of disorder or its cause.

The differential effect of the experimental manipulation on persuasiveness and perceived attitude change suggests that educational interventions are processed in a manner generally consistent with attribution theory but that the impact of that processing may not be consistent with attribution theory. With the exception of social distance, participants' beliefs about how persuasive the educational information was in supporting anti-stigmatizing attitudes were consistent with attribution theory. However, this belief did not generally translate into perceived attitude change. In contrast, initial attitude did significantly affect perceived attitude change. One interpretation of these trends is that while perceptions of educational information are predicted by initial attitudes and attribution theory, initial attitudes are the major predictor of perceived attitude change. Such an

interpretation is consistent with the phenomena of attitude polarization.

Based on previous correlational studies (Angermeyer & Matschinger, 2005; Dietrich et al., 2004, 2006; Read & Harré, 2001) we predicted that biological information would be perceived as more persuasive reason than psychosocial information to keep social distance from people with mental illness. This hypothesis was not supported by results; information about cause had no effect on social distancing. This result contradicts a previous study conducted by Walker and Read (2002), but the difference between the measures used in the studies may explain the results. Walker and Read measured perceptions of dangerousness and unpredictability directly while we assessed social distance behaviors that might result from those perceptions. Despite the lack of significant differences, it is important to note that biological information was not associated with decreased stigma as might be expected from attribution theory.

The primary research question at issue seems to be what effect does providing causal information have on mental illness stigma? The results of the current study provide further evidence that causal explanations have varying effects based on the type of stigmatizing attitude being assessed. For example, in this study the biological and psychosocial explanations affected social distance stigma in a similar way. In contrast, biological explanations reduced blame for the disorders relative to psychosocial explanations, which is consistent with Corrigan and Watson's (2004) assertion that reduction of blame is the main positive effect of portraying mental illness as biological. With the multifaceted nature of mental illness stigma, it is not surprising to find that one type of intervention may have divergent effects on various stigmatizing attitudes. Discovery of such varying effects was a primary reason for the systematic comparisons conducted in this study and suggests that future attempts to study anti-stigma interventions need to assess multiple stigmatizing attitudes.

The current study provides mixed evidence for attribution theory. With regard to stigmatizing attitudes related to blame, the results generally illustrated that less control leads to less blame, which is consistent with attribution theory (Wiener et al., 1988). However, social distance attitudes were unaffected by cause but were affected by disorder. In effect, people are not as easily persuaded for or against

the social distancing of people with addictions as they are people with schizophrenia. When considering other illnesses, it is no surprise that type of disorder should be a more powerful determinant of social distancing than cause of disorder. Imagine a person infected either with the highly contagious and deadly Ebola virus or a highly contagious and relatively harmless cold virus. Although the causes of these illnesses are both biologically based, social distancing will vary greatly because the potential consequence of close proximity to one of the infected people is more severe. Presumably, a similar process occurred in the current study when comparing schizophrenia and addiction in terms of social distance; regardless of cause, the negative consequences of being near people with addictions are perceived as more severe than the negative consequences of being near people with schizophrenia. In order to test this assertion future researchers might assess participants' perception of the negative consequences of being near people with the disorders. Overall, our results are consistent with previous researchers' (Corrigan et al., 2003) suggestion that perceptions of the dangerousness affect stigmatizing attitudes independently from attribution of responsibility.

IMPLICATIONS

One of the most important implications for the present study is that stigma should be addressed earlier than in young adulthood. The college students sampled for this study had well-established attitudes about mental illness despite the fact that it was extremely unlikely that they had learned about the topic as part of their college curriculum. Recent surveys of secondary school students indicate that they already know that schizophrenia is a mental illness (Schulze & Angermeyer, 2005), and other research indicates that children's attitudes are established even earlier than secondary school (Watson et al., 2004). The early formation of attitudes is important because, as this study illustrates, preexisting attitudes can have profound effects on the integration of new information. Our research suggests that a child with established negative attitudes about mental illness is less likely to reduce his or her stigmatizing attitudes through education than a child with generally neutral or positive attitudes. Relatively brief interventions with early to late teenagers can have positive effects on their attitudes toward mental illness (Pinfold

et al., 2003; Schulze et al., 2003; Watson et al., 2004); thus, anti-stigma campaigns are likely to be most effective if implement as early as possible in children's education.

One method for reducing mental illness stigma is to encourage contact with people who have mental illnesses (Corrigan & Penn, 1999), and it could offer an effective alternative to informational interventions. Past exposure to people with mental illness predicts current attitudes (Phelan & Link, 2004; Read & Law, 1999; Walker & Read, 2002), and an intriguing research topic would be to examine if contact also leads to biased assimilation and attitude polarization. Some correlational evidence suggests that contact may be less influenced by these biases in information processing than educational interventions. Phelan and Link examined if people's exposure to individuals with mental illness acting in a threatening way increased perceptions of dangerousness. On the contrary, contact with people who have mental illness increased exposure to potential harm from them but also seemed to reduce perceptions of dangerousness. As such, contact with individuals with mental illness may be impactful enough to override evidence supporting stigmatizing attitudes.

A final implication of this study seems to be that the mental illness stigma research needs to expand the range of disorders included in studies. The literature has primarily focused on metal illness generally or the prototypical disorders of schizophrenia and depression. However, differences between schizophrenia and addiction in the present study illustrate that not all disorders are perceived equally. For example, the seemingly impervious nature of social distance attitudes related to addiction suggests that more powerful interventions are necessary for disorders that are perceived to lead to dangerous behavior. Overall, the central question in improving attitudes about mental illness may be what intervention works for what attitude about what disorder?

LIMITATIONS AND FUTURE RESEARCH

Although this study has the advantage of being a systematically controlled experimental investigation into the effects of education about mental illness, it does have several limitations. First, the interventions and measurement were intentionally simple and brief. Although this procedure represents an intervention that occurs as part

of typical education in psychology, it may not have been as powerful as the interventions utilized in some previous studies. As such, a more extensive intervention may have affected participants more dramatically. Second, pre post attitude change was not measured; only persuasiveness and perception of attitude change was measured. Although these constructs provide insight into short-term information processing, they are not the same as long-term attitude change. Third, the sample was limited. Specifically, participants consisted of traditionally aged undergraduates who, presumably due to their interest in psychology, had mostly favorable attitudes toward mental illness.

Future research should first seek to address some of these limitations. Specifically, this study should be replicated with a sample that is more diverse in terms of demographics and attitudes towards mental illness. In addition, the processes of biased assimilation and attitude polarization should be examined when a more extensive intervention is used. It would be particularly interesting to know if educational efforts that span hours or even days still lead some individuals with strong preexisting negative attitudes toward mental illness to emerge from the intervention with those attitudes further polarized. Furthermore, long-term interventions would lend themselves to the measurement of attitude change.

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