

## Natural kind and entitative beliefs in relation to prejudice toward mental disorders

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### Abstract

Mental health campaigns often promote biogenetic beliefs to reduce stigma, but their effectiveness may vary across disorders. Our study ( $N = 127$ ) examined two components of essentialist beliefs—entitative (i.e., characterizing groupness) and natural kinds (i.e., biogenetic)—about two stigmatized mental disorders (schizophrenia, alcoholism) as well as a somatic disorder (Parkinson's disease), and their relation to prejudice. The three disorders significantly differed in natural kind beliefs (Parkinson's highest, then schizophrenia, and alcoholism lowest) and prejudice (alcoholism highest, then schizophrenia, and Parkinson's lowest), but not entitative beliefs. Entitative beliefs, however, was a stronger predictor of prejudice against schizophrenia than natural kind beliefs even after controlling for social dominance orientation and prior contact. Implications for anti-stigma efforts and strategies are discussed.

In the hope of reducing prejudice against individuals suffering from mental illness, anti-stigma campaigns have latched onto the idea of promoting biogenetic causal beliefs or “natural kind” beliefs through attributions of responsibility (e.g., it is not their fault). European and American campaigns directed at increasing the public's conception of mental illness as biogenetic or “an illness like any other,” however, have not necessarily been associated with reduced stigma. In a meta-analysis of 16 studies looking at knowledge and attitudes about mental illness using national representative population samples and national time trends, Schomerus et al. (2012) found a trend toward a greater knowledge of biogenetic models of mental illness (mainly for schizophrenia and depression), as well as a greater willingness among the general public to accept help from professionals for mental illness. Since 1990, however, there has been no change in the stigma attached to mental illness, and in some cases, a worsening of attitudes has been found. This latter effect has usually been reflected by a preference for a greater social distance from afflicted individuals. In order to shed further light on the relation between mental disorder beliefs and stigma, the current study will make a distinction between two types of beliefs about mental disorders (natural kind vs. entitative) and how they may differentially relate not only to stigma about mental disorders (schizophrenia and alcoholism), but also to stigma toward a somatic disorder (Parkinson's).

Although biogenetic causal attributions have been promoted as a means to decrease perceptions of the individual's responsibility for the disorder, perceived responsibility has been found to be unrelated to stigma toward individuals with schizophrenia. Instead, endorsement of biogenetic causal beliefs has been associated with a greater fear that individuals with schizophrenia are dangerous and unpredictable and a greater desire for social distance (Angermeyer, Holzinger, Carta, & Schomerus, 2011; Read, Haslam, Sayce, & Davies, 2006).

Beliefs about alcoholism have also been the focus of anti-stigma campaigns, but the effects of promoting such beliefs differ from those found for schizophrenia. Unlike schizophrenia, perceived responsibility for alcoholism is positively associated to greater stigma, yet biogenetic beliefs about alcoholism are not related to a preference for social distance (Angermeyer et al., 2011). Anti-stigma campaigns that promote alcoholism as an “illness like any other” have not been effective in changing beliefs about responsibility, possibly because people continue to believe alcoholism is something that is voluntarily inflicted and results from “bad character” (Crisp, Gelder, Rix, Meltzer, & Rowlands, 2000; Link, Phelan, Bresnahan, Stueve, & Pescosolido, 1999). In fact, research suggests that the general public does not consider symptoms of alcoholism to be reflective of a mental disorder when compared with schizophrenia (Link et al., 1999;

Schomerus et al., 2011). One large-scale American study found that while more people in 2006 (compared with 1996) endorsed a neurobiological understanding of schizophrenia and depression, alcohol dependence was associated with the smallest increase in biogenetic beliefs (Pescosolido et al., 2010). In the same period of time, attributions of “bad character” in explaining alcohol dependence significantly increased. As a result, stigma remains high for this disorder, and even higher than for schizophrenia (Schomerus et al., 2011).

Stigma can have far-reaching consequences for individuals suffering from mental illness on their ability to obtain housing (Page, 1996) and employment (Wahl, 1999), as well as the quality of their interpersonal relationships (Angermeyer, Beck, Dietrich, & Holzinger, 2004) and of life in general (Graf et al., 2004). Given the mixed findings from current anti-stigma efforts, it is imperative that other methods of reducing public stigma be investigated. One promising line of investigation may be the relationship between essentialist beliefs about mental disorders and stigma. Biogenetic beliefs are just one part of the broader concept of essentialism, a concept that may provide insight on other methods of combating stigma against mental disorders. Thus, the current study examined the components of essentialist beliefs in greater detail.

## **A two-factor model of essentialist beliefs: natural kind and entitative beliefs**

Psychological essentialism is an early-developing cognitive bias that underlies the tendency to believe that certain categories are more natural than others and that there is a true essence defining the members of that category, although one may not know exactly what that “essence” is (Gelman, 2004). Building on research in cognitive and developmental psychology, Rothbart and Taylor (1992) were the first to apply the construct of psychological essentialism to stereotyping and intergroup relations. They argued that people sometimes mistake socially constructed categories (e.g., race) to be natural categories (e.g., animal species) rather than categories that are constructed to represent sets of features apparent on the surface (e.g., skin color). In their seminal work on social categorization, Rothbart and Taylor (1992) focused on two main components of essentialism: immutability and inductive potential. When a social category is essentialized (i.e., perceived to be a natural category), members are understood to be immutable, that is, always belonging to that category. When inferences are made about the members of a group solely based on their category membership, this category is said to have inductive potential; in other words, category membership is informative about that person.

Haslam, Rothschild, and Ernst (2000) also proposed and found empirical support for a two-component model of essentialism that expands on Rothbart and Taylor’s (1992) concepts of immutability and inductive potential. The first factor is comprised of *natural kind beliefs*. This factor includes Rothbart and Taylor’s (1992) immutability belief, along with other beliefs such as discreteness (i.e., category or group membership does not allow a person to belong to other categories or groups), biogenetic essence, stability (i.e., unchanging over time), and possession of necessary characteristics. The second factor is comprised of *entitative beliefs*. This factor includes Rothbart and Taylor’s (1992) inductive potential belief (i.e., informativeness) as well as other beliefs such as uniformity (i.e., similarity among members), inheritance (i.e., members are basically the same underneath despite differences on the surface), and exclusivity (i.e., category excludes members from belonging to other categories). According to Haslam et al. (2000), this second factor represents groups as entities that are coherent, meaningful groups in the world (i.e., reified categories or groups) rather than a mere aggregate of individuals. The entitative factor differs from the natural kind factor in that it goes beyond the notion of a simple biogenetic essence, revealing a richer picture of the links between mental disorder beliefs and stigma beyond biogenetic causal beliefs.

Haslam et al. (2000, Haslam, Rothschild, and Ernst 2002) argued that different social categories vary in the extent to which they are understood as natural kinds and entities. Their empirical data indicate that natural kind beliefs are often elicited with categories based on gender, race, and ethnicity, whereas entitative beliefs are often associated with groups such as gay men, “Jews,” and patients with AIDS. Perceivers also differ in their tendencies to naturalize and reify particular categories, challenging Allport’s (1954) claim that essentializing social categories reflects only a trait-like style.

## **Essentialist beliefs, prejudice, and mental illness stigma**

The extent to which one holds natural kind and entitative beliefs about a certain group has been found to influence one’s prejudice toward that group. In their studies examining essentialist beliefs about a range of categories, Haslam et al. (2000, 2002) found that entitativity ratings, but not natural kind ratings, were negatively correlated with evaluations of 40 social categories (i.e., “how valued or favorable they are regarded in our culture”). Lower-valued social categories (e.g., women, homosexuals) were rated as being more entitative than higher-valued categories (e.g., men, heterosexuals). Prejudice toward gay men was also linked to stronger entitative beliefs and weaker natural kind beliefs, suggesting that groups that are less valued may be perceived

as more entitative and that higher perceived entitativity may be associated with greater prejudice.

Several studies have also found support for an association between essentialist beliefs and mental illness stigma. In Haslam and Ernst's study (2002), research participants were presented with summaries of mental disorders that differed in terms of discreteness, immutability, naturalness, informativeness, and uniformity. Results showed that targeting one aspect of essentialist thinking led to additional inferences about other essentialist beliefs (e.g., modifying beliefs about naturalness resulted in greater beliefs about discreteness) and that changing essentialist beliefs in this way can be associated with increased prejudice. In another study, Phelan (2005) provided participants with vignettes depicting schizophrenia and depression as either being genetically caused (i.e., essentialized) or not. Participants who were led to believe that the disorders were genetically caused were more likely to increase their social distance from the affected target on one of three social distance measures.

More recently, Howell, Weikum, and Dyck (2011) examined the relation between different facets of essentialist beliefs and stigmatizing attitudes (e.g., perceived dangerousness and social distance) toward individuals with mental illness or substance abuse. Results indicated that stronger beliefs of informativeness and discreteness were associated with more stigmatizing attitudes toward individuals with mental illness and substance abuse. Interestingly, believing that the disorder does not have a biological basis was also related to more stigmatizing attitudes toward individuals with substance abuse. Howell et al.'s study (2011) investigated beliefs surrounding individuals with mental illness and substance abuse, but did not focus on specific disorders. Furthermore, beliefs and prejudice related to mental disorders were not directly compared with other types of disorders (e.g., somatic). Their finding that essentialist thinking, specifically those related to biogenetic causes, contributed to the stigma toward some individuals, but not toward others alludes to the importance of focusing on specific disorders when aiming to understand how essentialist beliefs may impact prejudice and stigma.

## The present research

In this study, we examined natural kind and entitative beliefs about two specific mental disorders (schizophrenia and alcoholism), which have been associated with different biogenetic attributions and outcomes (Angermeyer et al., 2011), and one somatic disorder (Parkinson's disease), and how they differentially relate to prejudice toward individuals with the disorder. Four primary hypotheses were tested. First, consistent with research noted previously, showing that people have increased their biogenetic causal attributions for schizophrenia (Schomerus et al., 2012), but less so for alcoholism (Pescosolido et al., 2010), schizophrenia should be associated

with greater natural kind beliefs compared with alcoholism; both schizophrenia and alcoholism should still be associated with less natural kind beliefs than the somatic disorder of Parkinson's. Second, given the literature on mental illness stigma noted previously, it was hypothesized that alcoholism and schizophrenia would elicit more prejudice than Parkinson's disorder. Third, given that mental illness is more stigmatized than somatic illness, schizophrenia and alcoholism should be rated higher in entitativity than Parkinson's disorder.

Previous researchers have noted the need for future research to control for other correlates of stigmatizing attitudes. Thus, in addition to essentialist beliefs, we also investigated the role of specific individual differences that can lead to prejudice against mental illness. Social dominance orientation (SDO), the basic individual difference from social dominance theory (Sidanius & Pratto, 1999), is "a general attitudinal orientation toward intergroup relations, reflecting whether one generally prefers such relations to be equal, versus hierarchical" (Pratto, Sidanius, Stallworth, & Malle, 1994, p. 742). High-SDO people prefer to rank social groups in a hierarchy according to superiority. SDO has been found to be predictive of various types of prejudice, including ethnic prejudice (e.g., Akrami, Ekehammar, & Araya, 2000; Pratto et al., 1994), sexism (Pratto et al., 1994; Sidanius, Pratto, & Bobo, 1996), homophobia (Lippa & Arad, 1999), and prejudice toward individuals with mental illness (Bizer, Hart, & Jekogian, 2012). In addition, we wanted to control for previous contact with individuals having the disorder in question as greater contact has been shown to be associated with reduced levels of stigma (Angermeyer & Matschinger, 1997; Corrigan, Green, Lundin, Kublak, & Penn, 2001; Dannette & Miles, 2008; Read & Harre, 2001). Thus, we hypothesized that compared with natural kind beliefs, entitativity should be a stronger predictor of prejudice toward disorders, while controlling for SDO and contact with individuals having the disorder.

## Method

### Participants

Participants (92 women and 30 men, five unspecified; mean [*M*] age = 21.0, standard deviation [*SD*] = 3.70) were 127 undergraduate students attending a Canadian university. Participants received a course credit or a movie ticket for completing a study examining "perceptions of mental illness." Participants self-identified as White (*n* = 45), South Asian (*n* = 21), Asian (*n* = 14), Black (*n* = 10), "mixed" (*n* = 8), or "other" (*n* = 22).

### Procedure and measures

After providing informed consent, participants completed an online questionnaire. Each participant was randomly assigned to one of the three conditions Parkinson's disease

**Table 1** Factor Loadings and Cross Loadings for Natural Kind Beliefs and Entitative Beliefs

Items	Factor	
	1	2
<b>Natural kind beliefs</b>		
X disorder is caused by biological factors. (naturalness)	.93	-.06
X disorder symptoms and/or behaviors are innate genetically based tendencies. (naturalness)	.73	.11
People cannot change whether they have X disorder. (immutability)	.49	-.02
Doctors and psychologists can help cure X disorder so that the person no longer has it. (immutability; reverse-scored)	.32	-.12
<b>Entitative beliefs</b>		
X disorder is an informative disorder, so that knowing someone has schizophrenia tells us a lot about the person. (informativeness)	-.11	.63
X disorder is a relatively uniform disorder, so that people with schizophrenia are very similar to one another. (uniformity)	.01	.61
X disorder is a disorder that has an underlying reality, so that beneath the surface (i.e., their symptoms) people with schizophrenia are inherently the same. (inherence)	.21	.63
X disorder is a category that is exclusive; such a category does not allow a person to belong to other categories. (exclusivity)	.18	.61

Note. The same items were used for all three conditions (schizophrenia, alcoholism, and Parkinson's disorder), with the name of the disorder replacing "X disorder." The aspect of natural kinds or entitative beliefs captured by each item appears in brackets.

( $n = 36$ ), schizophrenia ( $n = 44$ ), or alcoholism ( $n = 47$ ). Questionnaire items were geared toward the disorder in question and associated with 7-point Likert-type scales ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Readers read a brief description of the purpose of the study (i.e., "to obtain perceptions of mental illness") and directed immediately to the ratings scales; no other information was provided about the disorders. Upon completing the primary measures described below, participants were asked for demographic information (e.g., age, gender), thanked, and fully debriefed.

### Natural kind beliefs

This measure was based on the essentialist belief scale used by Haslam and Levy (2006). Some of the original items were revised or removed because they either did not apply to mental disorders or failed to prove effective in a pilot study.<sup>1</sup> A principal components factor analysis of the 10 items indicated that they did not load onto a common factor. The eigenvalues and the scree plot suggested a three-factor solution, which was examined following a Varimax rotation. Only the first factor was considered, as multiple items were associated with substantial factor loadings (i.e., greater than .59). The four items from this factor reflected the naturalness and immutability aspects of essentialism, and they were averaged to provide a single measure of the "natural kind" dimension with higher scores indicating greater naturalization of categories,  $\alpha = .71$ .

<sup>1</sup>Four causal essence items (e.g., the thing that is shared by all people with schizophrenia causes or determines the symptoms these people display) used by Ahn, Flanagan, Marsh, & Sanislow (2006) were excluded because of poor internal consistency reliability.

### Entitativity

This measure was based on three items used by Haslam and Ernst (2002) with the addition of one item assessing the perceived exclusivity of group membership.<sup>2</sup> A principal components factor analysis revealed that all four items loaded on a common factor that reflected the entitative aspect of categories (i.e., informativeness, uniformity, inherence, exclusivity). Responses were averaged to provide a single measure of perceived entitativity, with higher scores indicating greater entitative beliefs about that category,  $\alpha = .71$ .

A maximum likelihood factor analysis of the eight items used to assess entitative and natural kind beliefs called for a two-factor solution based on the scree plot. Following a Varimax rotation of the two factor solution, natural kind belief items all loaded more highly in the first factor, which accounted for 22% of the variance, and entitative belief items all loaded more highly on the second factor which accounted for 20% of the variance. All items and their associated factor loadings and cross loadings can be found in Table 1.

### Prejudice

Seven items from the rejection dimension of the mental disorder prejudice scale (Tanaka, Inadomi, Kikuchi, & Ohta, 2004) were modified to assess prejudice against individuals

<sup>2</sup>Five items measuring perceived similarity and organization among members (e.g., the level of interaction between members; the degree of common fate) based on the concept of entitativity used by Demoulin, Lyens, and Yzerbyt (2006) and based on Campbell's (1958) conceptualization of entitativity were excluded because of poor reliability. This is consistent with research by Rutchick, Hamilton, and Sack (2008) indicating that perception of the entitativity of categorical groups is based less on interaction and more on similarity.

with schizophrenia, alcoholism, and Parkinson's disease. This measure of social distance was chosen as measures of social distance are commonly used to measure discriminatory attitudes toward people with mental illness (Angermeyer et al., 2011). Responses were averaged to provide a score of prejudice with a higher score indicating more prejudice toward individuals suffering from the disorder,  $\alpha = .87$ . Example items were "I would not be comfortable living with a person who has schizophrenia" and "I would prefer not to work with someone who has Parkinson's disease."

### SDO

A 15-item measure assessed an individual's tendency to separate *us* from *them* and to hierarchically order social groups (Pratto et al., 1994). Responses were averaged such that high scores indicated a stronger SDO,  $\alpha = .92$ . Example items were "some groups of people are simply inferior to other groups" and "it's probably a good thing that some groups are at the top and other groups are at the bottom."

### Contact

Participants were asked four questions about previous contact they had with the disorder to which they were assigned (e.g., participation in volunteer activities aimed at helping individuals with the disorder, contact with the person believed to have the disorder in question) as well as their own personal experience suffering from any mental illness. Participants' yes-or-no responses were summed, for a total ranging from 0 to 4; a higher score was indicative of greater contact. Forty-one percent of participants ( $n = 57$ ) had no personal experience with individuals suffering from the disorder in question. No participants reported suffering from their assigned disorder.

## Results

### Differences across disorders

A series of one-way analyses of variance were conducted to test for group differences on the primary measures (natural kind, entitativity, prejudice). Analyses were originally conducted with gender as a second independent variable, but no significant main or interaction effects were associated with gender. Subsequent tests of means used a Tukey honestly significant difference procedure. *M*s and *SD*s associated with these analyses are presented in Table 2.

The first hypothesis that the three disorders would differ in natural kind beliefs was supported,  $F(2, 124) = 45.40$ ,  $p < .001$ ,  $\eta^2 = .42$ . Alcoholism was associated with lower mean ratings on the natural kinds beliefs scale than schizophrenia and Parkinson's disease,  $ps < .001$ . Schizophrenia was also lower in natural kind beliefs than Parkinson's disease, but this difference was marginally significant,

**Table 2** Descriptive Statistics by Condition for All Primary Measures

Measures	Condition		
	Parkinson's disease <i>M</i> ( <i>SD</i> )	Schizophrenia <i>M</i> ( <i>SD</i> )	Alcoholism <i>M</i> ( <i>SD</i> )
Natural kind beliefs	5.23 (.85)	4.70 (1.08)	3.16 (1.14)
Entitativity	3.45 (1.06)	3.97 (1.42)	3.45 (1.20)
Prejudice	2.70 (1.18)	3.48 (1.35)	4.66 (1.11)

*M* = mean; *SD* = standard deviation.

$p = .066$ . The second hypothesis that there would be a condition effect for prejudice (preference for social distance) was also supported,  $F(2, 122) = 27.32$ ,  $p < .001$ ,  $\eta^2 = .31$ . Alcoholism elicited the highest level of prejudice, followed by schizophrenia, which elicited more prejudice than Parkinson's disease,  $ps < .02$ .

The third hypothesis that schizophrenia and alcoholism would be perceived as more entitative compared with Parkinson's disorder was partially supported,  $F(2, 124) = 2.54$ ,  $p = .08$ ,  $\eta^2 = .04$ . The pairwise differences between the three conditions in mean entitativity ratings were not significantly different from each other. However, when using one-tailed tests of the a priori hypothesis, the mean entitativity rating for schizophrenia was significantly higher than the mean rating for alcoholism,  $t(89) = 1.91$ ,  $p = .03$ ,  $d = .40$ , and Parkinson's disease,  $t(78) = 1.82$ ,  $p = .04$ ,  $d = .42$ .

### Regression analyses

The fourth hypothesis was that compared with natural kind beliefs, entitativity should be a stronger predictor of prejudice toward disorders, while controlling for SDO and contact with individuals having the disorder. As seen in Table 3, the zero-order correlations between the primary measures indicated that neither natural kind beliefs nor entitative beliefs were significantly correlated with prejudice toward alcoholism. Thus, our hypothesis was tested only for Parkinson's disease and schizophrenia. Hierarchical regression analyses were conducted separately for the two disorders, where control variables (SDO and contact) were entered in the first step, and natural kind beliefs and entitative beliefs were entered in the second step. The standardized coefficients for the variables at each step are presented in Table 4.

Results indicated that SDO, but not prior contact, significantly predicted prejudice against individuals with Parkinson's and remained a strong predictor when beliefs were included in the model,  $p < .002$ . While controlling for SDO and contact, natural kind beliefs was a marginally significant predictor of prejudice,  $p = .064$ , with stronger beliefs related to more prejudice. Entitative beliefs, however, was not a significant predictor of prejudice associated with Parkinson's,  $p = .11$ . The addition of natural kind and entitative beliefs as



**Table 3** Correlations of Key Variables with Prejudice by Condition

Disorder	Variable	Prejudice	Natural kind	Entitativity	Contact
Parkinson's disease	Natural kind	.30			
	Entitativity	.41*	.09		
	Contact	.17	-.05	-.06	
	SDO	.64***	.07	.29	.20
Schizophrenia	Natural kind	.05			
	Entitativity	.53***	-.18		
	Contact	-.41**	.06	-.41**	
	SDO	.35*	-.02	.53***	-.27
Alcoholism	Natural kind	.23			
	Entitativity	.20	.16		
	Contact	.07	.24	-.01	
	SDO	.21	.20	.16	-.00

Note. SDO = social dominance orientation. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

**Table 4** Hierarchical Regression for Predicting Prejudice with Mental Illness Beliefs while Controlling for SDO and Contact

Predictor	Prejudice			
	Parkinson's disease		Schizophrenia	
	Step 1	Step 2	Step 1	Step 2
SDO	.62***	.53**	.26 <sup>†</sup>	.09
Contact	.07	.11	-.35*	-.25
Natural kind beliefs		.25 <sup>†</sup>		.13
Entitativity beliefs		.22		.37*
$R^2$	.41	.52	.24	.33
$\Delta R^2$		.11		.10
$F/\Delta F$	11.04***	3.36*	5.98**	2.77 <sup>†</sup>

Note. Standardized beta coefficients are reported;  $\Delta$  = increment of change; SDO = social dominance orientation. <sup>†</sup> $p < .10$ . \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

predictors significantly increased the proportion of variance explained by SDO and contact alone,  $\Delta R^2 = .11$ ,  $F(2, 30) = 3.36$ ,  $p = .048$ . The final model for Parkinson's disease accounted for a significant proportion of variance in prejudice against individuals with this disorder,  $R^2 = .52$ ,  $F(4, 30) = 8.02$ ,  $p < .001$ .

A different pattern emerged for predicting prejudice associated with schizophrenia. SDO positively predicted (although marginally significantly),  $p = .08$ , and contact negatively predicted,  $p = .02$ , prejudice against individuals with schizophrenia; both SDO and contact, however, were no longer significant predictors when beliefs were entered in the second step. Unlike the case for prejudice related to Parkinson's disease, prejudice related to schizophrenia was significantly predicted by entitativity beliefs,  $p = .036$ , but not by natural kinds,  $p = .33$ . The increase in proportion of variance explained when natural kind and entitativity beliefs were added to the model was marginally significant,  $\Delta R^2 = .10$ ,  $F(2, 37) = 2.77$ ,  $p = .076$ . The final model accounted for a signifi-

cant proportion of variance in prejudice against individuals with schizophrenia,  $R^2 = .33$ ,  $F(4, 37) = 4.65$ ,  $p = .004$ .<sup>3</sup>

## Discussion

Like many other socially constructed groups or categories of people, individuals with mental illness have been associated with varying types of biogenetic beliefs (e.g., Angermeyer et al., 2011) that can influence how other people view or act toward them (e.g., Howell et al., 2011; Phelan, 2005). The current research examined two types of essentialist beliefs and their relation to prejudice toward individuals afflicted with one of three disorders (Parkinson's disease, schizophrenia, alcoholism). Four hypotheses were tested and largely supported.

Natural kind beliefs are thought to reflect a group's underlying essence that is immutable, discrete, and unchanging over time (Haslam et al., 2000). This underlying essence is often biological in nature, so it was hypothesized that natural kind beliefs would be more prevalent for somatic disorders than for mental disorders. In line with our prediction, Parkinson's disease was associated with stronger natural kind beliefs than alcoholism and somewhat stronger natural kind beliefs than schizophrenia. Furthermore, schizophrenia elicited stronger natural kind beliefs than alcoholism, which is consistent with Pescosolido et al.'s (2010) finding that biogenetic

<sup>3</sup>Although not part of our primary hypotheses, we also explored whether natural kind and entitativity beliefs predicted prejudice differentially for Parkinson's disease and schizophrenia by including these two conditions in the model. Using a hierarchical regression analysis with prejudice as the outcome variable, SDO and contact were entered in Step 1, natural kind and entitativity beliefs were entered in Step 2, and the interactions between condition (dummy-coded 0 = Parkinson's, 1 = schizophrenia) and each type of belief (centered) were entered in Step 3. Neither interaction term was statistically significant,  $ps > .68$ . In addition, including the interaction terms in Step 3 did not significantly increase the amount of proportion of variance in prejudice explained by the model,  $\Delta R^2 = .002$ ,  $F(2, 70) = .09$ ,  $p = .91$ .

beliefs were endorsed for schizophrenia and depression more so than for alcohol dependence among Americans.

Entitative beliefs, the other type of essentialist belief, are usually attributed to groups or categories that are perceived as uniform, coherent, and exclusive (Haslam et al., 2000). Groups associated with strong entitative beliefs tend to be objectified as socially meaningful entities in the world and do not reflect a biogenetic basis; thus, mental disorders should elicit stronger entitative beliefs than a somatic one. Although the omnibus test of differences across the three disorders was only marginally significant, a priori pairwise comparisons revealed that schizophrenia was associated with stronger entitative beliefs than Parkinson's disease. Surprisingly, schizophrenia was also associated with strong entitative beliefs than alcoholism. It is possible that alcoholism may not be seen as a legitimate category or representative of a group of individuals to the same extent as schizophrenia. In fact, some studies have demonstrated that the public perceives symptoms and behaviors of alcoholism to be less indicative of mental illness compared with symptoms and behaviors of schizophrenia (Link et al., 1999; Schomerus et al., 2011). Thus, symptoms of alcoholism may be regarded as stemming from a person's traits and disposition (e.g., bad character; Crisp et al., 2000; Link et al., 1999) rather than a reified category.

Participants also differed in their level of prejudice toward individuals having a disorder. As hypothesized, schizophrenia elicited significantly more prejudice than Parkinson's. Alcoholism was associated with an even higher level of prejudice than schizophrenia. This finding is consistent with previous work by Schomerus et al. (2011) that showed that alcohol dependence is even more stigmatized than schizophrenia. Despite anti-stigma efforts, the public may still perceive individuals with alcoholism as being ultimately responsible for their condition, more so than for other mental or somatic disorders (Crisp et al., 2000; Link et al., 1999).

Finally, the hypothesis that entitative beliefs would be a stronger predictor of prejudice than natural kind beliefs was supported for schizophrenia. Although SDO and prior contact with the disorder had significant zero-order correlations (positively and negatively, respectively) with prejudice toward individuals with schizophrenia, entitative beliefs about schizophrenia positively predicted prejudice over and above SDO, contact, and natural kind beliefs. A different pattern of results emerged for predicting prejudice associated with Parkinson's. SDO was the strongest predictor of prejudice toward individuals with Parkinson's, followed by natural kind beliefs; neither entitative beliefs nor contact were significant predictors when accounting for the effects of SDO and natural kind beliefs. Although natural beliefs was a marginally significant predictor of prejudice against Parkinson's in this study, the sample size for each condition was relatively small, especially given the number of predictors; with a larger sample, the moderate coefficients might have reached con-

ventional levels of statistical significance. Nonetheless, our results provide some evidence that prejudice against individuals with different disorders is likely related to different types of essentialist beliefs. Specifically, higher levels of prejudice for somatic disorders such as Parkinson's might be related to stronger natural kind beliefs and individual differences in SDO whereas higher levels of prejudice for mental disorders like schizophrenia might be most related to entitative beliefs.

Another interesting finding was that neither natural kind nor entitative beliefs were associated with prejudice for alcoholism. Given that some people believe that alcoholism is voluntary and reflective of an individual's character (Crisp et al., 2000; Link et al., 1999), it is likely that explicit beliefs about dangerousness, unpredictability, and responsibility are more closely linked to prejudice toward alcoholism (Martin, Pescosolido, & Tuch, 2000) than the types of essentialist beliefs that were examined in the present study. Our finding emphasizes the need for researchers to investigate other kinds of beliefs and attributions surrounding alcoholism in order to improve the effectiveness of anti-stigma campaigns, which continue to espouse biogenetic beliefs about alcoholism being an "illness like any other."

Even though there is robust evidence for the association between increased contact and reduced stigma (Angermeyer & Matschinger, 1997; Corrigan et al., 2001; Couture & Penn, 2003; Dannette & Miles, 2008; Read & Harre, 2001), entitative beliefs predicted prejudice toward individuals with schizophrenia more strongly than natural kind (or biogenetic) beliefs as well as contact. Our finding underscores the importance of developing a better understanding of entitative aspects of the disorder beyond biogenetic information (i.e., that target entitative beliefs). Campaigns that combine efforts that target entitative perceptions with those that encourage contact between the general public and those suffering from mental illness could be a promising avenue for combating mental illness stigma.

The present study was limited in that it did not examine the extent of participants' prior knowledge about the disorders, which may certainly affect their beliefs about individuals with the disorders. In addition, examination of beliefs about responsibility and blame may have been worthwhile given the strong association between these beliefs and mental illness stigma, but were not measured in the current study. Generalization of the present findings is also restricted given that an undergraduate sample may not be representative of the general population. Future studies should attempt to replicate these findings in the general population using larger samples and would also benefit from examining several DSM diagnostic categories and control categories to yield more meaningful results.

Our findings highlight the potential benefits of further research into the concept of entitativity as the basis for anti-stigma efforts targeting the general population, or at

least students. This may be especially important for targeting prejudice against schizophrenia as it is highly promoted by anti-stigma campaigns to be biogenetic, yet it does little to curb stigma associated with the disorder (Schomerus et al., 2012). Although the study of entitativity is nascent in the

field of anti-stigma research for mental illness, further research in this area could reveal new ways to educate the public about disorders, move beyond advocating biogenetic causal beliefs, and improve the lives of individuals suffering from mental illness.

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