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Sixty-nine undergraduates believed that they would meet a man with schizophrenia. They then read a bogus scientific article that attested to a categorical view of schizophrenia, a continuum view, or that merely described schizophrenia. Some participants then completed a task that required reflection on their differences from (categorical group) or similarities to (continuum group) the man with schizophrenia. Participants eventually moved to an adjacent room and sat in one of several seats that varied in their proximity to a seat ostensibly occupied by the man with schizophrenia.

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The continuum intervention decreased self-reported social distance and the categorical intervention increased endorsement of damaging stereotypes. Seat selection was unaffected by our manipulation, but we obtained evidence of significant links to validated stigma measures.

Limitations

Our sample was small, and our behavioral stigma measure could be modified to maximize variability in participants' seat selection.

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The study offers modest support of the stigma reduction effect of continuum belief intervention. It offers new evidence of the pernicious consequences of interventions that inflate perceptions of the "otherness" of individuals with psychiatric problems. Finally, it shines new light on stigma-related behavior measurable in the laboratory.

Disciplines

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Do Continuum Beliefs Reduce Schizophrenia Stigma? Effects of a Laboratory
Intervention on Behavioral and Self-Reported Stigma

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Conclusions: The study offers modest support of the stigma reduction effect of continuum belief intervention. It offers new evidence of the pernicious consequences of interventions that inflate perceptions of the "otherness" of individuals with psychiatric problems. Finally, it shines new light on stigma-related behavior measurable in the laboratory.

Keywords: psychiatric stigma; continuum beliefs; schizophrenia

1. Introduction

Public stigma of mental illness is a persistent problem. Individuals with psychiatric problems are commonly viewed as dangerous (Phelan, Link, Stueve, & Pescosolido, 2000), violent (Wahl, 1995), incompetent (Sadler, Meagor, & Kaye, 2012), and weak (Olmstead & Durham, 1976). These damaging stereotypes substantially impede the ability of individuals with psychiatric problems to lead satisfying lives. Indeed, public stigma reduces their ability to establish meaningful social connection (Sayce, 2000) and secure employment (Bordieri & Drehmer, 1986; Farina & Felner, 1973), educational opportunities (Van Brakel, 2006), and housing (Page, 1977). Most stakeholders acknowledge that psychiatric stigma is a serious social problem and an important target of policy aimed at improving mental health care (Hogan, 2003; World Health Organization, 2001).

Beliefs that people possess regarding the nature and causes of psychiatric problems predict stigma and could be promising targets for stigma reduction intervention. For example, strong belief in biomedical underpinnings of psychiatric problems, which may encourage outgroup categorization of affected individuals, leads to prognostic pessimism, avoidance, and stronger endorsement of damaging stereotypes (Haslam & Kvaale, 2015). In contrast, continuum beliefs center on the idea that psychopathology and normality are separate points on a single, fluid continuum. In this view, individuals with psychiatric problems are not categorically different from others; rather, continuum beliefs emphasize similarities between psychopathology and the ordinary distress to which everybody is vulnerable. There is a small but growing correlational literature that indicates that continuum beliefs are related to more positive and less negative emotional reactions, less desire for social distance, and weaker endorsement of damaging stereotypes (Angermeyer, Millier, Rémuzat, Refai, Schomerus, & Toumi, 2014;

Makowski, Mnich, Angermeyer, & von dem Knesebeck, 2016; Schlier, Scheunemann, & Lincoln, 2016; Schomerus, Matschinger, & Angermeyer, 2013; Thibodeau, 2016; Wiesjahn, Brabban, Jung, Gebauer, & Lincoln, 2014; Wiesjahn, Jung, Kremser, Rief, & Lincoln, 2016). These correlational findings have inspired enthusiasm for the development of stigma reduction programming centered on encouraging the public's embrace of continuum beliefs (e.g., Makowski et al., 2016; Wiesjahn et al., 2016). However, the correlational literature, which taps ordinary variation in beliefs that people already possess and arrived at on their own, does very little to inform the stigma reduction prospects of continuum belief manipulation.

There are now, as far as we can tell, four published papers that have examined experimental effects of continuum belief manipulation on psychiatric stigma. In one study (Schomerus et al., 2016), online volunteers read a newspaper-like text summarizing a continuum view of psychiatric problems, a similar text summarizing a categorical view, or no text at all. The volunteers then read a case vignette of a woman with depression or schizophrenia. Results indicated that, compared to the no-text control, the continuum manipulation led to decreased appraisals of differentness, decreased desire for social distance, and decreased blame. However, for blame, the continuum versus categorical condition comparison was nonsignificant, a pattern suggestive of a nonspecific effect of intervention rather than a unique effect of continuum intervention, specifically.

In another study (Wiesjahn et al., 2016), online volunteers read a text attesting to a continuum view of schizophrenia, a similar text attesting to a biogenetic view, or no text at all. Participants then completed scales capturing schizophrenia stigma. The single significant effect that emerged was very small: continuum intervention led to decreased appraisals of incompetence/unpredictability ($d = .10$).

In a third study (Thibodeau, 2016), online volunteers read a detailed description of a young man with schizophrenia and were then randomized to read either a summary of research attesting to a continuum view of schizophrenia, a summary of research attesting to a categorical view of schizophrenia, or no additional material. There was no evidence that the experimental manipulation affected self-reported stigma of the young man with schizophrenia.

Finally, Corrigan and colleagues (2016) asked online volunteers to watch short videos that attested to a continuum view of schizophrenia, attested to a categorical view, or that merely described schizophrenia. Results indicated that the continuum intervention led to decreased appraisals of the differentness of people with schizophrenia, a finding that could be interpreted as tantamount to a successful manipulation check. Results also showed that the continuum intervention led to increased appraisals of the recovery prospects of individuals with schizophrenia.

These results are promising, but taken together, they offer only limited support for continuum intervention as a stigma reduction strategy. Possible reasons for the mostly underwhelming results are worth pondering. First, efforts to encourage the embrace of continuum beliefs may be fraught by defensive resistance. That is, belief in the “otherness” of individuals with psychiatric problems may be useful insofar as it affords safe psychological distance from mental illness, a plight that is universally dreaded. Continuum intervention, which explicitly aims to weaken perceptions of “otherness,” could be met with an increase in perceived vulnerability and, ultimately, defensive rejection (Thibodeau, 2016). Second, continuum intervention may strip psychiatric problems of medical legitimacy, in which case people’s struggles could be appraised as arising from moral weaknesses or defects of character (Gergel, 2014). We focus on a third possibility in the present article. All of the experimental studies of

continuum intervention carried out to date have involved weak, text-based manipulations carried out strictly online. It is thus possible that the experimental methodology executed to date underestimates the promise of continuum intervention because it has permitted only weak tests of its efficacy. More potent, laboratory-based manipulations are clearly needed to provide stronger tests of the stigma reduction prospects of continuum intervention.

Laboratory-based research would help to address another important shortcoming of the small literature on continuum intervention, specifically, and research on psychiatric stigma, generally. That is, self-report measurement dominates the scientific literature on psychiatric stigma (Hinshaw & Stier, 2008). Self-report measurement is subject to well-known limitations across the spectrum of psychological science (Wilson & Nisbett, 1978), but these problems may be especially acute in the context of psychiatric stigma research. The public's endorsement of explicit bias toward various groups is increasingly socially unacceptable, and thus, it has waned (Rudman, Ashmore, & Gary, 2001). Frank reporting of negative attitudes toward individuals with psychiatric problems may be uniquely socially undesirable. Laboratory-based research would permit measurement of stigma-relevant behavior – an intrinsically important outcome – that has been impossible in the online experimental research conducted to date on continuum intervention.

The present study examines effects of a laboratory-based manipulation of continuum beliefs on several indices of psychiatric stigma, including a novel behavioral measure. Undergraduates were led to believe that they would meet a man with schizophrenia (“Allen”) and were then randomized to read a bogus scientific article that (1) attested to a categorical view of schizophrenia, (2) attested to a continuum view, or (3) merely described schizophrenia. Some participants then completed a task that required written reflection on their differences from

(categorical group) or similarities to (continuum group) the man with schizophrenia. After completion of several self-report measures of psychiatric stigma, they moved to an adjacent room and sat in one of several seats that varied systematically in their proximity to a seat they thought was occupied by the man with schizophrenia (a substantial modification of a procedure developed by Macrae, Bodenhausen, Milne, & Jetten, 1994; see also Bessenoff & Sherman, 2000).

We expected that this laboratory-based procedure would lend itself to a more potent manipulation of continuum beliefs than the text-based, online manipulations carried out to date. First, ours is the first study that asks participants to confront categorical or continuum information in an ostensible scientific article. This approach marshals scientific authority to maximize the legitimacy of the information. Second, we think that the follow-up task that we described previously is very important. The personal application of categorical or continuum information should facilitate participants' unearthing of potentially powerful supporting evidence, derived from one's own experience, of the information's veracity. It should also increase the emotional salience of information that could otherwise be appraised as academic, abstract, and inaccessible. Finally, we assume that the expectation of a personal encounter with a man with schizophrenia will increase participants' engagement with the articles that deliver the experimental manipulation, rendering them more vivid, compelling, and ultimately, effective.

We hypothesized that the continuum group, compared to the categorical and control groups, would show decreased self-reported psychiatric stigma. We made a similar prediction regarding our novel behavioral measure, but this hypothesis is necessarily more tentative in light of the measure's first use here. As a critical step toward establishing its validity, we also undertook a series of analyses that explored correlations between seat selection and validated

self-report measures of psychiatric stigma. We expected the emergence of statistically significant but modestly sized correlations, a pattern that would reflect measurement of a common construct but also meaningful divergence in the stigma-related processes they capture.

2. Method

2.1 Participants

Sixty-nine undergraduates (56 women, 12 men, one participant declined to indicate biological sex; 82.6% White; M age = 18.7, SD = 2.3) participated for course credit. Participants were randomly assigned to the categorical ($n = 22$), continuum ($n = 24$), or control ($n = 23$) conditions.

2.2 Measures

Self-reported stigma was indexed using three tools. The Social Distance Scale (SDS; Link, Cullen, Frank, & Wozniak, 1987) includes seven items that measure respondents' willingness to engage, at varying degrees of closeness, with a target person (e.g., "How would you feel about being a worker on the same job as someone like Allen?"). Responses were recorded on four-point scales (1 = definitely willing, 4 = definitely unwilling).

A 10-item measure of emotional reactions (Schomerus et al., 2013) was administered. Consistent with previous work, items were grouped into fear (e.g., "I feel insecure"), anger (e.g., "I feel annoyed"), and pro-social (e.g., "I feel the need to help") categories. Responses were recorded on five-point scales (1 = strongly disagree, 5 = strongly agree).

A 12-item semantic differential tool (Olmsted & Durham, 1976) was administered to measure stereotyped attitudes. Respondents rated both "Allen" and "Average Man" on seven-point scales anchored by bipolar adjectives (e.g., strong-weak, safe-dangerous, valuable-worthless). Difference scores for all 12 items were then computed by subtracting ratings for

“Average Man” from ratings for “Allen.” The 12 items were then averaged to form an overall index of stereotyped attitudes. We also executed separate analyses of two items, safe-dangerous and predictable-unpredictable, given their special relevance to schizophrenia stigma.

To evaluate the effects of the experimental manipulation, we administered a four-item scale that measured participants’ endorsement of continuum (e.g., “Anybody could develop schizophrenia under the right circumstances”) and categorical (e.g., “Symptoms of schizophrenia represent clear departures from the way normal people function”) views of schizophrenia (see Thibodeau, 2016). Responses were recorded on four-point scales (1 = strongly disagree, 4 = strongly agree).

2.3 Procedure

Participants were run individually. Upon arrival at the laboratory, they were told that the study – which aimed to measure college students’ knowledge of mental illness – was conceived via a collaborative partnership between the college’s psychology department and a local mental health advocacy organization. Participants were then told that they would momentarily meet the organization’s “community outreach coordinator,” Allen, who was waiting in a room across the hall for the introductory portion of the study to conclude. Participants were told that Allen would deliver a short presentation on mental illness and then administer scales that measure participants’ knowledge of mental illness. Upon their arrival at the laboratory, participants could not see into the room that Allen ostensibly occupied, but the door was wide open, the room’s lights were on, and a sign above the door that reads “In Use” was illuminated.

Participants were then given a bogus but authentic looking article from a scientific journal devoted to schizophrenia research. The first page of the article included highlighted material that participants’ were asked to carefully read; namely, the title and a short section

reminiscent of an abstract called “Highlights,” which contained bulleted information on schizophrenia. Participants were randomly assigned to read one of three versions of the bogus article. In the categorical condition, participants read an article titled “Schizophrenia is a distinct category: Theory and research evidence,” which described symptoms of schizophrenia and summarized evidence attesting to a categorical view of schizophrenia. In the continuum condition, participants read an article titled “Schizophrenia lies on a continuum: Theory and research evidence,” which described symptoms of schizophrenia and summarized evidence attesting to a continuum view of schizophrenia. In the control condition, participants read an article titled “Schizophrenia: Theory and research evidence,” which only described symptoms of schizophrenia. The experimenter then administered the four-item manipulation check.

Next, participants read a one-page letter that they were told Allen wrote to describe his organization and to “say a little about his background.” In this latter portion of the letter, which was printed on bogus letterhead stationary, Allen disclosed that he was diagnosed with schizophrenia in 2009. This section included detailed descriptions of Allen’s struggles with paranoid and other delusions, auditory hallucinations, and disorganized speech.

Participants then completed a follow-up task intended to boost the potency of the experimental manipulation. Participants in the categorical group were asked to “write down one way that you think you’re *different than* Allen.” Participants in the continuum group were asked to “write down one way that you think you’re *similar to* Allen.” Participants in the control group were given no such follow-up task.

Next, participants completed the three self-report measures of psychiatric stigma in a fixed order. To explain why participants were being asked to share impressions of a person with whom they were still unacquainted, the experimenter instructed that the scales were intended to

capture participants' *predictions* of what Allen would be like.

Upon completion of the self-report scales, participants were invited to accompany the experimenter to the room across the hall where Allen was ostensibly waiting. However, during the short walk, the experimenter stated: "I'm pretty sure Allen stepped out for a few minutes, and I don't think he has returned." The experimenter and participant then entered the room, at which point the experimenter confirmed Allen's absence. Six identical chairs, all equidistant from one another, lined a wall. The six chairs varied systematically in their proximity to a chair situated opposite the first chair in the row of six lining the wall. Pointing to the chair opposite the others, the experimenter stated: "Allen is sitting there. You're welcome to grab another seat – any seat is fine – and he'll get started with you when he returns in a moment." Allen's personal effects – a light jacket that draped the back of the chair, a leather carrying case on the chair, and a small notebook on an adjacent table – were intended to reinforce the psychological salience of his physical position in the room. Prior to departing the room, the experimenter recorded the seat on which participants elected to sit.

After approximately thirty seconds, the experimenter re-entered and informed the participant that the study had concluded. The experimenter then administered a funneled debriefing instrument that probed participants' suspicions about the study deception. After debriefing, participants were thanked for their participation and dismissed.

2.4 Data Analyses

First, correlational analyses were undertaken in order to inform the convergent validity of seat selection as an index of psychiatric stigma. These analyses explored whether seat selection was related to established demographic correlates of psychiatric stigma and the validated self-report measures we administered here. Second, we executed two separate one-way analyses of

variance (ANOVA) – with categorical beliefs and continuum beliefs, respectively, as outcomes – to inform the effectiveness of the experimental manipulation. Finally, we executed separate one-way ANOVAs for each of our primary stigma outcomes. In all of the ANOVA models, group (three levels; categorical vs. continuum vs. control) was entered as the sole between-subjects predictor. Follow-up contrasts were executed to clarify significant omnibus effects.

3. Results

3.1 Seat Selection as an Index of Psychiatric Stigma – Convergent Validity

Bivariate correlations between seat selection and several demographic and self-reported stigma variables are shown in Table 1. We subjected two seat selection variables to analysis in light of an unexpected observation we documented during data collection. That is, nine out of the total 69 participants (13.0%) changed their seat, in every case one closer to Allen's, after the experimenter's departure from the room and before her/his return a moment later. Interestingly, participants who reported having a friend or loved one with psychiatric problems were significantly more likely to move closer to Allen's seat than those who did not, $\chi^2(1) = 5.59, p < .02$. Of the 33 participants who did not have a friend or loved one with psychiatric problems, only one (3.0%) moved closer; of the 36 participants who did have a friend or loved one with psychiatric problems, eight (22.2%) moved closer.

For initial seat selection, women were marginally more likely than men to select seats closer to Allen ($r = .22, p < .08$). Moreover, greater self-reported social distance ($r = .26, p < .04$) and fear ($r = .27, p < .03$) predicted selection of seats farther away. A model regressing initial seat selection on the six self-report stigma variables we examined here was significant, $F(6,60) = 3.67, p < .01, r^2 = .27$.

For final seat selection, having a friend or family member with psychiatric problems

significantly predicted selection of a seat closer to Allen ($r = -.28, p < .02$). Greater self-reported social distance significantly predicted ($r = .27, p < .03$), and greater fear marginally predicted ($r = .22, p < .08$), selection of seats farther away. A model regressing final seat selection on the six self-report stigma variables was significant, $F(6,60) = 2.95, p < .02, r^2 = .23$.

In sum, the seat selection variables show statistically meaningful, but modestly sized, links to validated and commonly used self-report stigma measures. These patterns argue in favor of the validity of seat selection as an index of psychiatric stigma.

3.2 Effectiveness of the Experimental Manipulation of Continuum and Categorical Beliefs

The experimental manipulation was effective. One-way ANOVAs indicated that the three groups differed with respect to continuum beliefs, $F(2,66) = 25.69, p < .001, \eta_p^2 = .44$, and categorical beliefs, $F(2,66) = 45.22, p < .001, \eta_p^2 = .58$ (see Table 2).

3.3 Effects of Continuum and Categorical Beliefs on Psychiatric Stigma – Experimental Findings

Table 2 displays experimental findings for our primary stigma measures. There was no evidence that the experimental manipulation affected participants' initial, $F(2,66) = 0.08, p = .92, \eta_p^2 = .00$, or final seat selection $F(2,66) = 0.01, p = .99, \eta_p^2 = .00$.

The overall ANOVA for self-reported social distance was nearly significant, $F(2,66) = 2.96, p < .06, \eta_p^2 = .08$. Follow-up contrasts indicated that the continuum group desired significantly less social distance from Allen than the categorical group, $F(1,66) = 5.37, p < .03, \eta_p^2 = .08$. The continuum group also desired marginally less social distance from Allen than the control group, $F(1,66) = 3.14, p < .09, \eta_p^2 = .05$, an effect that approached medium size according to effect size conventions (Cohen, 1988). The categorical and control groups did not

differ, $F(1,66) = 0.31, p = .58, \eta_p^2 = .01$.

Effects for self-reported fear, $F(2,66) = 0.75, p = .48, \eta_p^2 = .02$, and anger, $F(2,66) = 0.92, p = .40, \eta_p^2 = .03$, were nonsignificant. The effect for prosocial emotion approached significance, $F(2,66) = 2.50, p < .09, \eta_p^2 = .07$. Follow-up contrasts illuminated one significant effect: the continuum group self-reported significantly less prosocial emotion than the categorical group, $F(1,66) = 4.93, p < .03, \eta_p^2 = .07$.

In an initial analysis that collapsed across all 12 measured attitudes, the overall ANOVA was significant, $F(2,66) = 5.29, p < .01, \eta_p^2 = .14$. Follow-up contrasts indicated that the categorical group showed greater endorsement of damaging stereotypes than the continuum group, $F(1,66) = 9.21, p < .01, \eta_p^2 = .12$, and the control group, $F(1,66) = 6.61, p < .02, \eta_p^2 = .09$, which did not differ from one another, $F(1,66) = 0.20, p = .66, \eta_p^2 = .00$.

Two stereotyped attitudes – dangerousness and unpredictability – were deemed especially important given their relevance to schizophrenia stigma. The overall ANOVA for dangerousness was significant, $F(2,66) = 4.20, p < .02, \eta_p^2 = .11$. Follow-up contrasts indicated that the categorical group showed greater endorsement of the dangerousness stereotype than the continuum group, $F(1,66) = 4.95, p < .03, \eta_p^2 = .07$, and the control group, $F(1,66) = 7.50, p < .01, \eta_p^2 = .10$, which did not differ from one another, $F(1,66) = 0.30, p = .59, \eta_p^2 = .01$.

Likewise, the overall ANOVA for unpredictability was significant, $F(2,64) = 4.49, p < .02, \eta_p^2 = .12$. Follow-up contrasts indicated that the categorical group showed greater endorsement of the unpredictability stereotype than the continuum group, $F(1,64) = 7.14, p < .01, \eta_p^2 = .10$, and the control group, $F(1,64) = 6.36, p < .02, \eta_p^2 = .09$, which did not differ from one another, $F(1,64) = 0.02, p = .90, \eta_p^2 = .00$. Thus, the experimental manipulation yielded group differences in participants' endorsement of stereotyped attitudes, but these effects were

attributable to damaging effects of the categorical view, not beneficial effects of the continuum view.

4. Discussion

A small number of studies have explored the stigma reduction prospects of experimental manipulations designed to encourage embrace of continuum beliefs. To date, all of this experimental work has been carried out online, using weak continuum belief manipulations. The current study was executed in the laboratory, a context that enabled execution of a more potent manipulation. We asked participants to read a bogus article ostensibly published in an academic journal, a strategy that evokes scientific authority in favor of the authenticity of the continuum view. Moreover, a follow-up task that potentiated this manipulation required participants to reflect on differences from, or similarities to, a person with psychiatric problems. We obtained robust evidence that our experimental manipulation affected public stigma of schizophrenia, albeit in different ways across measures.

First, our experimental manipulation affected participants' desire for social distance from Allen. The continuum group desired significantly less social distance from Allen than the categorical group and marginally less social distance from Allen than the control group; both effects were in the medium range according to effect size conventions (Cohen, 1988). These results largely corroborate and valuably extend the small body of published research on continuum belief intervention (Corrigan et al., 2016; Schomerus et al., 2016; Thibodeau, 2016; Wiesjahn et al., 2016). Notably, these effects emerged in spite of factors that could conspire to undermine them. That is, continuum intervention may encourage appraisals that people's psychiatric problems arise from character defects (Gergel, 2014) and it may be met with defensive rejection (Thibodeau, 2016). With respect to this latter possibility, we think that a

fruitful area for further inquiry involves detailed examination of people's responses to continuum information. Are some people threatened by continuum information, and thus inclined toward defensive rejection of it? If so, can we capture these processes in the laboratory by measuring threat-related affect and/or cognition? We should note that strategies that might be useful in minimizing defensiveness and increasing receptiveness to continuum intervention are available in the social psychological literature. For example, people are less defensive and more receptive to threatening information when their self-worth is reinforced (Sherman & Cohen, 2002).

Second, the continuum group reported feeling less prosocial emotion (e.g., sympathy, the need to help) toward Allen than the categorical group. Because this is the first demonstration of such an effect in the small literature on continuum belief manipulation, it seems wise to proceed with interpretive caution. Is it possible that the continuum view strips people's problems of the medical legitimacy (see Gergel, 2014) that licenses others' care and compassion? This interpretation is speculative, but we think it deserves scrutiny in future work. Replication of a deleterious effect on prosocial emotion would point to a critical limitation of continuum intervention.

Third, our experimental manipulation also affected participants' embrace of damaging schizophrenia stereotypes. However, these effects were not attributable to stigma reduction properties of the continuum view, but rather to stigma increasing properties of the categorical view. Much of the anti-stigma messaging delivered in service of mental health advocacy underscores the biomedical basis of psychiatric problems. These messages commonly encourage the view that psychiatric problems are "diseases like any other" (Pescosolido et al., 2010), attributable to "no fault brain disorders" (e.g., McEvoy, Scheifler, & Frances, 1999), or "chemical imbalances" (e.g., Schreiber & Hartrick, 2002). These starkly disease-based

explanations of mental illness etiology probably do a great deal to reinforce a categorical “otherness” of individuals with psychiatric problems (Hill & Bale, 1981; Read, 2007; Read, Haslam, Sayce, & Davies, 2006). Although studies reliably indicate that these strategies reduce the blameworthiness of individuals for their psychiatric problems, they come at the expense of inflated public perceptions of dangerousness, greater avoidance, and prognostic pessimism (see Kvaale, Haslam, & Gottdiener, 2013, for a review). Interventions that reinforce categorical difference probably do more harm than good.

But the categorical view of mental illness has long been part-and-parcel of the way that most Westerners understand, think about, and talk about mental illness. A shift away from these longstanding cultural habits may indeed help to assuage psychiatric stigma, but it is likely to prove very challenging in light of the continuing dominance of categorical assumptions. Yet, there are signs that the categorical dominance of the psychiatric landscape is weakening. Dimensional models of psychopathology (e.g., the Research Domain Criteria, Insel et al., 2010; the Hierarchical Taxonomy of Psychopathology, Kotov et al., 2017), are becoming increasingly prominent. These dimensional models may gradually come to encourage the public’s embrace of the continuum view and, ultimately, help to assuage psychiatric stigma.

Finally, our measurement of stigma-relevant behavior yielded important findings that we hope will stimulate renewed interest in the behavioral elements of stigma that are measurable in the laboratory. Our measure of the physical distance that participants’ sought from an individual they thought had schizophrenia was unaffected by the experimental manipulation, but it was significantly related to participants’ acquaintance with friends or loved ones with mental illness, self-reported social distance, and self-reported fear. Regression analyses indicated that our self-report measures collectively accounted for around a quarter of the variance in participants’ seat

selection, a pattern that offers preliminary evidence in favor of the validity of our procedure. We can conceive of a robust agenda for future research on this novel behavioral measure. First, experimental validation of the procedure would nicely complement the correlational evidence we have offered here. Would participants elect to sit farther away from a person with a psychiatric condition compared to a person with a medical condition? Second, significant links to self-report stigma measures notwithstanding, it is clear that the procedure taps a great deal of variance that is not shared with self-report measurement. In light of this evidence, what are the size of the links between seat selection and implicit measures (e.g., Peris, Teachman, & Nosek, 2008; Teachman, Wilson, & Komarovskaya, 2006) or real-world stigma outcomes? Third, our observations in executing the procedure suggest avenues for its refinement. Seat selection may have been partly confounded by gaze direction. That is, seats closer to Allen's seat afforded participants a forward-looking, direct gaze at Allen, who they thought would soon occupy the seat; seats farther away permitted only an indirect gaze that some participants may have appraised as awkward. In addition, the arrangement of six chairs along a wall, an unusual layout, could have tipped some participants to our measurement of physical distance. Moreover, our seat selection procedure did not take into account participants' trait-like interpersonal distance preferences. That is, some people are naturally inclined toward physical closeness in interpersonal encounters whereas others prefer greater distance. In our future work, we intend to include baseline interpersonal distance as a covariate in analyses involving seat selection to maximize the measure's sensitivity to stigma-related processes (see Goff, Steele, & Davies, 2008). Finally, the cover story we utilized probably biased participants toward selection of seats in closer proximity to Allen's. Allen was described as a competent professional currently employed full-time in a demanding job. Participants probably deemed it unlikely that the college

would permit an unstable, dangerous individual to work closely with students. Thus, participants may have reasoned that Allen, despite his struggles with schizophrenia, was more or less “normal” and approachable. Modification of the procedure to target these concerns could help to maximize variability in physical proximity and thus increase the measure’s sensitivity to stigma-related processes.

Our study was limited in other ways. First, and most importantly, our relatively small sample afforded limited statistical power to test critical hypotheses. One important comparison – the continuum group versus the control group for self-reported social distance – approached medium size (Cohen, 1988) but was only marginally significant. Replication of these effects in a larger sample, then, is clearly needed. Second, our manipulation check data suggested that the continuum manipulation was less effective than the categorical manipulation. That is, four participants in the continuum group (16.7%), but only one participant in the categorical group (4.5%), declined to endorse continuum and categorical beliefs, respectively. This finding could be attributable to the increasing prominence of categorical views of psychiatric problems in Western culture (Schomerus et al., 2012), greater consonance of categorical views and beliefs participants already possessed, and/or greater defensive rejection of the continuum view (see previous discussion). Whatever the explanation, these findings merit exploration of ways to increase the palatability of continuum views in future research.

5. Conclusions

The current study offers modest evidence in favor of the stigma reduction prospects of continuum belief manipulation. Identification of intervention parameters that lend themselves to maximal impact on stigma-related outcomes seems especially worth pursuing. The study also contributes new evidence as to the problems with categorical views of mental illness that we

hope will motivate continued reflection on whether interventions that inflate perceptions of “otherness” do more harm than good. We hope that findings bearing on the validity of our novel behavioral measure will stimulate renewed attentiveness to behavioral dimensions of stigma that are measureable in the laboratory.

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Table 1

Bivariate Correlations Between Two Seat Selection Measures and Demographic and Self-Reported Stigma Variables

Variable	Initial Seat Selection	Final Seat Selection
Age	.10	.01
Sex	.22 [†]	.18
Friend or Family with Psychiatric Problems	-.16	-.28*
Continuum Beliefs	-.04	-.02
Categorical Beliefs	.08	.11
Social Distance	.26*	.27*
Fear	.27*	.22 [†]
Anger	-.06	-.08
Prosocial Emotion	.16	.12
Stereotyped Attitudes		
Overall	-.14	-.09
Dangerousness	-.11	-.10
Unpredictability	-.14	-.11

[†] $p < .10$, * $p < .05$

Table 2

Effects of the Experimental Manipulation (Categorical, Continuum, Control) on the Manipulation Check and Behavioral and Self-Report Measures of Psychiatric Stigma

	Categorical Manipulation	Continuum Manipulation	Control Manipulation
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Manipulation Check			
Continuum Beliefs***	1.9 (0.9)	3.4 (0.6)	2.6 (0.5)
Categorical Beliefs***	3.8 (0.5)	2.2 (0.6)	2.7 (0.6)
Seat Selection			
Initial	2.9 (1.1)	3.0 (1.1)	3.0 (1.1)
Final	2.8 (1.0)	2.8 (1.1)	2.8 (1.2)
Social Distance [†]	2.4 (0.6)	2.0 (0.4)	2.3 (0.5)
Fear	2.3 (1.0)	2.2 (0.7)	2.1 (0.5)
Anger	1.9 (0.6)	1.8 (0.6)	2.0 (0.7)
Pro-Social Emotion [†]	3.7 (0.7)	3.2 (0.8)	3.5 (0.9)
Stereotyped Attitudes			
Overall*	1.1 (1.0)	0.4 (0.6)	0.5 (0.5)
Dangerousness*	1.6 (1.5)	0.8 (1.1)	0.6 (0.8)
Unpredictability*	2.7 (1.9)	1.4 (1.4)	1.4 (1.6)

For overall one-way ANOVA: [†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$