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Continuum Belief, Categorical Belief, and Depression Stigma: Correlational Evidence and Outcomes of an Online Intervention

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Disciplines

Psychology

Continuum Belief, Categorical Belief, and Depression Stigma: Correlational Evidence and Outcomes of an Online Intervention

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Abstract

Continuum belief interventions that erode boundaries between "normal" individuals and individuals with psychiatric problems may help to reduce psychiatric stigma, but a number of questions persist. The magnitude of belief change attributable to the intervention is unclear. Moreover, most studies have executed continuum interventions to reduce stigma of schizophrenia, and all studies have examined intervention effects on only public stigma. This study utilized a large sample (n = 654) to examine effects of a continuum intervention on depression stigma – public stigma in the full sample and self-stigma among participants with a self-reported history of depression. Participants were randomly assigned to one of three intervention groups: (1) the control group, which read material that merely described depression, (2) the continuum group, which read material that attested to a continuum view of depression, or (3) the categorical group, which read material that attested to a categorical view of depression. Correlational analyses demonstrated that pre-intervention categorical belief positively predicted, and pre-intervention continuum belief negatively predicted, depression stigma. Moreover, pre-intervention categorical belief positively predicted, and pre-intervention continuum belief negatively predicted, self-stigma among participants with a self-reported history of depression. There was scant evidence that the intervention affected public stigma among participants without a history of depression and no evidence that it affected self-stigma among participants with a history of depression. These findings illuminate a number of key priorities for future research on continuum belief intervention and its prospects for stigma reduction.

Keywords: psychiatric stigma; continuum beliefs; depression

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Individuals with mental illness are commonly devalued, rejected, avoided, and discriminated against. This public stigma (see Hinshaw & Stier, 2008, for a review) limits the opportunities available to individuals with mental illness and impedes their ability to lead satisfying lives. Stigma reduction has rightly become a key aim of policy aimed at improving mental healthcare around the globe (Hogan, 2003; World Health Organization, 2001).

Most scholars of psychiatric stigma agree that outgroup categorization of individuals with mental illness fuels stigma. That is, stigma manifests when the public ("us") appraises individuals with mental illness ("them") as occupying a distinct social category with rigid boundaries (Link & Phelan, 2001). People vary in the strength of their embrace of this appraisal, and this variation is related to psychiatric stigma. Indeed, correlational evidence consistently indicates that belief in categorical difference positively predicts stigma (e.g., Thibodeau, 2017; Thibodeau & Peterson, 2018; Thibodeau, Shanks, & Smith, 2018), whereas belief that psychopathology and normality are merely separate points on a fluid continuum negatively predicts stigma (Angermeyer, Millier, Rémuzat, Refaï, Schomerus, & Toumi, 2015; Makowski, Mnich, Angermeyer, & von dem Knesebeck, 2016; Schlier, Scheunemann, & Lincoln, 2016; Schomerus, Matschinger, & Angermeyer, 2013; Thibodeau, 2017; Thibodeau & Peterson, 2018; Thibodeau et al., 2018; Wiesjahn, Brabban, Jung, Gebauer, & Lincoln, 2014; Wiesjahn, Jung, Kremser, Rief, & Lincoln, 2016).

These correlational data reflect beliefs that people arrive at on their own. Is it possible to manipulate beliefs by, for example, presenting evidence consistent with a continuum view of mental health and illness? If so, could this kind of intervention erode appraisals of "otherness"

that ostensibly fuel public stigma, leading to a stigma reduction effect? Several studies have now addressed these questions. Intervention effects are usually small (Corrigan, Schmidt, Bink, Nieweglowski, Al-Khouja, Qin, & Discont, 2017; Schomerus, Angermeyer, Baumeister, Stolzenburg, Link, & Phelan, 2016; Thibodeau et al., 2018; Wiesjahn et al., 2016), and some null findings have been published (Thibodeau, 2017). Moreover, a certain kind of continuum intervention that compels a great deal of psychological closeness to individuals with mental illness may do more harm than good (Thibodeau & Peterson, 2018). Nevertheless, outcomes of continuum intervention are sufficiently promising to justify further exploration of this possible stigma reduction strategy.

There are several outstanding questions related to continuum intervention and its stigma reduction effects. First, intervention studies have nearly always manipulated continuum beliefs bearing on schizophrenia. It is not clear whether the same intervention outcomes that manifest in the context of schizophrenia would apply to other conditions (but see Schomerus et al., 2016). Continuum intervention may be most effective for schizophrenia, given the usually high degree of "otherness" attributed to individuals with this condition (e.g., Levey & Howells, 1995). The intervention may bear less fruit for more prevalent conditions (e.g., depression) probably lower in perceived "otherness." Put another way, an intervention that explicitly aims to weaken categorical belief may be ineffective when people already reject such a belief prior to the intervention.

Second, investigation of a more common condition like depression permits evaluation of intervention outcomes among people who themselves struggle with this condition. Particularly interesting in this regard are intervention effects on self-stigma, which manifests when individuals with psychiatric problems come to endorse damaging public stigma and suffer a loss

of self-esteem as a result (see Corrigan, Watson, & Barr, 2006). One could imagine both beneficial as well as detrimental effects of continuum intervention on self-stigma. On the one hand, if people with psychiatric problems appraise themselves as fundamentally similar to "normal" people, this could encourage optimistic projections for recovery and facilitate a sense of shared humanity that could serve as an important source of connection and self-esteem. On the other hand, categorical belief could potentiate a sense of the medical legitimacy of one's struggles (e.g., "I have a specific condition with sharp boundaries. This is a 'real' disease."). Weakening a sense of medical legitimacy could, for some people, fuel the damaging notion that a weak will or moral defect gave rise to one's problems (see also Gergel, 2014). In any event, effects of continuum intervention on individuals who themselves struggle with the condition under investigation are not clear.

Finally, in the small literature devoted to continuum intervention, continuum and categorical beliefs have been measured only once, after delivery of the intervention. Measurement of pre-intervention and post-intervention beliefs would enable the examination of some important questions heretofore ignored. How much do self-reported beliefs change from pre- to post-intervention? Is the magnitude of this change sufficient to meaningfully impact stigma measures? Do individual differences in the magnitude of change predict stigma?

The current study aimed to address all of these outstanding questions bearing on continuum intervention. A large sample of participants who varied with respect to their self-reported history of depression completed measures of continuum and categorical beliefs related to depression. They were then randomly assigned to one of three intervention groups: (1) the control group, which read material that merely described depression, (2) the continuum group, which read material that attested to a continuum view of depression, or (3) the categorical group,

which read material that attested to a categorical view of depression. Participants then completed post-intervention measures of continuum and categorical beliefs, followed by several self-report measures of depression stigma.

Correlational hypotheses were as follows:

(1) Consistent with previous research (see especially Schomerus et al., 2013) pre-intervention categorical beliefs were expected to positively predict depression stigma and pre-intervention continuum beliefs were expected to negatively predict depression stigma.

(2) Among participants with a self-reported history of depression, pre-intervention categorical beliefs were expected to positively predict self-stigma and pre-intervention continuum beliefs were expected to negatively predict self-stigma. This prediction was considered tentative in light of the previous speculation about the possible usefulness of categorical belief among individuals with psychiatric problems.

Intervention hypotheses were as follows:

(3) The continuum intervention was expected to substantially increase self-reported continuum belief and modestly decrease self-reported categorical belief. Likewise, the categorical intervention was expected to substantially increase self-reported categorical belief and modestly decrease self-reported continuum belief.

(4) In the full sample, the continuum intervention was expected to decrease depression stigma compared to both the control and categorical interventions. In light of previous arguments as to the lower perceived “otherness” of depression compared to other psychiatric problems (e.g., schizophrenia), the size of this effect was expected to be modest.

(5) Among participants with a self-reported history of depression, the continuum intervention was expected to decrease self-stigma compared to both the control and categorical interventions. Again, this prediction was considered tentative in light of the previous speculation about the possible usefulness of categorical belief among individuals with psychiatric problems.

(6) Individual differences in the magnitude of pre- to post-intervention change in continuum and categorical belief were expected to predict depression stigma. That is, greater increase in continuum belief was expected to predict decreased depression stigma, whereas greater increase in categorical belief was expected to predict increased depression stigma.

Method

Participants

A total of $N = 682$ participants completed the study using online survey software (Qualtrics; Provo, UT). Four hundred fifty-nine were recruited via Amazon's Mechanical Turk and paid $1.25 for participating. Two hundred twenty-three were recruited from an introductory psychology course at a small college in the northeastern United States and given course credit for participating.

Participants were excluded if they: (1) completed the study from outside the United States ($n = 10$), (2) failed to correctly complete two attention check items (i.e., identify George Washington as the first President of the United States, select the number 4 from a dropdown menu; $n = 5$), (3) completed the study in under 5 m ($n = 5$) or over 1 h ($n = 5$), thresholds that were both established during pre-testing of study procedures, and (4) showed strong evidence of response bias in their completion of measurement scales (i.e., recording of the same Likert scale

response on at least four out of eight total measurement occasions; $n = 3$).

Application of these exclusion criteria resulted in a final sample of $n = 654$ (307 women, 256 men, 1 other; 80.1% White; 65.1% single, 29.4% currently married; 39.9% with at least a Bachelor's degree; *M* age = 29.6, *SD* = 11.9). They were randomly assigned, using the Qualtrics randomization tool, to the control ($n = 220$), continuum ($n = 214$), or categorical ($n = 220$) groups.

Measures

Depression. Using two separate items, participants were asked to indicate whether they currently, or at some point in their lives, experienced problems with depression (1 = yes, 2 = no, 3 = I'm not sure).

Current depressive symptoms were also measured by administering the Center for Epidemiological Studies – Depression scale (CES-D; Radloff, 1977). The CES-D is a 20-item scale that measures the frequency of occurrence of depressive symptoms (e.g., low mood, anhedonia, sleep and appetite disturbances) in the last week (0 = rarely or none of the time to 3 = most or all of the time). A total CES-D score of 16 or higher was used to index clinically significant depressive symptoms. (e.g., Myers & Weissman, 1980; Weissman, Sholomskas, Pottenger, Prusott, & Loche 1977).

Continuum and categorical beliefs. Continuum and categorical beliefs were measured using a six-item scale developed for use in this study but inspired by previously used measures (see Thibodeau & Peterson, 2018). Three items assessed continuum belief (e.g., "Even people who don't have an official diagnosis of depression occasionally experience symptoms of depression) and three items assessed categorical belief (e.g., "People who have depression are fundamentally different from people who don't have depression"). Responses were recorded on

four-point scales (1 = strongly disagree, 4 = strongly agree). The two variables subjected to analysis were computed as means of the three continuum items and the three categorical items.

Psychiatric stigma. Three self-report measures of psychiatric stigma were administered. The Social Distance Scale (SDS; Link, Cullen, Frank, & Wozniak, 1987) includes seven items that measured participants' willingness to engage, at varying degrees of closeness (e.g., co-worker, neighbor) with "a person with depression." Responses were recorded on four-point scales (1 = definitely willing, 4 = definitely unwilling). The variable subjected to analysis was computed as a mean of the seven SDS items.

A 10-item measure of participants' emotional reactions (Schomerus et al., 2013) to people with depression was administered. Items were grouped into fear (e.g., "I feel insecure"), anger (e.g., "I feel annoyed"), and prosocial (e.g., "I feel the need to help") categories based on results of a principal components analysis (see online supplementary material). Responses were recorded on five-point scales (1 = strongly disagree, 5 = strongly agree). The three variables subjected to analysis were computed as means of the items in the relevant emotion categories.

The short form of the Self-Stigma of Mental Illness scale (SSMI-SF; Corrigan, Michaels, Vega, Gause, Watson, & Rüsch 2012) was administered. The SSMI-SF includes five items in each of four subscales: stigma awareness (e.g., "I think the public believes most people with depression are unpredictable"), stigma agreement ("I think most people with depression are to blame for their problems"), personal application of stigma (e.g., "Because I have had depression, I will not recover or get better"), and stigma-related reduction in self-worth (e.g., "I currently respect myself less because I am dangerous"). The first two subscales were administered to all participants; the last two subscales assess self-stigma and were administered to only those participants who previously self-reported a history of depression. Responses were recorded on

nine-point scales (1 = strongly disagree, 9 = strongly agree). The four variables subjected to analysis were computed as means of the five items in each of the subscales.

Procedure

First, participants provided informed consent to complete the study, which was approved by the local institutional review board. Second, participants completed the depression measures, followed by the pre-intervention measures of continuum and categorical beliefs. Third, the intervention was delivered (see Appendix). All participants read a brief statement about depression that simulated a short magazine article (adapted from Schomerus et al., 2016). Participants then read an excerpt from a bogus but authentic looking scientific article that reinforced the previously delivered content. Specifically, participants read the title and a short section reminiscent of an abstract called "Highlights," which contained bulleted information on depression. Participants in the control group read a magazine article and a scientific article (titled "Depression: Theory and Research Evidence") that merely described depression. Participants in the continuum group read a magazine article and a scientific article (titled "Depression Lies on a Continuum: Theory and Research Evidence") that attested to a continuum view of depression. Participants in the categorical group read a magazine article and a scientific article (titled "Major Depressive Disorder is a Distinct Category: Theory and Research Evidence") that attested to a categorical view of depression.

Fourth, participants completed the post-intervention measures of continuum and categorical beliefs, followed by the psychiatric stigma measures. Fifth, participants completed a short demographic questionnaire that included the two previously described attention check items. Finally, participants read a debriefing statement, selected the group to which they thought they had been assigned, and then terminated participation in the study.

Results

Correlational Findings

Table 1 reports bivariate correlations between pre-intervention continuum belief, pre-intervention categorical belief, and self-reported stigma. Data for only the control group were included in these analyses to ensure that effects of continuum/categorical belief reflect organic views that participants arrived at on their own, not subject to the influence of the interventions. Results of these analyses replicate and extend published findings in important ways. Among all control participants, greater pre-intervention continuum belief was related to a decreased desire for social distance, marginally less anger, and more prosocial emotion. Likewise, greater pre-intervention categorical belief was related to an increased desire for social distance, more anger, and greater stigma agreement.

Table 1 also reports correlational findings for the subset of control participants with a self-reported history of depression. For these participants, greater pre-intervention continuum belief was related to more prosocial emotion and lesser self-stigma (i.e., lesser stigma-related reduction in self-worth). Greater pre-intervention categorical belief was related to an increased desire for social distance, more anger, greater stigma agreement, and greater self-stigma (i.e., greater personal application of stigma).

Randomization Checks

The experimental groups were nicely balanced with respect to critical demographic and other variables. There was no evidence that the groups differed with respect to age, $F(2,651) = 0.33$, $p = .72$; sex, $\chi^2(4) = 7.09$, $p = .13$, ethnicity, $\chi^2(10) = 5.08$, $p = .89$; marital status, $\chi^2(8) = 6.40$, $p = .60$; or educational attainment, $\chi^2(10) = 7.17$, $p = .71$. Importantly, the groups were also not significantly different with respect to pre-intervention continuum belief, $F(2,651) = 0.46$, $p =$

.63, or pre-intervention categorical belief, $F(2,651) = 0.06$, $p = .94$. Finally, at debriefing, the groups were not significantly different in the accuracy with which they identified the group to which they were assigned, $\chi^2(2) = 0.66$, $p = .72$.

Intervention Effects on Continuum and Categorical Beliefs

The impact of the intervention was probed by examining pre- and post-intervention group differences in continuum and categorical beliefs. The data displayed in Table 2 were subjected to separate 3 (group; between-subjects) x 2 (time period; within-subjects) analyses of variance (ANOVA).

For continuum beliefs, a significant group by time period interaction, $F(2,651) = 118.21$, $p < .001$, $\eta_p^2 = 0.27$, indicated that the pattern of pre-post change differed as a function of group. The control group showed no significant change ($p = .07$, $\eta_p^2 = 0.02$), the continuum group showed a sizeable increase ($p < .001$, $\eta_p^2 = 0.50$), and the categorical group showed a significant decrease ($p < .001$, $\eta_p^2 = 0.17$).

For categorical beliefs, a significant group by time period interaction, $F(2,651) = 86.73$, $p < .001$, $\eta_p^2 = 0.21$, again indicated that the pattern of pre-post change differed as a function of group. The control group showed a significant but modest increase ($p < .02$, $\eta_p^2 = 0.03$) the continuum group showed a significant decrease ($p < .001$, $\eta_p^2 = 0.16$), and the categorical group showed a sizeable increase ($p < .001$, $\eta_p^2 = 0.35$).

In the total sample, participants' mean continuum belief was 3.1, which corresponds to the "Agree" anchor in the four-point measurement scale. In contrast, participants' mean categorical belief was 2.2, which approaches the "Disagree" anchor. A one-way repeated measures ANOVA indicated that this difference was highly significant, $F(1,653) = 1014.75$, $p < .001$, $\eta_p^2 = 0.61$. Thus, prior to the intervention, participants largely rejected a categorical view

and embraced a continuum view of depression.

Does the Continuum Intervention Reduce Depression Stigma?

Separate 3 (group; between-subjects) x 2 (history of depression; between-subjects) ANOVAs were computed for each of the stigma variables measured. None of the main effects of group achieved statistical significance for any stigma variables: social distance, $F(2,648) = 0.59$, $p = .55$, $\eta_p^2 = 0.00$; fear, $F(2,648) = 0.58$, $p = .56$, $\eta_p^2 = 0.00$; anger, $F(2,648) = 0.65$, $p = .52$, $\eta_p^2 = 0.00$; prosocial emotion, $F(2,648) = 0.14$, $p = .87$, $\eta_p^2 = 0.00$; stigma awareness, $F(2,648) = 0.57$, $p = .56$, $\eta_p^2 = 0.00$; stigma agreement, $F(2,648) = 1.11$, $p = .33$, $\eta_p^2 = 0.00$.

Furthermore, among participants with a self-reported history of depression, main effects of group did not achieve statistical significance for the self-stigma variables: personal application of stigma, $F(2,427) = 0.69$, $p = .50$, $\eta_p^2 = 0.00$; stigma-related reduction in self-worth, $F(2,427) = 0.39$, $p = .68$, $\eta_p^2 = 0.00$.

A self-reported history of depression was by itself commonly associated with lower stigma (see Table 3). However, there was no evidence that a self-reported history of depression moderated the effect of the intervention on any stigma variables: social distance, $F(2,648) = 2.21$, $p = .11$, $\eta_p^2 = 0.01$; fear, $F(2,648) = 1.22$, $p = .30$, $\eta_p^2 = 0.00$; anger, $F(2,648) = 2.77$, $p = .06$, $\eta_p^2 = 0.01$; prosocial emotion, $F(2,648) = 1.83$, $p = .16$, $\eta_p^2 = 0.01$; stigma awareness, $F(2,648) = 1.45$, $p = .24$, $\eta_p^2 = 0.00$; stigma agreement, $F(2,648) = 1.26$, $p = .29$, $\eta_p^2 = 0.00$.

Operationalizing depression in an alternative way only slightly modified this pattern of null findings. When participants' current level of depressive symptoms, measured via the CES-D, were entered into the model (0 = total score below the clinical cutoff of 16, 1 = total score at or above the clinical cutoff of 16), depression did not moderate the effect of the intervention in most models: social distance, $F(2,648) = 1.54$, $p = .22$, $\eta_p^2 = 0.01$; fear, $F(2,648) = 0.18$, $p = .83$,

$\eta_p^2 = 0.00$; prosocial emotion, $F(2,648) = 0.13$, $p = .88$, $\eta_p^2 = 0.00$; stigma awareness, $F(2,648) = 0.96$, $p = .38$, $\eta_p^2 = 0.00$.

Depression did moderate the effect of the intervention for anger, $F(2,648) = 3.98$, $p < .02$, $\eta_p^2 = 0.01$. Follow-up analyses indicated that the group effect was not significant among participants not currently depressed, $F(2,297) = 0.89$, $p = .41$, $\eta_p^2 = 0.01$. However, the group effect was significant among participants currently depressed, $F(2,351) = 3.64$, $p < .03$, $\eta_p^2 = 0.02$. Among these participants, pairwise contrasts indicated that the continuum group self-reported marginally greater anger than the categorical group ($p < .08$) and significantly greater anger than the control group ($p < .01$), which did not differ from one another ($p = .33$).

Depression also moderated the effect of the intervention for stigma agreement, $F(2,648) = 3.04$, $p < .05$, $\eta_p^2 = 0.01$. Follow-up analyses indicated that the group effect was not significant among participants currently depressed, $F(2,351) = 0.60$, $p = .55$, $\eta_p^2 = 0.00$. However, the group effect was significant among participants not currently depressed, $F(2,297) = 3.27$, $p < .04$, $\eta_p^2 = 0.02$. Among these participants, pairwise contrasts indicated that the continuum group self-reported marginally lower stigma agreement than the categorical group ($p = .10$) and significantly lower stigma agreement than the control group ($p < .02$), which did not differ from one another ($p = .43$).

Does the Magnitude of Pre-Post Change in Continuum and Categorical Beliefs Predict Stigma of Depression?

Among participants in the continuum group, the magnitude of change in continuum belief from pre- to post-intervention did not predict any of the stigma variables (all *p*s > .48). Likewise, among participants in the categorical group, the magnitude of change in categorical belief from pre- to post-intervention did not predict any of the stigma variables (all *p*s > .26).

Discussion

The current study examined effects of a continuum belief intervention on depression stigma in a large sample of participants who varied with respect to their history of depression. Correlational analyses indicated that pre-intervention categorical belief positively predicted, and pre-intervention continuum belief negatively predicted, depression stigma. These results provide further evidence that links between continuum/categorical belief and public stigma, heretofore documented largely in the context of schizophrenia, extend to the separate psychiatric context of depression (see also Schomerus et al., 2013). Importantly, pre-intervention categorical belief positively predicted, and pre-intervention continuum belief negatively predicted, self-stigma among participants with a self-reported history of depression. This appears to be the first study to document such an effect.

There was scant evidence that the intervention affected public stigma among participants without a history of depression. Current symptomatology (measured using the CES-D) moderated the intervention effect for anger and stigma agreement, but the exploratory nature of the analyses upon which these findings are based necessitates interpretive caution. There was no evidence that the intervention affected self-stigma among participants with a history of depression. Lastly, there was no evidence that individual differences in the magnitude of pre- to post-intervention change in continuum or categorical beliefs predicted depression stigma.

Several points merit exploration. First, the finding that pre-intervention continuum/categorical belief predicted self-stigma among individuals with a self-reported history of depression is perhaps this study's most novel result. Categorical belief predicted self-stigma in ways that mirrored its well-established links to public stigma. It was not at all obvious that this result would emerge. Indeed, as noted previously, the opposite pattern was eminently plausible.

Insofar as low continuum and/or high categorical belief could reinforce the medical legitimacy of psychiatric problems (see Gergel, 2014), individuals with psychiatric problems could have been predicted to embrace such a belief as a means of repudiating personal failing as an explanation for their struggles. These results suggest, on the contrary, that appraisals of "otherness" that are damaging in the domain of public stigma are just as damaging in the domain of self-stigma. Continuum belief likewise predicted self-stigma in ways that mirrored published links to public stigma. That is, individuals with a history of depression who embraced a continuum view of their struggles were less likely to report high levels of self-stigma.

Second, the data on pre- and post-intervention continuum and categorical belief (see Table 2) indicated that intervention effects were sizeable and in the intended directions. Thus, on the surface, the intervention appeared to be effective insofar as it led to meaningful self-reported change in participants' beliefs. However, it is not clear that these findings reflect a genuine change in belief. The post-intervention measures may reflect little more than participants' acknowledgement of the information embedded in the intervention materials they were assigned to read. Of course, the likely modest impact of the intervention is a limitation that characterizes not only the current study, but all continuum intervention studies published to date. In fact, the current intervention was probably the most potent delivered to date in online studies (Corrigan et al., 2017; Schomerus et al., 2016; Thibodeau, 2017; Wiesjahn et al., 2016). That is, it utilized an engaging, magazine-style article (adapted from Schomerus et al., 2016) that was reinforced with an ostensible research article that brought to bear scientific authority to maximize the legitimacy of the interventions. A key direction for future research on continuum belief is the development and delivery of potent interventions well-equipped to provide strong tests of hypotheses concerning continuum intervention effects. Truly potent interventions will probably require

participants to do more than simply skim brief texts. One critical challenge for scholars in this area is to move beyond the probably weak, text-based approach to intervention and start brainstorming novel, compelling interventions capable of achieving more powerful impact. For example, perhaps continuum intervention can be delivered via contact with individuals with mental illness, itself a tried-and-true stigma reduction strategy (see Couture & Penn, 2003, for a review). Moreover, it seems likely that interventions should be distributed across time to achieve maximal impact. That is, the single-session interventions that have been delivered to date seem destined to achieve only modest, time-limited impact.

Third, the pattern of pre- and post-intervention beliefs reflected in Table 2 deserves close scrutiny. Perhaps the most interesting finding concerns the comparative strength of pre-intervention continuum and categorical beliefs. As noted previously, participants' mean pre-intervention continuum belief was around three, which corresponds to the "Agree" anchor in the four-point measurement scale. Participants' mean pre-intervention categorical belief was around two, which corresponds to the "Disagree" anchor. Participants at study outset already, by and large, rejected a categorical view of depression. The continuum intervention that was subsequently delivered probably mostly "preached to the choir," an observation that may help to explain the current study's weak intervention effect. Furthermore, it is worth wondering whether a similar issue pervades even the literature on continuum intervention with schizophrenia. Although people with schizophrenia are often perceived as being very different (e.g., Levey & Howells, 1995), the patterns of continuum and categorical beliefs pertaining to schizophrenia tell an interesting story in the published literature. In numerous studies, participants endorse continuum and categorical beliefs to roughly the same extent (although social desirability concerns may compel participants to moderate their views of the "otherness" of individuals with

schizophrenia). This may help to explain the null (Thibodeau, 2017) or modestly sized intervention effects (Corrigan et al., 2017; Schomerus et al., 2016; Thibodeau et al., 2018; Wiesjahn et al., 2016) that have emerged from that literature. It is possible a one-size-fits-all approach is wrongheaded. Perhaps continuum intervention is indicated only for individuals who, at baseline, embrace strongly categorical views of psychiatric problems. This is an open question that awaits future research.

Fourth, as noted previously, there was no evidence that a self-reported history of depression moderated responses to the intervention. However, current symptomatology (measured using the CES-D) moderated the intervention effect for two variables: anger and stigma agreement. It is important to avoid over-interpreting these effects: they were uncovered on the basis of mostly exploratory analyses, the nature of the moderating effect was different for anger and stigma agreement, and type I error concerns loom.

Finally, participants' self-reported history of depression was a clear, consistent predictor of depression stigma (see Table 3). That is, participants with a self-reported history of depression were less likely to endorse depression stigma compared to participants without a history of depression. These findings are consistent with previous research indicating that familiarity with mental illness is negatively related to psychiatric stigma (Angermeyer, Matschinger, & Corrigan, 2004; Corrigan, Markowitz, Watson, Rowan, & Kubiak, 2003). As a brief aside, the remarkable number of participants in the sample (431/654, 65.9%) who self-reported a history of depression is worth pondering. The prevalence of psychiatric symptoms in Mechanical Turk samples is extremely high for a variety of concerns, including depression (Arditte, Çek, Shaw, & Timpano, 2016) and social anxiety (Shapiro, Chandler, & Mueller, 2013). Moreover, individuals with psychiatric problems would likely find Mechanical Turk tasks with psychopathology-related

themes especially stimulating, thereby facilitating their self-selection into a study like the present one.

The current study boasts several strengths. First, a large sample yielded statistical power sufficient to test study hypotheses. Second, several novel design elements (e.g., measurement of continuum and categorical beliefs pre- and post-intervention, recruitment of participants who varied with respect to depression, measurement of self-stigma) permitted evaluation of research questions heretofore unexamined in the small literature on continuum belief intervention. Third, as noted previously, the current intervention was probably the most potent delivered to date in online studies. That is, it included multiple texts written in different styles, including a bogus research article that brought to bear scientific authority to boost the believability and impact of the interventions.

There were also several weaknesses. First, delivery of the continuum intervention online clearly limited its potency. Participants' rather fast time to completion of the study (median time under 11 m) may call into question their attentiveness to the study procedures. On the other hand, at debriefing, 84.9% of the participants correctly identified the group to which they been assigned; this high proportion is suggestive of adequate attention. The online context for data collection permitted measurement of only self-reported depression stigma. A laboratory context would enable measurement of stigma-relevant behavior (e.g., Penn & Corrigan, 2002; Thibodeau & Principino, 2018) and implicit attitudes (Peris, Teachman, & Nosek, 2008; Teachman, Wilson, & Komarovskaya, 2006), both of which could valuably inform the impact of the intervention. Second, there was a great deal of previous speculation that the consequences of continuum intervention could be different for various kinds of psychiatric problems (e.g., schizophrenia versus depression). Critically, however, the current design did not enable a direct comparison of

multiple conditions (see, e.g., Schomerus et al., 2016). Future research might undertake this design modification. Finally, even a potent continuum intervention that dramatically changes participants' beliefs is certain to be hamstrung by the relatively modest link between continuum belief and stigma (around $r = .20$ in the present study and numerous others). Seen in this light, the null effects of intervention obtained here and the mostly small effects of intervention obtained elsewhere may be inevitable.

In sum, the current study replicated published links between continuum beliefs, categorical beliefs, and public stigma of mental illness. It further established that both continuum and categorical beliefs are related to self-stigma among participants with a self-reported history of depression. There was scant evidence that the intervention affected public stigma among participants without a history of depression, and no evidence that the intervention affected self-stigma among participants with a history of depression. These findings illuminate a number of key priorities for future research on continuum belief intervention and its prospects for stigma reduction.

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Table 1

Bivariate Correlations between Pre-Intervention Continuum Beliefs, Pre-Intervention Categorical Beliefs, and Self-Report Stigma Variables (Control Group Participants Only)

	Continuum Beliefs		Categorical Beliefs	
Stigma Variable	All Participants	History of Depression	All Participants	History of Depression
Social Distance	-0.17*	-0.09	0.25***	0.24**
Emotions				
Fear	-0.03	0.01	0.07	0.11
Anger	-0.12†	0.03	0.23**	0.21*
Prosocial Emotion	0.18**	0.21**	-0.03	-0.08
SSMI-SF				
Awareness	0.01	-0.08	0.01	-0.09
Agreement	-0.09	-0.06	0.29***	0.24**
Application	–	-0.08	–	0.22**
Hurts	–	-0.16*	–	0.12

Note. SSMI-SF = Short form of the Self-Stigma of Mental Illness scale. The bivariate correlation between continuum beliefs and categorical beliefs was $r = -0.14$ ($p < .04$) among all control group participants ($n = 220$) and $r = -0.14$ ($p < .09$) among the subset of control group participants with a self-reported history of depression ($n = 149$).

*** $p < .001$, ** $p < 0.01$, * $p < 0.05$, † $p < .10$

Table 2

Self-Reported Pre-Intervention and Post-Intervention Continuum and Categorical Beliefs, Separately by Group (Control vs. Continuum vs. Categorical)

	Control Intervention		Continuum Intervention		Categorical Intervention	
Belief	Pre	Post	Pre	Post	Pre	Post
Continuum	3.1 (0.4)	3.2 (0.4)	3.1 (0.4)	3.5 (0.5)	3.1 (0.5)	2.9 (0.6)
Categorical	2.2 (0.5)	2.3 (0.6)	2.2 (0.5)	2.0 (0.6)	2.2 (0.5)	2.6 (0.7)

Note. Responses were recorded on four-point scales (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree).

Table 3

Self-Report Stigma Variables, Separately by Depression Status (No History of Depression vs. History of Depression)

Stigma Variable	No History of Depression	History of Depression
Social Distance***	2.2 (0.6)	2.0 (0.6)
Emotions		
Fear*	2.2 (0.9)	2.0 (0.9)
Anger†	1.7 (0.7)	1.6 (0.7)
Prosocial Emotion*	3.6 (0.7)	3.7 (0.6)
SSMI-SF		
Awareness*	4.6 (1.7)	4.9 (1.7)
Agreement*	3.1 (1.3)	2.9 (1.4)

Note. SSMI-SF = Short form of the Self-Stigma of Mental Illness scale. Social distance (1 = definitely willing, 4 = definitely unwilling). Fear, anger, and prosocial emotion (1 = strongly disagree, 5 = strongly agree). SSMI-SF (1 = strongly disagree, 9 = strongly agree).

*** $p < .001$, ** $p < 0.01$, * $p < 0.05$, † $p < .10$

Appendix

CONTROL GROUP

Magazine article – What is depression?

Mental health experts are devoting renewed attention to depression.

A recent study published in World Psychiatry reviews theories and research evidence related to depression.

Dr. Randy Burke from the University of Missouri – Kansas City, lead author of the study, states: "Depression involves a lot of things, but depressed mood and loss of interest – or 'anhedonia' – really represent the core of depression."

Other features of depression include weight loss or weight gain, insomnia or hypersomnia, and fatigue. Dr. Burke: "Some of the more psychologically based features include feelings of worthlessness or guilt, diminished ability to concentrate, and indecisiveness."

According to Dr. Burke, mental health professionals are poised to make important contributions to knowledge on depression in the coming years. "New research is really promising to increase our understanding of depression."

Scientific article – Depression: Theory and Research Evidence

Highlights

- New research sheds light on the nature of depression, a psychiatric disorder marked by depressed mood, loss of interest, and other symptoms.
- Depressed mood and 'anhedonia' – or a loss of interest – represent the core of depression.
- Other symptoms include worthlessness or guilt, diminished ability to concentrate, and indecisiveness.
- Mental health professionals are poised to make important advances in our understanding of depression in the coming years.

CONTINUUM GROUP

Magazine article – Is there a sharp line between mental illness and mental health? No, it's a matter of degree.

Most people think that there is a sharp line between mental health and mental illness. But this is not true.

A recent study published in World Psychiatry shows that symptoms of depression are experienced by almost everybody at some point in their life.

Dr. Randy Burke from the University of Missouri – Kansas City, lead author of the study, states:

"Actually, almost everybody experiences symptoms of depression. It is just a question of how long and how severe."

Take anhedonia, or "loss of interest," a core symptom of depression. Dr. Burke: "One in four people in our study stated that they had experienced this at some point during the last two weeks. Some told us they experienced it strongly all the time whereas others said they experienced it much less strongly and for shorter periods of time." When several symptoms occur at the same time with a high degree of severity, a condition is considered a mental illness.

Scientists call this a continuum: Nobody is 100% mentally healthy, and nobody is 100% mentally ill. Instead, everybody experiences symptoms of depression to some degree. "We need the term 'depression' to define who needs treatment and who doesn't," says Dr. Burke. "But in terms of symptom experience, it is only a matter of severity. Depression is not all-or-nothing. It is a continuum."

Scientific article – Depression lies on a continuum: Theory and research evidence

Highlights

- New research sheds light on the nature of depression, a psychiatric problem marked by depressed mood, loss of interest, and other symptoms.
- Scientific evidence demonstrates that most people occasionally experience symptoms of depression.
- People differ only in the severity, duration, and degree of impairment associated with these symptoms.
- It is not a question of having depression or not. Rather, depression lies on a fluid continuum.
- It is not a special kind of person who develops depression; anybody could develop the disorder under the right circumstances.

CATEGORICAL GROUP

Magazine article – Is there a sharp line between mental illness and mental health? Yes, there are clear differences.

For many people, it seems unclear where exactly the boundary between mental illness and mental health is. But, in fact, there are clear differences.

A recent study published in World Psychiatry shows that people who have major depressive disorder experience symptoms that are very different from normal experiences. Looking at these symptoms, distinguishing mental illness from mental health is very straightforward.

Dr. Randy Burke from the University of Missouri – Kansas City, lead author of the study, states: "People with major depressive disorder think and feel in a way that is profoundly different from others. What they experience is way outside the experience of healthy people."

Take anhedonia, or "loss of interest," a core symptom of major depressive disorder. Dr. Burke:

“In mental illness, this means a complete inability to feel pleasure. Such experiences are truly beyond the imagination of healthy people.”

A skilled interviewer knows how to ask about these experiences. As Dr. Burke puts it: “If these abnormal states of mind are detected, a diagnosis of major depressive disorder can be made with great certainty.”

According to Dr. Burke, major depressive disorder always involves a state of mind that is fundamentally different from normal. “Looking at these core symptoms, it's either health or illness. There is no in-between. We need to identify these distinct illnesses, so we can give people specific treatment.”

Scientific article – Major depressive disorder is a distinct category: Theory and research evidence

Highlights

- New research sheds light on the nature of major depressive disorder, a psychiatric disorder marked by depressed mood, loss of interest, and other symptoms.
- Scientific evidence demonstrates that only people with major depressive disorder experience symptoms of depression.
- People who have the disorder are fundamentally different from people who do not. People who have depression and people who do not occupy different categories.
- People are either depressed or not depressed; there is no in-between.
- Only a special kind of person can develop major depressive disorder.