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Clinicians' Mental Representations of Psychopathology Are More Positive and Complex Than the Lay Public but Also Stigmatize Suicide

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Bias toward those with mental disorders is pervasive and consequential. We examined bias at the level of mental representation. Clinicians (comprised of graduate students in training and their supervisors; $N = 34$) and laypeople (comprised of undergraduate students; $N = 64$; $M_{age} = 18.58$; 75.0% female-identified) completed a reverse correlation procedure to generate images of their mental representations of people with stigmatized mental health conditions (i.e., schizophrenia, suicide, attention-deficit/hyperactivity disorder [ADHD]). Compared to laypeople, graduate student clinicians and supervisors generated more positive representations of all mental health conditions. However, relative to their representation of ADHD, graduate student clinicians' and supervisors' representations of suicide and schizophrenia were dehumanizing, cold, and threatening. These representations were as negative as those of laypeople, which were undifferentiated and uniformly negative. Graduate student clinicians' and supervisors' representations of suicide were especially negative and occasionally more negative than representations of schizophrenia. Although graduate student clinicians' and supervisors' mental representations of psychopathology were both more positive and complex than those of laypeople, their relatively negative mental representations of severe psychopathology suggest they may harbor subtle biases against some stigmatized mental health conditions. The negative evaluations of graduate student clinicians' and supervisors' mental representations of suicide attempters suggest that suicide is still stigmatized among potential care providers.

Public Significance Statement
The current work documents a subtle, nonconscious bias indicating that some clinicians have cold, negative impressions of people with severe mental health conditions (i.e., individuals who have attempted suicide and those with schizophrenia). This work is important because bias can impair treatment efficacy, and awareness of biases is essential to counteract them.

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Despite improved understanding of its causes, mental disorders remain highly stigmatized in the United States (Schomerus et al., 2012). The consequences of stigma for those grappling with psychopathology are legion and include job loss, educational problems, and relationship difficulties (Rüsch, Angermeyer, & Corrigan, 2005). Although mental health stigma has various sources, it can be especially damaging when it comes from mental health care providers. In particular, biased clinicians may provide clients with substandard care, and clients' perception of bias may lead them to avoid or discontinue treatment (Link & Phelan, 2001). Importantly, clinicians' bias may be nonconscious (e.g., Kopera et al., 2015), which can result in subtle and inadvertent but nevertheless negative responses toward members of stigmatized groups (e.g., McConnell & Leibold, 2001).

The current work used reverse correlation to test whether clinicians harbor subtle, nonconscious biases against people with low- (i.e., attention-deficit/hyperactivity disorder [ADHD]) and high-severity psychopathology (i.e., schizophrenia). We use the term clinician to refer to anyone who provides mental health care services to clients, whether they are licensed clinicians or graduate students in training. In the current work, we sampled graduate student clinicians and supervisors. Although this sample may be distinct from other samples of clinicians (e.g., professional psychologists, social workers), we believe it is nevertheless an important sample because it comprises future clinicians and the individuals training them. Although psychopathology severity is a continuum, research suggests that people associate some disorders with greater degrees of danger than others, even if there is a great deal of intradisorder variability (Jorm, Reavley, & Ross, 2012). Using reverse correlation, the current work tested three competing cross-group hypotheses and one within-group hypothesis. Looking across groups, first, a no-bias hypothesis predicted that due to their mental health training and professional goals, our sample of graduate student clinicians and their supervisors may exhibit less nonconscious bias than lay participants regardless of condition severity (e.g., Kingdon, Sharma, Hart, & the Schizophrenia Subgroup of the Royal College of Psychiatrists' Changing Minds Campaign, 2004; Vibha, Saddichha, & Kumar, 2008). Second, a general-bias hypothesis predicted that due to pervasive stigma surrounding psychopathology, graduate student clinicians and their supervisors may harbor nonconscious biases equivalent to lay participants for both low- and high-severity groups. Third, a severity-bias hypothesis predicted that although graduate student clinicians and their supervisors and lay participants may not differ in bias toward those with less severe psychopathology, stereotypes linking extreme psychopathology with violence and negative experiences with severely disordered clients may lead graduate student clinicians and their supervisors to hold more bias against those with severe psychopathology compared to lay participants (e.g., Mittal et al., 2014). Indeed, turning to our within-group hypothesis, we anticipated that negative experiences and expectations of severe psychopathology would lead graduate student clinicians and their supervisors to generate more negative representations of high-severity psychopathology compared to low-severity psychopathology.

In addition to the mental disorder groups, we also measured nonconscious bias against suicide attempters. Although not associated with any distinct mental disorder (Bertolote, Fleischmann, De Leo, & Wasserman, 2004; Milner, Sveticic, & De Leo, 2013), suicide is still highly stigmatized, even among care providers (e.g., Cerel, Currier, & Conwell, 2006; Emul et al., 2011). Suicide attempters report that care providers sometimes minimize their concerns, fail to adequately explain treatment, and ultimately leave them feeling stigmatized (Cerel et al., 2006). Given these common experiences with stigma and their potential to lead individuals to conceal suicidal thoughts and behaviors (Frey, Hans, & Cerel, 2015) and avoid treatment (Calear, Batterham, & Christensen, 2014), we also tested whether our sample of graduate student clinicians and their supervisors held bias against suicide attempters. By including these three comparison groups, it was possible to compare responses across populations and also test whether nonconscious biases related to suicide are more, less, or equivalent to biases against both low- and high-severity psychopathology. Given evidence that suicide is still viewed negatively by those in and outside the health care field (Cerel et al., 2006; Emul et al., 2011; Frey et al., 2015), we predicted that bias against suicide attempters held by graduate student clinicians and their supervisors would be comparable to bias exhibited by lay participants and equivalent to graduate student clinicians' and supervisors' bias toward severe psychopathology.

Nonconscious Bias

It is important to distinguish between conscious, cognitively accessible forms of bias and nonconscious forms of bias that may occur outside of awareness. Nonconscious biases are particularly insidious because they can influence behavior outside of conscious recognition and frequently are detected by members of stigmatized groups. For example, there is consistent evidence that people of color can detect Whites' nonconscious racial biases and motives (e.g., Carter, Peery, Richeson, & Murphy, 2015; LaCosse et al., 2015; Richeson & Shelton, 2005), and the perception of these biases inversely relates to liking and feelings of rapport in interracial interactions (e.g., Dovidio, Kawakami, & Gaertner, 2002; McConnell & Leibold, 2001; Plant, Devine, & Peruche, 2010). By extension, nonconscious biases held by clinicians may negatively impact their ability to develop rapport with their clients, thereby undermining treatment efficacy. Indeed, although care providers may not have conscious bias toward people with mental disorders, they may unwittingly harbor nonconscious biases (Kopera et al., 2015), which may ultimately hinder treatment efficacy. Hence, it is important to test whether clinicians hold nonconscious biases against people with mental disorders and whether these biases vary as a function of mental disorder severity.

Reverse Correlation and the Assessment of Nonconscious Bias

The current work addressed the understudied question of nonconscious clinician bias by employing reverse correlation, a data-driven technique used to estimate perceivers' mental representations (Brinkman, Todorov, & Dotsch, 2017). Reverse correlation is a data-driven technique that provides a visual estimation of the images people hold in their minds when asked to think about groups or individuals of interest (i.e., mental representation; Brown-Iannuzzi, Dotsch, Cooley, & Payne, 2017; Dotsch & Todorov, 2012; Dotsch, Wigboldus, Langner, & van Knippenberg, 2008; Imhoff & Dotsch, 2013; Imhoff, Woelki, Hanke, & Dotsch,

2013; Krosch & Amodio, 2014; Lloyd, Kunstman, Tuscherer, & Bernstein, 2017; Mangini & Biederman, 2004). Reverse correlation allows researchers to estimate the mental images that individuals form when they think about specific others. In this paradigm, participants typically view pairs of faces and select the face that looks the most like a member of the target group (e.g., "Which individual looks most like someone with schizophrenia?"). Although the base faces are identical, random noise patterns superimposed over the images render them distinct (see Figure 1). Because reverse correlation is unconstrained by experimenter expectations and stimuli selection, participants are free to use personal criteria when deciding which of the two faces more closely resembles their image of the target group. After completing numerous trials, selected images are aggregated to form a classification image (CI), which represents an estimation of perceivers' mental image of the target groups (e.g., people with schizophrenia). If, for instance, participants think people with schizophrenia have threatening eyes, they will consistently choose images with the most threatening eyes. When the selected images are aggregated, the resulting CI will have relatively threatening eyes, thus demonstrating how beliefs about a target group shape visual representation of those group members. Researchers can also aggregate CIs across groups of interest (e.g., clinicians and laypeople). The resulting CIs thus reflect an estimation of how people varying along a characteristic of interest tend to mentally represent others. These images are then presented to naïve evaluators who are asked to rate them on relevant characteristics (e.g., criminality, trustworthiness).

Reverse correlation is an ideal tool for uncovering the mental representations people hold of others. For instance, if perceivers stereotypically associate a group with criminality, mental representations of those group members should overlap with mental representations of criminals, broadly construed. In their seminal work, Dotsch et al. (2008) used reverse correlation to demonstrate that, compared to unbiased participants, nonconsciously biased participants generated CIs that naïve evaluators perceived as more stereotypic. Specifically,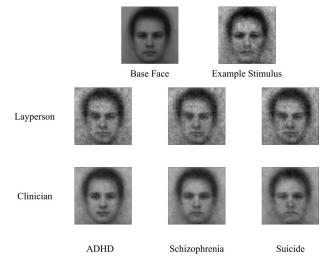 Dutch participants scoring relatively high on measures of nonconscious, anti-Moroccan prejudice generated a CI of Moroccans that naïve evaluators judged as more criminal and less trustworthy than the CI generated by relatively unbiased participants. Reverse correlation effectively captured participants' nonconscious bias and distilled that bias into a visual representation (for a review, see Brinkman et al., 2017). Within the context of research on bias, reverse correlation also has been used to demonstrate antigay mental representations (Dotsch, Wigboldus, & van Knippenberg, 2011) and biased mental representations of people who receive welfare (Brown-Iannuzzi et al., 2017). This past work supports the versatility and robustness of reverse correlation as a technique for assessing negative, nonconscious biased representations of stigmatized groups.

Although past work using reverse correlation has primarily focused on social categories (e.g., race, sex) and stereotypic traits (e.g., criminality), psychopathology is an important, unexplored domain for which reverse correlation is well suited. Much as nonconscious bias distorts the images people have in their heads of stigmatized ethnic groups, nonconscious bias also might alter how people mentally represent psychopathology. Moreover, mental representations are vital for social interaction. Mental images of others are influenced by perceiver motives (e.g., group membership, preexisting beliefs), and they help form expectations that in turn shape behavior (Word, Zanna, & Cooper, 1974). Indeed, simply labeling individuals with a mental disorder drastically changes how their behavior is interpreted (Rosenhan, 1973). Thus, using reverse correlation to investigate clinicians' potential mental health biases may provide insight into the treatment process. In particular, it might highlight areas of potential concern and points of intervention related to clinicians' ability to generate rapport and retain clients.

Reverse correlation is also ideal for providing a detailed (i.e., disorder or severity specific) assessment of clinicians' nonconscious bias because it is freed from the stimuli constraints common to reaction time (RT) measures of nonconscious bias. Indeed, we refer to the biases measured in the present research as subtle and nonconscious as opposed to implicit to distinguish them from biases observed with traditional implicit measures that rely on RT data. Specifically, RT measures of nonconscious bias like the implicit associations task (Greenwald, McGhee, & Schwartz, 1998) and the go/no-go associations task (Nosek & Banaji, 2001) typically rely on the sorting of category exemplars and positive and negative characteristics to assess cognitive associations between groups and positive/negative concepts. As such, they require multiple stimuli to serve as representatives for the category in question (e.g., schizophrenia, depression, anxiety, all being combined into a general mental disorder category). Although the use of these tasks has been instrumental in assessing broad nonconscious biases against those with mental disorders (e.g., Kopera et al., 2015; Teachman, Wilson, & Komarovskaya, 2006), collapsing disorders into a single category precludes tests of disorder-specific bias or how bias changes as a function of disorder severity. Because it can focus on a single decision criterion (e.g., "Which person looks more like a person with schizophrenia?"), the reverse correlation paradigm can assess nonconscious bias toward specific disorders rather than general psychopathology. This heightened level of specificity increases precision in the assessment of nonconscious bias toward people with mental disorders and allows for discrete comparisons between forms of psychopathology that

Figure 1. Base face, example stimulus, and resulting classification images for each sample and target group.

would be difficult if not impossible to perform with traditional RT measures of nonconscious bias.

The current work examined three distinct forms of bias in the evaluation phase of the reverse correlation procedure: dehumanization, warmth, and threat. One particularly virulent form of bias is *dehumanization*, or the perception of others as lacking the mental sophistication central to humanity. The human mind is theorized to have two related yet distinct dimensions (Gray, Gray, & Wegner, 2007). *Agency* involves the capacity for moral reasoning and the ability to willfully impact the world in a thoughtful, premeditated manner. *Experience* involves the capacity for sensation—feeling basic drives and emotions. Although healthy adults generally are seen as high in both agency and experience, these dimensions are theoretically independent. Indeed, children and dogs are perceived to be low in agency yet high in experience, whereas robots and automata are seen as high in agency yet low in experience. Consequently, mental representations of individuals with mental disorders that are perceived to lack agency or experience are suggestive of nonconscious beliefs that these individuals are less-than-fully human, which may predict poor treatment engagement and outcomes. Warmth and threat are also important aspects of person perception. Warm individuals engender approach responses and empathy (Fiske, Cuddy, & Glick, 2007). Threat, by comparison, elicits anxiety, discomfort, and avoidance (e.g., Blascovich, Mendes, Hunter, Lickel, & Kowai-Bell, 2001), which may have corresponding negative effects on treatment and its outcomes. Thus, participants assessed clinician and lay CIs on measures of dehumanization, warmth, and threat.

The Current Work

The current work enhances understanding of clinician bias in at least three important ways. First, because reverse correlation is a data-driven technique, we can use it to assess nonconscious bias in a way that is not limited to researchers' a priori hypotheses and thus limited by researchers' expectations and biases. Rather, participants are free to adopt whatever criteria are meaningful for them when making judgments. Second, by employing a single decision criterion rather than the multiple category exemplars needed for RT measures of nonconscious bias (e.g., implicit associations task, go/no-go associations task), the current work's use of reverse correlation provides a more nuanced test of nonconscious bias toward high and low severity psychopathology. Third, we also measured bias against suicide attempters to test whether graduate student clinicians and their supervisors harbor bias against these frequently stigmatized individuals relative to diagnosed mental disorders (Cerel et al., 2006; Sudak, Maxim, & Carpenter, 2008).

As noted above, we had three competing hypotheses for comparisons between graduate student clinicians and their supervisors and lay participants. The no-bias hypothesis predicted that for all forms of psychopathology, clinicians would demonstrate less bias than lay participants. The generalized-bias hypothesis predicted that clinicians would harbor equivalent levels of nonconscious bias as lay participants. Finally, a severity-bias hypothesis predicted that clinicians and laypeople would evince similar levels of bias for low-severity psychopathology but that clinicians would show greater nonconscious bias than laypeople for high-severity psychopathology. We also predicted that within clinician and lay participants, we would see distinct patterns of nonconscious bias. Specifically, whereas we expected lay participants to have undifferentiated mental representations of psychopathology, we expected persistent stereotypes and negative experiences with clients to lead clinicians to have more biased conceptions of severe psychopathology than less severe pathology. Finally, given the highly stigmatized nature of suicide, we also expected that among clinicians, mental representations of suicide survivors would be just as negative—or more negative—than mental representations of severe psychopathology (i.e., schizophrenia).

To test these hypotheses, we conducted an experiment in which graduate student clinicians and their supervisors and lay participants completed the reverse correlation paradigm.[1] The CIs generated by these samples were then evaluated by naïve evaluators on indices of dehumanization, threat, and warmth. As per the reverse correlation technique, CI evaluations served as the measure of nonconscious bias.

Method

We recruited laypeople and graduate student clinicians and their supervisors to serve as participants. We independently randomized them into one of three mental health conditions: ADHD, attempted suicide, or schizophrenia.

Participants

Laypeople ($N = 64$, $M_{age} = 18.58$, $SD = 1.01$) were undergraduate students at a midwestern university who participated for partial course credit. The majority self-identified as White (76.6%) and female (75.0%). Clinicians were graduate students and faculty in clinical and counseling PhD programs actively seeing clients and/or supervising clinical cases ($N = 34$) from midwestern and southeastern universities. Each clinician was remunerated $10 for their participation. In compliance with the internal review board, clinician demographic information was not collected to protect privacy. Clinicians averaged 4.15 ($SD = 6.41$) years of clinical experience (range = 0–30 years).

CI Generation Materials

Consistent with past work (Dotsch et al., 2008, 2011), one image, a 512×512 grayscale average of all male faces in the Karolinska Face Database (Lundqvist & Litton, 1998), was used as the base image. Randomized noise patterns were superimposed over this image to create the stimuli participants were asked to categorize (see Figure 1).

CI Generation Procedures

Data were collected in person in a private setting (e.g., lab, private office). After providing informed consent, participants

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[1] We also measured explicit attitudes toward ADHD, suicide, and schizophrenia for clinicians and laypeople. Analyses of participants' explicit attitudes revealed that although clinicians ($M = 68.09$, $SD = 21.57$) held marginally more negative attitudes toward ADHD than laypeople ($M = 76.36$, $SD = 21.94$), $t(96) = -1.79$, $p = 0.077$, 95% CI [−17.46, 0.92], $d = -0.38$, clinicians ($M_{schizophrenia} = 66.53$, $SD_{schizophrenia} = 21.61$; $M_{suicide} = 56.98$, $SD_{suicide} = 30.95$; $M_{suicide} = 56.98$, $SD_{suicide} = 30.95$) held more favorable attitudes than laypeople ($M_{schizophrenia} = 50.06$, $SD_{schizophrenia} = 21.22$) for both schizophrenia, $t(95) = 4.28$, $p < 0.001$, [7.44, 25.49], $d = 0.77$, and suicide, $t(94.59) = 4.28$, $p < 0.001$, [11.47, 31.33], $d = 0.78$.

were seated at a computer. Participants were independently randomized into one of the three mental health conditions (i.e., attempted suicide, ADHD, schizophrenia). They viewed two adjacent faces and determined which of the faces looked more like someone who has attempted suicide (or has ADHD/schizophrenia). Participants completed 400 trials of the image selection task, with a break after the 200th trial. After completing this task, our clinician participants were additionally asked to complete a brief clinical experience measure. Finally, participants were debriefed, thanked, and compensated.

Each group's (laypeople, clinicians) selections were used to generate three CIs (ADHD, suicide attempt, schizophrenia), resulting in six unique CIs: laypeople ADHD, laypeople suicide attempter, laypeople schizophrenia, clinician ADHD, clinician suicide attempter, and clinician schizophrenia. The means of the noise patterns from participants' selections were calculated within group (i.e., clinician vs. layperson) and condition (i.e., ADHD, suicide, schizophrenia). We then superimposed the resulting noise patterns onto the original base image to generate the CIs for each of the six experimental groups. Thus, the CIs reflect the average mental image that our sample of graduate student clinicians and their supervisors and laypeople had when imagining what someone looks like who has attempted suicide, who has ADHD, or who has schizophrenia.

CI Evaluations

Evaluators rated the six CIs generated in Study 1 (see Figure 1). We recruited naïve evaluators ($N = 136$, $M_{age} = 33.76$, $SD = 11.88$) via MTurk. The majority of evaluators self-identified as White (81.6%) and male (55.1%). Each received $0.40 for their participation. Attention check failures disqualified 16 evaluators (Oppenheimer, Meyvis, & Davidenko, 2009), leaving a final sample of 120.

Measures

Agentic capacity. We measured agentic capacity (i.e., the capacity to exercise self-control, act morally, have a good memory, and recognize emotions) using a four-item scale with responses ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). The scale demonstrated good internal consistency ($\alpha = .94$).

Experiential capacity. We measured experiential capacity (i.e., the capacity to feel hunger, fear, pain, and pleasure) using a four-item scale with responses ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). The scale demonstrated excellent internal consistency ($\alpha = .96$).

Perceived warmth. We measured desired social closeness using five items. The first four items (i.e., "I would like to be close to this person," "I would want this person to understand me well," "I would like to be open with this person," "I would want to connect with this person") were rated using a scale from 1 (*strongly disagree*) to 7 (*strongly disagree*). The fifth item, adapted from Popovic, Milne, and Barrett (2003), asked evaluators to indicate how close they would want to be to each CI on a scale ranging from 1 (*distant*) to 7 (*smothered*). Desired social closeness items showed excellent internal consistency ($\alpha = .97$).

Additionally, evaluators indicated how well traits associated with warmth (i.e., honest, social, truthful, caring, dishonest [re-

verse coded], happy) described each CI target on a scale ranging from 1 (*not at all descriptive*) to 7 (*extremely descriptive*). These items demonstrated excellent internal consistency ($\alpha = .96$). Because the measures of desired social closeness and warmth were highly correlated ($r = .66$) and they showed strong internal consistency when aggregated ($\alpha = .96$), the desired social closeness and warmth scales were combined to form an omnibus warmth measure (hereafter referred to as warmth).

Perceived threat. Evaluators indicated how well traits associated with threat (i.e., dangerous, threatening, crazy) described each CI target on a scale from 1 (*not at all descriptive*) to 7 (*extremely descriptive*). These items demonstrated good internal consistency ($\alpha = .93$).

CI Evaluation Procedure

After providing informed consent, naïve evaluators provided ratings of perceived agentic and experiential capacity, warmth, and threat for each of the six CIs created in Phase 1. Each evaluator was informed that they would be rating six faces that, although may look similar, were indeed all different. Evaluators were naïve to stimuli creation. The order of stimuli presentation was randomized across participants. After rating the CIs, naïve evaluators were asked to provide demographic information, were fully debriefed, and were compensated.
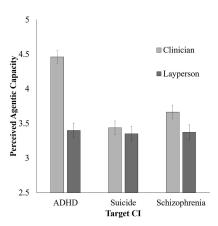
Results

We conducted a series of four analyses of variance (ANOVAs) to examine how evaluators judged the classification images. In an effort to control for Type I error amid multiple comparisons, we used Bonferroni corrections to adjust our alpha values. Because we had four primary tests, the adjusted alpha was .0125. For all tests with significant interactions, we conducted planned follow-up tests to better understand the nature of those interactions.

Agentic Capacity

A 2 (clinician CI vs. layperson CI) × 3 (ADHD vs. suicide vs. schizophrenia) repeated-measures ANOVA on perceived agentic capacity revealed a significant interaction, $F(2, 238) = 38.00$, $p < .001$, $\eta_p^2 = .24$ (see Figure 2, left panel). Evaluators judged the clinician ADHD CI ($M = 4.43$, $SD = 0.99$) as more agentic than the layperson ADHD CI ($M = 3.40$, $SD = 1.15$), $t(119) = 10.31$, $p < .001$, 95% CI [0.83, 1.23], $d = 0.94$. Evaluators judged the clinician schizophrenia CI ($M = 3.66$, $SD = 1.10$) as more agentic than the layperson schizophrenia CI ($M = 3.40$, $SD = 1.21$), $t(119) = 3.02$, $p = .003$, [0.09, 0.48], $d = 0.28$. However, evaluators did not differentially judge the suicide attempter CIs from clinicians and lay participants on agency ($Ms = 3.44$, 3.35; $SDs = 1.09$, 1.19), $t(119) = 1.00$, $p = .32$, [−0.08, 0.25], $d = 0.09$.

Comparing CIs within clinician and lay samples, among clinicians, evaluators judged the ADHD CI ($M = 4.43$, $SD = 0.99$) as more agentic than both the schizophrenia CI ($M = 3.66$, $SD = 1.10$), $t(119) = 8.47$, $p < .001$, 95% CI [0.59, 0.95], $d = 0.77$, and suicide attempter CI ($M = 3.44$, $SD = 1.09$). Evaluators judged clinicians' schizophrenia CI as more agentic than clinicians' suicide attempter CI ($M = 3.44$, $SD = 1.09$), $t(119) = 3.26$, $p < .001$,
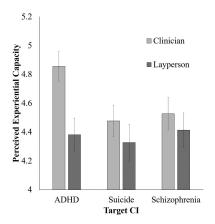
Figure 2. Perceived agentic capacity (left panel) and experiential capacity (right panel) as a function of sample and target group. Error bars represent ± one standard error of the mean. CI = classification image.

[0.09, 0.36], $d = 0.30$. Among the layperson CIs, evaluators judged the ADHD, suicide, and schizophrenia CIs equivalently ($ps > .54$; $Ms = 3.40, 3.35, 3.38$; $SDs = 1.15, 1.19, 1.21$).

Experiential Capacity

A 2 (clinician vs. layperson) × 3 (ADHD vs. suicide vs. schizophrenia) repeated-measures ANOVA on perceived experiential capacity yielded a significant interaction, $F(2, 238) = 7.22$, $p < .001$, $\eta_p^2 = .06$ (see Figure 2, right panel). Evaluators judged the clinician ADHD CI ($M = 4.86$, $SD = 1.15$) as having more experiential capacity than the layperson ADHD CI ($M = 4.38$, $SD = 1.26$), $t(119) = 6.02$, $p < .001$, 95% CI [0.32, 0.63], $d = 0.55$. Similarly, evaluators judged the clinician suicide attempter CI ($M = 4.48$, $SD = 1.19$) as having more experiential capacity than the layperson suicide attempter CI ($M = 4.33$, $SD = 1.40$), $t(119) = 1.99$, $p = .049$, [0.00, 0.39], $d = 0.18$. Evaluators did not differentially judge the clinician and lay schizophrenia CIs ($Ms = 4.53, 4.41$; $SDs = 1.24, 1.33$), $t(119) = 1.38$, $p = .17$, [−0.05, 0.28], $d = 0.12$.

Turning to within-group comparisons, evaluators judged the clinician ADHD CI ($M = 4.43$, $SD = 0.99$) as more experiential than their suicide attempter CI ($M = 4.48$, $SD = 1.19$), $t(119) = 4.13$, $p < .001$, 95% CI [0.20, 0.56], $d = 0.38$, and their schizophrenia CI ($M = 4.53$, $SD = 1.24$), $t(119) = 4.34$, $p < .001$, [0.18, 0.48], $d = 0.40$. Evaluators judged clinicians' suicide attempter and schizophrenia CIs equivalently ($Ms = 4.48, 4.53$; $SDs = 1.19$, 1.24), $t(119) = -0.66$, $p = .51$, [−0.20, 0.10], $d = -0.06$. Among the layperson CIs, evaluators judged the ADHD, suicide, and schizophrenia CIs equivalently ($ps > .20$; $Ms = 4.38, 4.33, 4.41$; $SDs = 1.26, 1.40, 1.34$).

Perceived Warmth

We submitted warmth ratings to a 2 (clinician vs. layperson) × 3 (ADHD vs. suicide vs. schizophrenia) repeated-measures ANOVA, which yielded a two-way interaction, $F(2, 238) = 81.92$, $p < .001$, $\eta_p^2 = .41$ (see Figure 3). Evaluators judged the clinician ADHD CI ($M = 4.11$, $SD = 1.13$) as warmer than the layperson ADHD CI ($M = 2.70$, $SD = 1.07$), $t(119) = 11.67$, $p < .001$, 95% CI [1.17, 1.65], $d = 1.07$. Neither between-groups comparisons

were significant for the schizophrenia CI ($Ms = 2.84, 2.69$; $SDs = 1.04, 1.13$), $t(119) = 1.43$, $p = .16$, [−0.05, 0.33], $d = 0.13$, or the suicide CI ($Ms = 2.71, 2.69$; $SDs = 1.02, 1.12$), $t(119) = 0.19$, $p = .85$, [−0.15, 0.18], $d = 0.02$.

Looking to within-sample comparisons, evaluators judged clinicians' ADHD CI ($M = 4.11$, $SD = 1.13$) as warmer than their schizophrenia CI ($M = 2.84$, $SD = 1.04$), $t(119) = 11.20$, $p < .001$, 95% CI [1.05, 1.50], $d = 1.02$. Evaluators judged clinicians' schizophrenia CI ($M = 2.84$, $SD = 1.04$) as warmer than their suicide attempter CI ($M = 2.71$, $SD = 1.02$), $t(119) = 2.04$, $p = .04$, [0.00, 0.25], $d = 0.19$. Among the layperson CIs, evaluators judged the ADHD, suicide attempter, and schizophrenia CIs equivalently ($ps > .95$; $Ms = 2.70, 2.70, 2.70$; $SDs = 1.07, 1.12, 1.13$).

Perceived Threat

We submitted threat ratings to a 2 (clinician vs. layperson) × 3 (ADHD vs. suicide vs. schizophrenia) repeated-measures ANOVA, which yielded a two-way interaction, $F(2, 238) = 36.42$, $p < .001$, $\eta_p^2 = .23$ (see Figure 4). Evaluators judged clinicians' CIs as less threatening than layperson CIs for ADHD ($Ms = 2.51$, 4.19; $SDs = 1.19, 1.47$), $t(119) = -11.13$, $p < .001$, 95% CI [−1.98, −1.38], $d = -1.02$, suicide attempter ($Ms = 3.74, 4.26$; $SDs = 1.45, 1.47$), $t(119) = -3.37$, $p = .001$, [−0.83, −0.22], $d = -0.31$, and schizophrenia ($Ms = 3.76, 4.15$; $SDs = 1.39$, 1.46), $t(119) = -2.60$, $p = .011$, [−0.68, −0.09], $d = -0.24$.
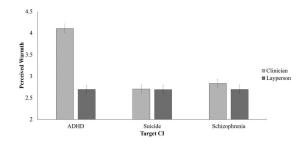

Figure 3. Perceived warmth as a function of sample and target group. Error bars represent ± one standard error of the mean. CI = classification image.
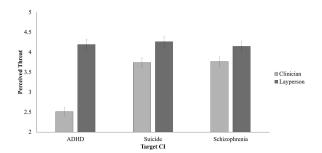
Figure 4. Perceived threat as a function of sample and target group. Error bars represent ± one standard error of the mean. CI = classification image.

As for within-group comparisons, evaluators judged clinicians' ADHD CI ($M = 2.51$, $SD = 1.19$) as less threatening than their schizophrenia CI ($M = 3.76$, $SD = 1.39$), $t(119) = -10.71$, $p < .001$, 95% CI [2.30, 2.73], $d = -0.98$, and their suicide attempter CI ($M = 3.74$, $SD = 1.45$), $t(119) = -8.99$, $p < .001$, [3.51, 4.41], $d = -0.82$, which did not differ from each other ($p = .83$). Among the layperson CIs, evaluators judged the ADHD, suicide, and schizophrenia CIs equivalently ($ps > .36$; $Ms = 4.19, 4.26, 4.15$; $SDs = 1.47, 1.47, 1.46$).

Discussion

The current work used reverse correlation to test graduate student clinicians' and supervisors' nonconscious bias for low- and high-severity psychopathology and suicide relative to an undergraduate sample. Across the study's three metrics of bias (i.e., dehumanization, warmth, and threat), the current cross-group results provide the most support for the no-bias hypothesis. Although schizophrenia and suicide CIs were occasionally rated equivalently (e.g., warmth), on eight of 12 comparisons, graduate student clinician and supervisor CIs were evaluated more favorably than CIs from laypeople. Overall, these results suggest that our sample of clinicians harbors less nonconscious bias toward those with mental disorders than the lay public.

Consistent with hypotheses, within-sample comparisons indicate that graduate student clinicians and supervisors hold more complex, differentiated conceptions of psychopathology than laypeople and that their conceptions of severe psychopathology are more negative than their conceptions of less severe psychopathology. Whereas evaluators judged lay participant CIs equivalently across all indices of bias, suggesting a uniform, undifferentiated conception of psychopathology, evaluators judged clinicians' CIs for high-severity psychopathology more negatively than CIs for low-severity psychopathology. Moreover, on two of four measures (warmth, agency), clinicians' representations of schizophrenia and suicide were distinct such that the suicide attempter CI received more negative evaluations than the schizophrenia CI. These results provide initial evidence that graduate student clinicians and supervisors hold more complex, nuanced mental representations of psychopathology but also that they have more negative conceptions of high-severity psychopathology (particularly related to suicide) than low-severity psychopathology. The results comparing representations of schizophrenia and suicide also underscore the continuing stigma surrounding suicidal behavior. As hypothesized, across the study's indices of bias, evaluators always judged

clinicians' suicide CIs more negatively than clinicians' ADHD CIs and just as negatively (if not more negatively) than clinicians' schizophrenia CIs. Despite suicide being unrelated to any single mental disorder (e.g., Bertolote et al., 2004), suicide mental representations were evaluated just as negatively as CIs of severe forms of psychopathology (i.e., schizophrenia). Consistent with past work on stigma experienced by attempters of suicide (e.g., Cerel et al., 2006), the present results provide suggestive evidence that graduate student clinicians and supervisors may hold negative mental representations of suicide. Suicide stigma is centuries old, and despite some evidence suggesting attitudes toward suicide are improving (e.g., Witte, Smith, & Joiner, 2010), suicide stigma still has the potential to lead to biased mental representations of suicide attempters, even among clinicians. These biased representations likely stem from a variety of sources, including beliefs that suicidal individuals are dangerous and less likely to recover. Further, individuals who have attempted suicide appear to experience a double-edged sword of stigma as they are stigmatized for both being a suicide attempter and for having a mental disorder (Sheehan, Dubke, & Corrigan, 2017). More specific to clinicians, Kleespies and Dettmer's (2000) review demonstrated that client suicide results in a variety of emotional responses among clinicians, including fear, guilt, and incompetence. As discussed by Sommers-Flanagan and Shaw (2017), these negative emotional states might increase the likelihood of engaging in rigid thought patterns, including overly focusing on diagnosis (i.e., emphasizing pathology), as opposed to adopting a holistic view of the individual sitting in front of them.

Summary and Concluding Discussion

Despite advances in understanding, mental disorder stigma remains pervasive. Stigma may be particularly damaging when it comes from clinicians. The current work used reverse correlation techniques to assess graduate student clinicians' and supervisors' nonconscious bias against individuals with high- (i.e., schizophrenia, suicide) and low-severity mental health conditions (i.e., ADHD). Across the study's bias measures (i.e., dehumanization, warmth, threat), most evidence suggests that graduate student clinicians and supervisors have, overall, less biased mental representations than laypeople. However, results suggest that graduate student clinicians and supervisors hold more negative mental representations of high-severity psychopathology than low-severity psychopathology, generating mental representations of schizophrenia and suicide that were more dehumanized, more threatening, and less warm than representations of those with ADHD. Moreover, mental representations of suicide seemed especially negative, hinting at suicide's continued stigmatization among mental health care professionals. Although graduate student clinicians' and supervisors' mental representations of mental disorder were generally more positive, complex, and nuanced than those of laypeople, they also belied evidence of bias against survivors of suicide.

By documenting distinct mental representations of low- and high-severity pathologies and providing evidence that some graduate student clinicians and supervisors hold more negative mental representations of high-severity mental health conditions—particularly suicide—relative to low-severity conditions, the current work advances the study of nonconscious bias among clinicians.

Whereas input stimuli requirements would make it difficult to compare bias toward low- (i.e., ADHD) and high-severity psychopathology (i.e., schizophrenia, suicide) with traditional RT measures of nonconscious bias, reverse correlation's use of a single decision criterion allowed us to directly compare nonconscious biases toward these discrete groups. By using reverse correlation, these results move the study of clinicians' bias beyond general responses to mental disorder, provide evidence of clinicians' complex mental representations of low- and high-severity psychopathology, and highlight the negativity of mental representations of suicide.

These results also have treatment implications. Compared to their ADHD mental representations, evaluators judged graduate student clinicians' and supervisors' suicide attempter and schizophrenia CIs as lower on both agentic and experiential capacity, implying that these individuals may be subtly dehumanized, even by their treatment providers. These dehumanizing mental representations could influence expectations of treatment, resulting in a self-fulfilling prophecy in which clinicians might mentally represent clients as lacking cognitive and emotional control, leading them to respond to clients in ways that may undermine clients' autonomy (Wang, Link, Corrigan, Davidson, & Flanagan, 2018). In keeping with this perspective, suicide attempters sometimes report feeling that their treatment questions and concerns were dismissed by health care providers, resulting in feelings of stigmatization (Cerel et al., 2006) and likely reduced feelings of autonomy. As past research shows, autonomy support is crucial for maintaining treatment gains for people with mental disorders (e.g., Ryan & Deci, 2008). Similarly, clinicians whose mental representations of their clients lack warmth may have difficulty developing empathic relationships, and clinicians whose mental representations of their clients are threatening may provide substandard care or refuse treatment entirely. Together, these results illustrate a range of paths through which biased mental representations could undermine clinicians' care for clients grappling with suicide and schizophrenia.

These results also have important training and intervention implications. Although most training programs incorporate ethics and multicultural competence into their curriculum, to our knowledge, there is no standardized mechanism for mental health stigma training. Our data suggest that the development of such training components may be needed for more severe forms of mental disorders and suicide. The awareness of nonconscious biases affords individuals the opportunity to act in less discriminatory ways. Indeed, awareness and effort can lead to a reduction in nonconscious biases (Devine, Forscher, Austin, & Cox, 2012). Thus, training programs may consider incorporating discussions regarding nonconscious biases. Such discussions should highlight that these biases may affect behavior in subtle ways that can be detrimental to treatment. Further, these discussions may allow individuals to become aware of cues that trigger biased responses (e.g., interacting with survivors of suicide and those with schizophrenia) and consequently aid clinicians in controlling their biases (Monteith, Ashburn-Nardo, Voils, & Czopp, 2002).

It is worth reiterating that our clinician sample was comprised of graduate student clinicians and academic clinicians who, despite overseeing training, may not frequently see clients. We believe targeting these populations is important because many graduate student clinicians will go on to become professional clinicians who see clients on a daily basis, and academic clinicians are largely responsible for the supervision and training of the aforementioned trainees. Nevertheless, it will be important for future work to test whether similar biases exist in professional clinicians who see clients regularly or if the present results are unique to our predominantly academic sample. Likewise, it may also be the case that the clinical training that our participants received changes how they interpret and form impressions from faces (e.g., a face perceived as cold by a layperson might not be similarly judged by a clinician; cf., Willis & Todorov, 2006). To our knowledge, no work directly provides evidence for this, though, suggesting another opportunity for future research.

Finally, it is worth noting that although our clinician sample was drawn from universities located in different regions of the United States, it is still a small subset of the larger clinician population, and caution should be observed in generalizing these results. Moreover, to maintain clinicians' anonymity, we were unable to collect demographic information for these participants. Hence, it remains unclear how important demographic factors like race and gender might interact to determine clinicians' mental representations. More work is needed to demonstrate how pervasive these biases are, how they influence treatment, and how training might reduce these biases in more diverse samples of both lay and professional populations.

Conclusion

The current work provides new insight into nonconscious bias among clinicians. Our sample of graduate student clinicians and their supervisors held more positive, complex, and nuanced mental representations of psychopathology compared to laypeople. However, compared to their representations of low-severity psychopathology, clinicians' representations of schizophrenia and suicide attempters were dehumanized, threatening, and low in warmth. These results provide evidence that clinicians may hold nonconscious bias against people with severe psychopathology. Such biases may undermine treatment efficacy and result in substandard care for those most in need (i.e., clients grappling with severe, highly stigmatized mental health conditions). Training institutions may consider means of reducing nonconscious mental disorder stigma to counteract these harmful biases.

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