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Prejudice Toward People With Mental Illness, Schizophrenia, and Depression: Measurement, Structure, and Antecedents

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Objectives: **Many existing measures of prejudiced attitudes toward people with mental illness have conceptual, theoretical, and psychometric problems. The recently created Prejudice toward People with Mental Illness (PPMI) scale has addressed many of these limitations, but prejudice toward people with different mental disorders may be unique and require further exploration. This study aimed to facilitate this exploration by adapting the PPMI to focus on schizophrenia and depression, and investigate the structure, distinctiveness, and the nomological network of prejudice toward people with these mental disorders.** ***Study Design:*** **We adapted the original 28-item PPMI scale to create the Prejudice toward People with Schizophrenia (PPS) and Prejudice toward People with Depression (PPD) scales. There were 406 participants from the general population, who completed these scales and related measures.** ***Study Results:*** **The original 4-factor structure (fear/avoidance, unpredictability, authoritarianism, and malevolence) was supported for each scale. Participants expressed the highest levels of prejudice toward people with schizophrenia, followed by prejudice toward people with mental illness, and lastly by prejudice toward people with depression. Analyses supported the proposed nomological network of prejudice, which involves theoretical antecedents of social dominance orientation, right-wing authoritarianism, empathy, personality traits, disgust sensitivity, and prior contact.** ***Conclusions:*** **This research provides evidence for the validity and psychometric properties of the PPMI, PPS, and PPD scales, expanding our understanding of antecedents to prejudice toward people with different mental disorders. This research also shows that we gain more insight into prejudice when we use measures targeting specific disorders rather than mental illness in general.**

Key words: scale for prejudice/stigma/psychosis/clinical depression/scale construction/psychometrics

Introduction

People with mental illness (MI) suffer widespread discrimination leading to negative outcomes such as social isolation, exclusion from employment, and loss of self-worth.[1] Besides individual costs, discrimination results in substantial societal costs. It reduces the economic and social contribution of people with MI, leads to homelessness, and exacerbates mental health issues, resulting in a greater dependency on the health system and social services.[2] Discrimination is one of the three components of public stigma, which is defined as the general population's reaction to people with MI.[3] The 2 other components are stereotypes and prejudice.[4,5] Stereotypes represent positive or negative beliefs that exist in the population and that link particularly attributes to a subgroup of people, and these beliefs may or may not be endorsed by a person. Prejudice, on the other hand, involves personally holding negative out-group attitudes.[6] Discrimination is behavior, referring to the negative differential treatment of a person based on their group membership. Prejudice, defined as negative out-group attitudes,[6] is the core component of public stigma that drives discriminatory behaviors.[7] As such, the content and structure of prejudice toward people with MI are of particular interest in addressing discrimination and its consequences.

Although many scales measuring attitudes toward people with MI exist, scales often do not include indicators of prejudice, the central aspect of stigma, and suffer from psychometric limitations, such as unknown or poor validity, double-barreled or ambiguous items, acquiescence bias, nonreplicable factor structure, and difficult language that is inappropriate for the general population.[8] A recent comprehensive review of measures in the area[9] showed that they have significant limitations, with researchers failing to carefully psychometrically

evaluate even two-thirds of the 400 reviewed measures. Additionally, few studies in the area have developed a nomological network—a pattern of logically derived connections between a construct, its antecedents, and its observable outcomes[10]—within which to understand prejudiced attitudes. Finally, there has been little integration between the psychological research into prejudice, which has most notably focused on ethnic, racial, sexist, and religious prejudice, with the research into stigma and prejudice toward people with MI, which has been primarily studied in the fields of psychiatry and sociology—despite important avenues for the integration between these areas of study.[11]

The Prejudice toward People with Mental Illness (PPMI) scale, created by Kenny et al.,[8] addresses many of these limitations through statistical analysis and theoretical integration. Their research has identified 4 dimensions underlying prejudice: fear/avoidance (fear of people with MI and the desire for social distance from them), unpredictability (belief that the behavior of people with MI is unpredictable), authoritarianism (belief in the need to corrosively treat and control people with MI), and malevolence (lack of benevolent attitudes and belief in inferiority of people with MI). The scale and subscales manifest reliability (Cronbach's alpha from .79 to .91 in a community sample), have no double-barreled items, and control for the acquiescence bias by having equal numbers of positively and negatively worded items. The scale and subscales also evinced construct, convergent, and criterion validity across studies.

The authors, building on existing empirical and theoretical work into individual differences in prejudice,[12–14] also demonstrated a nomological network of hypothesized antecedents and consequences of prejudice. The rationale for the nomological network is presented in Kenny et al.,[8] and we will briefly outline here the main findings supporting the network. First, prejudice is related to broader personality traits of lower empathic concern, perspective taking, agreeableness, and openness to experience. In addition, prejudice is related to right-wing authoritarianism (RWA, which includes ideological beliefs such as authoritarian aggression, submission to authority, and conventionalism)[15] and social dominance orientation (SDO, which is an ideology in favor of social inequality[16]). Finally, prejudice is related to lower levels of prior contact with persons with MI. Intriguingly, the authors found that SDO and RWA best predicted prejudice. Further, the PPMI scale correlated with hypothesized consequences, such as self-reported discriminatory behaviors toward people with MI and behavioral intentions in hypothetical scenarios. Lastly, the measure did not correlate significantly with social desirability.

Other research has further supported the validity and usefulness of the PPMI scale. An Arabic version of the scale performed well in a sample of participants from Saudi Arabia, with adequate levels of reliability (both Cronbach's α and test–retest reliability) and replication of the 4-factor structure.[17] Similarly, a study testing a German version of the scale[18] demonstrated the scale's and subscales' high-to-excellent Cronbach's α coefficients, confirmed the 4-factor structure, and established correlations with RWA and low negative correlations with social desirability. Additionally, experimental research using the PPMI scale showed that prejudice tended to increase after watching the movie *Joker*, which depicts a person with MI as violent, as opposed to watching the movie *Terminator*,[19] but tended to decrease following participation in workshops targeting attitudes toward people with MI.[20] All these studies support the proposed nomological network of prejudice, including the internal structure of prejudice and its construct validity.

There is evidence of disparities between attitudes toward different mental illnesses.[21–25] Schizophrenia and depression are the 2 most commonly studied mental illnesses in relation to attitudes, in part due to the disparate reactions to each. Schizophrenia and depression are also better understood by the general population than mental disorders such as personality disorders, and are more commonly perceived as MI than conditions such as substance use disorders.[26] There have been consistent findings that people with schizophrenia are viewed as more dangerous and unpredictable than people with depression and elicit greater fear and desire for social distance, as well as less benevolent responses.[21,23–25] Reavley and Jorm[21] asserted that disparities in attitudes toward different mental illnesses indicate the necessity of targeting antistigma interventions to specific disorders, rather than to people with MI as a general group.

Accordingly, our main aim is to understand the content, structure, and extremity of prejudice toward people with discrete disorders, ie, schizophrenia and depression, and measure it accurately. The PPMI scale has successfully measured prejudice toward people with MI in general, and it correlated significantly with measures of dislike and disrespect of people with several specific illnesses, including schizophrenia and depression.[8] It may thus be tentatively predicted that the dimensions of prejudice toward people with MI, people with schizophrenia, and people with depression are similar, though they may vary in degree. Based on this reasoning, we expected that prejudice toward people with MI, people with schizophrenia, and people with depression would consist of 4 intercorrelated dimensions: fear/avoidance, unpredictability, authoritarianism, and malevolence (Hypothesis 1).

Past research has demonstrated that people with schizophrenia elicit greater fear and desire for social distance compared to people with depression, are viewed as more unpredictable, and provoke less benevolent responses.[7] Given that they are likely to be seen as more threatening and unpredictable, people with schizophrenia are likely

to elicit more authoritarian attitudes[27] than people with depression, and experience worse outcomes as a result. In consequence, we expected that prejudice toward people with schizophrenia, including all its dimensions, would be more negative than attitudes toward people with depression on all 4 attitudinal factors (Hypothesis 2).

As mentioned, the nomological network of the PPMI scale included antecedents of SDO, RWA, perspective taking, empathic concern, Big Five personality traits of agreeableness and openness to experience, and prior contact. Given the role of disgust in prejudice,[28] we also included in the nomological network disgust sensitivity, which is an individual's propensity to heightened sensitivity to possible elicitors of disgust, and which relates to prejudice toward many out-groups.[29] As people with MI are frequent targets of prejudice, we expected that overall prejudice toward people with MI, people with schizophrenia, and people with depression would relate to lower perspective taking, empathic concern, openness to experience, agreeableness and prior contact, and higher SDO, RWA, and disgust sensitivity (Hypothesis 3).

We expected that the dimensions of prejudice toward people with MI and the 2 specific disorders would differentially relate to antecedents (Hypothesis 4). More specifically, given the findings that contact decreases fear and social distance from people with mental disorders,[23] we expected that fear/avoidance would primarily negatively relate to prior contact (Hypothesis 4a). As taking the perspective of others increases the ability to anticipate their behavior,[30] we expected that perspective taking would primarily negatively relate to unpredictability (Hypothesis 4b). RWA predicts authoritarian attitudes toward a diverse range of minority groups,[31] and is likely to drive authoritarian attitudes toward people with mental disorders through a desire for collective security and societal uniformity.[12,32] As a result, we expected that RWA would primarily relate to authoritarianism (Hypothesis 4c). SDO is inversely related to benevolence, the conceptual opposite of malevolence,[33] whereas compassion and motivation toward benevolent responses are caused by higher empathic concern.[34] Accordingly, we expected that high SDO and low empathic concern would primarily relate to malevolence (Hypothesis 4d).

Methods

Participants

Participants were recruited through online forums, psychology research websites, social media, and word of mouth. They gave informed written consent to participate in this study, which was approved by the relevant research ethics committee. There were 406 participants (see Supplemental Materials 1 regarding data screening). Their mean age was 27.43 (SD = 10.76). The majority were females (64%), Australian citizens (58%), Whites (78%), and had English as their primary language (96%). There were 48% of participants with a bachelor's or higher degree, 35% with some university or vocational tertiary training, 14% with high school education, and 3% with only primary education. As for their socioeconomic status (SES), 19% were low, 62% moderate, and 19% high (the measure of SES is described below).

Materials and Procedure

Participants completed an online survey containing the following measures. Unless stated otherwise, all measures used a 9-point Likert-type scale, ranging from 1 (*very strongly disagree*) to 9 (*very strongly agree*).

Prejudice Towards People with MI, People with Schizophrenia, and People with Depression. The 28-item PPMI scale[8] was included (α = .90), with balanced subscales measuring the factors of fear/avoidance (8 items; α =.87), unpredictability (6 items; α =.81), authoritarianism (6 items; α =.77), and malevolence (8 items; α = .72). The Prejudice Toward People with Schizophrenia (PPS) and Prejudice Toward People with Depression (PPD) scales were created by replacing the term "mental illness" in the PPMI with the terms "schizophrenia" or "depression" as appropriate (see Supplemental Materials 2). The PPS scale also had satisfactory reliability (α = .92), as its subscales measuring fear/avoidance (α = .90), unpredictability (α = .89), and authoritarianism (α =.85), whereas the scale measuring malevolence had a slightly lower alpha (α = .68). Likewise, the PPD scale was reliable (α = .88), as its subscales measuring fear/avoidance (α = .78), unpredictability (α = .88), authoritarianism (α = .79), and malevolence (α = .74).

RWA. RWA was measured with the 6-item Very Short Authoritarianism scale[15] (α = .73; eg, "It's great that many young people today are prepared to defy authority"—reverse scored).

SDO. SDO was measured with a shortened 6-item SDO scale (α = .74; eg, "Inferior groups should stay in their place").[16]

Empathy. Empathy was measured using a 14-item scale composed of two 7-item subscales from the Interpersonal Reactivity Index,[35] measuring empathic concern (α = .82; eg, "I often have tender, concerned feelings for people less fortunate than me") and perspective taking (α = .86; eg, "Before criticizing somebody, I try to imagine how I would feel if I were in their place").

Big Five Personality Traits. The balanced Ten Item Personality Inventory[36] was used to measure Big Five personality traits of agreeableness (Spearman–Brown reliability = 0.45), openness to experience (Spearman–Brown reliability = 0.44), extraversion (Spearman–Brown

reliability = 0.79), neuroticism (Spearman–Brown reliability = 0.79), and conscientiousness (Spearman–Brown reliability = 0.71). For example, a reverse-scored item measuring neuroticism was: "I see myself as calm and emotionally stable." The reliability of agreeableness and openness to experience was lower, but internal consistency is not essential for this exceptionally short measure, as it correlates strongly with longer relevant measures and has high test–retest reliability.[36]

Contact. A 10-item version of the Level of Contact Report[37] was adapted to create 3 scales, measuring participants' past contact with people with MI, schizophrenia, and depression (αs = .65, .66, and .69, respectively). Participants responded true (coded 2) or false (coded 1) to statements such as "I have a relative who has schizophrenia."

Disgust Sensitivity. Disgust sensitivity was measured with the 13-item Disgust scale[38] (α = .65; eg, "It would bother me to see a rat run across my path in a park"), which asked participants to respond true or false to statements.

SES. SES was measured with an established 6-item scale[39] (α = .82; eg, "My family usually had enough money for things when I was growing up"), with low SES being a mean of 4 or lower, and high SES being a mean of 7 or higher.

Attention Checks. Three attention checks were included (eg, "To respond to this question, please select option 5, 'neutral'") to ensure that participants were reading and responding to questions appropriately.

Participants completed demographic questions first, then measures of prejudice toward people with MI, people with schizophrenia, and people with depression, and, finally, measures of proposed antecedents. The PPMI scale was presented immediately after demographic questions, followed randomly by either the PPS, then PPD scale, or PPD, then PPS scale. The order ensured that participants were not primed with a particular disorder when completing the PPMI scale.

Results

Descriptive Statistics

The means and standard deviations of each prejudice scale and subscale are in table 1, and those of antecedents are in Supplemental Materials 3. Participants' scores were generally below the mid-point of the scale for the prejudice measures, RWA, SDO, extraversion, and neuroticism, but above the mid-point for empathy, agreeableness, openness to experience, and conscientiousness. Participants tended to score lower on disgust sensitivity and contact with people with schizophrenia, but higher on contact with people with mental illness and depression. Finally, standard deviation values were appropriate indicating that there is sufficient individual difference variability in participants' responses.

Confirmatory Factor Analysis

The hypothesized 4-factor structures of the PPMI, PPS, and PPD were examined using confirmatory factor analysis, conducted with the lavaan R package.[40] The variance–covariance matrices were analyzed using maximum-likelihood estimation and the hypothesized models with 4 correlated factors were created. Besides the 4 factors, a "method factor" was created to account for method variance. All reverse-scored items loaded on this factor, which was orthogonal to the 4 substantive factors. Although no definitive cutoff points for acceptable fit indices exist, Tabachnik and Fidell[41] suggest a model has a good fit if CFI > 0.90, RMSEA is <0.08 with the upper bound of the 90% confidence interval (CI) not exceeding 0.10, and SRMR is <0.08.

Acceptable fit was found, supporting the 4-factor structure, for each scale: PPMI: $\chi^2(330) = 640.83$, $p < .001$, CFI = 0.91, RMSEA = 0.048 (95% CI = [0.043–0.054]), SRMR = 0.048; PPS: $\chi^2(330) = 776.78$, $p < .001$, CFI = 0.92, RMSEA = 0.058 (95% CI = [0.052, 0.063]), SRMR = 0.063; and PPD: $\chi^2(330) = 673.06$, $p < .001$, CFI = 0.90, RMSEA = 0.051 (95% CI = [0.045, 0.056]), SRMR = 0.052. The 4-factor models were compared to unidimensional solutions in which all items loaded onto 1 factor, and also to 3-factor solutions in which the 2 factors in each scale with the highest correlation were combined into 1 factor (fear/avoidance and authoritarianism for the PPMI and PPS, and fear/avoidance and malevolence for the PPD). Based on comparison-of-fit indices and the AIC, the fit of the 4-factor models was better than that of alternative models tested for all 3 scales, suggesting the superiority of the proposed structure (see Supplemental Materials 2). These analyses supported Hypothesis 1.

Figure 1 presents correlations between the latent variables of the PPMI, PPS, and PPD scales. No correlations between subscales were so strong as to indicate that 2 variables should be merged. All items had

Table 1. Means and SD of Scales and Subscales

Scale and subscale	PPMI	PPS	PPD
Full scale	3.28 (0.90)	3.85 (1.02)	2.73 (0.83)
Fear/avoidance	3.20 (1.29)	4.10 (1.51)	2.58 (1.10)
Unpredictability	4.95 (1.27)	5.70 (1.26)	4.03 (1.43)
Authoritarianism	3.18 (1.27)	3.52 (1.55)	2.46 (1.20)
Malevolence	2.16 (0.93)	2.45 (0.93)	2.10 (0.94)

Note. PPMI, Prejudice toward People with Mental Illness; PPS, Prejudice toward People with Schizophrenia; PPD, Prejudice toward People with Depression.

Table 2. Zero-Order (*r*) and Semipartial (*sr*) Correlations of the PPMI Scale and Its Subscales With Antecedents

Antecedent		PPMI	Fear/avoidance		Unpredictability		Authoritarianism		Malevolence	
		r	*r*	*sr*	*r*	*sr*	*r*	*sr*	*r*	*sr*
SDO		.51***	.39***	.05	.23***	.02	.40***	.14**	.54***	.37**
RWA		.36***	.22***	−.01	.26***	.12*	.35***	.21***	.29***	.16**
Empathy	Empathic concern	−.35***	−.28***	−.05	−.12*	.03	−.26***	−.08	−.41***	−.30***
	Perspective taking	−.33**	−.29***	−.11*	−.16**	−.03	−.23***	−.04	−.30***	−.17***
Big Five Traits	Agreeableness	−.21***	−.18***	−.06	−.12*	−.04	−.12*	.01	−.21***	−.14**
	Openness to experience	−.24***	−.25***	−.15**	−.09	.03	−.20***	−.06	−.17***	−.04
	Extraversion	−.02	-.09	−.14**	.07	.10	.02	.07	−.02	.01
	Neuroticism	−.10	-.09	−.03	−.02	.04	−.12*	−.10	−.06	−.01
	Conscientiousness	.08	.06	.01	.06	.02	.11*	.09	.00	−.05
Disgust Sensitivity		.14**	.14**	.09	.10*	.05	.08	-.02	.10*	.03
Contact with PMI		−.26***	−.32***	−.25***	−.09	.04	−.16**	.03	−.19***	−.04

Note. $N = 406$. *$p < .05$ **$p < .01$. ***$p < .001$. PMI, people with mental illness.

Fig. 1. Intercorrelations between factors in the 4-factor model of prejudice toward people with mental illness, schizophrenia, and depression. *Note.* $N = 406$. Manifest indicators and the method factor are not shown. Correlations for Prejudice toward People with Mental Illness are on the first line, for Prejudice toward People with Schizophrenia are on the second line, and for Prejudice towards People with Depression are on the third line. *** $p < .001$.

loadings greater than 0.30 on their hypothesized factors (see Supplemental Materials 2), except for 1 PPS item. As this item's loading, however, was statistically significant, and this item when applied to people with MI and depression had loadings greater than 0.30, the item was retained (future studies should, however, investigate its performance in other samples). All 3 resulting scales and its subscales were significantly intercorrelated (see Supplemental Materials 4).

Comparison of Mean Levels of Prejudice

Repeated-measures ANOVAs were conducted to assess differences in mean scores (Supplemental Materials 5 include detailed analyses). Overall means for each full scale were significantly different from one another, $F(1.77, 717.74) = 630.94$, $p < .001$, partial $\eta^2 = 0.61$, as were the means of the subscales: fear/avoidance, $F(1.86, 753.44) = 438.05$, $p < .001$, partial $\eta^2 = 0.52$; unpredictability, $F(1.76, 713.18) = 386.56$, $p < 0.001$, partial $\eta^2 = 0.49$; authoritarianism, $F(1.85, 749.43) = 217.09$, $p < .001$, partial $\eta^2 = 0.35$; and malevolence, $F(1.99, 806.91) = 69.46$, $p < .001$, partial $\eta^2 = 0.15$. Pairwise

comparisons using the Bonferroni adjustment for multiple comparisons showed that only 1 comparison was not statistically significant (means on malevolence between the PPMI and PPD), whereas all other differences were significant. Prejudice toward people with schizophrenia was more negative than toward people with MI and people with depression in every dimension, whereas prejudice toward people with depression was the least negative, supporting Hypothesis 2. The overall effects appeared to be strongest for fear/ avoidance and unpredictability, less strong for authoritarianism, and weakest for malevolence. Malevolence was the lowest scoring dimension, and unpredictability the highest scoring dimension, for all 3 scales. Interestingly, the mean score on the PPMI fell between the means of the PPS and PPD and was almost equidistant from each (mean distance = 0.57 and 0.55 from the PPS and PPD, respectively).

Correlations Between Prejudice and External Variables

Tables 2–4 present zero-order and semipartial correlations of prejudice with antecedents (for means, standard deviations, and intercorrelations of antecedents, see Supplemental Materials 6). Zero-order correlations show that prejudice toward all 3 groups significantly related to all proposed antecedents in the expected direction, supporting Hypothesis 3. Prejudice related (a) strongly positively to SDO and moderately positively to RWA; (b) moderately negatively to empathic concern and perspective taking; (c) weakly to moderately negatively to agreeableness and openness to experience; (d) weakly positively to disgust sensitivity; and (e) weakly to moderately negatively to past contact. As expected, agreeableness and openness to experience were the central Big Five correlates for each kind of prejudice, whereas extraversion, neuroticism, and conscientiousness were generally unrelated to prejudice.

Semipartial correlations were used to investigate unique associations of each dimension of prejudice with antecedents when controlling for the other 3 dimensions. In support of Hypothesis 4a, prior contact primarily and consistently related to fear/avoidance for all 3 scales. In contrast to Hypothesis 4b, perspective-taking ability did not significantly relate to unpredictability, which related to RWA for both the PPMI and PPD scales. Supporting Hypothesis 4c, RWA primarily and consistently related to authoritarianism for all 3 scales. Finally, in support of Hypothesis 4d, high SDO and low empathic concern primarily related to malevolence. These findings demonstrate a differential pattern of relationships between antecedents and dimensions of prejudice.

In contrast to most antecedents, demographic variables (age, gender, education, and SES) were generally nonsignificant or weak correlates of prejudice (see Supplemental Materials 7). A somewhat consistent finding seems to be weak relationships between higher SES and fear/avoidance, lower education and unpredictability, and male gender and malevolence.

Discussion

The findings of the study supported all hypotheses, apart from 1 sub-hypothesis. Supporting Hypothesis 1, the 4-factor structure of the PPMI was replicated and had good fit for prejudice toward people with schizophrenia and people with depression. This provides support for the structural validity of the PPMI scale and indicates that the 4 dimensions of prejudice toward people with MI form the basis of prejudice toward people with schizophrenia and people with depression.

In support of Hypothesis 2, prejudice toward people with schizophrenia was greater than prejudice shown toward people with depression. Mean attitudes toward people with MI were almost exactly halfway between mean attitudes toward people with schizophrenia and people with depression. This may indicate that the public's representation of a person with MI is not distinctly of either someone with schizophrenia or with depression. This is contrary to expectations based on previous research, which found that schizophrenia was most commonly cited when people were asked to name a mental illness,[42] and that vignettes depicting the symptoms of schizophrenia were more likely to be labeled "mental illness" than those depicting depression.[7,25,26] Our findings may reflect increased awareness of mental health over time and the public conception of MI including a broader range of disorders.[21] People may also perceive depression and schizophrenia as opposite extremes of MI, with depression least severe and schizophrenia most severe, and that the perception of an average "mental illness" falls between them. Significant differences between means suggest that assessing attitudes toward people with MI, people with schizophrenia, and people with depression separately appears to provide greater accuracy and information.

Supporting Hypothesis 3, overall prejudice toward all 3 groups was correlated with each proposed antecedent: lower empathic concern, perspective taking, openness to experience, agreeableness, and prior contact, and higher SDO, RWA, and disgust sensitivity. These links, of theoretically related constructs correlating with each scale in the expected direction, provide convergent validity for the PPMI, PPS, and PPD measures, and further develop the nomological network surrounding prejudice toward people with MI, people with schizophrenia, and people with depression.

Finally, in support of Hypothesis 4, there were differential relationships between antecedents and prejudice dimensions: lower prior contact related to increased fear/avoidance (Hypothesis 4a); RWA related to increased authoritarianism (Hypothesis 4c); and SDO and lower empathic concern related to malevolence (Hypothesis 4d).

Table 3. Zero-Order (*r*) and Semipartial (*sr*) Correlations of the PPS Scale and Its Subscales with Antecedents

Antecedent		PPS	Fear/avoidance		Unpredictability		Authoritarianism		Malevolence	
		r	*r*	*sr*	*r*	*sr*	*r*	*sr*	*r*	*sr*
SDO		.48***	.37***	.05	.25***	.02	.40***	.13*	.50**	.33***
RWA		.32***	.22***	−.03	.20***	.04	.33***	.20***	.25***	.12*
Empathy	Empathic concern	−.27***	−.22***	−.06	−.13***	−.01	−.18***	.00	−.33***	−.26***
	Perspective taking	−.28***	−.27***	−.14**	−.13**	.01	−.19***	.01	−.28***	−.18***
Big Five Traits	Agreeableness	−.14**	−.12*	−.05	−.10*	−.04	−.08	.03	−.15**	−.11*
	Openness to experience	−.19***	−.20***	−.14**	−.03	.11*	−.16**	−.05	−.16**	−.07
	Extraversion	.05	−.01	−.09	.13**	.14**	.05	.03	.01	.00
	Neuroticism	−.09	−.05	.02	-.07	−.05	−.06	−.01	−.10*	−.08
	Conscientiousness	.09	.08	.02	.08	.03	.08	.02	.06	.02
Disgust Sensitivity		.17***	.22***	.18***	.06	−.06	.13**	.00	.09	−.02
Contact with PS		−.18***	−.23***	−.21***	.01	.14**	−.10*	.05	−.20**	−.12*

Note. $N = 406$. *$p < .05$ **$p < .01$. ***$p < .001$. PS, people with schizophrenia.

Table 4. Zero-Order (*r*) and Semipartial (*sr*) Correlations of the PPD Scale and Its Subscales with Antecedents

Antecedent		PPD	Fear/avoidance		Unpredictability		Authoritarianism		Malevolence	
		r	*r*	*sr*	*r*	*sr*	*r*	*sr*	*r*	*sr*
SDO		.54***	.39***	.06	.26***	.09	.39***	.14**	.53***	.35***
RWA		.39***	.22***	−.03	.27***	.14**	.39***	.26***	.26***	.12*
Empathy	Empathic concern	−.36***	−.33***	−.14**	−.08	.04	−.22***	−.03	−.40***	−.26***
	Perspective taking	−.33***	−.29***	−.13*	−.18***	−.08	−.19***	−.01	−.30**	−.18***
Big Five Traits	Agreeableness	−.17***	−.17***	−.10	−.03	−.002	-.06	.05	−.21***	−.15**
	Openness to experience	−.23***	−.21***	−.09	−.10	.02	−.21***	−.11*	−.16***	−.05
	Extraversion	.07	.02	−.02	.07	.05	.07	.05	.04	.01
	Neuroticism	−.09	−.11*	−.08*	.01	.07	−.10*	−.06	−.08	-.02
	Conscientiousness	.02	.04	.06	.01	−.01	.05	.05	−.05	−.01
Disgust Sensitivity		.13**	.15**	.13**	.10*	.06	.07	−.01	.04	−.04
Contact with PD		−.20***	−.27***	−.23***	−.02	.07	−15**	−.04	−.13*	.01

Note. $N = 406$. *$p < .05$ **$p < .01$. ***$p < .001$. PD, people with depression.

In contrast to Hypothesis 4b, however, unpredictability did not relate to lower perspective taking. Perspective taking increases the ability to anticipate the behavior of other people,[30] causing them to seem more predictable. Nonetheless, this does not appear to relate to people with MI, people with schizophrenia, and people with depression. Instead, unpredictability is only related to RWA for both the PPMI and PPD scales, possibly because people higher on RWA tend to perceive increased everyday risks for self,[43] and may therefore perceive people with MI and depression to pose unpredictable risks. The fear/avoidance dimension is also uniquely related to disgust sensitivity for prejudice toward people with schizophrenia and people with depression. Disgust sensitivity is thought to have evolved from a disease-avoidance mechanism,[44] strongly predicting interpersonal and intergroup disgust, and consequent avoidance, even when controlling for actual fear of infection.[45] It has been found to predict prejudice toward unknown (eg, foreign) or socially deviant out-groups.[45] That fear and avoidance of people with mental disorders, who are frequently seen as both unknown and socially deviant,[22,46] is predicted by disgust sensitivity may thus provide further convergent validity evidence. Semipartial correlations, therefore, support the nomological network, and their small-to-medium effect sizes suggest that each of the 4 dimensions has a generally unique pattern of relationships with external variables.

As in past research,[7] demographic variables were nonsignificant or weak predictors of prejudice toward people with MI, people with schizophrenia, and people with depression. They all tended to be poorer predictors than the proposed antecedents discussed above, indicating that psychological variables included in this research, in general, are much more important predictors of prejudice than demographic variables, supporting past research.[12,13,31,34] Past research into antecedents to attitudes toward people with MI has generally only included demographic variables and measures of prior contact, leaving a dearth of knowledge about the causes and correlates of attitudes and a resulting lack of a well-articulated nomological network.

To our knowledge, this study has created the first scales measuring prejudice toward people with schizophrenia and depression specifically for which construct validity has been established through factor analysis and a nomological network. This leads to several practical implications. Researchers can now better assess prejudice toward people with schizophrenia and people with depression as unique groups. Additionally, understanding the content of attitudes allows for the creation of more effective interventions specifically tailored to address specific kinds and dimensions of prejudice, thus improving health outcomes. Finally, effective measures also allow more reliable tracking of changes in attitudes across time and following interventions.

It should be pointed out that the current study had several limitations, which future research should address. First, although the sample included diverse participants, future research should use these scales with representative samples across cultures. Second, the study used correlational analyses to examine the relationship between the proposed antecedents and prejudiced attitudes. We use the term antecedents based on past theory and research, which suggests that variables such as SDO, RWA, and personality traits as more general and broader constructs predispose people to hold negative evaluations of out-groups, ie, prejudice.[14,32,47] It is, therefore, more plausible that broader ideology and personality traits predispose people to have prejudice toward people with MI than that holding such prejudice would cause people to have particular ideologies or personality traits. Nonetheless, causation cannot be fully inferred, and future studies can address it in experimental or longitudinal studies. Further, as we used shorter measures of certain constructs, their reliability was at times lower and future research should use the full measures.

Further research should investigate other potential antecedents of prejudice. For example, past research has shown that biogenetic causal beliefs about MI tend to lead to more prejudice and psychosocial causal beliefs lead to less prejudice.[48–50] This is in part because biogenetic causal beliefs involve essentialist thinking about mental disorders, ie, that they are "a naturally occurring, sharply bounded category, whose causal basis is some sort of inhering, biological pathology" [51(p1305)] It is also possible that biogenetic causal beliefs may act as mediators between ideological beliefs and prejudice as past research shows that essentialist thinking mediates the relationship of RWA and SDO with prejudice.[52,53]

Additionally, given that the current study has successfully adapted the PPMI scale to measure prejudice to people with specific disorders, further studies may investigate if participants' levels of prejudice vary as a result of employing different terms in items. Recently, a study[54] showed that stigma endorsement did not substantially vary as a result of employing different terms in stigma measures, such as "mental illness," "mental health problem," "psychological disorder," and when participants chose their own term that was subsequently inserted in the survey. The study found somewhat higher levels of stigma when the term "emotional distress" was used. Adapting the PPMI scale and subscales to employ different terms might be able to offer a nuanced approach to investigating the role of terminology in prejudice.

Finally, this study adapted the PPMI to create scales measuring prejudice toward people with schizophrenia and people with depression. The significant differences in prejudice toward people with schizophrenia and people with depression highlight the need for examining prejudice toward people with specific disorders. Researchers can now use the scales to understand why people's

prejudice toward people with schizophrenia and depression are so distinct. It is also recommended that future research adapts the PPMI scale and determines whether its structure applies to a wider range of disorders, enabling a more sophisticated study of prejudice in this area.

In conclusion, this research has provided evidence for the validity and strong psychometric properties of the PPMI, PPS, and PPD scales. It has integrated theory and research from psychiatry, psychology, and sociology to develop the nomological network surrounding prejudice toward people with mental disorders. We hope that the findings of this study will be put into practice in developing interventions that are tailored to address specific disorders and dimensions of prejudice, and that this would reduce prejudice and discrimination toward people with mental disorders.

Supplementary Material

Supplementary data are available at *Schizophrenia Bulletin Open* online.

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