



Research article

Somatized or stigma? Causal attributions and emotional responses in shaping social distance towards people with mental illness, China

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ABSTRACT

Background: Mental illness in China has traditionally been attributed to physical factors and somatization tendencies, which seldom result in stigma. How has this perception changed after decades of social change?

Methods: Based on the Chinese General Social Survey database in 2011, this study constructed a structural equation model to analyze the effects of causal attribution and emotional responses on social distance. The causal attributions include dangerousness, controllability, and responsibility. And the emotional responses encompass negative affect, traditional prejudice, treatment carryover, and exclusionary sentiments. In addition, higher scores indicating greater social distance, whereas a low score reflected stronger emotional responses or a greater degree of internal attribution.

Results: The results reported a high level of social distance towards people with mental illness. These findings indicated that emotional responses have a direct impact on social distance. Specifically, when negative affect, traditional prejudice, and exclusionary sentiments increase by one standard deviation, the social distance decreases by 0.497, 0.178, and 0.073 standard deviation, respectively. Conversely, as the level of treatment carryover rises, social distance increases by 0.087. Meanwhile, the causal attribution only exerts a significant indirect effect on social distance by the function of emotional causal responses.

Conclusion: The results indicated that the public attributes mental illnesses like depression primarily to psychological issues rather than somatic ones. It suggested widespread stereotypes and public stigma towards people with mental illness in China, as well as an arduous task in anti-stigma. In addition, a targeted way to address public stigma lies in changing the stereotype of people with mental illness.

1. Introduction

The number of people with mental illnesses have increased a lot since the pandemic of COVID-19 [1,2]. It is shown that nearly 36 million individuals suffered from depression in China in 2019 [3]. Then a higher prevalence was observed among the general population during the pandemic [4,5]. As a result, there has been an extensively reported increase in mortality, as well as an increase in suicide cases [6,7]. China has made plans to help people with mental health, but some of them haven't been fully implemented

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yet [8]. In addition, without considering the public and self stigma toward people with mental illness, the policy seldom achieves success.

Scholarly literature pertaining to mental illness in China exhibits contradictions when addressing emotional responses and causal attribution. When it comes to public stigma, on the one hand, studies focused on emotional responses found social exclusion. It is found people with mental illness are prevented from obtaining resources [9–11], and have limited integration into communities [12,13]. In addition, it also intervenes in the willingness to care for persons with mental illness [14]. This social segregation extends to their family caregivers, the descendants, among others [15–18]. As a result, the family members desire to conceal having a mentally ill family member [19,20]. On the other hand, previous studies that focused on the causal attribution of the mental illness in China reached contrary conclusions. Due to the treatment from indigenous healers such as shamans and fortune-tellers, mental illness in China is attributed to the problem of physicals, and is shaped by the prevailing somatization [21–25], which is seen as curable, just like any other physical illness. Due to biocultural patterns or cultural reasons, neurasthenia is recognized in Chinese clinical settings [23,26,27], and as a result, few stigmas are evident [28,25,20].

However, there are still questions deserve discussion. First, mental illness has traditionally been attributed to physical factors and somatization tendencies, which seldom results in stigma. What is the fact after decades of social change? In fact, the stigma toward people with mental illness attracted few researchers' attention in mainland China in the past two decades [29]. Second, how do causal attribution, stigmas and their impacts interact with each other? Third, how can we develop a comprehensive model that combines causal attribution, emotional response, and social distance?

This study explores the effects of causal attribution and emotional response on social distance in China. The data of this study is the Chinese General Social Survey (CGSS) 2011. Insofar as our efforts, the health and healthcare module in CGSS 2011 is the only national wide survey related with mental illness in China. And few researchers had noticed this module. It includes a vignette that depicts the symptoms of schizophrenia, depression, or asthma meeting DSM-IV randomly (please find the vignette in Appendix A.2). By structural equation model, this study analyses the relationships between causal attribution, emotional response, and social distance towards mental illness. This object is achieved by exploring the following subjects: (1) the characteristics of social distance towards people with mental illness in China; (2) the relationships between causal attributions, emotional response, and social distance.

2. Social distance and the influencing factors

People with mental illnesses must struggle with the psychological symptoms of their disease, the impact of comorbid physical illnesses, and the misunderstandings and prejudices society holds towards their condition [30,31]. These misunderstandings are stigmas, which include public stigma and self-stigma [32–35]. The term “public stigma” refers to the harmful effects to mental health issues, like discrimination, prejudice from the general public. While “self-stigma” occurs when those with mental illness internalized the public stigma [30,36].

The focus of this study is public stigma, which is usually measured through social distance, and kinds of stereotypes. Social distance (SD) is the pro-social and social relations from a personal perspective [37]. It is the perception of distance from others [38,39]. SD reflects an individual's willingness to admit others [40]. It is also used as the level of group identity, particularly in the context of inter- or in-group relationships [41]. The measurement of SD is a series of questions about how close a person is to another person, whether they are a social companion, a co-worker, a neighbor, a friend, or an in-law [42]. It depicts psychological distance, just like interpersonal space (IPS) used to depict interaction distance from others [43].

Stigma as a negative outcome and a barrier to recovery has attracted attention of researchers in recent years [44]. Two currents in sociological research have evolved before 2000. One concerns the mechanism of self-stigma increasing the symptoms of mental illness [32]. Studies focused on culture showed that the group differences in public stigma related to mental illness have been one of the major reasons [45–47,41,48]. Further studies showed that public stigma was found in deviant actions, including those of alcoholics, drug addicts, and individuals with severe mental illness (i.e., schizophrenia), among others [49,12,50,51]. All of these public stigmas increase the self-stigma of individuals with mental illness. After 2000, the attributions about the causes of mental illness dominated the related research [32]. Some studies focused on understanding the attribution effect of stigma related to mental illness or decreasing stigmatized perceptions [52–55]. Other focused on three factors related to causal attributions [56,32]. They were controllability, responsibility, and dangerousness. These three factors were the use of Weiner' theory. Weiner distinguished mental-action-based from physically-based factors. The former one is onset-uncontrollable and thus evokes pity as well as behavioral judgments of help-giving. Whereas the physically-based factors are onset-controllable and therefore evoke little liking but anger and stand idly by [57].

The definitions related to stereotypes are complicated and often contradictory. In some study, they are blame, anger, pity, help, fear, avoidance, segregation, and coercion [36]. In other study, there are emotional responses, which thought to be the backbone of stigma [58]. These responses include tradition prejudice, exclusionary sentiments, negative affect, treatment carryover, social distance, perceptions of dangerousness, among others [58].

With the purpose of clearing the relationships of emotional responses, causal attribution, and social distance, we introduce the causal attribution model [32]. We also made small revision on this model and to explore its impact on social distance for individuals with mental illness in China [59,60,32,56]. The structural model is showed in Fig. 1. It implies that, when the mental illness is internal causal attribution, negative emotional response will arouse, social distance will be enlarger.

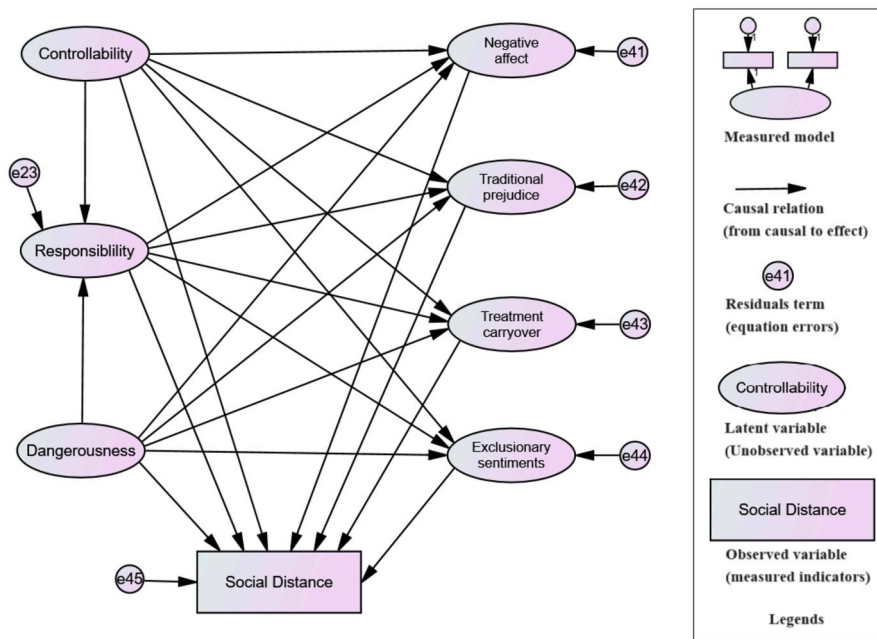


Fig. 1. Structural model of the attribution process in mental illness stigma.

3. Materials and methods

3.1. Data

The CGSS, as a national representative survey, has been officially implemented by Renmin University since 2003. The 2011 CGSS includes 4 modules, (1) core content, (2) psychological health and stigma, (3) health and healthcare, and (4) house condition. The second module, which was also conducted in the International Social Survey Program (ISSP) and in the General Social Survey 2006, depicted a vignette related with the symptoms of schizophrenia, depression, or asthma in people of different ethnic groups and genders (please find the vignette in Appendix A.2). After the vignette had been read, the respondents were asked to answer the related questions. The survey was conducted from June to August, 2011. The sample size was 5,620, with 4,736 valid. Due to the samples were from freely accessed database, the ethics approval was not needed.

3.2. Measurement

3.2.1. Social distance

SD. After the vignette had been read, respondents were asked to indicate how willing they would be to: (1) “To have a person described as having a mental health problem as a neighbor”; (2) “To spend time socializing with that person”; (3) “To have that person care for children”; (4) “To make friends’ with that person”; (5) “have the person work closely with them on a job”; and (6) have that person “marry into your family”.

The responses were, “Definitely willing”, “Probably willing”, “Probably unwilling”, and “Definitely unwilling”. They were coded 1 to 4, respectively. We combined SD to produce a summed scale that ranged from 6 (low SD/prejudice) to 24 (high SD/prejudice) [61,56]. The higher score, the larger SD is.

3.2.2. Emotional response

This study introduces four emotional responses according to previous studies [58]. The first is negative affect (NA), which is the public stereotype that people with mental illness are difficult to interact with. The second is the traditional prejudice (TP), which is the impression that those with mental illness are inferior to others. Due to the positive wording, this study reverses the assignment the value labels. The third is the treatment carryover (TC), which is the negative consequence of being known to have mental health treatment. The fourth is the exclusionary sentiments (ES), which pertains to the denial of the full benefits of citizenship. Specific items are showed in Appendix A.1.

Based on the coding, a low score of TP, NA, ES, and TC means higher emotional responses, whereas a high score means mild or weak emotional response.

3.2.3. Causal attributions

In this study, the causal attributions include Controllability, responsibility, and dangerousness. Specific items are showed in Appendix A.1. Based on the coding, a low score means internal causal attributions.

Table 1
Mean differences of social distance among the sample, and the percentage of the sample in each group.

Variables	Value	Mean	N	Std. Deviation	F	Sig.	Percent
SD		16.36	4736	3.86	-	-	-
Gender	Male	16.32	2129	3.92	0.54	0.461	45.66
	Female	16.40	2607	3.80			54.34
Ethgroup	Majority	16.39	4480	3.86	3.99	0.046	94.62
	Minority	15.89	250	3.79			5.38
Ages	18 - 39	15.99	1500	3.58	11.14	0.000	31.69
	40 - 60	16.47	2170	3.90			45.05
	>60	16.67	1066	4.11			23.26
Education level	Less than high school	16.18	1726	4.07	1.94	0.100	37.28
	High school	16.45	2347	3.83			48.59
	Junior college	16.35	348	3.41			7.30
	Bachelor	16.75	280	3.15			6.07
	Graduate	16.57	35	3.60			0.77
Marital status	Married	16.42	3772	3.88	2.42	0.047	79.42
	Widowed	16.33	396	4.09			8.81
	Divorced	16.40	93	3.84			1.99
	Separated	16.44	9	3.57			0.20
	Never married	15.82	440	3.39			9.59
	Total	16.36	4736	3.86			100.00

3.2.4. Sociodemographic variables

These variables are: (1) Gender (Male = 1, Female = 2). (2) Marital status (Married = 1, Widowed = 2, Divorced = 3, Separated = 4, Never married = 5). (3) Ethnic groups (**Ethgroup**) (Majority = 1, Minority = 2). (4) Ages (18-39 = 1, 40-60 = 2, > 60 = 3). (5) Education level (Less than high school = 1, High school = 2, Junior college = 3, Bachelor = 4, Graduate = 5).

3.3. Method

First, the descriptive statistics of the sample and the analysis of variance about SD differences were presented. Then, we used SPSS 26.0 and AMOS 21.0 for structure equation model (**SEM**) analysis.

4. Results

4.1. Group difference of SD and descriptive results

Table 1 reports the socio-demographic condition of the respondents in the last column. Table 1 also shows that the means of social distance (**SD**) is 16.36. Due to a higher score represented a larger SD, respondents have significant stigma towards people with mental illness. We also combine the analysis of variance (**ANOVA**) results in Table 1. The results show that there are significant differences in SD between respondents in various ethnic groups ($f = 3.99, p = 0.046 < 0.05$), ages ($f = 11.14, p = 0.000 < 0.01$), marital condition ($f = 2.42, p = 0.047 < 0.05$).

Table 2 presents the mean difference in social distance between gender, ethnic groups, education level, ages groups, and marital status. The results show that there are significant differences in ages and education level. In detail, female endorses stronger social distance (i.e., in caring kids, marrying into family) compared with males. The majority exhibits larger social distance (i.e., as a neighbor, socialize with, care kids, and marry into family) compared with the minority. The respondent with higher education level endorses stronger social distance (i.e., as a neighbor, socialize with, care kids), whereas those with lower education level exhibit larger social distance in marrying into family. Moreover, respondents of different marital status show differences in making friends and marrying into family.

4.2. Structure equation model results

4.2.1. Model fit tests

Several parameters are used in the model fit test, which is asked before conducting the analysis. Based on previous studies, this study adopts several index like χ^2 , and RMSEA to depict the model fit. These indexes are showed in Table 3.

Generally speaking, a suitable sample size for the χ^2 test is 100 to 200, whereas a suitable number of variables is less than 20 [62]. That is, a larger sample size, or more estimated parameters (variables) will enlarge the value of χ^2 , and further increase the value of the normed χ^2 ($NC = \chi^2/df$). As a result, the χ^2 value and normed χ^2 ($NC = \chi^2/df$) are not helpful for assessing the model fitness [63,64]. The root mean square error of approximation (**RMSEA**) is 0.059. Based on previous studies, a value

Table 2
Mean difference in social distance between gender, ethnic groups, education level, age groups, and marital status.

		As neighbor	Socialize with	Cares kids	Make friends	Work with Work with	Marry into family
Gender	male	2.32	2.38	3.2	2.44	2.58	3.29
	female	2.34	2.37	3.25	2.43	2.59	3.35
	<i>P</i>	0.632	0.479	0.034	0.653	0.795	0.013
Ethnic group	majority	2.34	2.38	3.23	2.43	2.59	3.33
	minority	2.25	2.29	3.13	2.39	2.53	3.22
	<i>P</i>	0.087	0.071	0.041	0.381	0.247	0.03
Education level	LT HIGH SCHOOL	2.29	2.34	3.11	2.44	2.59	3.29
	HIGH SCHOOL	2.34	2.38	3.28	2.42	2.58	3.35
	JUNIOR COLLEGE	2.39	2.37	3.3	2.38	2.54	3.29
	BACHELOR	2.41	2.48	3.42	2.45	2.64	3.35
	GRADUATE	2.47	2.57	3.36	2.38	2.57	3.18
	<i>P</i>	0.018	0.026	0.000	0.653	0.664	0.071
Ages	18 - 40	2.29	2.31	3.25	2.32	2.51	3.23
	40-60	2.33	2.38	3.24	2.47	2.6	3.37
	more than 60	2.39	2.44	3.18	2.52	2.66	3.36
	<i>P</i>	0.009	0.000	0.053	0.000	0.000	0.000
Marital status	MARRIED	2.33	2.38	3.24	2.45	2.59	3.33
	WIDOWED	2.34	2.35	3.14	2.45	2.6	3.36
	DIVORCED	2.26	2.49	3.31	2.55	2.55	3.33
	SEPARATED	2.11	2.6	3.36	2.64	2.64	3.27
	NEVER MARRIED	2.31	2.33	3.2	2.24	2.49	3.2
	<i>P</i>	0.734	0.331	0.088	0.000	0.118	0.006

Table 3
Model fit summary for the proposed research model.

Index	χ^2	<i>df</i>	χ^2/df	<i>RMSEA</i>	<i>NFI</i>	<i>CFI</i>	<i>PNFI</i>
value	2577.931	255	10.110	0.059	0.830	0.843	0.705

df denote “degree of freedom”.

of *RMSEA* between 0.05 to 0.08 is reasonable fit [65–67]. The normed fit index (*NFI*), which is also called the delta index, is formulated by the equation,

$$NFI = \frac{\chi^2_{Independent.mode} - \chi^2_{Default.mode}}{\chi^2_{Independent.mode}}$$

The comparative fit index (*CFI*) is [68],

$$CFI = 1 - \frac{\max[\chi^2_{Default.mode} - df_{Default.mode}, 0]}{\max[\chi^2_{Independent.mode} - df_{Independent.mode}, \chi^2_{Default.mode} - df_{Default.mode}, 0]}$$

where,

$$\chi^2_{Default.mode} \gg df_{Default.mode}, \chi^2_{Independent.mode} \gg df_{Independent.mode}$$

The parsimony-adjusted NFI (*PNFI*) is,

$$PNFI = NFI \times \frac{df_{Default.mode}}{df_{Independent.mode}}$$

In this model, the values of *CFI*, and *NFI* are 0.843 and 0.830, respectively, which are acceptable. In addition, the parsimony-adjusted NFI (*PNFI*) is 0.705 > 0.50, which means the model is acceptable.

4.2.2. Direct effect analysis

Fig. 2 shows the path diagram of the SEM (with β). Table 4 is the structural results.

The results indicate that emotional responses have a significant impact on social distance. Table 4 reports that negative affect (NA), traditional prejudice (TP), treatment carryover (TC) and Exclusionary sentiments (ES) are significant on social distance (SD).

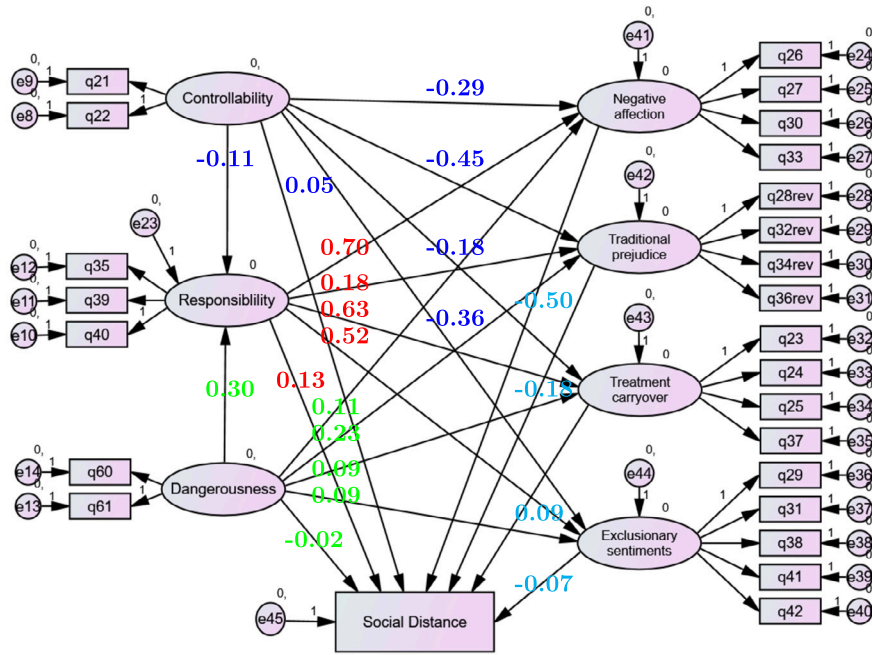


Fig. 2. The path diagram of the structural equation model (with β). The coefficients correspond one-to-one with the β value in Table 4, except for the difference in rounding to two decimal places. The coefficients in *blue* ($-0.29, -0.45, -0.18, -0.36, -0.11$) are related to Controllability on Emotional Response, Social distance, and Responsibility. The coefficients in *red* ($0.70, 0.18, 0.63, 0.52, 0.13$) are related to Responsibility on Emotional Response, and Social distance. The coefficients in *green* ($0.11, 0.23, 0.09, -0.02, 0.30$) are related to Dangerousness on Emotional Response, Social distance, and Responsibility. The coefficients in *cyan* ($-0.50, -0.18, 0.09, -0.07$) are related to Emotional response on Social distance.

Table 4
Estimates of regression weights and the standardized weights.

	Path	Estimate	S.E.	C.R.	P	β
Responsibility	← Controllability	-0.062	0.021	-2.947	0.003	-0.108
Responsibility	← Dangerousness	0.182	0.023	8.057	***	0.297
NA	← Controllability	-0.251	0.027	-9.143	***	-0.285
TP	← Controllability	-0.289	0.024	-11.866	***	-0.451
TC	← Controllability	-0.141	0.024	-5.825	***	-0.178
ES	← Controllability	-0.253	0.024	-10.754	***	-0.364
NA	← Responsibility	1.071	0.073	14.707	***	0.696
TP	← Responsibility	0.206	0.037	5.527	***	0.184
TC	← Responsibility	0.868	0.063	13.828	***	0.627
ES	← Responsibility	0.636	0.052	12.199	***	0.525
NA	← Dangerousness	0.102	0.027	3.717	***	0.108
TP	← Dangerousness	0.159	0.021	7.463	***	0.233
TC	← Dangerousness	0.072	0.025	2.877	0.004	0.085
ES	← Dangerousness	0.070	0.021	3.384	***	0.094
SD	← Dangerousness	-0.153	0.192	-0.797	0.426	-0.021
SD	← Responsibility	1.519	1.054	1.441	0.149	0.126
SD	← Controllability	0.366	0.314	1.164	0.244	0.053
SD	← NA	-3.889	0.498	-7.810	***	-0.497
SD	← TP	-1.920	0.339	-5.664	***	-0.178
SD	← TC	0.757	0.346	2.189	0.029	0.087
SD	← ES	-0.725	0.373	-1.944	0.052	-0.073

When NA, TP, and ES go up by one standard deviation, SD goes down by 0.497 (the standardized direct effect $\beta = -0.497, p < 0.001$), 0.178 (the standardized direct effect $\beta = -0.178, p < 0.029$), and 0.073 (the standardized direct effect $\beta = -0.073, p = 0.052 < 0.01$) standard deviations, respectively. When TC goes up by one standard deviation, SD goes up by 0.087 standard deviations (the standardized direct effect $\beta = 0.087, p = 0.029 < 0.01$). The results also report that NA has the largest effect on SD compared to other variables, whereas TP has a larger effect compared to NA.

Table 5
Standardized effect results using bootstrap method (bias-corrected percentile method).

Path	Total	direct	Indirect	Indirect effect		Significance
				Lower	Uppers	
ES ← Controllability	-0.421	-0.364	-0.056	-0.106	-0.011	0.016
TC ← Controllability	-0.245	-0.178	-0.068	-0.129	-0.013	0.016
TP ← Controllability	-0.471	-0.451	-0.020	-0.050	-0.004	0.010
NA ← Controllability	-0.360	-0.285	-0.075	-0.145	-0.015	0.015
ES ← Dangerousness	0.250	0.094	0.156	0.108	0.219	0.000
TC ← Dangerousness	0.272	0.085	0.187	0.132	0.258	0.000
TP ← Dangerousness	0.287	0.233	0.055	0.023	0.101	0.001
NA ← Dangerousness	0.315	0.108	0.207	0.144	0.289	0.000
SD ← Controllability	0.312	0.053	0.259	0.192	0.346	0.000
SD ← Dangerousness	-0.186	-0.021	-0.165	-0.222	-0.121	0.000
SD ← Responsibility	-0.236	0.126	-0.362	-0.567	-0.208	0.000

As shown in Table 4, there are no significant relationships between dangerousness and SD (the standardized direct effect $\beta = -0.021$, $p = 0.426 > 0.05$), controllability and SD (the standardized direct effect $\beta = 0.053$, $p = 0.244 > 0.05$), as well as responsibility and SD (the standardized direct effect $\beta = 0.126$, $p = 0.149 > 0.05$). However, there may be indirect effect among causal attribution and SD, although some direct effects are not significant. In addition, there are three potential mediating paths through which both the controllability and dangerousness effects on SD can be explained. The first is that responsibility may serve as an intermediary. The second is that emotional responses act as the potential intermediary. The third is that both responsibility and emotional responses play multiple intermediary roles. This study further analyzes the potential mediating effects. Moreover, this study examines the indirect effect of controllability and dangerousness on emotional responses.

4.2.3. Indirect effect analysis

We performed 5000 bootstrap samples at 95% bias-corrected confidence level to test the mediating variable effect. The standardized total, direct, and indirect effects with lower and upper bounds are showed in Table 5.

When asked for the indirect effect among causal attribution on social distance (SD), the data in Table 5 indicates that the total standardized effects of controllability, dangerousness, and responsibility on SD are 0.312, -0.186, and -0.236, respectively. This means that SD increases by 0.312 standard units for each increase in controllability, decreases by 0.186 standard units for each increase in dangerousness, and decreases by 0.236 standard units for each increase in responsibility, respectively. Based on previous studies, when the interval does not contain zero, the indirect effect exists [69]. The results reveal that the intervals are (0.192, 0.346), (-0.222, -0.121), (-0.567, -0.208), respectively. Due to these intervals do not contain zero, the indirect effects are existed.

The results show that there are indirect effects between controllability and the emotional response. In detail, the standardized total effect of controllability on exclusionary sentiments (ES) is -0.421, which is the addition of direct effect (-0.364) and indirect one (-0.056). It means ES decreases by 0.421 standard units when controllability increases by 1 standard unit. The indirect effect is -0.056, and its 95% confidence interval (-0.106, -0.011) does not contain zero, so there is an indirect effect. The indirect effects of controllability on treatment carryover (TC), traditional prejudice (TP), negative affect (NA) are -0.068, -0.020, -0.075, respectively. And the 95% confidence intervals are (-0.129, -0.013), (-0.050, -0.004), (-0.145, -0.015), respectively. Due to these intervals do not contain zero, so there are indirect effects.

The results also indicate that there is an indirect effect between dangerousness and the emotional response. In detail, the indirect effects of dangerousness on ES, TC, TP, and NA are 0.156, 0.187, 0.055, and 0.207, respectively. And the 95% confidence intervals are (0.108, 0.219), (0.132, 0.258), (0.023, 0.101), and (0.144, 0.289), respectively. Due to the intervals do not contain zero, therefore, there are indirect effects.

In brief, causal attribution has significant indirect effect on SD, although it does not exert direct relationship. In detail, the indirect effects of controllability, and dangerousness on SD are taken place by the double mediating effects arising from responsibility and the emotional responses. While responsibility takes advantage of the effect of emotional responses to influence SD indirectly. In conclusion, emotional response plays an important role in the relation between causal attribution and SD.

5. Discussion

In this study, we examined Chinese' public stigma towards people with mental health problems. Further, we introduced a model combining the causal attribution, emotional response, and social distance. The causal attribution was measured by controllability, responsibility, and dangerousness. The emotional response was measured by negative affect, traditional prejudice, treatment carryover, and exclusionary sentiments.

The first finding of this study indicates a higher social distance exists in China. The results show that the main obstacle for Chinese people to interact with persons with mental illness exists in marrying into family, and caring for kids. The results also report significant difference among males and females, educational level, ages, among others. It adds to previous studies, which found that

individuals with mental illness were excluded from jobs, social interaction, and rational debates [70–73]. The results are differed from the findings that the desire for social distance decreased in US [74]. In addition, this study depicts that the stigmas towards persons with mental illness in China have widened over the past decades of years. In the past, people with mental illness in China were attributed to physical problems and were shaped by the prevailing trend of somatization [21–25], which is seen as curable. As a result, few stigmas are evident [28,25,20]. However, the symptoms are defined as mental illness, such as depression, and schizophrenia, among others. These definitions lead to stigma and widen the social distance. This finding is consistent with the study in America, which found that the public are unwilling to interact with people with mental illness as neighbors, friends, among others [56]. It implied that the public imposes another social harm, which originates from social structure, towards people with mental illness [40].

The second finding of this study shows that the controllability, dangerousness, and responsibility characteristics of people with mental illness do not have a direct effect on social distance. The path diagram shows that these causal attribution characteristics function through emotional responses, including negative affect, traditional prejudice, treatment carryover, and exclusionary sentiments towards people with mental illness. In addition, controllability leads to decrease in emotional responses, whereas the dangerous and responsibility lead to increase in emotional responses. As a result, the emotional response leads to gaps between the public and the people with mental illness [14]. The finding is consistent with previous study which found that affect plays an important role in interact rejection response [32]. However, some different mechanisms are needed to be stressed. One is that the function of controllability, responsibility on social distance are not the same as in America. Another is that emotional response in China is not like that in America, where fear of emergency is a strong predictor factor in social distance [58]. Furthermore, emotions like traditional prejudice, exclusionary sentiments, negative affect, as well as treatment carryover lead to the rejection of people with mental illness. When the analysis of effect factors is the first step in combating stigma [75], this finding is a supplement to a previous study which found that mental illness was considered to be the result of social institutional distress in China [26].

The association of mental illness and emotional response, which has been studied by previous studies [56], can be interpreted by the public stigma towards the label “mental illness”. First, labels of “mental illness” traditionally have a negative impact on public willingness to social interaction in China. It is found that the willingness to work of the mental health guards at the local level in China was low [76]. Visiting a psychological counselor may be unsettling, although it is the first step in solving the issue, and there were lots of patient abuse during the Cultural Revolution [77,78]. Therefore, people with mental illness are encountering social exclusion, and are limited integration into communities [13,16,12]. Moreover, social exclusion increases the pressure and triggers intentions of self-stigma. When people with mental illness are unable to find a way to release the pressure, harmful effects including suicide cases may occur. This condition has been identified during the COVID-19 epidemic [13,6,79,2].

6. Strengths, limitations and future directions

This study used the nationwide sample database based on random sampling for social change. It helps to understand the public stigma, attribution, as well as emotional responses. It is also helpful in understanding the changes in people’s views on psychological problems in China. Meanwhile, there are limitations. Due to the vignettes related to symptoms of mental illness are random, this study has not considered the types of mental illnesses. In addition, with the purpose of constructing a comprehensive model, this study has not focused on attributions like genetics, character, among others. In fact, mental illness is not only a medical problem but also a constructed matter of fact [80,81]. It is found that people who made more attributions to God and the devil had a higher meaning in life, particularly among those with stronger religious worldviews [82,83]. Therefore, our future study should focus on these attributions.

7. Conclusions

The results reveal evident public stigmas towards people with mental illness in China. It indicates that the public attributes mental illnesses like depression primarily to psychological ones rather than somatic issues. The results also illuminated the process through which stereotypes evolve over time. Initially, people with mental illness in China were viewed as somatic issues. However, they have been ascribed to patients with conditions such as depression, schizophrenia, and others. This shift has contributed to increased stigma and widened social distance. In addition, the results show that the social distances towards people with mental illness are affected by both direct and indirect factors. As the research has found, emotional responses, which include negative affect (NA), traditional prejudice (TP), treatment carryover (TC), and exclusionary sentiments (ES), have direct effect on SD. The NA, TP, and ES show significant negative effects on SD, whereas the positive effect of TC on SD is prominent. The results also prove that causal attributions have indirect effects through emotional responses, although the direct path effect is not significant. When the coding is reversed, it indicates that, the emotional responses lead to the rejection of persons with mental illness. The function of emotional responses reveals widespread stereotypes and prejudice towards persons with mental illness in China. This implies that the fight against stigma is an arduous task. Thus, a targeted way to address public stigma lies in changing the stereotype of people with mental illness.

Abbreviations

The following abbreviations are used in this manuscript:

NA	Negative affect
TP	Traditional prejudice
TC	Treatment carryover
ES	Exclusionary sentiments
SD	Social distance
Ethgroup	Ethnic groups
SEM	Structure equation model
ANOVA	Analysis of variance
RMSEA	Root mean square error of approximation
CFI	Comparative fit index
NFI	Normed fit index
PNFI	Parsimony-adjusted NFI

Ethics statement

The author confirms this research study did not require ethics approval AND. The author confirms that a detailed explanation of why ethics approval was not required for the study is included in the Ethics and Consent section of the manuscript.

CRedit authorship contribution statement

Xiangming Zeng: Writing – review & editing, Writing – original draft, Software, Methodology, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data can be freely accessed. The link is <http://www.cnsda.org/>.

The data comes from 2011 Chinese General Social Survey (CGSS). The CGSS has been officially implemented by the Renmin University of China (RMU) since 2003. This study analyzes further the data collected by RMU.

The psychological health and stigma module was also conducted in the International Social Survey Program (ISSP), and in the General Social Survey 2006 (the questionnaire number is 2006 GSS V7).

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Appendix A

A.1. Items for the measurement of causal attribution, emotional responses

Causal attributions

1. Controllability.

q21. How able is him or her to decide whether should he or her receive treatment.

q22. How able is him or her to make decisions about managing his or her own money.

“Very able” = 1, “Moderately able” = 2, “Not very able” = 3, and “Not at all able” = 4.

2. Responsibility.

q35. He or she should feel embarrassed about the situation.

q39. He or she should feel afraid to tell others about the situation.

q40. Members of his or her family would be better off if the situation was kept secret.

“Strongly agree” = 1, “Agree” = 2, “Disagree” = 3, and “Strongly disagree” = 4.

3. Dangerousness.

q60. How likely is it he or she would do something violent or harmful toward other people.

q61. How like is it he or she would do something violent or harmful toward himself or herself.

“Very likely” = 1, “Somewhat likely” = 2, “Not very likely” = 3, and “Not at all likely” = 4.

Emotional responses

1. Negative affect.

(For the next several questions, please tell me whether you strongly agree, agree, disagree, or strongly disagree with the statement.)

q26. Being around X would make me feel uncomfortable.

q27. People like X are unpredictable.

q30. People like X are hard to talk to.

q33. Being around X would make me feel nervous.

2. Traditional prejudice.

q28. People like X are just as intelligent as anyone else.

q32. People like X are more creative than most other people.

q34. People like X who have jobs are just as productive as most other workers.

q36. People like X are just as trustworthy as anyone else.

3. Treatment carryover.

q23. Getting treatment would make X an outsider in (his/her) community.

q24. If X let people know (he/she) is in treatment, (he/she) would lose some of (his/her) friends.

q25. No matter how much X achieves, (his/her) opportunities would still be limited if people knew (he/she) had received treatment.

q37. A person like X has little or no hope of ever being accepted as a member of (his/her) community.

4. Exclusionary sentiments.

q29. People like X should not be allowed to hold public office.

q31. People like X should not be allowed to have children.

q38. If a person like X is qualified for a job, he or she should be hired like any other person.

q41. People like X should not be allowed to supervise others at work.

q42. People like X should not be allowed to teach children.

“Strongly agree” = 1, “Agree” = 2, “Disagree” = 3, and “Strongly disagree” = 4.

A.2. The vignette that depicted the symptoms of schizophrenia, depression, or asthma

Condition 1—X is a Han woman. For the last several weeks X has been feeling really down. She wakes up in the morning with a sad mood and heavy feeling that sticks with her all day long. She isn't enjoying things the way she normally would. In fact nothing seems to give her pleasure. Even when good things happen, they don't seem to make X happy. The smallest tasks are difficult to accomplish. She finds it hard to concentrate on anything. She feels out of energy, out of steam and cannot do things she usually does. And even though X feels tired, when night comes she can't go to sleep. X feels pretty worthless, very discouraged, and guilty. X's family has noticed that she has lost appetite and weight. She has pulled away from them and just doesn't feel like talking.

Condition 2—X is a Han man. Up until a year ago, life was pretty okay for X. But then, things started to change. He thought that people around him were making disapproving comments, and talking behind his back. X was convinced that people were spying on him and that they could hear what he was thinking. X lost his drive to participate in his usual work and family activities and retreated to his home, eventually spending most of his time on his own. X became so preoccupied with what he was thinking that he skipped meals and stopped bathing regularly. At night, when everyone else was sleeping, he was walking back and forth at home. X was hearing voices even though no one else was around. These voices told him what to do and what to think. He has been living this way for six months.

Condition 3—X is a Han man. X has a history of breathing problems. X often has bouts of coughing at night, and doesn't sleep very well. His family and friends have noticed that these problems seem to be particularly bad during challenging situations, in the spring and fall, and during strenuous activities. X used to enjoy playing tennis but recently gave it up because of these problems. X feels badly about his breathing problems, which seem to be getting worse, and wishes he could “be just like everyone else.” X is involved in several activities and hobbies, and shares these activities with several friends.

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