

Depressive Interpretation Bias and Social Outcomes: the Mediating Role of Shame Proneness

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Abstract: The present study aimed to explore the association between depressive interpretation bias and poorer social outcomes with the potential mediating effect of shame proneness. The Modified Ambiguous Scenarios Test, the short-form of the Test of Self-Conscious Affect-3, Social Network Index, the short-form of the UCLA Loneliness Scale, and the Patient Health Questionnaire 9 were administered to 178 Chinese adults through online survey. Results indicated that the depressive interpretation bias was positively related to interpersonal difficulties and shame proneness, while shame proneness was positively associated with interpersonal difficulties, specifically loneliness. Moreover, depressive interpretation bias may enhance shame proneness, which was associated with externalizing behaviors which could be detrimental to interpersonal relationship, especially our subjective social connectedness.

1. Introduction

Depression is a mood disorder caused by psychological, physical, and social factors and many other factors, and is characterized by a persistent depressed mood out of proportion to any cause. The symptoms of depression could take over the whole person, including emotions, bodily functions and thoughts. Depression is a pervasive disorder with a high public health burden that affects individuals around the world (World Health Organization, 2008), and still the leading cause of disability worldwide (World Health Organization, 2017). In China, depressive disorders have been estimated to be the second leading cause of years lived with disability (Lu, Xu, Huang, et al., 2021). Exploring risk factors of depression has great significance on advancing our understanding of the onset, maintenance, and treatment of depression. Psychological theories attempt to contribute to the prevention and intervention of depression by explaining the causes of the onset and maintenance of depression, with each theory having a different focus. For example, cognitive theorists have proposed that the ways people think can contribute to depression and maintain it, while the interpersonal theorists have considered the role of relationships in causing and maintaining depression.

The interpersonal theories of depression suggest that interpersonal relationships in depressed people are often fraught with difficulties, and that such difficulties are often a precursor to depression and are the most frequently reported stressors that trigger depression (Hammen, 2018). In other word, interpersonal difficulties are robust predictors and consequences of depression. Because depressed people lack social and communication skills when interacting with others (Segrin, 2001), having rejection sensitivity (Downey & Feldman, 1996), being excessive reassurance seeking (Rudolph & Conley, 2005; Hammen, 2018), people around them may be tired of getting along with them, and in turn the lack of social support may exacerbate the depressive symptoms of depressed people.

The cognitive theory of depression (Beck, 1967) suggests that depressed individuals have negative perceptions of themselves, the world, and the future, as well as misperceptions to support these negative perceptions, and that this negative thought pattern can lead to or maintain depression.

Indeed, information processing bias for positive and negative stimuli plays a key role in depression (Teasdale, 1988), and this bias is widely present, affecting memory, attention, and

interpretation of the environment. Depressed individuals are more prone to selectively focus on negative information, filter out positive information, and tend to interpret neutral information as more negative/less positive than it actually is (Mathews & MacLeod, 2005).

The potential importance of interpretation bias in the development and maintenance of depression is emphasized in the cognitive theory of depression (Lawson, MacLeod, & Hammond, 2002). There is relatively consistent evidence for interpretation biases in depressed individuals: Depressed individuals are more likely to form negative statements than non-depressed individuals in unscrambling sentences (Wenzlaff, & Bates, 1998); when interpreting ambiguous textual scenarios, depressed subjects assigned more negative interpretations a higher ranking than non-depressed subjects.

The negative interpretation bias of depression is also reflected in interpersonal interactions. Normansell and Wisco (2017) found that because dysphoric individuals begin to worry and anticipate rejection long before social situations begin, they may tend to interpret ambiguous social scenarios in a negatively biased manner. Beevers et al. (2009) found that depression appeared to enhance the recognition of negative emotions in others when confronted with ambiguous emotional faces (i.e., mixed with happy sadness/mixed with happy fear). Hillary et al. (2016) presented evidence that depressed individuals had more hostile interpretations of ambiguous interpersonal scenarios than non-depressed individuals, reflecting a hostile interpretation bias. These negative interpersonal-related interpretation biases may cause depressed individuals to develop a particular style of behavior, which creates an interpersonal environment that can lead to and sustain depression, that is, individuals interact with others in their environment in ways that increase their likelihood of interpersonal rejection and depressive episodes, leading to poorer social outcomes.

Shame is a kind of self-conscious emotion that is evoked by self- reflection and self- evaluation (Tracy & Robins, 2004), which typically arise from the recognition of one's own negative attributes or behaviors. As Helen Block Lewis (1971) proposed, shame involves a negative evaluation of the global self. Considering depressive interpretation bias is characterized by negative views of self, we speculate that depressive interpretation bias may enhance shame proneness. Actually, there are positive relationship between proneness to shame and a host of psychological symptoms (Fergus, Valentiner, McGrath, & Jencius, 2010; Gupta, Rosenthal, Mancini, Cheavens, & Lynch, 2008; Schoenleber & Berenbaum, 2010), including depression (Porter, Zerkowitz, Gist & Cole, 2019; Shorey, 2011). As a self-conscious emotion, shame is also important to a range of social outcomes. Because shame often leads to a desire to avoid or hide, it drives a tendency toward separation, distance, and defensiveness, which can leave a person feeling disconnected from others, thereby damaging relationships and causing a person to experience isolation.

To sum up, interpersonal difficulties and negative cognitive bias have been identified as important risk factors for depression. Recent evidence shows that depressive interpretation bias may be a mechanism through which maladaptive interpersonal styles confer risk for depression; it is speculated that interpretation bias may lead to adverse social outcomes, thus contributing to depression. This study examines whether depressive interpretation bias is associated with poorer social outcomes and explores the potential mediating role of shame proneness between them. As shame is typically triggered by a negative evaluation of self, we speculate that depressive interpretation bias may enhance shame proneness because depressive interpretation bias is characterized by negative views of self. Furthermore, shame is associated with externalizing behaviors like anger and aggression, which are detrimental to interpersonal relationship.

We therefore predict that the negative interpretation bias leads to increased shame proneness, which in turn contributes to adverse social outcomes, and that shame proneness can explain the association between negative interpretation bias and social outcomes. We will use social connectedness and loneliness as objective and subjective indicators of social outcomes, respectively.

The specific hypotheses are as follows: (1) Negative interpretation biases is positively associated with interpersonal difficulties. (2) Negative interpretation biases is positively associated with proneness to shame. (3) There is a positive relationship between proneness to shame and

interpersonal difficulties. (4) Proneness to shame mediates the association between negative interpretation biases and interpersonal difficulties.

2. Methods

2.1 Participants

All data were collected via the sample service provided by www.wjx.cn, a Chinese online survey company. In total, 178 adults (90 females; $M_{\text{age}} = 29.9 \pm 6.8$, ranged from 18 to 55) took part in and completed the study.

2.2 Materials and Measures

2.2.1 Modified Ambiguous Scenarios Test (M-AST).

The modified Ambiguous Scenarios Test consists of 1 scenario from the Interpretation Bias Questionnaire (Wisco & Nolen-Hoeksema, 2010) and 6 scenarios from the Ambiguous Scenarios Test (Berna, Lang, Goodwin, & Holmes, 2011). These scenarios were translated into Chinese and were modified to ensure they are relevant to Chinese young adults. The participants were instructed to vividly imagine each scenario and rate the pleasantness on a nine-point Likert scale (1=extremely unpleasant; 9=extremely pleasant). A mean pleasantness rating across 7 scenarios was calculated as the index of interpretation bias, with lower scores indicating a more negative interpretation bias. In the present study, the alpha coefficient of the full scale is 0.725. Moreover, the M-AST is moderately associated with depressive symptoms (as assessed with PHQ-9; $r=-0.39$, $p<0.001$), suggesting good criterion validity.

2.2.2 The Short-Form of the Test of Self-Conscious Affect-3 (TOCSA-3).

The TOCSA-3 is composed of 11 negative and 5 positive scenarios yielding indices of Shame-Proneness, Guilt-Proneness, Externalization, Detachment/Unconcern, Alpha Pride, and Beta Pride. Here we used the short version of the TOCSA-3 by dropping the positive scenarios. Each scenario is a situation that people are likely to encounter in day-to-day life, and followed by several common reactions to each scenario. As participants read each scenario, we let them try to imagine themselves in that situation. Then indicate how likely they would be to react in each of the ways described from 1(not likely) to 5(very likely). We asked them to rate all responses because people may feel or react more than one way to the same situation, or they may react different ways at different times. Scale scores are the sum of responses to relevant items. In the present study, the alpha coefficient of the TOCSA-3 Shame is 0.720, while the alpha coefficient of the TOCSA-3 Guilt is 0.845, and the alpha coefficient of the Externalization and Detachment is 0.834 and 0.769 respectively.

2.2.3 Social Network Index (SNI)

Social Network Index (SNI) is a questionnaire to assess the number of high-contact roles (network diversity) and the number of people in social network (network size). Network diversity is the number of social roles in which the respondent has regular contact (i.e., at least once every 2 weeks) with at least one person. The maximum number of high-contact roles is 12. Network size is the total number of people with whom the respondent has regular contact (i.e., at least once every 2 weeks).

2.2.4 The Short-Form of the UCLA Loneliness Scale (ULS-8).

The ULS-8 is an 8-item self-report questionnaire which assesses subjective social connectedness. Each item is rated on a 4-point (1-4) Likert scale for subjective feeling of loneliness. A summated score across 8 items was calculated as the index of loneliness, with higher scores indicating a more severity of loneliness. In the present study, the alpha coefficient of the full scale is 0.787.

2.2.5 Patient Health Questionnaire 9 (PHQ-9)

Patient Health Questionnaire 9 (PHQ-9) (Kroenke, Spitzer, Williams, & Lowe, 2010) is a self-administered tool to screen depressive disorders. There are totally 9 items for respondents to rate on basis of their feelings during the past 2 weeks and the rating scale range from 0 to 3. Examiners measure depressive severity on a scale of 0-27 and scores more than 10 indicate clinically significant depression. In the present study, the alpha coefficient of the PHQ-9 is 0.784.

3. Results

3.1 Descriptive Statistics

In our sample, 37(20.8%) participants endorsed none to minimal depressive symptoms (PHQ-9 score ranged from 0 to 4), 76(42.7%) endorsed mild symptoms (5 to 9), 50(28.6%) participants scored in the range of moderate depression (10 to 14), and 15(8.4%) endorsed moderately severe to severe depressive symptoms (PHQ-9 score ≥ 15). See Table 1.

Table 1 Levels of Depression Symptoms in the Current Sample.

Depression Severity	Scores	N(Percent)
none to minimal	0-4	37(20.8%)
mild	5-9	76(42.7%)
moderate	10-14	50(28.6%)
moderately severe to severe	≥ 15	15(8.4%)

Means and SDs of all measurements and zero-order correlations among these measurements are presented in Table 2.

Table 2 Descriptive Statistics And Correlations among Variables.

	<i>M</i>	<i>SD</i>	2	3	4	5	6	7	8	9
1.M-AST	5.75	1.10	-.185*	.204**	-.238**	-.018	.271***	.280***	-.434***	-.391***
2.Shame	34.71	6.40		.289***	.286***	-.015	-.133	-.083	.266***	.340***
3.Guilt	46.33	5.99			-.352***	-.185*	.186*	.330***	-.259***	-.084
4.Externalization	26.54	7.41				.665***	-.152*	-.264***	.300***	.340***
5.Detachment	33.23	6.66					-.028	-.155*	.077	-.018
6.SNI-diversity	5.53	2.12						.796***	-.390***	-.218**
7.SNI-size	14.23	6.61							-.396***	-.262***
8.ULS-8	16.79	4.23								.522***
9.PHQ-9	8.30	4.34								

Note: M-AST = Modified Ambiguous Scenarios Test; SNI = Social Network Index; PHQ-9 = Patient Health Questionnaire 9; ULS-8 = The short-form of the UCLA Loneliness Scale; *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

3.2 Confirmatory Analysis

As predicted in our Hypothesis 1 (H1), negative interpretation bias is significantly correlated to interpersonal difficulties. Specifically, for the objective indicator of social outcomes, individuals who have a more negative interpretation bias are more likely to have fewer high-contact roles (network diversity, $r = .271$, $p < .001$) and fewer people in social network (network size, $r = .280$, $p < .001$). For subjective indicator of social outcomes, individuals who have a more negative interpretation bias are more likely to feel lonely ($r = -.434$, $p < .001$).

In addition, negative interpretation bias is associated ($r = -.185$, $p < .05$) with proneness to shame, which supports the Hypothesis 2 (H2). Individuals who have a more negative interpretation bias are more likely to experience feelings of shame.

Hypothesis 3 (H3) is partly confirmed. Shame proneness is positively associated with loneliness ($r = .266$, $p < .001$), but doesn't have a significant relationship with network diversity ($r = -.133$, $p > .05$) and network size ($r = -.083$, $p > .05$).

To test the Hypothesis 4 (H4), we conducted a mediation analysis with negative interpretation biases as the predictor, shame proneness as the mediator, and interpersonal difficulties as the outcome.

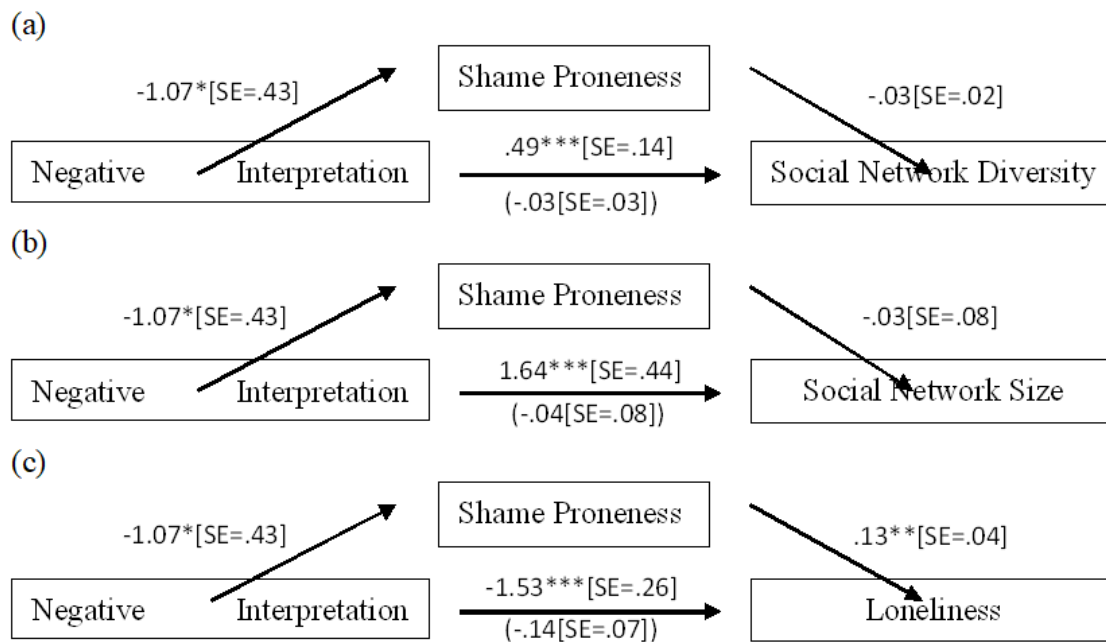


Figure 1. Mediational models examining shame proneness as mediator of the association between negative interpretation biases and interpersonal difficulties (social connectedness including (a) Social network diversity and (b) Social network size, and (c) Loneliness as objective and subjective indicators of social outcomes, respectively.)

Note: Unstandardized coefficients are reported.

As shown in Fig. 1(a), although the relationship between negative interpretation biases and shame proneness ($a=-1.07$, $SE=.43$, $p=.014$, 95% CI [-1.92, -.22]) and the relationship between negative interpretation biases and social network diversity ($c'=.49$, $SE=.14$, $p<.001$, 95% CI [.21, .77]) were significant, the relationship between shame proneness and social network diversity ($b=-.03$, $SE=.02$, $p=.25$, 95% CI [-.08, -.02]) were not significant. And the indirect effect of the negative interpretation biases on social network diversity through shame proneness was not significant ($ab=-.03$, 95% CI [-.02, .11]), which indicates that shame proneness is not the mediator of the association between negative interpretation biases and social network diversity.

As shown in Fig. 1(b), although the relationship between negative interpretation biases and shame proneness ($a=-1.07$, $SE=.43$, $p=.014$, 95% CI [-1.92, -.22]) and the relationship between negative interpretation biases and social network size ($c'=1.64$, $SE=.44$, $p<.001$, 95% CI [.77, 2.51]) were significant, the relationship between shame proneness and social network size ($b=-.03$, $SE=.08$, $p=.66$, 95% CI [-.18, .12]) were not significant. And the indirect effect of the negative interpretation biases on social network size through shame proneness was not significant ($ab=-.04$, 95% CI [-.13, .21]), which indicates that shame proneness is not the mediator of the association between negative interpretation biases and social network size.

In Fig. 1(c), negative interpretation biases had a significant relationship with loneliness ($c'=-1.53$, $SE=.26$, $p<.001$, 95% CI [-2.04, -1.01]) and the mediator, shame proneness ($a=-1.07$, $SE=.43$, $p=.014$, 95% CI [-1.92, -.22]). The relationship between shame proneness and loneliness was also significant ($b=.13$, $SE=.04$, $p=.005$, 95% CI [.04, .22]). The indirect effect of the negative interpretation biases on loneliness through shame proneness was significant ($ab=-.14$, 95% CI [-.30, -.02]).

4. Conclusion

Taken together, the findings from the present study partially support our hypothesis that the proneness to shame mediates the association between negative interpretation biases and interpersonal difficulties, specifically loneliness. However, shame proneness is not the mediator of the relationship between negative interpretation bias and social connectedness, such as social network diversity and social network size. In short, interpretation bias leads to increased shame

proneness, which in turn contributes to subjective adverse social outcomes, instead of objective adverse social outcomes.

We supposed that as shame is typically triggered by a negative evaluation of self, depressive interpretation bias may enhance shame proneness because depressive interpretation bias is characterized by negative views of self. And considering shame often leads to a desire to escape or to hide, motivating people toward separation, distance, and defense, which may let people feel disconnected with others, it may consequently does damage to our subjective loneliness. And also, subjective interpersonal difficulties could help maintain the current major depressive episode and create a troubled interpersonal context that could potentially trigger future episodes of depression.

All in all, these findings support the idea that depressive interpretation bias may enhance shame proneness, which is associated with externalizing behaviors which could be detrimental to interpersonal relationship, especially our subjective social connectedness.

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