The Relationship Between Co-Rumination on Social Media and Internalized Symptoms During the COVID-19 Pandemic: The Moderating Role of Balanced Time Perspective

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Abstract: Faced with the COVID-19 pandemic, countries have implemented stringent preventative measures. Individuals impacted by quarantine policies have become more reliant on cell phones to interact with others. It is still uncertain whether recurrent internet talks of one's struggle aggravate anxiety and despair in individuals. This study investigated the effects of social media-based co-rumination on mental health. In this study, 352 Chinese participants were recruited online, took the online test, and returned 309 valid surveys. There were 127 men and 182 women among them. The researchers looked into the relationship between respondents' co-rumination, balanced time perspective, anxiety, and depression. The study discovered that persons under quarantine had higher levels of co-rumination, but this did not result in more acute anxiety or despair. The unbalanced time perspective negatively moderated the association between the two variables, but the balanced time perspective had no moderating impact. The cognitive style of co-rumination predicted psychological disorders negatively.

Keywords: co-rumination, balanced time perspective, internalizing symptoms.

1. Introduction

People faced not only life and health hazards during the COVID-19 epidemic, but also mental health threats as a result of preventative measures such as at-home isolation [1]. People frequently seek emotional support from others on social media to lessen the psychological burden of the COVID-19 pandemic. The remote and instantaneous nature of social media communication is important in breaking down communication barriers to access information and stay in touch with others, but research has found that social media use is associated with a number of mental health issues [2-3], including depression and anxiety. One of the major causes of depression and anxiety is co-rumination, which involves continuously discussing the reason, impact, and feelings of unfavorable occurrences with others [4].

However, past research has focused on face-to-face co-rumination, and only a few studies have looked at the effect of social media-based co-rumination on internalized symptoms. Because co-

rumination pertains to past or present issues, we hypothesize that a psychological temporal perspective may influence the link between co-rumination and internalized symptoms. When people have a balanced temporal perception, they are optimistic about the future and do not dwell too much on the past-negative, present-hedonistic, or present-fatalistic [5-6]. Individuals with an unbalanced time perspective, on the other hand, are more prone to suffer from major psychological issues when they are unable to forecast the future growth of the epidemic and their own health under quarantine policies. The purpose of this study was to look at the effect of social media-based co-rumination on internalized symptoms in isolated people, as well as the moderating role of balanced time perspective in this relationship.

1.1. Co-Rumination and Social Media-Based Co-Rumination

Rose considers co-rumination to be a negative emotion control technique [4]. Although self-exposure to co-rumination can improve closeness and friendship quality, it can also aggravate internalizing symptoms and lead to more severe anxiety and depression, even when the rumination is controlled [7-9]. Co-rumination has even been shown to generate both positive and harmful friendships [10]. Several research have found a link between ruminating and poor psychological experiences. Rumination, for example, not only predicts short-term depressed symptoms in teenagers, but it also predicts the probability of depression two years later [11]. Even co-rumination helps to spread depression and anxiety symptoms among peers [12]. However, co-rumination is a more generally utilized method that may also be applied with family members and has different characteristics. Father-adolescent co-rumination, for example, predicts longer-term depressive symptoms than mother-adolescent co-rumination [13-14]. Furthermore, researchers controlling for environmental and genetic variations discovered that co-rumination increased anxiety in twin children [15]. Perhaps because excessive discussion of the topic kept both spouses in a bad mood, increased stress hormones, and caused them to worry more about the situation [16]. What experts can now agree on is that face-to-face rumination can lead to more severe internalizing symptoms.

It is worth noting that during the COVID-19 Pandemic, people rarely attain face-to-face co-rumination with others, and phone co-rumination has arisen as a substitute [17]. Co-rumination can take place via social media, text messaging, and phone calls. However, the role of co-rumination in various means of communication has varied. Unlike traditional face-to-face rumination, which was associated with greater rates of despair and anxiety, text-based and phone-based rumination had positive benefits, whereas social media-based rumination was associated with a drop in positive affect [18]. Another study, however, indicated that social network-based rumination did not predict depressive symptoms in teenagers [18-19]. Because of the minimal number of studies available, the impact of social media-based co-rumination on mental health cannot be concluded.

1.2. Co-Rumination and Balanced Time Perspective

The aspects of co-rumination with peers point to the past rather than the future, and the relationship between co-rumination and internalizing symptoms may be altered by the individual's time perspective. Time perspective is Zimbardo proposed a concept that alludes to the fact that people partition their experiences into different time frames and attribute different meanings to them [20]. A good and balanced time perspective, according to the individual's perception and experience of mental time, should contain less attention on past-negative and present-fatalistic, moderate present-hedonic, and higher degrees of positive-past and future-positive perceptions [21]. When people continually share their previous misfortunes with others, an unbalanced time perspective might reinforce the individual's past negative temporal inclinations and cause worry about the present and future, worsening the individual's anxiety and despair. In people with anxiety problems, studies have found

a substantial positive link between repetitive negative thinking and distorted time perspective [22]. However, because there has been little research on the relationship between co-rumination and balanced temporal perspective, this would be covered in greater depth in this study.

1.3. The Present Study

During the COVID-19 pandemic, when social media has become a major contact tool in modern day life, it is necessary to investigate whether online co-rumination may have different consequences on mental health. Furthermore, most past study has focused on adolescents and teenagers, whose brain processes differ greatly from those of adults. In summary, this study would investigate the impact of social media-based co-rumination on anxiety and depression in adults, as well as the moderating influence of the balanced time perspective in the interaction between the two. The current study has two hypotheses:

H1: Co-rumination on social media predicts anxiety and depression symptoms.

H2: Balanced time perspective moderated the relationship between co-rumination on social media and internalizing symptoms.

2. Methods

2.1. Participants and Procedures

The current study used social media to recruit volunteers who were quarantined and took an online test. Prior to official testing, each individual was told of the study's potential dangers and signed an informed permission form. The researchers then distributed an online questionnaire to gather information on social media use, co-rumination, anxiety, depression, and a balanced time perspective. This study circulated 352 questionnaires, and 309 valid questionnaires were received, with the selection criteria being persons under quarantine precautions and adults. Participants ranged in age from 18 to 54 years (M_{age} = 29.74, SD = 6.303), with 41 students. There were 182 females and 127 males, 228 living in urban areas and 81 in rural areas; 129 were unmarried, 166 were married, and 14 were divorced or widowed.

2.2. Measures

To assess co-rumination with others, a short version of the Co-rumination Questionnaire-9 was utilized [23]. The scale consists of nine items, to which participants respond on a 5-point Likert scale ranging from "not at all" (1 point) to "completely" (5 points). Scores are averaged across the nine items, with a total score range of 0 to 5, with higher scores indicating more co-rumination. The scale involves nine components, including ① frequency of discussing the problem; ② discussing the problem instead of participating in other activities; ③ the person encourages friends to participate in the problem discussion; ④ friends encourage the person to participate in the problem discussion; ⑤ discussing the same problem repeatedly; ⑥ speculating about the cause of the problem; ⑦ speculating about the consequences of the problem; ⑧ speculating about the suspicion of the problem, and ⑨ focusing on negative feelings. The Cronbach's α for the total scale is 0.777.

The balance time perspective was measured by the Swedish Zimbardo Time Perspective Inventory (S-ZTPI) [24]. The scale contains 64 items, divided into six subscales: past positive (PP), past negative (PN), present hedonic (PH), present fatalistic (PF), future positive (FP), and future negative (FP) (PN). Subjects were asked to rank each item on a scale of 1-5 based on their actual situation (not at all = 1, fully = 5). And questions 9, 26, 29, 47, and 62 were scored backwards, while the rest were

scored forward. Higher scores on a dimension indicate a stronger preference for that time perspective. Cronbach's α for the entire scale is 0.907.

The balanced time perspective was calculated using Rönnlund, ström, and Carelli's adapted Deviation from the balanced time perspective Extended (DBTP-E), which indicates the distance between subjects' time perspectives and the ideal balanced time perspective; the higher the score, the more unbalanced the time perspective [25]. The following is the precise formula:

$$\sqrt{(oPN - ePN)^2 + (oPP - ePP)^2 + (oPF - ePF)^2 + (oPH - ePH)^2 + (oFP - eFP)^2 + (oFN - eFN)^2} \quad (1)$$

O = observation score and E = optimal critical value. According to Zimbardo & Boyd [26] the original values were used for PN, ePP, ePF, ePH, and eFP, and the optimal critical value for eFN was set at the 10th percentile of the dimension. In this study, ePN=1.95, ePP=4.60, ePF=1.50, ePH=3.90, eFP=4.00, and eFN=2.1.

Depression was assessed by the Center for Epidemiologic Studies Depression Scale (CES-D) [27]. The CES-D is a self-rating scale with 20 items, each graded (0-3), and a 4-item reverse rating. The total score goes from 0 to 60. The higher the score, the greater the severity of the depression. The Cronbach's α for the total scale is 0.952.

Anxiety was assessed by the Self-Rating Anxiety Scale (SAS), a 20-item self-rating anxiety scale [28]. Each item is graded on a scale of 1-4, with 5 things being graded backward. The overall score runs from 20 to 80, with higher scores indicating greater anxiety. The Cronbach's α for the scale is 0.941.

2.3. Data Analysis

SPSS was used to evaluate the reliability and validity of all questionnaires and to generate descriptive statistics of the sample. Missing data was processed using mean interpolation before data analysis. MODEL 1 in the PROCESS program was used to test the moderating effect of balanced time perspective. The common method bias of the variables was evaluated using the Harman single-factor test, and the exploratory factor analysis revealed that there were 21 factors with a characteristic root greater than 1, and the first factor had an explanatory rate of 27.532%, which was less than the critical value of 40%. This indicates that there is no significant common method bias in the data of this study.

3. Results

3.1. Correlations Among Main Measures

Spearman correlation analysis of co-rumination, DBTP-E and internalizing symptoms showed significant correlations between each study variable (Table 1), with co-rumination negatively correlated with anxiety (r=-0.123, $p<0.05$), depression (r=-0.166, $p<0.01$), DBTP-E (r=0.152, $p<0.01$) was positively correlated; DBTP-E was positively correlated with depression (r=0.608, $p<0.01$) and anxiety (r=0.584, $p<0.01$).

Table 1: Descriptive statistics and correlation among model variables.

	1	2	3	4
1.CR	1			
2.DBTP-E	.152**	1		
3. Depression	-.123*	.608**	1	
4. Anxiety	-.166**	.584**	.911**	1

Note: *$p<0.05$, ** $p<0.01$. CR=Co-Rumination, DBTP-E= Deviation from the balanced time perspective Extended.

3.2. The Moderating Effect Of DBTP-E Between Co-Rumination and Internalizing Symptoms

Stratified stepwise regression was used to assess the moderating effect of DBTP-E between co-rumination and depression and anxiety. The steps were as follows: In the first step, gender, residence, occupation, and marital status were placed as covariates in the first regression equation; in the second step, the centralized independent variable (co-rumination) and the moderating variable (DBTP-E) were placed in the second regression equation; in the third step, the product term of the independent variable and the moderating variable was placed in the third regression equation. The results are shown in Tables 2 and 3: The product term of DBTP-E and co-rumination had a significant negative predictive effect on depression and anxiety.

Table 2: Hierarchical multiple regression analysis for predicting depression.

	β	t	p	β	t	p	β	t	p
Gender	-0.100	-1.814	0.071	-0.099	-2.322	0.021	-0.104	-2.474	0.014
Residence	-0.259	-4.765	0.000	-0.135	-3.154	0.002	-0.145	-3.424	0.001
Occupation	-0.117	-2.144	0.033	-0.062	-1.452	0.148	-0.077	-1.817	0.070
Marital status	0.144	2.596	0.010	0.073	1.682	0.094	0.084	1.969	0.050
CR				-0.098	-2.327	0.021	-0.157	-3.401	0.001
DBTP-E				0.629	14.541	0.000	0.683	14.694	0.000
CR*DBTP-E							-0.145	-2.962	0.003
R²	0.110			0.477			0.492		
F	9.356			45.923			41.629		

Note: CR=Co-Rumination, DBTP-E= Deviation from the balanced time perspective Extended.

Table 3: Hierarchical multiple regression analysis for predicting anxiety.

	β	t	p	β	t	p	β	t	p
Gender	-0.083	-1.492	0.137	-0.082	-1.903	0.058	-0.087	-2.047	0.042
Residence	-0.256	-4.668	0.000	-0.131	-3.038	0.003	-0.141	-3.298	0.001
Occupation	-0.112	-2.028	0.043	-0.056	-1.311	0.191	-0.071	-1.666	0.097
Marital status	0.119	2.129	0.034	0.048	1.091	0.276	0.059	1.365	0.173
CR				-0.102	-2.397	0.017	-0.160	-3.432	0.001
DBTP-E				0.632	14.487	0.000	0.686	14.606	0.000
CR*DBTP-E							-0.143	-2.890	0.004
R ²	0.096			0.468			0.482		
F	8.068			44.209			40.008		

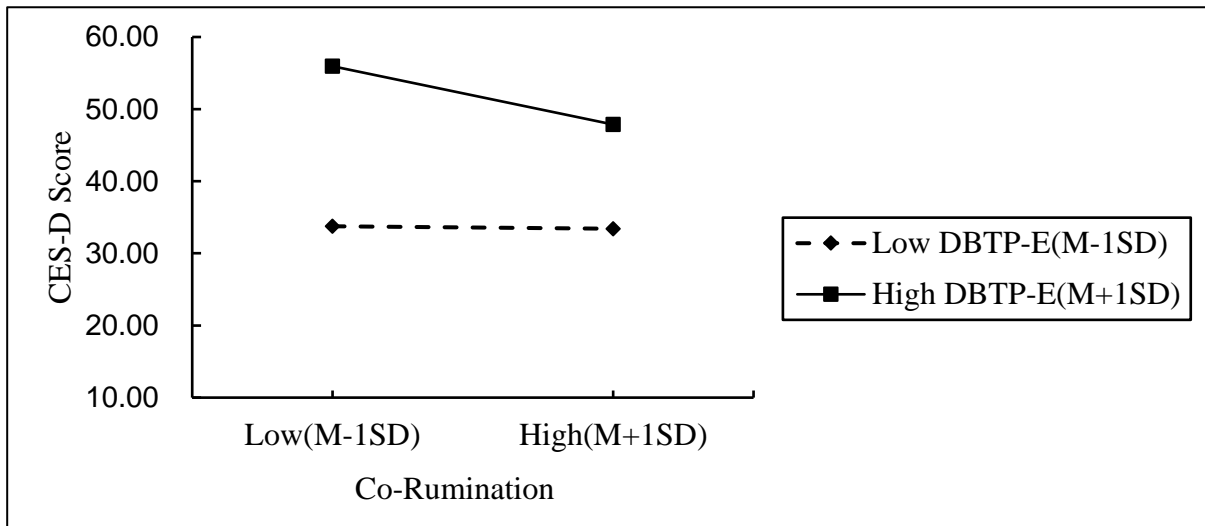Note: CR=Co-Rumination, DBTP-E= Deviation from the balanced time perspective Extended.

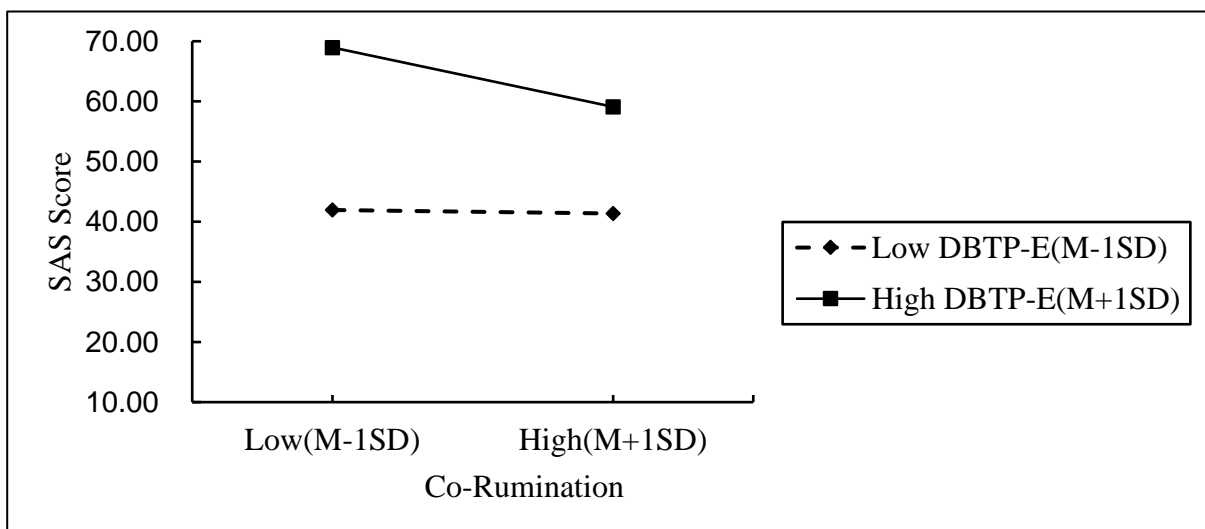Figure 1: Moderating role of DBTP-E between co-rumination and depression.

Figure 2: Moderating role of DBTP-E between co-rumination and anxiety.

The above moderating effects were then analyzed by progression using a simple slope test and the results are presented in Figures 1 and 2. As can be seen in Figure 1, at low DBTP-E levels, co-rumination did not significantly predict depression (t = -0.25, p> 0.05) and anxiety (t = -0.348, p> 0.05). At high DBTP-E levels, co-rumination significantly and negatively predicted depression (t = -3.755, p< 0.001), anxiety (t = -3.729, p< 0.001).

4. Discussion

The current study used a quarantined sample to investigate for the first time the influence of social media-based co-rumination on individual internalizing symptoms, as well as the moderating effect of balanced time perspective.

In the present study, the subjects supported social media-based co-rumination and a high level of co-rumination was detected (*M* =3.8, *SD* = 0.53). Surprisingly, no gender difference was found in this investigation. Physical distance affects interpersonal interactions significantly, and since the COVID-19 pandemic has made face-to-face communication impossible, individuals prefer to communicate and acquire information through social media. Both men and women suffer the same health risks, and discussing their predicament has become an important aspect of contact with others, so co-rumination is more common.

Contrary to H1, the current study found that co-rumination reduced anxiety and sadness rather than positively predicting internalizing symptoms, which contradicts earlier research [18; 29]. This could be attributed to the reason that self-exposure to co-rumination promotes positive friendship in a specific setting, friendship quality may be a protective factor for internalizing symptoms, and co-rumination is not a significant predictor of depression in high-quality friendship relationships [30]. In addition to friendship quality, subjects may have felt social support during co-rumination, which played an important role in preventing internalizing symptoms [31]. According to social support theory, social support can act as a stress buffer for individuals and minimize the negative impacts of bad occurrences [32]. Perceived social support, especially during quarantine, might alleviate feelings of loneliness and boost hope [33]. Individuals who have high levels of perceived social support are substantially less likely to suffer from depression and sleep difficulties than those who have low amounts [34].

Consistent with H2, the findings revealed that a balanced time perspective moderated the relationship between co-rumination and internalizing symptoms, however this trend was only significant in the high grouping and not in the low subgroup. The high subgroup described the moderating influence of a highly imbalanced time perspective since the DBTP-E formula utilized in this study represents the degree of deviation from the time perspective. The more warped the time perspective, the greater the anxiety and melancholy. Individuals with a balanced time perspective can readily move between the past, present, and future time frame repertoires, and if they are stuck in one temporal domain, this may impair their interpretation and response to other domains [20]. Co-rumination is about problems in the past or present, and the process of repeated discussion leads individuals to continuously experience the emotions and cognitions brought about by negative events in the past. Individuals with a high level of balanced time perspective can jump out of these dilemmas, remain optimistic, and reduce negative emotions such as worry and anxiety about the future[35]. With an imbalanced time perspective, people had fewer internalizing symptoms, which, as mentioned above, may have been influenced by perceived social support. Further research should be conducted on this component in the future.

5. Conclusion

The present study found that social media-based co-rumination negatively and significantly predicted internalizing symptoms and that unbalanced time perspective negatively moderated the relationship between the two during the COVID-19 pandemic. This provides a rationale for interventions for anxiety and depression at special times. It is important to acknowledge that the present study has some limitations. First, this study used online recruitment of subjects, which may have amplified the tendency to use social media. Again, the cross-sectional study used in this study was unable to validate the causal relationship between co-rumination and internalizing symptoms, and future studies could further adopt a longitudinal approach. Finally, the present study did not control for rumination, initial anxiety, and depression levels that could require further attention in the future.

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