

Impact of Employees' Rumination on Work Engagement: Mediating and Moderating Roles of Emotional Intelligence

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Objectives: Work engagement is critical in organizational development as it improves and enhances performance and innovative behavior. Work engagement could be influenced by individual traits, work environment, and other factors. Hence, a need was felt to investigate whether and how rumination, as a personality trait, influences work engagement. **Methods:** This study expanded on previous research on rumination and work engagement by introducing emotional intelligence to build mediating and moderating models. The study focused on rumination affecting work engagement and explored emotional intelligence for its role in mediating and moderating the relationship between rumination and work engagement. A questionnaire was distributed to a sample of 930 employees of Chinese central enterprises were identified to investigate the relationship between rumination, emotional intelligence, and work engagement. The findings were calculated on Ruminative response scale, Work-engagement scale, and Emotional intelligence scale. **Results:** Results showed that rumination had a significant negative predictive effect on work engagement ($\beta = -0.35$, $P < 0.001$). Moreover, emotional intelligence mediated ($B = -0.39$, $P < 0.001$) and moderated ($B = -0.16$, $P = 0.024$) the effect of rumination on work engagement. **Conclusion:** This study enriches the understanding of work engagement by quantitatively demonstrating the influence of emotional intelligence on the relationship between rumination and work engagement. This study has implications for enterprises to improve the level of mental health and work engagement among their employees.

Keywords: Rumination, Work Engagement, Emotional Intelligence, Mediating and Moderating Roles.

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Individuals respond differently to major stressors or changes in interpersonal relationships, job advancement, or daily life. Some people adapt rapidly to these changes, while others cannot relieve the pressure or changes for a long time. The latter would indulge in continuous negative thoughts such as “Why am I so horrible?” or bemoan “why am I always like this?” This phenomenon is defined in psychology as rumination.¹⁻³ Nolen-Hoeksema⁴ presents the concept of “rumination” as a sort of emotional reaction, hence developed the term “ruminative response”. Nolen-Hoeksema⁴ states that rumination is a negative way of thinking characterized by constant thinking about emotion, induced causes, and possible negative consequences in terms of distressing emotions. Even worse, rumination can evoke an inability to address

the problem actively and is both a maladaptive response pattern and a stable personality trait.⁵ The goal progress theory has been used extensively in research to explain the causes of rumination.^{6,7} This theory states that rumination occurs when people fail to attain their predetermined goals. Rumination can cause a wide variety of negative emotional reactions in people, such as depression and anxiety.⁸

Emotional intelligence is one of the personal abilities to identify, express, and understand emotions and control negative emotions by translating their emotions into thoughts.⁹⁻¹² Researchers have demonstrated that using emotional intelligence as an independent variable can affect psychological and behavioral aspects, work performance, and personality disorders. Individuals with high emotional intelligence tackle problems more

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positively.¹³⁻¹⁵ Even when these individuals experience unpleasant emotions, they can remain more logical at work and stay involved in getting their job done. In a study of 103 salesmen, Rojell et al.¹⁶ discovered that emotional intelligence was positively correlated with sales performance. In a study of employees, Carmeli and Josman¹⁷ obtained similar observations. Guo and Wu¹⁸ investigated the role of rumination on both negative and positive emotions, and they found that the reflecting and depressive dimensions of rumination can positively and negatively influence emotional intelligence, respectively.

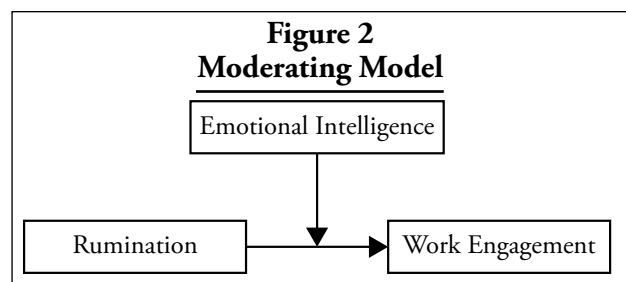
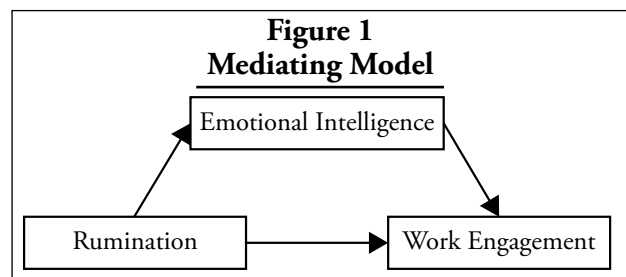
Past research studies have dwelt upon the mediating role of emotional intelligence, and focused on the relationship between stress and other factors.^{19,20} Emotional intelligence can help individuals relieve stress and better adapt to diverse life rhythms.²¹ Ciarrochi et al.²² discovered that emotional intelligence mediates the relationship between stress and mental health so that people with high emotional intelligence can better find and address their emotions. Ashkanasy et al.²³ developed a new model called the "stress-related emotional response," which was established upon Jordan and Troth's²⁴ model on the association between job insecurity and emotional intelligence and other current studies. The model demonstrates that emotional intelligence mediates the influence of workplace stresses on individual and organizational performance. The approach is consistent with Jordan and Troth's²⁴ findings, revealing that emotional intelligence is a critical mediating variable.

One of the most essential elements influencing job performance is work engagement.²⁵⁻²⁷ Schaufeli et al.²⁸ define work engagement as a state wherein the individual maintains a sustained and positive emotional and motivational well-being characterized by vigor, dedication, and absorption. Schaufeli et al.²⁸ developed the Utrecht Work Engagement Scale (UWES), which is widely used by researchers. Rabinowitz and Hall²⁹ provided a comprehensive model of work engagement that classified factors influencing work engagement into three categories: personal traits, working situation, and interplay between the two. Personal traits include personal background and personality traits. Tenacity, accomplishment drive, and emotional intelligence are all positively correlated with work engagement.³⁰ Furthermore, numerous studies have found that work engagement positively predicts work performance and overall corporate performance.^{31,32} Moreover, raising individual work

engagement levels has practical implications for enhancing organizational performance.³³⁻³⁵

Previous studies have made it evident that rumination predicts emotional intelligence, which can affect work engagement. However, a comprehensive model for describing their relationship has yet to be built if we want to evaluate the work evaluation using individual rumination as a personality trait. While rumination, work engagement, and emotional intelligence have all been extensively researched on national and global scales, the link between the three has received little attention. Most Chinese studies on rumination focused on particular populations (e.g., students and adolescents), and few emphasized central enterprise employees.

The current study aimed to study the impact of employees' rumination on work engagement, in the context of the Chinese culture. For this purpose, variables like rumination, emotional intelligence, and work engagement were combined into a single model to investigate how rumination influences work engagement. The role of emotional intelligence was also examined to find how rumination influences work engagement. To study the inter-relationship of these variables, the study formulated three hypotheses: rumination and its dimensions predict work engagement (Hypothesis 1); emotional intelligence mediates the effect of rumination on work engagement (Hypothesis 2); and emotional intelligence moderates the effect of rumination on work engagement simultaneously (Hypothesis 3). The study developed a mediating model (Figure 1) and a moderating model (Figure 2), to study the role of Emotional Intelligence.



METHOD

Sampling

This study selected employees from a few Fortune 500 companies as sample of the study using a convenience sampling method. These employees belonged to central enterprises in Beijing, Shandong, Guangdong, Guangxi, Sichuan, and Hainan. The research instrument, a questionnaire was distributed to randomly selected 1020 employees. After removing invalid questionnaires with the same question alternatives and exceeding the allotted answer time, 930 valid questionnaires with a valid recovery rate of 90.73% were finalized. Table 1 presents the demographic information of the sample of the study.

Instruments and Tools

Ruminative Response Scale

The Ruminative Responses Scale developed by Nolen-Hoeksema⁴ and revised by Chinese researchers^{36,37} was used in this study. The scale included 22 items divided into three categories: symptom rumination, brooding, and reflective pondering. The first dimension included items such as “I often think about how lonely I am.” The second dimension included items such as “I often analyze recent events to understand why I feel depressed.” The third dimension included items such as “I often wonder what I did to cause this.” The scale was graded on a 4-point scale, with 1 indicating never, 4 indicating always, and 2 and 3 indicating varying degrees in between. Scores on the scale ranged between 22 and 88. Those with higher scores have higher rumination levels. In this study, the Cronbach’s alpha for this scale was 0.964, while the Cronbach’s alpha for the three dimensions (i.e., symptom rumination, brooding, and reflective pondering) were 0.944, 0.872, and 0.835, respectively.

Work-engagement Scale

To assess Chinese employees’ work engagement, the Chinese version of the UWES-9 developed by Schaufeli et al.²⁸ and validated by Fong and Ng³⁸ was used. The scale combined nine items, separated into three dimensions: vigor, absorption, and dedication. The first dimension contained questions like “I feel strong and energetic while I work.” The second dimension included “I am absorbed in my job.” The third dimension included “I am passionate about my

work.” The scale is scored on a 7-point scale, with 0 representing never, 6 representing always, and 1–5 representing various degrees in between. Scores range between 0 and 54. A higher score suggested a better level of work involvement. In this study, Cronbach’s alpha for this scale was 0.936, while Cronbach’s alpha for the three dimensions (vigor, absorption, and dedication) were 0.806, 0.879, and 0.865, respectively.

Emotional Intelligence Scale

The Wong and Law Emotional Intelligence Inventory (WLEIS) constructed by Law et al.³⁹ was used. The scale had 16 questions divided into four dimensions: emotional assessment of self, emotional assessment of others, emotional management, and emotional utilization. The first dimension contained questions such as “I can understand my feelings.” The second dimension contained questions such as “I am good at observing other people’s emotions.” The third dimension contained questions such as “I can control my emotions.” The fourth dimension contained questions such as “I often encourage myself to do my best.” On this 5-point scale, 1 represented complete nonconformity, 5 represented complete conformity, and 2, 3, and 4 represented various degrees in between. The higher the scores on the scale, the higher the emotional intelligence. The Cronbach’s alpha for the study’s scale was 0.931, but those for the four aspects (i.e., emotional management, self-emotional evaluation, emotional assessment of others, and emotional usage) were 0.865, 0.917, 0.900, and 0.933, respectively.

Analyzing and Processing Data

SPSS25 was used to analyze data. First, the Harman one-way test was used to examine common method bias. Next, the key variables’ descriptive statistics were statistically examined through a Pearson correlation analysis between the variables. The regression analyses was performed to determine the predicted impacts of rumination on work engagement and emotional intelligence. Next, using Model 4 in the PROCESS plug-in, we determined the mediating role of emotional intelligence in influencing rumination on work engagement. Finally, we utilized the PROCESS plug-in’s Model 1 to investigate the moderating effect of emotional intelligence. Both models used centralized data⁴⁰.

RESULTS

Right at the outset, demographic information of the sample of the study was summarized. The information contained gender, marital status, raising

children, age, working years, and job position. Table 1 presents the detailed information about these demographic elements.

Table 1
Demographic Information

Variables	Item	Number	Percentage
Gender	Male	677	73.8%
	Female	253	26.2%
Age	20–30 years old	134	14.6%
	31–40 years old	196	20.9%
	41–50 years old	264	28.1%
	51 years old and over	336	36.4%
Marital status	Married	767	82.7%
	Unmarried	163	17.3%
Raising children	Yes	742	79.9%
	No	188	20.1%
Working years	1–10years	176	19.0%
	11–20years	200	21.1%
	21 years and above	554	59.9%
	Frontline operation	506	54.8%
Job position	Technical and professional	198	21.1%
	Primary management	192	20.5%
	Mid-level management	34	3.6%

While the data was collected using self-assessment scales, common method bias was probable. Using Harman's one-way test, a factor analysis of all questionnaire items was conducted. It was found that the first common factor contributed 36.73% of the variance, less than the stipulated threshold

value of 40%. This indicated that this study had no significant common method bias.⁴¹

Table 2 displays the descriptive statistics for rumination, work engagement, emotional intelligence, and their differences as the control variables.

Table 2
Descriptive Statistics

Control Variable (N=930)		Rumination		Work Engagement		Emotional Intelligence	
		M(SD)	t/F	M(SD)	t/F	M(SD)	t/F
Gender	Male (677)	1.86 (0.55)	0.92	4.36(1.15)	1.73	3.59(0.60)	0.195
	Female (253)	1.83(0.57)		4.21(1.03)		3.58(0.59)	
Marital status	Unmarried (163)	1.85(0.56)	-0.16	4.29(1.13)	1.56	3.69(0.53)	2.405*
	Married (767)	1.86(0.56)		4.44(1.03)		3.56(0.61)	
Raising children	Yes (742)	1.87(0.56)	1.44	4.29(1.13)	-1.65	3.55(0.62)	-3.14**
	No (188)	1.80(0.53)		4.44(1.04)		3.71(0.52)	
Age	20–30 years old (134)	1.82(0.54)	1.32	4.51(0.97)	3.63*	3.78(0.52)	7.23***
	31–40 years old (196)	1.80(0.48)		4.44(1.03)		3.63(0.57)	
	41–50 years old (264)	1.86(0.58)		4.18(1.15)		3.53(0.62)	
	51 years old and over (336)	1.89(0.59)		4.27(1.17)		3.59(0.60)	
Working years	1–10 years (176)	1.83(0.51)	2.28	4.47(0.97)	6.28**	3.74(0.53)	11.04***
	11–20 years (200)	1.79(0.48)		4.47(1.03)		3.65(0.55)	
	21 and more (554)	1.88(0.60)		4.21(1.18)		3.51(0.63)	
	Frontline operations (506)	1.93(0.60)		4.12(1.19)		3.49(0.63)	
Job position	Technical and professionals (198)	1.77(0.50)	6.97***	4.49(0.99)	14.19***	3.67(0.54)	11.58***
	Primary management (192)	1.77(0.51)		4.52(0.96)		3.70(0.55)	
	Mid-level management (34)	1.71(0.35)		5.04(0.88)		3.90(0.50)	

Note.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Independent sample T-test results with gender, raising children, and marital status as independent variables revealed that rumination and work engagement were not substantially different in any of these three variables. While we found no significant differences in emotional intelligence by gender, we found substantial differences in raising children and marital status. Unmarried subjects outperformed married subjects, and no-children subjects outperformed parent subjects.

Our one-way ANOVA test used age, working year, and job position as independent variables, while rumination, work engagement, and emotional intelligence were used as dependent variables. The one-way ANOVA revealed no significant differences in rumination in terms of age and working year. However, significant differences were found in job position, with the highest scores for subjects in frontline operational positions and the lowest scores for subjects in mid-level management positions. A difference of 0.22 was noted between the two groups. We found substantial disparities in work engagement based on age, working year,

and job position. Unmarried subjects had higher emotional intelligence scores compared to married subjects. Subjects with children had lower emotional intelligence scores than subjects without children. Subjects aged 20–30 had the highest emotional intelligence scores, and subjects aged 41–50 had the lowest, with a 0.25 difference between the two groups. Subjects with 1–10 years of employment had the highest emotional intelligence, while individuals with 21 years of work or more had the lowest. A difference of 0.23 was noted between the two groups. Subjects in frontline operational jobs scored the lowest in emotional intelligence, while those in middle management scored the highest. A 0.41 difference was noted between the two groups.

While examining rumination and work engagement, we controlled for age, years of work, and job position. Conversely, when studying emotional intelligence, we controlled for marital status, raising children age, working year, and job position. Table 3 displays the findings of the correlation analysis between rumination, work engagement and emotional intelligence.

Table 3

Correlation on Rumination and Each Dimension and Work Engagement and Emotional Intelligence

	Mean	SD	1	2	3	4	5	6
1. Symptom rumination	1.80	0.58	1					
2. Brooding	1.98	0.60	0.865**	1				
3. Reflective pondering	1.86	0.58	0.839**	0.841**	1			
4. Rumination	1.85	0.56	0.977**	0.934**	0.919**	1		
5. Work engagement	4.32	1.12	−0.421**	−0.291**	−0.280**	−0.376**	1	
6. Emotional intelligence	3.59	0.60	−0.419**	−0.318**	−0.273**	−0.380**	0.630**	1

Note.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Rumination and the three dimensions can be demonstrated to be significantly and negatively related to work engagement and emotional intelligence. The higher the level of rumination and each dimension, the lower the level of work engagement and emotional intelligence. Emotional intelligence was significantly and positively connected with work engagement. Notably, this association was moderate, indicating that the higher the level of emotional intelligence, the higher the level of work engagement.

Four stratified regression equations were created to evaluate the prediction of rumination and its dimensions on work engagement in depth. In these

equations, symptom rumination, brooding, reflective pondering, and rumination were used as independent variables and work engagement as the dependent variable. Age, working years, and job position were included as demographic variables in the first layer to account for their effects. All demographic variables were categorical and dummy-coded before the regression equation was entered. Age, working years, and job position were the comparison standard for 20–30 years, 1–10 years, and frontline operational positions, respectively. The second layer incorporated each independent variable separately. Table 4 shows the results of the regression.

Table 4
Predictive Effect of Rumination on Work Engagement

		B	SE	β	t	Adjusted R2
Layer 1	Age2	-0.31	0.2	-0.12	-1.61	0.05
	Age 3	-0.33	0.25	-0.13	-1.28	
	Age 4	-0.15	0.27	-0.07	-0.58	
	Working years 2	0.12	0.19	0.04	0.62	
	Working years 3	-0.08	0.24	-0.04	-0.32	
	Job position 2	0.36	0.10	0.13	3.80***	
	Job position 3	0.39	0.10	0.14	4.14***	
Layer 2 (Symptom rumination)	Job position 4	0.93	0.20	0.16	4.74***	0.20
	Age 2	-0.24	0.18	-0.09	-1.35	
	Age 3	-0.25	0.23	-0.1	-1.05	
	Age 4	-0.06	0.24	-0.03	-0.23	
	Working years 2	0.08	0.17	0.03	0.45	
	Working years 3	-0.1	0.22	-0.04	-0.43	
	Job position 2	0.22	0.09	0.08	2.52*	
Layer 2 (Brooding)	Job position 3	0.25	0.09	0.09	2.87**	0.12
	Job position 4	0.71	0.18	0.12	3.96***	
	Symptom rumination	-0.76	0.06	-0.39	-13.18***	
	Age 2	-0.29	0.19	-0.10	-1.53	
	Age 3	-0.27	0.24	-0.11	-1.12	
	Age 4	-0.10	0.26	-0.05	-0.41	
	Working years 2	0.05	0.18	0.02	0.29	
Layer 2 (Reflective pondering)	Working years 3	-0.14	0.23	-0.06	-0.60	0.12
	Job position 2	0.29	0.09	0.11	3.13**	
	Job position 3	0.32	0.09	0.12	3.55***	
	Job position 4	0.87	0.19	0.15	4.60***	
	Brooding	-0.50	0.06	-0.27	-8.80***	
	Age 2	-0.3	0.19	-0.11	-1.60	
	Age 3	-0.29	0.24	-0.12	-1.20	
Layer 2 (Rumination)	Age 4	-0.12	0.26	-0.05	-0.47	0.17
	Working years 2	0.11	0.18	0.04	0.61	
	Working years 3	-0.1	0.24	-0.04	-0.41	
	Job position 2	0.32	0.09	0.12	3.48**	
	Job position 3	0.34	0.09	0.12	3.71***	
	Job position 4	0.85	0.19	0.14	4.50***	
	Reflective pondering	-0.50	0.06	-0.26	-8.50	
Layer 2 (Rumination)	Age 2	-0.26	0.18	-0.10	-1.45	0.17
	Age 3	-0.26	0.24	-0.10	-1.09	
	Age 4	-0.08	0.25	-0.03	-0.32	
	Working years 2	0.08	0.18	-0.05	0.42	
	Working years 3	-0.11	0.23	-0.05	-0.49	
	Age 2	0.25	0.09	0.09	2.85**	
	Age 3	0.28	0.09	0.10	3.18**	
Layer 2 (Rumination)	Age 4	0.78	0.18	0.13	4.23***	0.17
	Rumination	-0.70	0.06	-0.35	-11.60***	

Note.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4 indicates the predictive influence of rumination and each dimension on work engagement after controlling for demographic variables, including age, working years, and position. These findings demonstrated that rumination and all three characteristics predicted work engagement significantly, verifying Hypothesis 1. With a standardized regression coefficient of -0.39 and an explanatory rate of 20%, symptom rumination had the most significant effect on work engagement. The second is rumination, with a standardized regression coefficient of -0.35 and an explanatory rate of 17%. Brooding and reflective pondering had a relatively small predictive effect of both, at 12%.

The impact of Rumination on emotional intelligence was extensively investigated using stratified regression with rumination as the independent variable and emotional intelligence as the dependent variable. On the first layer, demographic parameters were considered, including marital status, raising children, age, working years, and job position. Since the demographic variables were all categorical, they were dummy-coded before entering the regression equation. Marital status was compared with unmarried, raising children was compared with having children, age was compared with 20–30 years old, working years was compared with 1–10 years, and job position was compared with first-line operation post. Layer 2 showed the independent variables.

Table 5 shows that the standardized regression coefficient of rumination on emotional intelligence is -0.36. It has an 18% explanation rate after controlling for the effects of demographic variables. Hence, rumination negatively predicts emotional intelligence.

Table 5
Predictive Effect of Rumination on Emotional Intelligence

		B	SE	β	t	Adjusted R2
Layer 1	Marital status 2	0.09	0.09	0.06	1.02	0.05
	Raising children 2	0.03	0.09	0.02	0.36	
	Age 2	-0.30	0.12	-0.21*	-2.60	
	Age 3	-0.20	0.15	-0.20	-1.83	
	Age 4	-0.24	0.15	-0.19	-1.56	
	Working years 2	0.05	0.10	0.03	0.47	
	Working years 3	-0.06	0.13	-0.05	-0.48	
	Job position 2	0.17	0.05	0.11	3.24**	
	Job position 3	0.21	0.05	0.14	4.07***	
	Job position 4	0.44	0.11	0.14	4.17***	
	Marital status 2	0.04	0.08	0.03	0.50	
	Raising children 2	-0.02	0.08	-0.02	-0.29	
	Age 2	-0.28	0.11	-0.19	-2.61**	
	Age 3	-0.24	0.14	-0.18	-1.76	
Layer 2	Age 4	-0.21	0.14	-0.16	-1.44	0.18
	Working years 2	0.02	0.1	0.02	0.23	
	Working years 3	-0.08	0.12	-0.07	-0.67	
	Job position 2	0.11	0.05	0.07	2.27*	
	Job position 3	0.15	0.05	0.1	3.14**	
	Job position 4	0.35	0.1	0.11	3.59***	
Layer 2	Rumination	-0.38	0.03	-0.36	-11.76***	0.18

Note.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Hypothesis 2 predicts that emotional intelligence will moderate the effect of rumination on work engagement. We used Model 4 in the SPSS PROCESS plug-in (a general mediator model) to test this hypothesis.⁴² Table 6 shows that, after controlling for demographic variables, rumination

negatively predicts emotional intelligence ($B = -0.36, p < 0.001$). Conversely, emotional intelligence

positively predicts work engagement ($B = 0.55, p < 0.001$).

Table 6
Test of the Mediation Model of Rumination on Work Engagement

Predictive variables	Model1 (W-E)		Model2 (E-I)		Model 3 (W-E)	
	B	t	B	t	B	t
Gender	-0.10	-3.14**	-0.06	-1.77	-0.07	-2.58*
Marital status	-0.04	-0.76	0.00	0.01	-0.04	-0.92
Raising children	-0.04	-0.72	0.02	0.40	-0.05	-1.13
Age	0.03	0.47	-0.02	-0.32	0.04	0.77
Working years	-0.11	-1.70	-0.10	-1.44	-0.06	-1.08
Job position	0.15	4.96***	0.13	4.21***	0.08	3.13**
Rumination	-0.36	-11.76***	-0.36	-11.79***	-0.16	-5.85***
Emotional intelligence					0.55	20.16***
R ²	0.18***		0.18***		0.43***	
F	28.66		28.72		86.88	

Note.
W-E is short for work engagement; E-I is short for emotional intelligence. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The mediating effect test revealed that emotional intelligence has a significant mediation impact on the effect of rumination on work engagement ($B = -0.39, SE = 0.05, CI [-0.48, -0.30]$), thus validating Hypothesis 2. Moreover, rumination has a significant direct influence on work engagement ($B = -0.32, SE = 0.05, CI [-0.42, -0.21]$). This demonstrates that emotional intelligence partially mediates the effect of rumination and work engagement. The indirect effect accounts for 54.9% of the total effect, while the mediating effect accounts for 45.1%.

To test Hypothesis 3 of this study, we used

Model 1 of the SPSS PROCESS plug-in (congruent with the hypothetical model), which expects that emotional intelligence moderates the influence of rumination on work engagement.⁴² Table 7 shows the test results, which show that after including emotional intelligence in the model, the product term of rumination and emotional intelligence had a significant predictive effect on work engagement ($B = -0.16, t = -2.26, p = 0.024$). It indicated that emotional intelligence could moderate the prediction of rumination on work engagement, supporting Hypothesis 3.

Table 7
A Test of Emotional Intelligence as a Moderator of Rumination on Work Engagement

Result Variable	Regression Equation (N=930)		Fitting Index		Coefficient Significance	
	Predictive Variables	R	R ²	F(df)	B	t
Work engagement		0.66	0.43	78.14*** (9)		
	Gender				-0.17	-2.62**
	Marital status				-0.11	-0.91
	Raising children				-0.13	-1.06
	Age				0.05	0.89
	Working years				-0.10	-1.20
	Job position				0.10	3.15**
	Rumination				-0.34	-6.17***
	Emotional intelligence				1.03	20.27***
	Rumination*Emotional intelligence				-0.16	-2.26 *

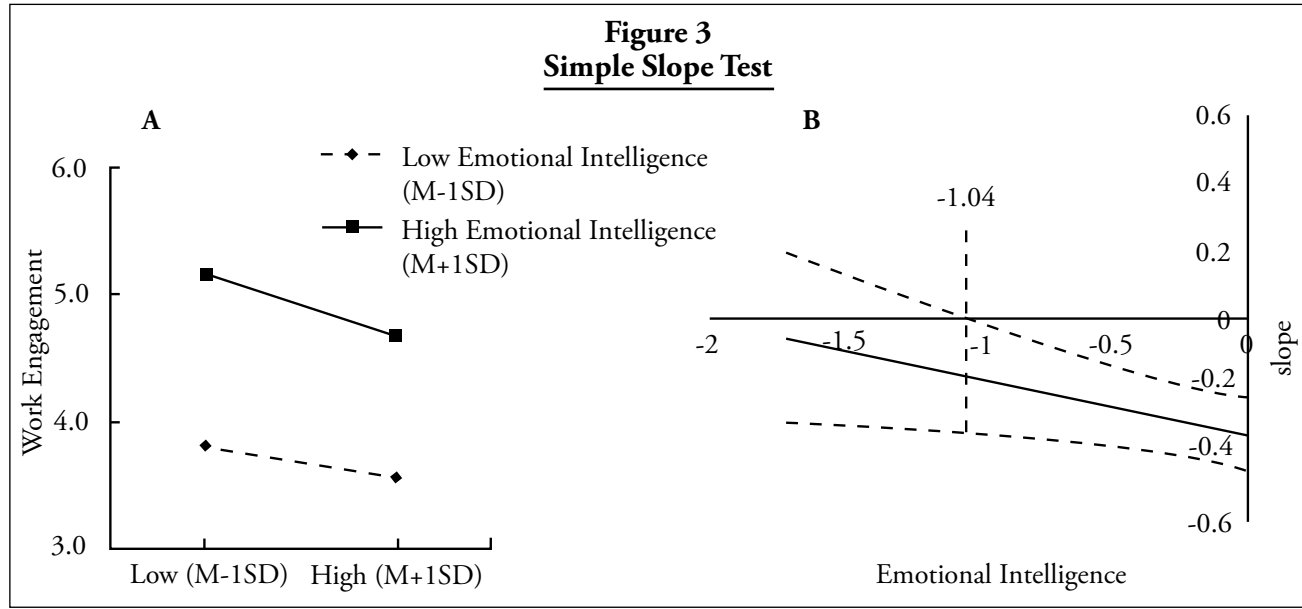
Note.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

A simple slope analysis was conducted (Figure 3A). Rumination showed a significant negative predictive influence on work engagement in those with lower levels of emotional intelligence (M-1SD) (simple slope = $-0.24, t = -3.75, p < 0.001$). Moreover, rumination

also negatively predicted work engagement for subjects with higher levels of emotional intelligence (M + 1SD) (simple slope = $-0.44, t = -5.75, p < 0.001$). It indicated that the prediction of work engagement by ruminative thinking gradually increased as individuals'

emotional intelligence levels increased. We used the Johnson–Neyman method to conduct a more quantitative investigation of the process of emotional intelligence regulation.⁴³ The method decisively reveals the relationship between emotional intelligence regulation scores and the intensity of the influence of rumination on work engagement. Figure 3B

shows the results, which demonstrate that when the emotional intelligence scores of the surveyed employees exceed -1.04 , the confidence interval of the effect of rumination on work engagement is not 0. This shows rumination significantly affected work engagement, and the effect becomes increasingly significant as emotional intelligence scores increase.



DISCUSSION

Studies on rumination, emotional intelligence, and work engagement have been conducted independently, but few studies have combined all three and explored their relationship. To explore the association between rumination, emotional intelligence, and job engagement, a model was created using rumination as the independent variable, emotional intelligence as the mediating and moderating variable, and work engagement as the dependent variable. Significantly, the findings support the original research concept. More specifically, rumination and the dimensions were negative predictors of work engagement in the workforce of Chinese central enterprises. Emotional intelligence partially mediated the effect of rumination on work engagement and moderated the effect of rumination on work engagement.

Rumination scores between male and female employees showed no significant difference, but female rumination scores were slightly lower than male. Nolen-Hoeksema et al.'s⁴³ study confirmed the existence of rumination in gender differences. Han and Yang⁴⁰ also confirmed the existence of

rumination in gender differences in a group of Chinese university students. The inconsistency of this study's results can be attributed to the study's small and underrepresented sample of female employees.⁴⁴

Employees in frontline operational positions scored much higher on rumination than those in other positions. It could be related to the features of frontline positions in the respondents' industries. In this industry, employees in frontline operation positions are mostly directly oriented to production and operation. These employees comprise a larger proportion of the total number of employees in the enterprise. They have more difficult working conditions, 24-hour shifts, relatively low education, and a stronger desire to improve working conditions and achieve personal advancement.⁴⁵

The goal process theory of rumination defines rumination as a mental phenomenon that arises when an individual believes that an important objective is being obstructed. Moreover, this thinking is frequently out of the individual's control. When a person feels that they have not accomplished their desired aim, they may automatically and

unconsciously employ rumination to compensate. This may help explain why individuals in frontline operational positions have poor rumination scores. Employees with children have much lower levels of work engagement than those without children, which is congruent with reality. Employees with children bear a disproportionately larger load in work and life, use more energy, and influence the level of job engagement. Employees aged 41–50 years and 50 years and older have lower work engagement ratings than other age groups. Moreover, employees with 21 years of experience have lower work engagement scores than other age groups, which is consistent with the general trend. Employees who have worked for a long time and are elderly have developed their professions to a somewhat mature stage, with little potential for upward mobility, falling personal energy, and consequently affected job engagement levels.

Employees in frontline operational positions had much lower work engagement scores than those in other positions. This is similar to the rationale for their high rumination scores. Work engagement is one of the judgment indicators of employees' mental health, and enterprises and managers should prioritize employees who have high rumination and low work engagement.⁴⁶

Studies on rumination have focused on its association with depression and anxiety, while even fewer have focused on its relationship with organizational behavior component. This study investigated the relationship between rumination and work engagement, broadening the breadth of research on outcome variables influenced by rumination and broadening research on work engagement antecedent variables. The findings supported the hypothesis that rumination and its dimensions negatively predict work engagement. The symptom rumination dimension has the most significant predictive effect, followed by rumination, and the brooding and reflective pondering dimensions have a relatively small predictive effect. It is in line with previous research on the impact of rumination on job engagement.^{47,48}

These findings are consistent with Nolen-Hoeksema et al.⁴⁹, who state that rumination impairs problem-solving, and with Lyubomirsky and Tkach⁵⁰, who report that rumination in employees could help them formulate effective solutions, but they would also lack the drive to execute their plans. Current research on factors influencing work engagement mostly focuses on work-related traits. This study uses individual traits as the entry point and concludes that the ruminative

personality negatively predicts work engagement. The analysis further confirms the influence of individual factors on work engagement in the theoretical model of work engagement—the integrated model.

The findings also show that emotional intelligence can partially mediate the influence of rumination on work engagement. Hence, rumination might not only have a direct impact but also an indirect impact on work engagement via emotional intelligence. For the first half of this mediation model, rumination negatively predicts emotional intelligence. This is not surprising, given the connotation of rumination and emotional intelligence. Rumination is a type of negative emotion that is difficult to withdraw from. Conversely, emotional intelligence is a positive psychological trait that assists individuals in taking a constructive approach to problem-solving and managing negative emotions, which shortens and alleviates negative emotions in individuals. Emotional intelligence predicted work engagement levels positively in the model's second half. This finding backs with earlier research findings.^{43,51-53}

Previous research has found a two-by-two association between emotional intelligence, rumination, and work engagement.²⁸ We developed a moderating model in this study to investigate the function of emotional intelligence in moderating the relationship between rumination and work engagement. The findings indicate that emotional intelligence moderates the relationship between rumination and work engagement. Particularly, the predictive effect of rumination on work engagement was stronger in people with high emotional intelligence than in those with low emotional intelligence. This finding suggests that emotional intelligence is a protective factor for rumination, leading to lower work engagement. This is in line with past research. Emotional intelligence is a person's ability to detect and express, interpret, integrate into reasoning, and manage emotions.⁵⁵ Individuals with high emotional intelligence can swiftly retreat from unfavorable emotional states and engage in work. Individuals with low emotional intelligence may soon become overwhelmed by their emotional conditions. These individuals would constantly experience unpleasant emotions and would be unable to act efficiently. Wong and colleagues found that people with high levels of emotional intelligence can regulate and control emotional experiences to help them achieve behavioral goals.⁵⁶ Individuals with high levels of emotional intelligence can improve their work engagement.

CONCLUSION

This study concludes that rumination is an influential factor in employees' work engagement and negatively predicts work engagement. Emotional intelligence moderates and partially mediates the influence of rumination on work engagement. Employees with high emotional intelligence levels have a greater moderating effect between rumination and work engagement compared to employees with low emotional intelligence. Our findings supported our hypotheses and would enrich research on the psychological traits of employees in Chinese enterprises. We believe our findings have significant implications for improving employees' mental health and further enhancing work performance and innovative behavior. In future, we can use a longitudinal study to further verify the relationship between rumination, emotional intelligence, and work engagement. An in-depth study can be conducted on the effects of different dimensions of rumination on emotional intelligence. Further studies will help better explore the psychological mechanisms by which rumination affects work engagement.

This study contains several limitations. First, as this study used a cross-sectional design, the findings are not causally inferable. Future studies could investigate causal links between relevant variables using experimental or longitudinal designs. Second, questionnaire data in this study were gathered through self-assessment, which may be prone to common method bias (though this study's common method bias was not severe). Future studies may collect research data using numerous measures. Third, while the samples in this study originated from different regions, they were all from the same industry, with an uneven gender ratio. Future studies might look at samples from a broader range of industry backgrounds and a more balanced gender ratio. Fourth, the subjects' educational qualifications were not examined in this study, which may have influenced the results. Future studies could test this study's findings with this factor controlled. Finally, this study did not extensively analyze the relationship between the characteristics of rumination and emotional intelligence. Hence, the investigation of the underlying mechanism of action is incomplete and should be expanded in the future. Despite the study's limitations, we found the following contributions to be noteworthy.

The two models established in this study, from a theoretical approach, bridge the three variables of rumination, work engagement, and emotional

intelligence. This fills a vacuum wherein the interaction between the three has rarely been explored concurrently before. The mediation model describes how rumination affects work engagement. Moreover, this can be altered directly through rumination and indirectly through the mediation of emotional intelligence. The moderation model reveals individual differences in the influence mechanism. Moreover, it answers the question of whether the level of emotional intelligence is significant in influencing rumination on work engagement. This has positive implications for expanding research on the relationship between rumination, individual psychology, and behavior and would be useful for developing a better model of influence on work engagement.

Practically, our findings have major reference importance for businesses looking to improve employees' mental health in a focused manner while encouraging an increase in job engagement. First, the current status of rumination, work engagement, and emotional intelligence of employees in the companies evaluated in this study reflects some of the contemporary mental health features of enterprise employees. Frontline operational positions have higher levels of rumination and lower levels of work engagement than other positions. This implies that enterprises and managers should prioritize the mental health of this segment of the workforce, establish and improve relevant mental health work mechanisms, and conduct EAP (Employee Assistance Program) work in a targeted manner. Second, the role of emotional intelligence as a mediator in the influence of rumination on work engagement suggests that enterprises and managers can attempt to improve employees' emotional intelligence while also implementing targeted management initiatives to reduce employees' rumination and improve their work engagement. This is a practical manifestation of people-oriented management thinking and a new management perspective and thinking.

Third, the emotional intelligence regulation effect reveals that rumination has varied degrees of impact on work engagement for people with varying levels of emotional intelligence. This offers a reference for corporate talent selection, deployment, and training. Enterprises can assess a talent's level of rumination and emotional intelligence and predict their level of work engagement, establishing supporting recruitment and selection indicators. This will enable recruiters to select talents who better match the requirements of the position and have higher levels of work engagement, laying a solid foundation of talent resources for

enterprise development.

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