

Mindfulness and Work Engagement: An Examination of Mediating Mechanism and Boundary Condition

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ABSTRACT

This study takes employees of enterprises and institutions as the research sample, exploring the mechanism and boundary condition of mindfulness on work engagement with questionnaire survey. Specifically, our study focuses on the direct influence of mindfulness on employees' work engagement, the mediating effect of ego-depletion in the influence of mindfulness on employees' work engagement and the moderating effect of depletion sensitivity in the influence of ego-depletion on work engagement. The final results confirm that: a) Mindfulness has positive impact on work engagement; b) Ego-depletion mediates the influence of mindfulness on work engagement; c) Depletion sensitivity moderates the influence of ego-depletion on work engagement, which means the higher level of depletion sensitivity is associated with the stronger negative impact of ego-depletion on work engagement.

Keywords: *Mindfulness, work engagement, ego-depletion, depletion sensitivity*

1. INTRODUCTION

The competition among various enterprises is becoming much more fierce in an unstable and increasingly complex business environment, which have put forward higher requirements for employees, asking for devotion and concentration while finishing their tasks. Work engagement is beneficial for organizations and employees, since employees who are engaged will have more power to achieve a challenging goal. Meanwhile, sufficient vigor and absorption can help employees release full potential at work (Bakker et al., 2008) [1], improve their performance. Therefore, it's significant to enhance employees' work engagement in managing organizations.

Many scholars are working on exploring the influencing factors of work engagement. Li Rui (2007) [2] has summarized previous studies and believed that the factors which can affect work engagement could include individual characteristics (e.g., personality characteristics and self-efficacy) and job-related factors (e.g., work resources and interpersonal relationships).

Recent years, some scholars have found that mindfulness or mindfulness training in the workplace can have influence on attitude and performance through improving people's cognitive ability, emotion, and self-regulation ability (Glomb et al., 2011) [3]. Besides, the research on how mindfulness affect work engagement has also attracted widespread attention. Some scholars have found that mindfulness can positively relate to employees' work engagement, but the mechanisms and conditions are not comprehensive. Most of studies take positive emotions such as optimism, hope or psychological capital as mechanisms to explore the relationship between mindfulness and work engagement (Leroy et al., 2013; Malinowski, 2015) [4, 5],

few scholars pay attention to the defensive function of mindfulness, considering how mindfulness impacts employees' work engagement. Based on available literature, we will consider resistance to ego-depletion as a mediating variable to explore how mindfulness affect employees' work engagement, and the moderating effect of depletion sensitivity.

2. THEORY AND HYPOTHESIS

2.1. Mindfulness and Work Engagement

Mindfulness is derived from Eastern Buddhism, emphasizing a purposeful and conscious attention to the present. Mindfulness describes a state of mind in which the individual focuses on events and experiences that are happening, which includes internal thoughts, physical sensations, and external natural and social environmental stimulation in a receptive, non-judgmental way. Individuals do not impose any judgment or evaluation, any meaning and personal cognitive control on these stimulations. Consciousness and attention are the core of mindfulness.

Mindfulness is widely considered as a state of consciousness essentially (Brown & Ryan, 2003) [6], but in fact, when we study mindfulness, we will discuss it as a trait. Brown and Ryan (2003) has mentioned that trait should be a tendency that individuals behave in a certain way. Mindfulness has a stable internal personal difference, which is similar to other personality characteristics. And individuals should have different mindfulness levels (Glomb et al., 2011) [3], so we will take mindfulness as a trait to conduct research.

Kabat-Zinn (2015) [7] believes that mindfulness is an ability and an internal spiritual quality that everyone has. The ability and quality can be strengthened through training. Scholars have proved the positive effects of mindfulness-based intervention training in the clinical and psychological fields. Mindfulness can help reduce the perceived psychological pressure and relieve the symptoms of depression, while enhancing positive emotions and life satisfaction, etc. (Keng, Smoski, & Robins, 2011)[8]. In the workplace, current empirical researches have also confirmed that mindfulness is related to some positive work results, including improving performance, reducing turnover (Dane & Brummel, 2014)[9], stress and job burnout (Hülshager et al., 2013)[10], improving work engagement (Leroy et al., 2013) [4], satisfaction (Hülshager et al., 2013) [10] and adaptability (Hunter & Thatcher, 2007) [11].

Work engagement is defined by Bakker et al. (2008) [1] as a state related to well-being which is positive, emotionally motivated and satisfied, exactly opposite the work burnout. Work engagement is characterized as an extreme vigor and recognition of work. Specifically, vigor, dedication and absorption can be considered as the components of work engagement.

We believe that mindfulness and work engagement are beneficial to work and employees based on previous researches. Glomb et al. (2011) [3] pointed out that mindfulness can enhance people's response flexibility, self-determination and persistence with a reduction of individual's automatic responses. We infer that energy, resilience and persistence are closely related to the vigor dimension, and dedication and absorption dimensions are associated with employees' perception of the meaning of work (Schaefeli & Bakker, 2003) [12].

Since mindfulness has a broad and in-depth observation of internal and external environment, it will be easier to perceive various stimulation (Dane, 2011) [13], which helps to enhance individual's self-determination and allows people to perceive the right and appropriate values, match their behavior with values. From this perspective, our study believes that individuals with high level of trait mindfulness can better perceive the organization climate, approve organizational values and have behaviors that match organizational values in the workplace. Actually, it can also help enhance their loyalty to the organization, and make employees to perceive the meaning of work much more easily.

In addition, some researches have shown that positive emotions are usually closely related to higher work engagement (Guo Zhongze, Xie Baoguo, & Cheng Yanyuan, 2019) [14]. There is an upward spiral process between mindfulness and positive emotions, and they can improve each other (Du, J et al., 2019) [15]. Based on this, we can infer that individuals with high level of trait mindfulness are more likely to get positive emotions and be easier to put into work. Besides, individuals can achieve their goals more persistently and make them more vigorous if they adjust their behaviors to adapt to organizational goals and values. Meanwhile, mindfulness reduces the individual's automatic response and makes individuals less contemplative, while studies have confirmed that individuals who are more

contemplative are less likely to be dedicated (Ingram & Smith, 1984) [16]. According to the above analysis, we believe that mindfulness can help enhance the three dimensions of work engagement, so we propose the first hypothesis:

H1: Trait mindfulness has positive impact on work engagement.

2.2. Mediating Effect of Ego-Depletion

2.2.1. Mindfulness and Ego-depletion

Baumeister et al. (1998)[17] pointed out that "ego-depletion is a state of temporary reduction of individual ability or willingness (resources/energy) caused by the execution of previous volitional behaviors (such as self-control, making choices, etc.)." Hagger et al. (2010) [18] compared the process of self-loss to the process of muscle loss after exercises. They believed that after people perform self-control behavior, the effect of the next self-control behavior will be reduced. The occurrence of self-control or self-regulation behavior is considered to be dependent on a limited resource, and any self-control behavior will consume this resource.

According to the Theory of Resource Conservation (COR theory), individuals will try to preserve, protect and develop resources. Individuals will feel threatened, if these resources are lost or depleted. The resources mentioned are defined as material resources, individual characteristic resources, conditional resources, energy resources, or tools and means that can help to obtain the resources mentioned above. While, the individual characteristic resources refer to the resources possessed by the individual which can help them to resist stress (Hobfoll, 1989) [19].

After revising the COR theory, Hobfoll et al. (2018) [20] put forward an inference: individuals with more initial resources are less likely to suffer resource depletion. On the contrary, individuals with less initial resources are more likely to lose resources. This inference has already been confirmed. Studies have found that individuals with high initiative will lose less resources in the process of self-control (Jostmann & Koole, 2007) [21], and individuals with high self-control characteristics are perform better in resisting self-loss (DeWall et al., 2011) [22]. The core of mindfulness is consciousness and attention. Consciousness is considered to serve self-control and self-monitoring. Attention and cognition of one's inherent self and behavior are also considered as necessary conditions for effective self-regulation (Brown et al., 2007) [23]. Under this situation we can infer that mindfulness is a trait that involves a self-control mechanism. Brown et al. (2007) [23] also concluded that paying attention to the task itself or getting rid of interference can help reduce anxiety, thus reducing energy depletion caused by self-control or self-regulation under high task requirements. Therefore, we believe that in the state of mindfulness, high concentration, high persistence, and high self-awareness are all resources owned by

themselves, which can help them to resist resource depletion, so as to perform better in following tasks. According to the core mechanism of ego-depletion, the state of ego-depletion is temporary, and resources can be restored and replenished (Baumeister et al., 1998) [17]. In this regard, Galiot et al.(2007)[24] proved that self-control resources can be supplemented by supplementing physiological resources (such as supplementing glucose, etc.). Therefore, we can also infer that rich psychological resources or supplementation of psychological resources can prevent the resources needed for individual self-control from being in missing status. Glomb et al. (2011) [3] concluded in the meta-analysis of mindfulness that there is a close relationship between mindfulness and positive emotions. Individuals in positive emotions will recover and replenish the consumed resources faster. From this point of view, we can infer that employees with high mindfulness traits will have more initial resources than employees with low mindfulness traits, and they can recover and replenish consumed resources more quickly, so as to resist resource depletion and prevent themselves from being in a state of high ego-depletion. Therefore, we can propose a hypothesis as follows:

H2: Trait mindfulness has negative impact on ego-depletion.

2.2.2 .Ego-depletion and Work Engagement

When the individual’s resources are consumed, the individual’s ability of self-control or self-regulation will deteriorate. This is because individual’s available resources reduced. The decline in this ability will lead to emotional exhaustion or depression (Diestel & Schmidt, 2011) [25]. If an individual is in emotional exhaustion and depression, the energy involved in work will diminish and if an employee’s resources reduce, the following work performance will be influenced. This is because resource depletion will weaken the individual’s willpower in subsequent actions (Baumeister et al., 1998) [17].

From the "dual path" hypothesis of the work requirement-resource model (JD-R model), we can know that: a) when employees are in a state of high work requirements and work resources cannot be replenished, they will have emotional exhaustion and the energy will continue to be consumed, which will have a negative impact on employee performance; b) The increase in work resources will increase employee engagement and stimulate employee motivation, having a positive impact on the organization (Schaufeli et al., 2009) [26]. Based on this model, we think that when an individual is in a state of ego-depletion, the reduction of its work resources will affect the employee's investment and vitality at work, thereby reducing the employee's work engagement. This leads to hypothesis 3 of this article:

H3: Ego-depletion has negative impact on work engagement.

Combining Hypothesis 2 and 3, employees with high mindfulness characteristics will have more initial resources and will replenish resources more quickly than other

employees to resist losses to increase their work engagement. So we propose the following hypothesis:

H4: Ego-depletion mediates the influence of trait mindfulness on work engagement.

2.3. Moderating Effect of Depletion Sensitivity

According to the JD-R model, if the employee's resources cannot make up for the employee's work requirements, the employee's energy will continue to be lost during work, which will have a negative impact (Demorouti & Bakker, 2007) [27]. When employees are more sensitive to loss than others in self-control behaviors, their resources will be consumed faster, and they will be more likely to be out of control or difficult to adjust. Salmon et al. (2014) [28] proposed “depletion sensitivity” and defined it as “the performance when influencing self-control under the condition of consuming resources”. It determines the rate of loss of self-control resources. They think that some people consume resources faster in self-controlling. There are individual differences. The latest research by Salmon et al. (2016) [29] found that the higher the individual's depletion sensitivity, the easier it is to buy junk food. That is to say, the individual’s high depletion sensitivity will make it more prone to self-control failure in life. Previous research by Salmon (2014) [28] confirmed that individuals with high depletion sensitivity will perform worse after experiencing ego-depletion, which indicates that depletion sensitivity may have a reverse promoting effect on individuals’ ego-depletion and the effect can be adjusted. Based on the research above, this article believes that when employees are more sensitive to depletion, the speed of consuming resources will be faster than of replenishing resources, leading to their inability to make up for work requirements, failure of self-control, appearance of emotional exhaustion and loss of enthusiasm. This will aggravate the loss of resources of individuals in ego-depletion, which make it more difficult to put into work. Conversely, employees who are not so sensitive to depletion have slow resource consumption and can save excess resources to devote to work. They will have a higher degree of enthusiasm, vitality and focus on work, so they are more likely to be in a state of high work engagement. In this way, the following hypothesis is proposed:

H5: Depletion sensitivity plays a moderating role in the negative influence of ego-depletion on work engagement. That is, the higher the individual's depletion sensitivity, the stronger the negative impact of the individual's ego-depletion on work engagement and vice versa.

To sum up, this research will start from the Theory of Resource Conservation and explore the positive influence mechanism and conditions of mindfulness's defensive effect on work engagement, as shown in Figure 1.

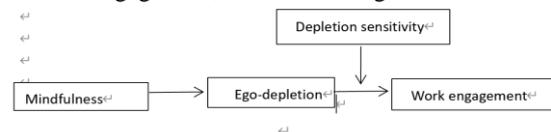


Figure 1 Research model

3. RESEARCH DESIGN

3.1. Participants

We have collected data from 216 employees in 3 private enterprises and 2 public institutions, using questionnaire to test our hypothesis. Among the participants, the proportion of male is 51.5% and that of female is 48.5%, and 69.6% of employees have a bachelor degree.

3.2. Measures

3.2.1. Mindfulness

The Mindfulness Scale comes from the Mindful Attention Awareness Scale (MAAS) developed by Brown & Ryan (2003)[6], including 15 items, such as "I It may be in a certain mood, but it is not noticed until some time later." The Cronbach's alpha is 0.906. The higher value indicates higher mindfulness.

3.2.2. Work engagement

The work engagement scale comes from the UWES scale developed by Schaufeli and Bakker (2003)[12], which is divided into three dimensions: vigor dedication, and absorption, with a total of 17 items. Each item describes the feelings while working, including "I feel that I burst out of energy at work", etc. The Cronbach's alpha is 0.953.

3.2.3. Ego-depletion

We used the ego-depletion scale from the 5-item scale used by Lanaj et al. (2014) [30] to measure the degree of ego-depletion, including "I feel exhausted", "I can't concentrate now", and "I am not energetic" etc., the Cronbach's alpha is 0.92.

3.2.4. Ego-depletion sensitivity

We used the Depletion Sensitivity Scale (DDS) developed by Salmon (2014) [29] to measure employees' ego-depletion sensitivity. The scale consists of 11 items and includes employees' feelings if they are in exhaustion and the situation that causes the depletion of resources. The Cronbach's alpha is 0.903.

4. DATA ANALYSIS

4.1. Reliability and Validity of the Questionnaires

We can see from Table 1, all items of 4 scales have an overall Alpha value more than 0.8, so the internal consistency reliability of each questionnaire is good. KMO value was significant, and all the questionnaires had good construct validity.

4.2. Descriptive Statistics and Correlation Analysis of Variables

As shown in Table 2, first of all, there was no significant correlation between employees' age, service year and 4 main variables: mindfulness, ego-depletion, work engagement and depletion sensitivity, therefore age and service year are not included in the following regression analysis as control variables.

This study used SPSS to analyze the correlation among mindfulness, ego-depletion, work engagement and depletion sensitivity. There was a significant positive relationship between mindfulness and work engagement, and mindfulness significantly negatively related to ego-depletion and depletion sensitivity. Also, ego-depletion negatively relates to work engagement, while there was a significant positive correlation between ego-depletion and depletion sensitivity. Therefore, the four variables: mindfulness, ego-depletion, depletion sensitivity and work engagement are in regression analysis.

Table 1 Reliability and validity of the questionnaires

	Numbers of terms	Cronbach's Alpha	KMO	Bartlett sphericity test		
				Approximate chi-square	DOF	Sig.
Mindfulness	15	.906	.913	1200.130	105	.000
Work engagement	17	.953	.944	2243.134	136	.000
Ego-depletion	5	.920	.872	612.990	10	.000
Depletion sensitivity	11	.903	.903	924.223	55	.000

Table 2 Descriptive statistics and Correlation (N = 171)

	Mean	Standard Deviation	1	2	3	4	5	6	7	8
1.Mindfulness	4.1053	.86826	1							
2.Work engagement	4.8686	1.12249	.350 * *	1						
3.Ego-depletion	2.345	.96918	-.719 **	-.433 * *	1					
4.Depletion sensitivity	3.9607	1.13520	-.638 **	-.270 * *	.585 * *	1				
5.Sex	-	-	-.188 *	-.099	.243 * *	.087	1			
6.Age	-	-	.009	.144	.059	-.046	-.043	1		
7.Education	-	-	.057	.152 *	-.066	-.050	.073	-.152 *	1	
8.Service Year	-	-	-.146	.000	.139	.100	.023	.760 **	-.201 * *	1

4.3. Main Effect and the Mediating Effect of Ego-Depletion

In order to further test our hypothesis, we used SPSS to test the intermediary effect. Firstly, 4 main variables were de-centralized, and the regression analysis of Y(work engagement) to X (mindfulness) was performed to test whether the coefficient *c* in the model $Y = cX + e_1$ was significant to indicate the main effect of X (mindfulness) on Y (work engagement). Then we used regression analysis of M (mindfulness) by X (ego- depletion) to test the coefficient *a* in model $M=aX+e_2$ to examine the relationship between mindfulness and ego-depletion, at last, we test whether the coefficient *b* in the model $Y = c_1X + b_1m + e_3$ is significant, and then examine whether the coefficient *c*₁ is significant.

Based on the results in Table 3, firstly, the D-W value of $Y = cX + e_1$ is $1.840 < 2.5$, there was no autocorrelation and the VIF value is $1.042 < 2$, so there is no serious multicollinearity in the model. Meanwhile, $Sig. < 0.01$ predicts that the regression model is significant, the regression coefficient is 0.333, so mindfulness has a positive effect on work engagement, hypothesis 1 can be supported. We then examined Model 2: $M=aX+e_2$, where there is no autocorrelation or multicollinearity. $Sig. < 0.01$ indicates that the regression model is significant, and the coefficient is -0.695, which means that mindfulness affects ego depletion negatively. Hypothesis 2 is supported. The regression coefficient of ego-depletion to work engagement is -0.423, which means that ego-depletion has a negative effect on work engagement. The lower ego-depletion indicates the higher work engagement, and vice versa. So hypothesis 3 can be supported.

In Model 4: $Y = c_1X + b_1M + e_3$, it can be seen from Table 3 that there is no multicollinearity or autocorrelation in the model, and the coefficient *b*₁ is significant, but the coefficient *c*₁ is not significant. Therefore, the higher trait mindfulness usually means the lower ego-depletion and the higher work engagement, vice versa, Hypothesis 4 was supported.

4.4. Moderating Effect of Depletion Sensitivity

In order to test the moderating effect of depletion sensitivity, firstly we need to do the regression analysis of work engagement on depletion sensitivity and mindfulness to examine whether the coefficient of mindfulness was significant. Then next step was to regress the sensitivity of ego-depletion to mindfulness and ego-depletion, and also to determine whether the coefficient of mindfulness was significant, whether the coefficient of self-loss is significant, and whether the coefficient of interaction is significant, finally, the work input is sensitive to mindfulness, self-loss, loss and regression of interaction terms. If the coefficient of each step is significant, then the adjustment effect is significant.

From Table 4, we can figure out that there is no autocorrelation and multicollinearity in the four models. And *a*₁ and *a*₂ are significant in Model 1 and Model 2. Meanwhile, in Model 3, the coefficient *c*₁ of ego-depletion was significant, and coefficient *d* was slightly significant. Therefore, depletion sensitivity moderates the mediating effect of ego-depletion on work engagement. And 0.199 predicts that depletion sensitivity can enhance the relationship between ego-depletion and work engagement, that is, the higher depletion sensitivity indicates the stronger negative effect of ego-depletion on work engagement. Hypothesis 5 is supported.

Table 3 Main effect and the mediating effect of ego depletion

Variable	Model 1 ($Y=cX+e_1$)			Model 2 ($M=aX+e_2$)			Model 3 ($Y=bM+e$)			Model 4 ($Y=c_1X+b_1M+e_3$)		
	β	t	Sig.	β	t	Sig.	β	t	Sig.	β	t	Sig.
Constant	-	-1.209	.228		-.708	.480		-1.451	.149		-1.450	.149
Sex	-.046	-.627	.531	.114	2.107	.037	-.005	-.072	.943	-.004	-.055	.956
Education	.137	1.898	.059	-.035	-.654	.514	.125	1.794	.075	.124	1.779	.077
Mindfulness	.333	4.553	.000	-.695	-12.831	.000				.077	.778	.438
Ego-depletion							-.423	-5.918	.000	-.368	-3.646	.000
Depletion sensitivity												
Ego-depletion×depletion sensitivity												
R ²												
Adjusted R ²		.142			.530			.203			.205	
ΔF		.126			.521			.188			.186	
VIF		9.201			62.683			14.141			10.732	
D-W		1.011-1.044			1.011-1.044			1.013-1.072			1.013-2.126	
		1.84			2.130			1.902			1.893	

Table 4 Moderating effect of depletion sensitivity

Variable	Model 1 ($Y=a_1X+b_2W+e_1$)			Model 2 ($M=a_2X+b_3W+e_2$)			Model 3 ($Y=a_3X+c_1M+b_4W+e_3$)			Model 4 ($Y=a_4X+c_2M+b_5W+dWM+e_3$)		
	β	t	Sig.	β	t	Sig.	β	t	Sig.	β	t	Sig.
Constant	-1.175	.242		-.851	.396		-1.445	.150		-1.612	.109	
Sex	-.049	-.663	.508	.122	2.307	.022	-.004	-.052	.958	-.002	-.025	.980
Education	.136	1.883	.061	-.032	-.625	.533	.124	1.774	.078	.112	1.629	.105
Mindfulness	.282	2.981	.003	-.553	-8.125	.000	.078	.725	.470	.118	1.106	.271
Ego-depletion							-.368	-3.529	.001	-.398	-3.869	.000
Depletion sensitivity	-.079	-.844	.400	-.220	3.280	.001	.002	.025	.980	.023	.251	.802
Ego-depletion×depletion sensitivity										.199	2.828	.005
VIF		1.011-1.744			1.011-1.744			1.013-2.437			1.017-2.480	

5. RESEARCH FINDINGS AND CONTRIBUTIONS

5.1. Conclusions

Our results show that mindfulness positively related to employees' work engagement. Higher trait mindfulness always predicts higher work engagement. When employees have higher levels of mindfulness, they will pay much attention on their work and have better judgment.

Ego-depletion, as a negative element, will bring employees both physical and psychological discomfort, making them unable to fully focus on the present moment and current affairs. It has a negative impact on work engagement. But employee with high trait mindfulness are more absorbed because they have the ability against the depletion of resources.

Moreover, due to the differences between individual's ability to consume resources, some individuals consume resources more quickly. The difference will lead to various depletion sensitivity which can affect individual's work performance in a negative state. The higher depletion sensitivity usually indicates higher depletion rate which means resources are consumed more quickly, resulting in less attention and vigor at work, and vice versa.

5.2. Contributions

These findings made several contributions to previous research. First, the research on the influence of mindfulness on work engagement is of great theoretical significance, but most recent studies have explored the influence of mindfulness on work engagement through positive emotion and psychological capital (Leroy et Al., 2013 [4]; Malinowski, 2015[5]), focus on the positive reinforcement of mindfulness. Based on the defensive function of mindfulness, this study explores the influence, mechanism and moderate effect of mindfulness on employees' work engagement, which provides a new perspective for the study of mindfulness and work engagement. Second, our findings provide evidence that trait mindfulness is a meaningful antecedent of work engagement. Third, our results provide empirical evidence for the assumptions that ego-depletion and depletion sensitivity is the mechanism and boundary condition in the influence of mindfulness on work engagement.

These research findings are also significant to management practice. In real management practice, mindfulness training can improve the level of mindfulness, which can reduce ego depletion and protect resources used to finish tasks, thus increase employees' work engagement.

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