



# The Impact of New Generation Employees' Effort-Reward Imbalance on Emotional Exhaustion: Modeling Based on Multiple Linear Regression and Support Vector Machines

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## ABSTRACT

As new generation employees are gradually becoming the main force of organizations, research on the relationship between employee effort-reward imbalance and emotional exhaustion needs to be supplemented and updated. Based on social exchange theory, we constructed a mediating model in which psychological contract breach (PCB) acts as a mediating variable. In this study, we collected data from 200 post-90s new generation employees from various industries through online questionnaire. Using this data as a sample, a multiple linear regression method was used to build a model and observe the multiple linear regression relationship. The results showed that both effort-reward imbalance and PCB had a significant positive effect on emotional exhaustion, while effort-reward imbalance also had a significant positive effect on PCB. In addition, PCB mediated the impact of effort-reward imbalance and emotional exhaustion. Support Vector Machines (SVM) was used to model the relationship between emotional exhaustion and independent variables. Finally, research implications and directions for future research are discussed.

**Keywords:** *New generation employees, Effort-Reward imbalance, Psychological contract breach, Emotional exhaustion, Multiple Linear Regression*

## 1. INTRODUCTION

In recent years, along with the generational change in the workforce, the proportion of new generation employees in the labor market is gradually increasing, and the new generation employees represented by "post-90s" are gradually taking the leading position in the organization. To reflect the effort-reward imbalance and emotional exhaustion of the new generation in the current era, the new generation of post-90s employees described in this study specifically refers to the workplace group born in 1990-1999. They grow up in the Internet era with rapid social development. Unequal effort and reward will make them significantly stronger than previous generations of employees to return to the psychology of rebellion, more likely to produce emotional exhaustion, thus affecting the efficiency and quality of work. From this perspective, the research on effort-reward imbalance and emotional exhaustion needs to be updated to keep pace with the times.

Based on social exchange theory, social interaction is an exchange process. In terms of the effort-reward imbalance, if employees are in a state of high pay-low return for a long time, they will easily feel imbalance and perceive a break in the psychological contract, which will have a negative impact on their emotions and even emotional exhaustion, thus affecting their enthusiasm for work and work efficiency; on the contrary, if employees are in a state of low pay-high return for a long time, it is also not a good state for the organization for sustainable development. To clarify the relationship between effort-reward imbalance, psychological contract breach (PCB) and emotional exhaustion is of practical significance for the optimization and enhancement of current organizational management.

The influencing factors of a certain phenomenon or behavior are often multifaceted. Therefore, in management research, researchers often consider many aspects to reflect the integrity of the analysis. When regression is used for data processing, if two or more

independent variables are included in the regression model, it is called multiple linear regression. This analysis method can find the difference of the impact of each predictor. At the same time, by entering the regression model in different order, researchers can further investigate the mediation effect. This has great theoretical and practical value, because it can explore the internal mechanism of phenomena or behaviors. Obviously, using multiple linear regression to study, the depth and breadth of phenomenon analysis are better, and its research results are more practical value. In this study, taking the data of 200 post-90s new generation employees in various industries as samples, we use multiple linear regression to establish a model, observe the multiple linear regression relationship between effort-reward imbalance, PCB, and emotional exhaustion, and verify the existence of mediation effect.

## 2. LITERATURE REVIEW AND HYPOTHESES

### 2.1 *The Impact of Effort-Reward Imbalance on Emotional Exhaustion*

Siegrist's research (1996) [19] indicated that the effort-reward imbalance reflected employees' evaluation of the reciprocal relationship between themselves and the organization, i.e., whether the organization had fulfilled its promise of matching pay and reward equally. If employees invest time, energy, and emotion in their work, but do not get the corresponding feedback and return, they will be in a state of effort-reward imbalance. Effort refers to the time, energy, and responsibility that employees need to put into their work, while reward includes material money, moral respect, and personal career development in the form of promotion [5] [13]. Emotional exhaustion refers to the psychological response that involves exhaustion, gradual alienation from work-related people and events, and a state of self-denial, as individuals are unable to cope with the stresses at work and inevitably devote excessive time and energy resources to their work. (Maslach & Leiter, 2008) [10]

Social exchange theory suggests that each person in society has something that the other person expects to receive and expects to receive something in the other person, and motivated by this expectation, both parties may agree on the willingness to exchange [1]. Both parties to the exchange spontaneously analyze the cost and benefit equivalence of the part already exchanged and use it as a criterion to decide whether to proceed with the exchange [12]. Accordingly, when employees receive material rewards such as money and spiritual rewards such as social respect and interpersonal emotions from the organization that meet or exceed expectations, they feel a responsibility to reward the organization with better attitudes and behaviors [11]. Cristobal's (2017) [3] study of ICU nurses, on the other hand, showed a significant

positive effect of effort-reward imbalance on emotional exhaustion, matching Liza's (2018) [9] findings on humanitarian aid workers. Yuan's (2021) [21] study showed that effort-reward imbalance had a significant positive effect on emotional exhaustion and that effort-reward imbalance was a determinant factor of emotional exhaustion. Thus, we proposed the following hypothesis based on the above analysis and literature.

**H1** Effort-reward imbalance will be positively associated with emotional exhaustion.

### 2.2 *The Impact of Effort-Reward Imbalance on Psychological Contract Breach*

Rousseau (2001) [17] defined the psychological contract as the individual's perception of whether the psychological expectations of the obligations and responsibilities due to the organization are met, i.e., the individual employee's perception of whether the organization is fulfilling its commitments or not. Psychological contract had a significant impact on the behavior and attitudes of employees within the organization [6]. PCB described an employee's subjective perceptions or cognitive appraisal of the organization's non-fulfillment the rewards or responsibilities promised in the psychological contract [7]. It is the result of the individual employee's mental arithmetic between what he or she received and what he or she was promised would be received [16]. According to the cognitive evaluation theory of emotion, when faced with a stressful stimulus, employees assess the impact of that stimulus before triggering a specific emotional response [15].

When employees give less time, energy, and emotion than they receive in return for their work, they are in a state of effort-reward imbalance. If employees feel that the company is not delivering on its expected promises, they will believe that the organization has broken the mutually beneficial agreement, which will lead to psychological contract breach of the organization's employees [2]. Based on the above analysis, we proposed hypothesis 2.

**H2** Effort-reward imbalance will be positively associated with PCB.

### 2.3 *The Impact of Psychological Contract Breach on Emotional Exhaustion*

Based on social exchange theory, employees may stop exchanging or become less motivated to exchange when they perceive that the costs they pay are not rewarded with corresponding benefits. Piccoli's (2015) [14] study confirmed the mediating role of PCB between job insecurity and emotional exhaustion. Du's (2020) [4] study on psychological contract and employee safety behavior in the context of pandemic showed that the fulfillment of psychological contract negatively affected

emotional exhaustion, i.e., PCB had a positive effect on emotional exhaustion. Based on the above analysis, we proposed the hypothesis 3.

**H3** PCB will be positively associated with emotional exhaustion.

### 2.4 Mediating role of Psychological Contract Breach

This study used effort-reward imbalance as the independent variable and emotional exhaustion as the dependent variable. As previously analyzed, effort-reward imbalance will be positively associated with PCB, and PCB will also be positively associated with emotional exhaustion. Based on social exchange theory, it can be inferred that PCB may have a mediating role in the effort-reward imbalance and emotional exhaustion. In summary, we proposed hypothesis 4.

**H4** PCB mediates the effect between effort-reward imbalance and emotional exhaustion.

The above analysis and hypotheses are combined to form a theoretical model, as shown in Figure 1.

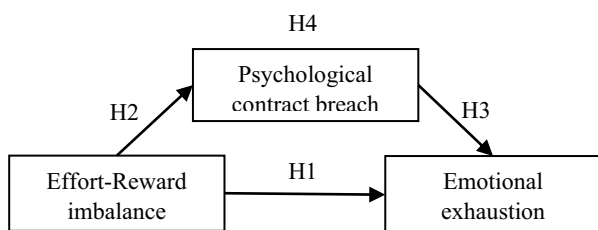


Figure 1. The Conceptual Model

## 3. METHOD

### 3.1 Participants and Procedure

We collected data by questionnaires. The questionnaire consists of four parts: demographic information, effort-reward imbalance Scale, PCB Scale, and Emotional Exhaustion Scale. The questionnaires were distributed through Credamo platform. 227 questionnaires were distributed and 200 valid questionnaires were selected.

### 3.2 Measures

**Effort-reward imbalance.** The Effort-Reward Imbalance Questionnaire (ERI-Q) developed by Siegrist (1996) [19] was used, which was translated into Chinese by Yang and Li (2004) [20] and found to have good reliability and validity. In this study, the "effort" and "reward" dimensions were used. At the same time, the reverse scoring questions in the "reward" dimension and the questions reflecting inter-employee rewards were eliminated to focus more on the rewards provided by the organization. Six of the 11 items were "effort" and five were "reward". The Cronbach's alpha coefficients of "effort" and "reward" were 0.858 and 0.729. The effort-reward imbalance score is calculated by effort minus reward.

**Psychological contract breach.** The PCB Scale, as revised by Shen and Yuan (2007) [18], was used. The scale consists of four items. The Cronbach's alpha coefficient of PCB Scale was 0.843.

**Emotional exhaustion.** Li and Shi (2003) [8] modified the MBI Job Burnout based on Chinese organizational contexts. The five-item emotional exhaustion subscale was used in this study. The Cronbach's alpha coefficient of Emotional Exhaustion Scale was 0.863.

These items are scored on a five-point Likert scale, from 1 for "very unlikely" to 5 for "very likely".

## 4. RESULTS

### 4.1 Confirmatory Factor Analyses

Confirmatory factor analysis (CFA) was performed using AMOS software, and the results are shown in Table 1. The 4-factor model had a satisfactory fit ( $\chi^2/df = 1.942$ ,  $RMSEA = 0.069 < 0.08$ ,  $CFI = 0.922$ ,  $IFI = 0.923$ ) and was significantly better than 3-factor model (effort and reward combined), 2-factor model (effort and reward combined, PCB and emotional exhaustion combined), and single-factor model (all items combined). Thus, there was good discrimination between the variables.

Table 1. Results of Confirmatory Factor Analysis

Models	$\chi^2/df$	RMSEA	CFI	IFI
4-factor model	1.942	0.069	0.922	0.923
3-factor model	3.706	0.117	0.772	0.774
2-factor model	4.904	0.140	0.667	0.670
Single factor model	6.156	0.161	0.557	0.562

## 4.2 Descriptive Statistics and Correlations

We used SPSS to carry out descriptive statistical analysis on the research variables, and used Spearman correlation coefficient for correlation analysis. The means, standard deviations, and correlations of the

variables are shown in Table 2. Effort was significantly and positively correlated with PCB and emotional exhaustion, reward was significantly and negatively correlated with PCB and emotional exhaustion, and the effort-reward imbalance was significantly and positively correlated with both PCB and emotional exhaustion.

Table 2. Means, Standard Deviations and Correlations

Variable Name	mean	SD	1	2	3	4
1. Effort	3.000	0.862				
2. Reward	4.239	0.441	-.142*			
3. Effort-reward imbalance	-1.240	1.025	.925**	-.463**		
4. Psychological contract breach	1.913	0.722	.299**	-.523**	.467**	
5. Emotional exhaustion	2.294	0.872	.611**	-.270**	.641**	.432**

Note: \* $p < .05$ , \*\* $p < .01$ .

## 4.3 Hypothesis Testing

PROCESS was used for hypothesis testing. The results are shown in Table 3. Controlling for gender, marital status, age, education, tenure, enterprise size, and level, the positive predictive effect of effort-reward imbalance on emotional exhaustion was significant ( $B = 0.546$ ,  $t = 10.503$ ,  $p < 0.01$ ), H1 was supported; the positive predictive effect of effort-reward imbalance on

PCB was significant ( $B = 0.408$ ,  $t = 9.487$ ,  $p < 0.01$ ), H2 was supported; the positive predictive effect of PCB on emotional exhaustion was significant ( $B = 0.201$ ,  $t = 2.549$ ,  $p < 0.05$ ), H3 was supported. Further, bootstrapping was used to test the mediating effect, and it was found that the mediating effect of PCB between effort-reward imbalance and emotional exhaustion was 0.082, 95%CI [0.001, 0.169], indicating a significant mediating effect, and H4 was supported.

Table 3 Results of Regression Analysis

Variables	Emotional exhaustion			Emotional exhaustion			Psychological contract breach		
	B	t	p	B	t	p	B	t	p
Gender	0.038	0.375	0.708	0.060	0.598	0.551	0.114	1.245	0.215
Marital Status	0.021	0.169	0.866	0.051	0.398	0.691	0.146	1.270	0.206
Age	0.128	1.233	0.219	0.139	1.321	0.188	0.054	0.571	0.569
Education	0.070	0.528	0.598	0.053	0.393	0.695	-0.085	-0.703	0.483
Tenure	-0.348	-3.457	0.001	-0.347	-3.395	0.001	0.007	0.072	0.943
Enterprise Size	-0.036	-0.551	0.583	-0.004	-0.064	0.949	0.156	2.688	0.008
Job Level	0.086	1.454	0.148	0.060	1.017	0.310	-0.128	-2.410	0.017
Effort-Reward Imbalance	0.464	8.176	0.000	0.546	11.503	0.000	0.408	9.487	0.000
Psychological contract breach	0.201	2.549	0.012						
R <sup>2</sup>	0.476			0.458			0.354		
F	19.195			20.201			13.082		

## 4.4 Modeling

In the previous research on the relationship between emotional exhaustion and antecedents, the statistical

method used focuses on exploring the linear relationship between variables. However, due to the complex relationship between things, the variables often show a non-linear relationship with each other. Therefore, we use

machine learning in Python, Support Vector Machines (SVM) to model the relationship between emotional exhaustion and independent variables and to test the predictive power of the model by making theoretical predictions.

Through previous validation, we selected the variables effort-reward imbalance, and PCB to build the model. We randomly selected 1/5 of 200 data as the validation set. The remaining 160 data, 3/4 as the training set and 1/4 as the test set, were randomly selected. The comparison under the default parameters reveals that the prediction accuracy is higher for the selected Radial Basis Function (RBF). We choose the combination of Grid Search and CV to optimize the parameters ( $C$ ,  $\gamma$ ) of the previously constructed prediction model, and the optimization results are analyzed by using error analysis 1. The results of parameter optimization are  $C=35$ ,  $\gamma=0.00045$ ,  $R^2=0.993$ , in Figure 2. The results in Figure 3 showed that the error of the BRF based on SVM for the prediction model of emotional exhaustion was within a reasonable range ( $R^2=0.9994$ ). It provides new methods and ideas for studies related to emotional exhaustion.

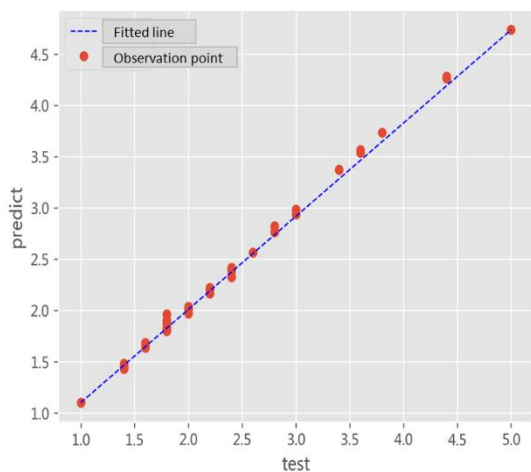


Figure 2. RBF kernel parameter calibration result

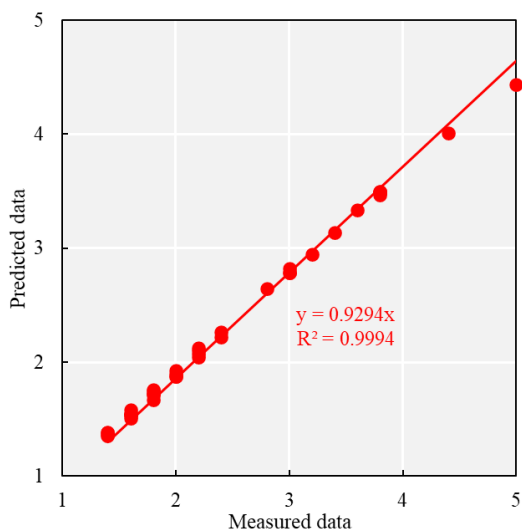


Figure 3. Prediction results of RBF kernel

## 5. DISCUSSION

### 5.1 Research Conclusions

The effort-reward imbalance is often unavoidable in the workplace, either in the long term or in phases. Most employees are facing or have faced a high effort-low reward situation. At a time when the post-90s new generation employees are more concerned about fairness and are more willing to express their dissatisfaction and resistance, the effort-reward imbalance is more likely to lead to excessive depletion of employees' emotional resources, which is detrimental to the interests of the organization and its sustainable development. Based on this background, this study takes the post-90s new generation employees as the sample object and constructs a mediating model by introducing PCB as a mediating variable to study the impact of effort-reward imbalance on the emotional exhaustion of new generation employees. After a series of empirical analyses, this study came up with the following findings.

Effort-reward imbalance is positively associated with emotional exhaustion. In the organization, when employees perceive that they are not getting the expected return, i.e., they are in a state of effort-reward imbalance, they are prone to emotional exhaustion and feel that their emotional resources are overly depleted, resulting in a serious sense of exhaustion at work.

Effort-reward imbalance is positively associated with PCB. When employees are in a state of effort-reward imbalance, they feel that they have been let down and believe that the organization has broken the contractual balance between them, thus subjectively believing that the organization has not fulfilled its promises and thus experiencing PCB.

PCB is positively associated with emotional exhaustion. When employees perceive a PCB, they will feel a sense of betrayal, disappointment, and anger towards the organization, and then feel a sense of excessive depletion of emotional resources and enter a state of emotional exhaustion, which will have a negative impact on the organization's work.

PCB mediates the effect between effort-reward imbalance and emotional exhaustion. The effort-reward imbalance can have an impact on emotional exhaustion not only directly, but also indirectly through the PCB. PCB partially explains the mechanism of effort-reward imbalance on emotional exhaustion.

### 5.2 Practical Implications

First, establish a scientific and reasonable salary system and performance appraisal system. The salary system should reflect the basic principles of distribution according to work and fairness, and convey the signal of "those who can get more" to employees; the performance

appraisal system should also reflect the basic principles of fairness and impartiality, which is the basis and guarantee for the salary system to play its incentive role smoothly. If an organization makes a promise to its employees, whether in writing or verbally, and if the employees make corresponding payments, the organization must fulfill its promise, thus maintaining the effort-reward balance of employees and reducing emotional exhaustion from the source.

Second, improve the employee promotion system. In terms of maintaining the effort-reward balance and reducing PCB and emotional exhaustion, a scientific and effective promotion system can complement the salary system and performance appraisal system to alleviate the negative emotions brought by unreasonable performance appraisal and salary. Even if employees experience an imbalance in pay-reward, equal and reasonable promotion opportunities and experiences can help alleviate the sense of rupture felt by employees in terms of psychological contract, and thus reduce emotional exhaustion.

Third, diversify work contents. Repetitive work every day will make employees tired and bored, through job rotation or enrich the work content and other forms to give employees a fresh work experience, so that they get more sense of achievement and fulfillment, which can help employees maintain enthusiasm for work, enhance the sense of belonging to the organization and sense of responsibility, and thus reduce the situation of emotional exhaustion of employees.

Fourth, create a harmonious organizational atmosphere and give employees more humane care. When the company no longer could give employees more in terms of money and other material benefits, it should pay more attention to the spiritual rewards of employees, by creating a harmonious organizational atmosphere to give employees more spiritual rewards, including the respect of supervisors, good interpersonal relations and so on. In addition, a good climate experience helps employees' emotional stability, and makes employees have a stronger sense of inclusiveness and belonging to the organization, thus reducing employees' perception of PCB and emotional exhaustion.

### ***5.3 Limitations and Future Research***

First, the research data were cross-sectional, and it is expected that future studies can adopt the longitudinal or experimental design. Second, the sample size is small in this study, and it is expected that the future study can expand the sample size to make the research results more convincing. Finally, all the data in this study were self-reported. It is expected that in future studies, researchers can obtain data from multiple sources.

## **FUNDING RESOURCES**

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