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Preschool Teachers' Job Stress and Emotional Labor: Based on BP neural network model

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Abstract

Emotional labor is the third kind of labor alongside mental and physical labor. Preschool teachers are highly emotional workers, and their emotional labor not only affects their own physical and mental health and professional development, but also has an important impact on the development of young children. Focusing on the emotional labor of early childhood teachers can help reduce turnover rates, improve emotional management at work, and reduce emotional depletion. Through a questionnaire survey of early childhood teachers, we conducted an analysis of the impact of work stress on emotional labor from the perspectives of political economy, behavioral economics, and other research perspectives, using the BP neural network model to explore the impact of the dimensions of work stress on the choice of emotional labor strategies and the role of occupational identity in it. The results of the study indicated that preschool teachers' work Stress both significantly predicted preschool teachers' surface play (positively), natural performance (negatively), and professional identity (negatively), but did not predict deep play. Preschool teachers' Professional identity significantly and positively predicted preschool teachers' surface play, deep play, and natural performance. The BP neural network model analyzed the effects of job stress on emotional labor more effectively than regression analysis.

Keywords

Preschool teacher; emotional labor; job stress; BP neural network.

1. Introduction

Emotional labor is a common phenomenon in industries with high levels of human interaction. It is the act of an individual adjusting his or her facial expressions and body language to produce an expression of emotion that meets the requirements of the organization.(Clipa 2015). Preschool teachers are the key subjects for the implementation of the fundamental task of establishing morality and cultivating socialist builders and successors with all-round development of morality, intelligence, physical fitness and aesthetics. The emotional labor of preschool teachers affects the physical and mental health of teachers and children, and the degree of emotional labor paid by preschool teachers differs greatly from that paid by teachers in other school segments. The frequent occurrence of child abuse incidents in recent years, in addition to reflecting the lack of teacher ethics of preschool teachers, also In addition to the lack of teacher morality, the frequent occurrence of child abuse incidents in recent years also reflects that teachers have been exerting intense emotional labor for a long period of time, which in turn leads to the disorders of negative emotion management. and the management of negative emotions is out of order.

2. Measures

A questionnaire for preschool teachers was generated by sorting out demographic variables that might be predictive and drawing on well-established scales of job stress, sense of

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organizational support, emotional labor, and professional identity for preschool teachers. The questionnaires were distributed and returned to conduct a systematic study of the current status and relationships among preschool teachers' job stress, sense of organizational support, emotional labor, and professional identity. The samples were subjected to factor analysis suitability tests (KMO and Bartlett's test), exploratory factor analysis using Principal Component Analysis and Maximum Variance Rotation, and internal consistency reliabilities, i.e., Cronhach Alpha coefficient pairwise reliabilities tests, were chosen.

The Teachers' Emotional Labor Scale (Cukur, 2009) was used to measure teachers' ability to use emotional labor strategies, with two dimensions: surface play and deep play, and a total of 10 items. It is scored on a 5-point Likert scale, with 1 indicating "very non-compliant" and 5 indicating "very compliant", with higher scores indicating higher levels of emotional labor. Lu Jieli (2016) revised the scale with good reliability and validity, indicating that the scale is suitable for measuring the emotional labor level of primary and secondary school teachers in China. In this study, the internal consistency reliability coefficient of the total scale was 0.80, the consistency coefficient of the superficial play subscale was 0.82, and the consistency coefficient of the deep play subscale was 0.86. In the empirical validated factor analysis, the model fit indexes of this scale were all in the acceptable paradigm (x/df=2.40,RMSEA=0.06,SRMR=0.06,CFI=0.95, TLI = 0.90), with good construct validity.

The Early Childhood Teachers' Occupational Stress Questionnaire was used to assess the level of teachers' work stress (Zhu, Congshu, et al., 2002), which consists of six dimensions, including examination stress, students' factors, self-development factors, interpersonal factors at home, workload factors, and occupational expectations factors, with a total of 46 items. A 5-point Likert scale was used, with 1 indicating "no stress" and 5 indicating "a lot of stress". The higher the score of each dimension, the higher the corresponding stress. The reliability of the questionnaire in this study was good, with an internal consistency reliability coefficient of 0.87. The validated factor analysis showed that the model fit indices were within the acceptable range (x/df=2.14, RMSEA=0.06, SRMR=0.06, CFI=0.96, TLI=0.92), and the construct validity was good.

3. Data Analyses

SPSS 24.0 was used to analyze the data for descriptive statistics, correlation analysis and reliability analysis. In addition, Mplus 8.1 was used to analyze the validity of the scales used in this study.

4. Results

Common method bias refers to artificial covariation between predictor variables and validity variables resulting from the same data sources or raters, the measurement environment, and the characteristics of the items themselves. In this study, procedural controls such as anonymous completion of the scale by the subjects, administration of the test by the subject using the same instructions, and disorganization of the order of the scale questions were used to avoid common method bias. In addition, using exploratory factor analysis, 14 factors with an eigenroot greater than 1 were rotated, and the maximum variance explained by the first factor was 33.781%, which was lower than the 40% criterion, so there was no obvious common method bias in this study.

Job stress was significantly negatively correlated to varying degrees with deep play ($r=-0.41$, $p<0.001$) and professional identity ($r=-0.55$, $p<0.001$), while it was significantly positively correlated to varying degrees with surface play ($r=0.57$, $p<0.001$) and burnout ($r=0.71$, $p<0.001$). significant positive correlations. Surface play was significantly negatively correlated with job satisfaction ($r=-0.46$, $p<0.001$) and positively correlated with burnout ($r=0.66$,

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p<0.001). Deep play was significantly positively correlated with job satisfaction (r=0.29, p<0.001) and significantly negatively correlated with burnout (r=-0.56, p<0.001). Job satisfaction was significantly negatively correlated with burnout (r=-0.62, p<0.001). In the analysis of gender and teaching age and each of the main variables, the correlation between teaching age and each of the main variables was not significant, but the correlation between gender and job stress (r=-0.17, p<0.001) reached significance, and there was no correlation with the other variables.

Table 1 The means, standard deviations, and correlations of all studied variables

变量	1	2	3	4	5	6	7	8	9	10	11
1	-										
2	0.857**	-									
3	0.926**	0.789**	-								
4	0.913**	0.743**	0.787**	-							
5	0.882**	0.666**	0.779**	0.741**	-						
6	0.924**	0.705**	0.800**	0.814**	0.818**	-					
7	0.394**	0.349**	0.351**	0.328**	0.418**	0.349**	-				
8	0.144**	0.134**	0.144**	0.069	0.221**	0.107**	0.902**	-			
9	0.620**	0.537**	0.520**	0.619**	0.520**	0.592**	0.486**	0.062	-		
10	0.638**	0.534**	0.549**	0.598**	0.571**	0.618**	0.327**	0.095*	0.565**	-	
11	0.616**	0.518**	0.528**	0.572**	0.555**	0.599**	0.341**	0.122**	0.542**	0.978**	-
12	0.629**	0.524**	0.544**	0.598**	0.559**	0.607**	0.296**	0.060	0.562**	0.973**	0.905**

From the correlation analysis, it can be seen that the correlation between job stress, surface playing, deep play, job stress and burnout have all reached a significant level, so structural equation modeling was constructed based on the hypothesis (Fangjie et al., 2014), and the bias-corrected percentile Bootstrap method (5,000 repetitions) was used to calculate the percentage of burnout. method (5000 repetitions), and calculated 95% confidence intervals. The chain-mediated effects of emotional labor and job satisfaction on the relationship between job stress and burnout were investigated. The chain mediation effect between emotional labor and job satisfaction in the relationship between job stress and burnout was tested. The results showed that SRMR=0.05, CFI=0.93, TLI=0.92) were all within acceptable ranges (Hooper et al., 2008), indicating a good model fit.

In order to further explore the impact of work stress on emotional labor, and the impact of the content of the five dimensions of work stress on the content of the three dimensions of emotional labor, regression analysis of the variables was carried out, with work stress as the independent variable and emotional labor as the dependent variable, and the results of the regression analysis showed that work stress had a significant positive impact on emotional labor; affective commitment had a significant negative impact on superficial performance, and had a significant natural performance positive effect; normative commitment has a significant positive effect on deep performance and natural performance. However, the regression fitting effect of each variable is poor, and the degree of explanation of the independent variables to the dependent variables is low, indicating that the relationship between work pressure and emotional labor may not be a simple nonlinear relationship. Therefore, a BP neural network model was established and fitted again.

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In this paper, we use matlab software to establish a BP neural network model to explore the curve fitting of the dimensions of organizational commitment as the independent variable on the impact of the dimensions of emotional labor, the algorithm has the ability of adaptive learning as well as non-linear mapping ability, which is commonly used in the field of artificial intelligence to simulate the calculation of the human brain to solve the problem of complex relationships. The BP neural network algorithm is used to build the BP neural network model on the data collated from the questionnaire survey. The data of 30 sets of samples taken from X 1 and Y 1 were fitted by quadratic fitting, and the goodness of fit R 2 was 0.907, and the significance parameter was 0.000. The goodness of fit R 2 was 0.907, the significance parameter was 0.000, and the fitting equation was: Y 1 = 0.895 + 0.831X 1 + 0.015X 21, X1 had a significant positive effect on Y1.

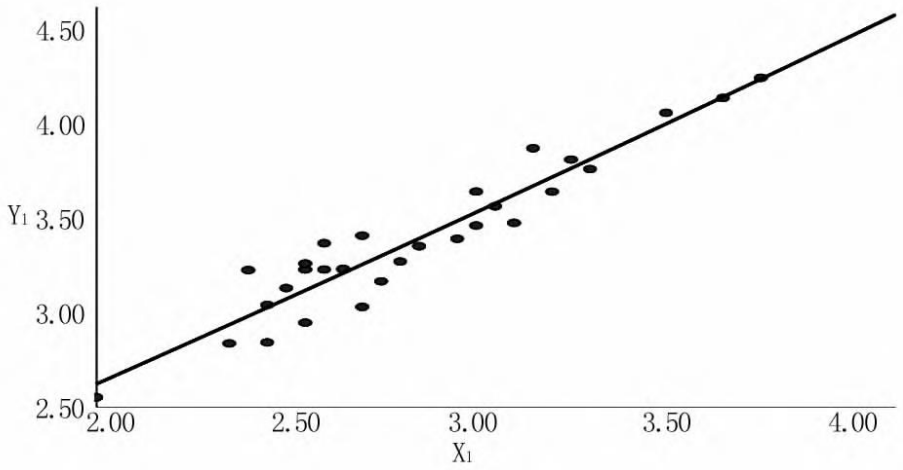

Fig. 1 X1 vs. Y1 fitting graphs

5. Discussion

Previous studies of burnout in the JD-R model have mainly focused on the influence of environmental resources, with less attention paid to the role of individual psychological resources on work attitudes. This study starts from the emotional labor of individual resources to explore how work stress affects burnout, providing more empirical data for the JD-R model from different perspectives. At the same time, it provides a reference for improving teachers' work status, and schools can target the improvement of teachers' work attitudes from the perspectives of job satisfaction and emotional labor. Teaching activity is a high emotional activity work, need to invest a lot of energy to control emotions and behaviors, so school administrators can target to develop some effective measures to help primary and secondary school teachers to reasonably release and deal with emotions, so that they can be more natural in teaching activities. In addition, for primary and secondary school teachers who are currently facing heavy tasks, schools can consider primary and secondary school teachers' problems in various aspects such as personal development, teaching reforms, students' problems and school management(Flook et al. 2013).

The organization should change the management system and cultivate the professional identity of preschool teachers. They should also pay attention to the principle of "knowing people and appointing them well", provide preschool teachers with fair promotion space, give them more humanistic care, cultivate their emotional intelligence, strengthen their professional support and meet their development needs. They should provide preschool teachers with fair promotion space, give them more humanistic care, cultivate their emotional intelligence, and strengthen their professional support to meet their development needs.

Finally, in terms of research methodology.BP neural network model is superior to correlation regression analysis. In studying the analysis of the impact of work stress on emotional labor,

the BP neural network model digs deeper into the data than the correlation regression analysis, improves the degree of explanation of the independent variable on the dependent variable, and has a higher degree of curve fitting, and at the same time, the BP neural algorithm can greatly reduce the experimental workload.

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