

A NOVEL FRAMEWORK BASED ON THE IMPROVED JOB DEMANDS-RESOURCES (JD-R) MODEL TO UNDERSTAND THE IMPACT OF JOB CHARACTERISTICS ON JOB BURNOUT FROM THE VIEW OF EMOTION REGULATION THEORY

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received: 16.11.2017;

revised: 5.2.2018;

accepted: 15.2.2018

SUMMARY

Background: It has been suggested that individual job characteristics have a significant impact on job burnout, and the process is subject to the regulation of demographic variables. However, the influence path of job characteristics on job burnout is still a "black box".

Subjects and methods: On the basis of a systematic literature review by employing Pub Med, Science Direct, Web of Science, Google Scholar, CNKI and Scopus for required information with the several keywords "Job burnout", "Emotion regulation", "Personality traits", and "Psychological stress", in this study, an improved mine rescue workers-oriented job demands-resources (JD-R) model was put forward. Then, a novel analysis framework, to explore the impact of job characteristics on job burnout from the view of emotion regulation theory, was proposed combining the personality trait theory.

Results: This study argues that job burnout is influenced by job demands through expressive suppression and by job resources through cognitive reappraisal respectively. Further more, job demands and job resources have the opposite effects on job burnout through the "loss-path" caused by job pressure and the "gain-path" arised from job motivation, respectively. Extrovert personality traits can affect the way the individual processes the information of work environment and then how individual further adopts emotion regulation strategies, finally resulting in indirectly affecting the influence path of mine rescue workers' job characteristics on job burnout.

Conclusions: This present study can help managers to realize the importance of employees' psychological stress and job burnout problems. The obtained conclusions provide significant decision-making references for managers in intervening job burnout, managing emotional stress and mental health of employees.

Key words: Job burnout - Emotion regulation - Personality traits - job characteristics - Psychological stress

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INTRODUCTION

With the continuous advancement of science and technology and the cumulatively social activities in recent years, human beings have been facing the increasingly frequent occurrence of all kinds of emergencies in the world while sharing social civilization brought by scientific & technological achievements. For example, in the nuclear leakage disaster at the Fukushima nuclear power plant in Japan in 2011, 19 rescue workers were exposed to nuclear radiation, resulting in the emergency evacuation of hundreds of thousands of people from Fukushima. Subsequently, the nuclear proliferation crisis even aroused the nuclear radiation panic in neighboring countries. The massive gas explosion occurred in 2005 at Sunjiawan coal mine in Fuxin City of China killed Chinese coal miners and injured 30 others, and especially in recent years, since emergency accidents occurring in China's coal mines are frequently reported, coal mine accidents has become a hot topic for international discussion in the industrial and academic circles (Lu et al. 2014).

After the occurrence of coal mine disasters, mine rescue workers need to immediately engage in emergency response tasks in the shortest time. However, due to the unpredictability of the accident cause and the onsite work environment, mine rescue workers need to bear greater psychological pressure and emotional stimulation, thereby resulting in psychological stress reactions such as physical fatigue and cardiac exhaustion, including depression, anxiety, nervousness, sleep disorder and coronary disease, and psychological stress problems are subsequently widespread in mine rescue teams (Li et al. 2012). However, the problem of job burnout caused by psychological stress is often overlooked by managers and mine rescue workers. Besides, the instability of psychological stress is just one of the reasons that affect work performance & rescue effect, and cause safety accidents. Furthermore, several studies have shown that (Li et al. 2012) most of the objects suffering job burnout caused by psychological stress are front-line rescue workers. At the same time, these rescue workers have the following common features in terms of work environment and work nature: boring and poor working environment, higher work intensity and

pressure, higher workload and skill requirements, overt work-family conflicts, observable “bottlenecks” in career development, limited work autonomy etc., all of which can lead to a significant increase in psychological stress and job burnout of rescue team members, further resulting in a drastic drop in their efficiency (Lu et al. 2014). Thus it can be speculated on this basis that the special characteristics in the work nature and work environment of mine rescue worker may have influence on the status of their job burnout to a certain degree, and the influencing mechanism may differ from that in other occupational fields such as nurses, police and teachers.

Hence, exploring the influence of job characteristics on job burnout in the context of mine rescue workers can enhance managers’ awareness of the importance of employees’ psychological stress and job burnout. The related conclusions obtained in the study can provide decision-making references for managers in terms of intervention in employees’ job burnout, emotional stress management, mental health counseling, etc.

STATE OF THE ART

On the basis of different industrial backgrounds, scholars in the world have conducted a large number of studies on the relationship between job characteristics and job burnout from different perspectives. The job characteristic model proposed by Hackman & Oldham (1975) introduced job characteristics into the study of job burnout, assuming that different dimensions of job characteristics have differential impact on individual’s psychological state, which in turn influences their work satisfaction, work enthusiasm, work performance and other external expression. Based on the Person-Environment Fit model, Maslach et al. (2001) argued that the mismatch between individual traits and job characteristics could easily lead to the occurrence of individual job burnout. Meanwhile, the Job Demand-Control (JD-C) model emphasized that higher job requirements and lower social support could increase individual’s work pressure, further leading to job burnout (Stansfeld & Candy 2006). De Jonge & Dormann (2003), in the proposed Demand-Induced Strain Compensation (DISC) model, concluded that the negative effects of excessive job requirements could be offset by positive and effective compensation of job resources, so that the work pressure of individuals was decreased to reduce the incidence of job burnout. The most representative theory, namely, the Job Demand-Resource (JD-R) model put forward by Demerouti et al. (2001), based on the conservation of resources (COR) theory, put forward that the ambiguity of job requirements may lead to role conflicts and individual pressure among employees, thereby causing emotional exhaustion, the decline of mental health, labor injury and other job burnout problems. Nevertheless, job resources are the material, psychological, social or organizational aspects that organizations provide to stimulate personal develop-

ment, skill learning, enthusiasm for work and investment in work, and therefore effectively alleviate the problem of job burnout caused by excessive job requirements. Since the JD-R model considers the relationship between job characteristics and job burnout from the aspects of job requirements and job resources, brings the possibility to introduce more factors into the abovementioned relationship and has been therefore widely accepted by academics (Liu 2015). Most scholars believed that individuals have instinctive resistance against job requirements, so that they were forced to devote more resources during the work process (Zhou & Liu 2013). With the continuous depletion of individual resources, work pressure also comes. Employees often lower the aim of job performance to protect their resources. If this state of resource depletion again persists, it will lead to individual emotional exhaustion, resulting in the formation of the path of health loss, while the lack of job resources can affect the motivation of individuals. To be specific, employees are physically and mentally alienated from work, and accompanied by the decline in the sense of accomplishment, forming the process of motivation damaging. This research view has also been validated by empirical analysis in various occupational areas such as home care workers (Bakker et al. 2003), teachers (Ju 2007), police officers (Zhang et al. 2006), coal miners (Li & Wang 2009) and corporate employees (Demerouti et al. 2001). In addition, the JD-R model emphasizes the impact of organizational environmental factors on job burnout, but ignores the role of individual factors. Such as the mediating and interaction effects of individual factors can also cause the deviation of the relationship between job characteristics and job burnout. Yu et al. (2014) found that the interaction between self-efficacy and job resources has a significantly joint moderating effect on the relationship between job requirements and work pressure. Tremblay & Messervey (2011) pointed out in the analysis of the role of individual factors in the JD-R model that compassion satisfaction can weaken the impact of job requirements on work pressure. Zhou et al. (2016) believed that psychological resilience plays a mediating role in the relationship between job resources and job burnout.

It can be seen that plenty of explorations on the relationship between job characteristics and job burnout have been conducted, related achievements provided important reference value for scholars to explore the “black box”: the influence path of job characteristics on job burnout. However, the results from the current studies still cannot clearly explain the real problem of job burnout among mine rescue workers. The existing shortages are as follows: (1) The JD-R model is rarely involved in the analysis of job burnout among mine rescue workers. Through comparison, it has been found that job requirements and job resources with different occupational types have differential effects on the specific dimensions of job burnout. For example, job

requirements among front-line rescue workers have a significant impact on all the three dimensions of job burnout (Li & Wang 2009), while teachers' job requirement has a significant impact on two dimensions, namely, emotional exhaustion and dehumanization (Ju 2007). It can be known that the differences among individuals in job requirements and job resources caused by different work environments and work types are one of the causes of the differential impact of job characteristics on job burnout (Xia & Lin 2013). Nonetheless, as the members of the occupational, technical and militarization mine rescue team, there are great differences in job requirements and job resources between mine rescue workers and other occupational fields. The existing studies cannot be directly applied herein and their specific influencing mechanism also needs further theoretical analysis and empirical verification; (2) The effect of individual emotion regulation is ignored in the JD-R model. Numerous studies have shown that emotional stress and psychological stress are the direct causes of job burnout (Bian & Long 2003), which are not only related to excessive job requirements and the lack of job resources, but also associated with normative restrictions of the organization on employees' emotional performance and individual emotion regulation behavior. When employees' emotional experience in the work process does not match the emotional performance required from organizational expectations or professional norms, individuals will then change their emotional experience and psychological stress through emotion regulation behavior, so as to achieve the normative requirements on their emotional expression (Cheng & Chen 2010). Frequent oppressive and negative emotions can significantly increase individual's work tension, frustration and depressive disorder, resulting in the formation of job burnout (Brotheridge & Lee 2002). It can be seen that emotion regulation can explain more variations in forming job burnout, but the existing theories do not give a clear and systematic answer to the role of emotion regulation in the JD-R model; (3) The impact of personality traits on the abovementioned influencing path is ignored in the JD-R model. With the deepening of research on job burnout, more scholars generally believe that personality traits can indirectly affect job burnout (Austin et al. 2008). Noticeably, the differences in personality traits directly affect the mode of individuals' pressure response, emotion management (Judge et al. 2009), therefore indirectly affecting job burnout. Nevertheless, the influence of different personality traits has not been reflected in the existing studies of JD-R model, most of which only analyzed the differences of the influencing path in the model from the occupational type perspective. Also the influencing relationship between personality traits and job burnout may show deviations due to different types of occupations (Zapf & Holz 2006). It is still necessary

to further explore how the differences in personality traits affect the relationship between job characteristics and job burnout in light of the industrial background of mine rescue teams and the characteristics of mine rescue workers themselves.

Hence, based on the basic views of the JD-R model, the job characteristics of mine rescue workers under the background of Chinese culture through interview analysis is firstly analyzed, then emotion regulation and extraversion personality, acting as two major factors that play a key role in exploring the "black box" relationship between job characteristics and job burnout, is introduced to conduct logical analysis of the impact path of job characteristics on job burnout on the basis of dual-path mechanism in the JD-R model.

JOB CHARACTERISTICS AND EMOTION REGULATION STRATEGY OF MINE RESCUE WORKERS

JD-R model

Job Demand-Resource (JD-R) model proposed by Demerouti et al. (2001) explores the relationship between job characteristics and job burnout from two dimensions, including job requirements and job resources. The JD-R model, due to its strong explanatory power, has been widely used by scholars all over the world. The JD-R model believes that for whatever type of job, employees will suffer from job burnout in face of high job requirements and the lack of job resources. The JD-R theoretical model contains four main hypotheses (Bakker & Demerouti 2007). First, the core hypothesis suggests that although different occupations involve different factors that affect employees' job burnout, they can be classified into two different types, i.e., job requirements and job resources. Job requirements refer to material, psychological, social or organizational requirements in the job setting, including role conflict and workload; job resources refer to material, psychological, social or organizational resources at work, including job autonomy, support from the organization and leaders, and so on. Second, the dual-path hypothesis indicates that, on one hand, higher job requirements will consume employees' personal resources, and the lack of resources leads to the increased work pressure, resulting in job burnout as the loss-path in the JD-R model; on the other hand, the acquisition of job resources is helpful to motivate employees, thus reducing job burnout, which is the gain-path in the JD-R model. Third, the buffer hypothesis demonstrates that the access to job resources can buffer the formation of loss-path, and then reduce the negative effects of job requirements. Fourth, the coping hypothesis mentions that higher job requirements can amplify the gain-path. In other words, under higher job requirements, the acquisition of job resources has a more significant effect on promoting job motivation.

Job characteristics of mine rescue workers

Through the review of related literatures concerning the JD-R model, it has been found that there is no consensus on the intrinsic dimensions of job requirements and job resources in the existing studies (see Table 1). In other words, according to different research themes, different analytical dimensions will be employed to measure job requirements and job resources. With regard to mine rescue workers, as mentioned above, they have their own characteristics in terms of job characteristics that are obviously different from those in traditional industries. Meanwhile, few studies have been conducted to specifically analyze job characteristics of mine rescue workers. In order to more fully and accurately reveal the particular characteristics of job demands and job resources of mine rescue workers, as well as their corresponding impacts on job burnout, the specific internal dimensions of job demands and job resources of mine rescue workers are further clarified in this study through the combination of literature analysis and in-depth interview.

Table 1. Potential dimensions of job characteristics

Job demands	Job resources
Work complexity	Social support
Workload	Co-worker support
Emotional requirements	Leadership support
Skill requirements	Tool support
Work-family conflicts	Autonomy
Work conditions	Mission autonomy
	Decision autonomy
	Decision-making participation
	Career development opportunities
	Learning opportunities
	Performance feedback

Source: Self-elaboration

This study selected 10 mine rescue workers from four rescue institutions, including rescue teams of Jiaozuo Coking Coal Group, Dayou Energy Co., Ltd., Chaochuan coalmine of Pingdingshan Coal Group and Yi coalmine of China PingMei ShenMa Group, as the interviewees from April 2017 to May 2017. The guideline of semi-structured interviewing was employed through two modes, namely, face-to-face and telephone & online video/voice.

After the collation of interview records, it was found that mine rescue workers had their own particular job characteristics, which also validated the expected assumption that mine rescue work has its own characteristics in terms of job demands and job resources. With regard to job resources, all the respondents regarded workload as an intrinsic manifestation of job demands of mine rescue workers, work-family conflicts were considered as a prominent manifestation of their own job demands, and work environment had a higher level of

risk. Through reviewing the interview results, it was also found that there was such a phenomenon: front-line rescue workers mostly selected the measurement dimension of work complexity, while technical workers chose skill requirements. Hence, four dimensions of job demands of mine rescue workers were defined in this study as workload, job-family conflicts, work environment and skill requirements. In the aspect of job resources, the interview results showed that resource support obtained at work was focused on three aspects: leadership support, co-worker support as well as training facility & rescue equipment support. However, respondents' selections on dimensions of autonomy and decision-making participation aspect were more decentralized, but their expressions of the choice ground still showed commonness. In addition, the respondents were also very concerned about personal growth and career development. Thus, four dimensions of job resources of mine rescue workers were defined in this study as social support, equipment support, career development and autonomy.

Emotion regulation

In recent years, plenty of scholars have studied the problem of emotion regulation. The concept of emotion regulation was first proposed in the field of developmental psychology (Campos et al. 1989), and then was deepened and gradually improved by Gross and his research team. They assumed that there were two main kinds of emotion regulation. One is called Antecedent-focused Emotion Regulation, referring to different reactions that individuals take through emotional changes when a certain opportunity or challenge occurs. The other is the regulation of a certain emotion after it has been generated, also known as Response-focused Emotion Regulation (Gross 1998). In addition, several scholars also consider emotion regulation as a kind of ability (Karim & Weisz 2011), thinking that this ability enables individuals to have self-suggestion, cognitive assessment and other behaviors, which make individuals generate positive emotions easily during the process of work, as a result individuals can respond to stress successfully. Gross's Process Model of Emotion Regulation (Gross 2002) believes that at different stages of the emotion generation process, individuals adopt five strategies of emotion regulation, including situation selection, situation modification, attentional deployment, cognitive change and response modulation. The model further points out that the two most frequently used and most effective strategies are cognitive reappraisal and expressive suppression. Therefore, this study also focused on these two types of emotion regulation strategies to explore their differential effects on job burnout of mine rescue workers.

Cognitive Reappraisal

It is a kind of antecedent-focused emotion regulation strategy adopted by individuals before the emotional response is activated. In other words, the individual

chooses an implicit mode, which is beneficial to alleviating the negative emotion in the emotional event, to correct the subjective understanding on the emotional event, so that the emotional experience of individuals can be developed towards the positive and beneficial direction (Gross 2002). Hence, cognitive reappraisal is a kind of positive emotion regulation strategy.

Expressive Suppression

It is a type of focused-response emotion regulation strategy adopted by individuals after the emotional response is generated. Namely, individuals suppress the emotional expression that will occur or is generating, and prevents the emotional experience from being expressed through body, language and facial expression. However, this strategy only changes the external performance of emotion, and the innermost emotional experience is not changed accordingly (Hou & Yu 2006). Thus, expressive suppression consumes more individual resources than cognitive reappraisal (Yuan et al. 2014).

Through the interview analysis of job characteristics of mine rescue workers, it can be found that the work environment of mine rescue workers has obvious difference compared with other industries. High intensity & monotonous actual combat training, and high uncertainty & harsh rescue environment often lead to a certain degree of psychological stress and mood swings among rescue team workers such as anxiety, depression, sadness, fear, etc. However, the nature of the rescue work poses higher emotion management requirements on rescue workers. In the management practice, rescue workers need to ensure a successful implementation of the work through their own effectively emotion regulation. In other words, when rescue workers' emotional state is in conflict with their job demands, they need to engage in emotion regulation, i.e., individuals take the initiative to intervene in the process of emotion generation, experience and expression. During the work process, rescue workers are often required to carry out necessary emotion regulation actions considering the following work necessities: firstly, to prevent excessive negative emotions from causing stress reaction among rescue workers and then the failure of the rescue task; secondly, to adjust the emotional state of rescue workers at a proper controllable level so that they can adopt effective cognitive strategies and cognitive approaches; thirdly, to make rescue workers treat victims and persons in distress with an appropriate emotional state to avoid the spread of their own negative emotions. According to conservation of resources (COR) theory, emotion regulation is a process of resource consumption and thereby is bound to affect job burnout (Zhang et al. 2013). Evidently, emotion regulation occupies an important position in the intervention in job burnout of rescue workers. Hence, this study argues that exploration from the perspective of emotion regulation can fully and clearly explain the problem of job burnout among rescue workers and clarify the impact mechanism of job characteristics on job burnout.

FRAMEWORK BASED ON THE IMPROVED JD-R MODEL TO UNDERSTAND THE IMPACT OF JOB CHARACTERISTICS ON JOB BURNOUT

As mentioned above, since mine rescue workers often are faced with more negative stressors during their work process, they are more likely to experience emotional pressure such as nervousness, fear, irritability and depression etc., resulting in a decrease in their enthusiasm for daily-work. In particular, as individuals' conscious subjective perception and experience towards external environmental stimuli, emotions can affect the work performance of rescue workers. Specifically, in the process of emergency response and rescue work, this emotional pressure can affect the quality of emergency decision-making through the selection of rescue solutions, influence the occupational safety of rescue workers through the implementation of risk-preference rescue behaviors, and further affect execution effectiveness of rescue tasks. In turn, the eventual rescue effect makes rescue workers to subjectively evaluate their work performance on the basis of the obtained social recognition and trust, thereby affecting their perception of job burnout (Lu et al. 2016). It should be pointed out that negative emotions themselves are also important causes of job burnout (Toker & Biron 2012).

Nonetheless, different strategies of emotion regulation are closely related to the dual-path in the JD-R model, which is manifested in the following aspects: job pressure acts on the loss-path which is associated with job demands and further affects job burnout; job motivation affects job burnout through the gain-path associated with job resources; job pressure and job motivation further influence individuals' choice of emotion regulation strategies (Li & Zhou 2013). Based on the above analysis, this study further believes that embedding emotion regulation into the theoretical framework of JD-R model will not undermine the logic and interpretation of JD-R model, but can deeply explain the problem of job burnout of mine rescue workers more appropriately from the perspective of emotion regulation. It should be pointed out that most of the previous studies on the antecedent variables of job burnout mainly focus on work environment. However, further studies finds that individual factors also play an important role in the abovementioned problem, and their impact on job burnout also interacts with environmental factors. According to transactional model of stress and coping (Lazarus 1993), job pressure is subject to the influence of the relationship between the individual and the work environment, and depends on the individual's appraisal on the environmental stimuli. When job demands exceed level of individuals' job resources, psychological stress will generate. Besides, differences in the personality traits of individuals can affect this process of evaluation (Folkman et al. 1986). And under the analytical framework of "stressful event-emotion regulation-individual response", the view that personality traits can

influence emotion regulation strategies and thus employee response has also been verified (Gross & John 2003). Hence, in this study, through integrating the factors of emotion regulation strategies, personality traits are further considered in the improved JD-R model, the interaction mechanism among job demands, job resources, emotion regulation and personality traits is analyzed, and finally an improved mine rescue workers-oriented JD-R model is proposed, as is shown in figure 1.

With regard to job demands of mine rescue workers, except the dimensions of work environment, workload, work-family conflicts and others that are included in general work, its particularity is also reflected in the stringent requirements on mine rescue workers in various aspects, such as work skills, psychological control and physical conditions. At the same time, rescue workers bear the pressure to meet standards of work assessment and job performance when facing higher job demands. In their explicit and self-aware response to excessive job demands, rescue workers often face environmental stressors such as noise, high temperature, and workload or time pressure. There are usually two types of coping strategies for them: performance protection strategy and passive coping mode. Encountering higher job demands, mine rescue workers will consume lots of individual resources to ensure the stability of work performance if adopting the performance protection strategy. When job resources are not supplemented, they are more likely to fall into the "loss spiral" of resources, resulting in emotional exhaustion. However, if the passive coping mode is adopted, due to the lack of work preparation and skill utilization, it is more likely to lead to a decrease in job control, which further causes a sense of alienation from the work and a depersonalization among rescue workers. Undoubtedly, job demands have a direct positive effect on job burnout. Another job-specific factor that corresponds to job demands is job resources. According to the interview results obtained in this study, job resources involve four aspects, including social support from the organization and interpersonal relationship, rescue equipment support with the technical level, personal and career development and autonomy at work. As illustrated in the analysis framework in figure 1, excessive job demands can result in the depletion of resources of mine rescue workers. The shortage of job resources will lead to the lack of motivation for mine rescue workers, thereby exacerbating their experience of emotional exhaustion. Furthermore, this unconventional influencing path may eventually lead to the failure of rescue tasks. In turn, the failure of work tasks will cause the loss of social trust and thus negatively reinforce job frustration among mine rescue workers, forming a vicious cycle of emotional exhaustion, aggravating their psychological imbalance and further deepening their performance of job burnout (Lu et al. 2016).

Again, according to the analysis framework in figure 1, this study embedded expressive suppression and cognitive reappraisal, the two most commonly used and effective emotion regulation strategies in academia, as the

mediating variables in the theoretical framework of JD-R model. Thus, the classic JD-R dual-channel model was expanded into "the loss-path of the expressive suppression affects job demands as the mediator and the gain-path of the cognitive reappraisal affects job resources as the mediator". From the perspective of the antecedents of expression strategies, excessive job demands will lead individuals to enhance their own work engagement, thereby consuming their physical and psychological resources, resulting in energy loss and the generation of a series of psychological and physiological stress problems, such as anxiety, depression, mental and physical disabilities, health damage, etc. (Lawrence et al. 2011). In addition, job demands can also be viewed as the source of stressors in work contexts (Bakker & Demerouti 2007), making individuals constantly consider whether they have adequate capabilities to meet these requirements and to meet performance targets under these requirements, and finally resulting in a long-term sense of work pressure and the subsequent emotional performance as stress, anxiety, irritability and other symptoms. According to the coping theory, individuals tend to adopt appropriate emotion regulation strategies to alleviate such work pressure and negative emotions (Lazarus 1993).

Especially in this mood state, individuals are far more likely to adopt the expressive suppression strategy than the cognitive reappraisal strategy (Zapf & Holz 2006, Adams & Buck 2010). From perspective of the consequences of expressive suppression strategies, if mine rescue workers frequently resort to expressive suppression to prevent the expression of negative emotions, they will suffer from the inconsistency between implicit emotions and explicit emotions experienced by them, resulting in emotional dissonance. In the long run, this inconsistency will cause pressure and stress reactions among rescue workers, which can further lead to job burnout (Hülshager & Schewe 2011). On the other hand, according to the job characteristics theory (Hackman & Oldham 1976), the access to job resources can enhance job motivation of rescue workers and further improve their efforts and willingness to achieve their work goals. Meanwhile, the activation of job motivation will also enable rescue workers to take measures more proactively to adjust their emotional disorders in face of negative emotions and psychological stress. When there is higher work motivation, cognitive reappraisal is much more effective in regulating the effect on negative emotions than the passively expressive suppression strategy. In addition, cognitive reappraisal consumes fewer resources (Cheng et al. 2009) and is more likely to stimulate the generation of positive emotions of rescue workers, thereby reducing their work pressure and relieving the development of job burnout symptoms. Finally, mine rescue workers will be able to accomplish their work targets more efficiently under the guidance of positive emotions and higher job motivation. To a certain extent, the improvement of job performance can enhance the work self-efficacy of mine rescue workers by widening their successful experience, thus weakening the formation of job burnout perception.

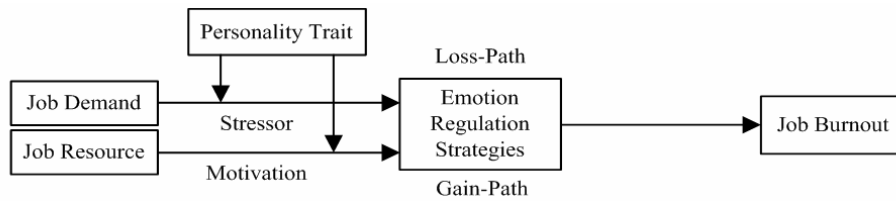


Figure 1. Job demand-resource model for mine rescue workers from the perspective of emotion regulation

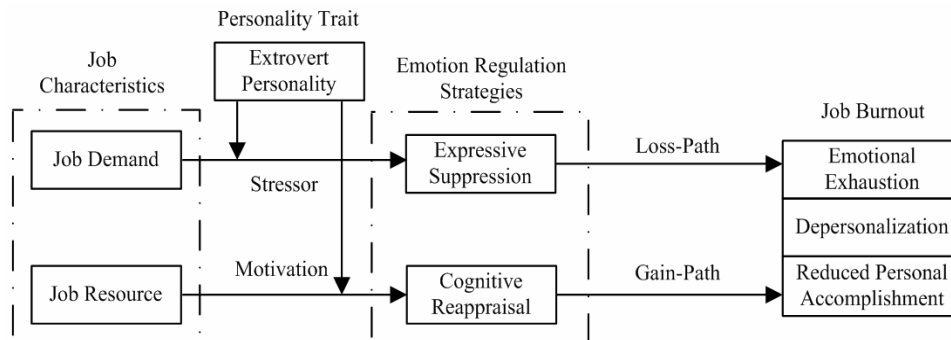


Figure 2. Novel Framework for analyzing the influence path of job characteristics on job burnout

Personality traits, especially the Big Five Personality Traits, are the most important research variables among various individual factors, which not only have a direct impact on job burnout, but also adjust the interaction intensity between work environment and job burnout (Bakker et al. 2006). Under the mediating mechanism of emotion regulation, the external dimension of the Big Five Personality Traits has the most significant influence on different strategies of emotion regulation (Gresham & Gullone 2012). Individuals with higher extroversion tend to cope with job pressure more actively. In face of high job pressure, on one hand, highly-extroverted rescue workers are more likely to allocate their attention to positive stimuli, namely, attention bias effect, and it is difficult for them to remove attention from these stimuli, resulting in higher sensitivity to positive stimuli and stronger positive emotional experience (He et al. 2008). Therefore, due to the positive stimulation of job resources in rescue workers, the mentioned stimulation effect will be magnified among highly-extroverted individuals, leading to further increase of internal and external work motivation. In an environment conducive to inspiring job motivation, the priming effect of positive stimulation on job motivation is more pronounced for those with higher extroversion (Robinson et al. 2010). For highly-extroverted rescue workers, job resources exhibit a stronger priming effect on their job motivation, thereby enhancing the role of job resources in the use of cognitive reappraisal. On the other hand, when highly-extroverted rescue workers confront negative stimuli, they generally have the symptoms such as increased heart rate, happiness and skin temperature, as well as decreased body activities and job interest. Therefore, they are not physiologically and psychologically sensitive enough to the stimuli, but if necessary they can mobilize more resources to participate in emotion regulation activities (Huang & Guo 2003). To a certain extent, this mechanism makes highly-extroverted rescue workers insensitive to stres-

sors arising from job demands, and the corresponding resource consumption reduces greatly. As a result, highly-extroverted rescue workers maintain relatively higher reserves of job resources and can deal with job pressure generated by excessive job demands more calmly. Further more, the decreased negative influence of psychological and physical aspects of individuals on job pressure undermines the impact of excessive job demands on the usage of expressive suppression. Thus, it can be seen that extraverted personality traits can affect the mode that how individuals process information from the work environment and which emotion regulation strategy they will further adopts, which further indirectly influence the impact mechanism of job characteristics of mine rescue workers on job burnout. Considering the analysis results given above, the extraversion dimension was selected in this study to examine the role of personality traits in the relationship between job characteristics and job burnout among mine rescue workers.

Finally, job burnout was used in earlier studies to describe the negatively cognitive and psychological responses among nurses caused by long-term emotional pressure and interpersonal stress (Freudenberger 1974), which can further increase a tendency for individuals to adopt a disengaged, inflexible, and inhuman attitude at work (Maslach 1978). According to the actual situation of job burnout among mine rescue workers, based on the analytical dimensions of job burnout divided by Maslach & Jackson (1981), job burnout was still classified into three dimensions: emotional exhaustion, depersonalization and reduced personal accomplishment, to describe the exhaustion status of emotions, attitudes and behaviors of mine rescue workers owing to the ongoing job pressure and negative emotional experiences.

To sum up, a novel analytical framework to understand influence path of job characteristics on job burnout among mine rescue workers, as shown in figure 2.

CONCLUSIONS AND FUTURE WORK

On the basis of systematical literature review, an improved JD-R model for mine rescue workers is proposed in this study, and then combining personality trait theory, a novel framework for analyzing the influence path of job characteristics on job burnout among mine rescue workers from the view of emotion regulation theory is put forward. Job burnout is influenced by job demands through expressive suppression and by job resources through cognitive reappraisal respectively. Further more, job demands and job resources have the opposite effects on job burnout through the "loss-path" caused by job pressure and the "gain-path" arised from job motivation respectively. Extrovert personality traits can affect the procedure that individual process the information of work environment and then how individual further adopt emotion regulation strategies, finally resulting in indirectly affecting the influence path of mine rescue workers' job characteristics on job burnout. Thus from the standpoint of research route, it is a feasible and practical way to explain the influence of job characteristics on job burnout based on emotion regulation theory, through which we can also find out variables causing job burnout as well as influenced by job characteristics and individual personality traits. Emotion regulation is a key node in the causal chain between job characteristics and job burnout. Nevertheless, this study merely presented an analytical framework, and future research can empirically test the theoretical framework proposed in this study on the basis of measuring relevant research variables described in figure 2, so as to clarify the specific interaction relationships among abovementioned variables and identify the detailed influence mechanism among job burnout, job characteristics and emotion regulation strategies.

Acknowledgements:

This work was supported by National Natural Science Foundation of China (No. 71171162).

Conflict of interest: None to declare.

Contribution of individual authors:

All authors contributed equally to this manuscript.

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