

## Article

# A Comprehensive Model of the Relationship between Miners' Work Commitment, Cultural Emotion and Unemployment Risk Perception

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**Abstract:** The psychological health and work commitment of miners are prerequisites to ensuring their sustainable safety behavior, and it is also significant to the sustainable development of coal mines in China. In this context, we conducted a questionnaire survey among coal miners of state-owned coal enterprises to explore the relationships between cultural emotion, unemployment risk perception, Big Five personality traits, and work commitment. The results reveal that (1) cultural emotion and its three dimensions played a significant positive role in promoting work commitment. (2) Unemployment risk perception, policy unemployment risk perception, and individual differential unemployment risk perception had a negative moderating effect. (3) Moreover, work commitment was associated with differences in personality characteristics except for agreeableness. This research is of important theoretical value and practical significance, as it can guide Chinese coal miners to increase their work commitment and thereby improve safety in production.

**Keywords:** cultural emotion; unemployment risk perception; work commitment; personal characteristics



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## 1. Introduction

The characteristics of China's "rich in coal, poor in oil, and few in gas" energy reserves, and the energy production structure and energy consumption structure, which are dominated by coal production, mean that coal will continue to be China's main energy source into the future. However, although China has made significant progress in coal mining technology and safety equipment configuration [1], coal mine accidents still occur frequently [2,3], and coal mine safety production is facing difficulties. Previous studies found that human factors have become the leading cause of coal mine accidents [4–6]. Accidents caused by unsafe human behavior accounted for 96.5% of the total number of accidents [7], and findings regarding workplace behavior and the health and safety of coal workers are not promising [8]. As Ji and Jan [9] pointed out, employees play a key role in the overall operation of an enterprise and paying attention to employee sustainability has become an important issue. As the front-line staff in coal production activities, coal miners' continuous safety production behavior plays an important role in ensuring the sustainable development of coal mines and even the stable operation of the mineral economy. Behavior is dominated by psychology. Therefore, we must pay attention to the psychology of miners when studying coal mine safety production [10].

The cognitive theory of emotions proposes that emotion is not a simple physiological response but, depends on an individual's evaluation of their real-world experience [11,12]. Research related to organizational culture indicates that individual work commitment is influenced by organizational and individual factors [13,14], among which organizational factors include the organizational climate, culture [15], and relationships [16]. Employees have a range of emotional reactions to organizational factors. Miners' emotions represent

a form of internal motivation which can encourage them to follow safety guidelines, thereby influencing the process of receiving, processing, and reacting to information from underground operations [17]. Throughout this process, if the miner's emotions are positive, they become a directed force that drives employees to pay positive attention to safety issues; if the emotions are negative, they result in a series of unsafe behaviors that are highly likely to lead to accidents [18]. Dissecting the path of culture and emotions in work commitment can help leaders to understand the current state of employees' culture and emotions and identify and improve the current state of the company's culture.

China's de-production policy has significantly reduced coal production capacity, resulting in the laying-off of 1.3 million coal mine employees. The National Bureau of Statistics on employment and production capacity estimated that 1,542,000 people will become unemployed [19]. Most miners have an education level of high school or below, and their ability to accept new technologies and knowledge declines gradually. In the face of rapid change, it is difficult for miners to re-adapt, and their career choices are seriously limited. All of these factors cause miners to develop bleak and imbalanced psychological expectations about future development, which results in a lack of motivation. This situation, in turn, can adversely impact the standard of miner safety and production. Risk perception represents an individual's perception of various objective external risks and emphasizes the influence on cognition of the individual's experiences gained from intuitive judgments and subjective feelings [20]. Thus, unemployment risk perceptions are unique [21]; that is, the individual characteristics of the public lead to differences in the public's life experiences and attitudes towards risk, resulting in differences in public risk [22].

Therefore, we designed a questionnaire to obtain relevant data and employed empirical analysis to explore the relationship between work commitment, cultural emotion, and unemployment risk perception. This study is innovative in the following three respects: (1) based on the inherent connection between emotions and behavior, the concept of cultural emotions is defined, and the three-dimensional structure is clarified from a material level, behavioral level, and conceptual level, which constitutes an important breakthrough in the theoretical study of cultural emotions. (2) This study conducted in-depth research on the connotation, structure, and measurement of unemployment risk perception, clarified the three-dimensional structural framework, thus providing a theoretical reference and methodological support for the assessment of employees' perceptions of unemployment risk. (3) A comprehensive theoretical model of the relationship between miners' cultural emotions, unemployment risk perception, and work commitment was constructed and verified, which provides a new perspective, model, path, and method for analyzing miners' work commitment, and offers a new reference for the field of cultural emotions research.

The structure of this study is organized as follows: Section 2 presents the theoretical basis and hypothesis. Section 3 describes the methodology. Section 4 presents the results. Section 5 discusses the findings, and Section 6 contains conclusions and policy recommendations.

## 2. Research Theories and Hypotheses

### 2.1. Related Concepts

#### 2.1.1. Work Commitment

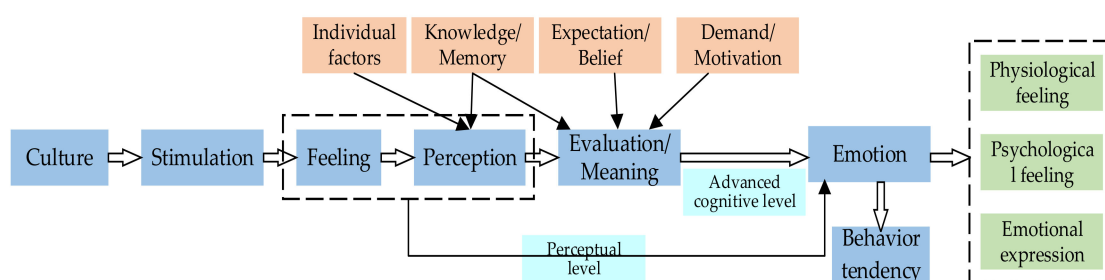
Commitment is defined as "a force that binds individuals to a course of action related to one or more goals" and it has multiple dimensions, including affective commitment, normative commitment, and sustained commitment [23,24]. Lodahl and Kejner [25] first proposed the concept of work commitment. They believed that work commitment represents a significant organizational problem. According to Morrow [26], organizational commitment includes work involvement, organizational affective commitment, continuous commitment, professional commitment and work ethic commitment. Randall and Cote [27] replaced continuous commitment with group commitment. According to Chen and Zhang [15], miners' work commitment includes work attitude, work behavior, and

work outcome. Among these, the work attitude measured miners' attitudes towards their work relationship, cooperation, and mutual support. The work behavior measured the actual performance of miners who autonomously implemented safe and efficient behaviors at work. The work outcome measured the actual work performance of the miners and their teams. According to Yan [28], the work commitment structure includes organizational commitment, professional commitment, work involvement, and work ethics.

By collating research on work commitment, it was found that although there was no unified standard for work commitment, it was a complex concept that included dimensions such as emotion, behavior, and outcome. Considering the commitment subject, target audience, and commitment outcome, this study agreed with Carmeli et al.'s [29] concept of work commitment based on aspect theories. The miner's work commitment was defined as the positive/negative performance (attitude, behavior, outcome, etc.) of the individual (commitment subject) in the current position, work task, work team, or the organization (commitment object) to which they belong.

### 2.1.2. Cultural Emotion

Based on organizational culture and the cognitive theory of emotions, this research analyzed the generation process of cultural emotions. The concept of organizational culture comes from anthropological culture. Since then, scholars have conducted special research on organizational culture and formed different connotations. For example, Badia et al. [30] defined organizational culture as the common norms, values, and world vision formed during the interaction between members, while Marcos et al. [31] believed that organizational culture is a collection of key values shared by organization member. Although no consensus has been reached on the connotation of organizational culture yet, they all contain common elements—that is, organizational culture is a collection of values and behavioral norms shared by organization members. According to the cognitive theory of emotions, individuals often obtain information about external stimuli through the sensory system, and then evaluate external objects and events through the perceptual system to form emotional reactions of anger, happiness, disgust, like, fear, or excitement, and induce certain behavioral tendencies. The generation process of cultural emotion is shown in Figure 1.



**Figure 1.** The generation process of cultural emotion.

At present, the study of cultural emotion has not yet formed a system, and only a few scholars have developed the concept of cultural emotion, but it can still serve, to some extent, as a reference for this study. As Cheng and Jiang [32] pointed out, cultural emotion refers to the overall state of socio-cultural psychology and ethos in a given period. Chen et al. [33] proposed that cultural emotion represents people's cognitive evaluations of the real world in a specific social and cultural period. It can be seen that cultural emotion essentially constituted a cognitive evaluation of culture. In the research on emotion and organizational behavior, Fuchs et al. [34] pointed out that emotion not only affects employees' physical and mental health, but also affects employees' innovative behavior and organizational performance. Similarly, Wang et al. [35] pointed out that emotional creativity has a significant positive impact on employees' innovative behaviors. In addition,

from the perspective of organizational culture, Hodder [36] proved that emotion has a significant impact on organizational performance and efficacy.

Based on these theses, this study theorized that cultural emotion can reflect the true perception and acceptance of corporate culture by employees, and it is an important factor in eliciting many employee behaviors [37]. Combined with the connotation of organizational culture and emotion, this study defined cultural emotion as a product that is influenced by corporate culture. It represents information that stimulates the organizational culture, and it is acquired by employees via the sensory system which is influenced by the corporate culture. It informs cognitive evaluations of the organizational culture. Accordingly, it elicits a particular emotional response, and triggers a series of emotional expressions (e.g., anger, disgust, disappointment, rejection or excitement, appreciation, satisfaction, approval, etc.), which induce certain cognitive and behavioral tendencies. Furthermore, based on the physiological feelings, behavioral orientation and emotional expression of cognitive theory of emotions, this study divided cultural emotions into physical, behavioral, and conceptual levels, and thus cultural emotion was divided into benefits and distribution (e.g., economic benefits), employee-organizational relations (e.g., organizational commitment, organizational citizenship behavior, anti-productive behavior), and humanity and fairness (e.g., respect for humanity, freedom and equal justice).

### 2.1.3. Unemployment Risk Perception

Perception is the last critical link in the relationship between human beings and the external world, and it is a key factor in the series of emotional changes, cognition, and other psychological processes that are produced by stimulating the external environment and things within it. The definition of risk perception is complex and interwoven, and it consists of a series of cognitive processes that are triggered by an individual's psychology which ultimately guides their decision making [38]. Research on risk perception dates back to the 1960s, when Sowby [39] devised a set of risk comparison methods and found that risk acceptability is not simply a matter of assessing the return on risk itself; it is more about people's subjective scales. Therefore, based on the subjectivity, objectivity, and differences associated with risk perception, this study defined unemployment risk perception as the miners' perceptions and understanding about various objective risks in the outside world that may lead to unemployment (objectivity), which emphasized the influence on cognition of the individual's experience gained from intuitive judgments (difference) and their subjective feelings (subjectivity).

Both exogenous factors (e.g., changes in policy, era and technology) and endogenous factors (e.g., individual ability, experience, age, etc.) can cause miners to experience unemployment pressures [40]. In the context of China's "reducing excess capacity" policy and its energy structure transformation strategy, miners' perceptions of unemployment risk are complicated. Based on the two levels of internal and external sources, combined with China's national conditions, this study divided unemployment risk perception into the following three dimensions: policy unemployment risk perception (e.g., unemployment risk perception caused by national policies, such as the de-capacity policy, which is exogenous), individual differentiated unemployment risk perception (e.g., unemployment risk perception caused by individual differences, such as age, interpersonal relationships, and contract expiration, which is endogenous), and technological unemployment risk perception (e.g., unemployment risk perception caused by technological factors, such as job assimilation and professional limitations, which is endogenous).

## 2.2. Hypotheses

### 2.2.1. Culture Emotion and Work Commitment

Miners' cultural emotion refers to the perception and evaluation of the organizational culture by miners, producing certain emotional reactions and inducing specific behavior tendencies. In other words, cultural emotion contains the two core concepts of organizational culture and emotional response. There is an important relationship between

organizational culture and employee behavior. A large number of studies have discussed the promoting effect of organizational culture on employees' organizational citizenship behavior, innovation behavior, knowledge sharing behavior, and team learning behavior. From example, Cameron [41] found that organizational culture is a key variable that affects organizational commitment, while Lok and Crawford [42] had a similar opinion, noting that a supportive and innovative organizational culture is a significant predictor of organizational commitment. A sense of mission and adaptability among employees can have a significant impact on organizational commitment [43]. Neelam et al. [44] conducted a study on employees in the Indian IT industry and found that an organizational culture of trust, openness, experience, autonomy, and cooperation positively influenced emotional commitment. Martyka and Lebecki [45] used Likert scales and questionnaires to evaluate the basic elements of corporate culture among supervisors (middle managers) and blue-collar workers in three underground coal mines, and found that safety culture plays an important role in their behavior.

In addition, the cognitive theory of emotions holds that cognition plays a decisive role in emotion, and the same stimulus situation will produce positive and negative emotional reactions due to different evaluations of it. Miners' emotion is the internal motivation of safety production, which affects the information reception, processing and reaction process of miners' underground work. In this process, if the miner's emotion is positive, it will become a directional force that encourages employees to actively pay attention to safety [46]; if the emotion is negative, it will produce a series of unsafe behaviors, which will often lead to accidents. For example, some scholars have pointed out that job satisfaction (positive emotional response) has a close positive relationship towards work commitment [47], while emotional exhaustion (negative emotional response) will lead to damaged self-esteem, frustration, tension and irritability of employees [48], and reduce employees' commitment to work [49]. In summary, employees with organizational culture perception will produce many positive states, such as higher job satisfaction [50,51], high organizational commitment [52], strong job engagement [53] and less emotional exhaustion [54], etc. In other words, the higher the miner's organizational culture is, the more likely it is to produce a positive emotional response, and thus trigger work commitment. Therefore, consistent with the above research results, we propose the following hypotheses:

**Hypothesis 1.** *Cultural emotion is positively related to work commitment.*

**Hypothesis 1a.** *The benefits and distribution are positively related to work commitment.*

**Hypothesis 1b.** *Employee–organization relationship is positively related to work commitment.*

**Hypothesis 1c.** *Humanity and fairness is positively related to work commitment.*

## 2.2.2. The Moderating Effect Hypothesis of Unemployment Risk Perception

As an individual's perception of the objective and subjective risks of unemployment, unemployment risk perception weakens the positive relationship between miners' cultural emotion and work commitment through two mechanisms, namely weakening miners' positive emotions and amplifying negative effects. Generally speaking, unemployment can easily result in psychological problems [55], and emotion is regarded as an important influence in terms of understanding risk perceptions [56]. A study proved that 63% of people's attitudes fluctuated when they were faced with risks, and anger and fear were identified as the most obvious types of emotion [20]. In addition, the study also proposed that risk perception is the basis for behavioral decision-making and people's judgments of risk, and emotion was the key factor. Unemployment risk can be understood as a manifestation of the psychological condition of miners in crisis situations [57]. Given the increasing pressures of environmental protection, low carbon emission reduction, and the continuous adjustment of the energy structure, the psychological expectations of miners for



the future development of coal mines tend to be bleak, which contributes to mental imbalance and poor psychological expectations [58]. Based on exogenous factors (e.g., changes in policy, era and technology) and endogenous factors (e.g., individual ability, experience, age, etc.), miners' perceptions of unemployment risk weaken the positive relationship between cultural emotion and work commitment by arousing negative emotions, such as anxiety and depression.

Previous studies have shown that unemployment risk perceptions reflect miners' expressions of worry or concern about unemployment [59], including information needs and emergency behaviors associated with unemployment risk, all of which determine how miners will manage and respond to existing and unknown unemployment risk. Risk perception has a social amplification effect [60], which can amplify or diminish the impact of risk events, and thus usually results in undesirable consequences. In response to China's de-capacity policy and energy restructuring strategy, coal mining enterprises have drastically reduced the number of miners. As such, a large number of coal miners are faced with the dilemma of re-streaming, and under the influence of the social amplification effect, miners' perceptions of unemployment risk have dramatically increased, which means that miners are highly susceptible to anti-production behavior. Thus, the social amplification effect weakens the positive relationship between cultural emotion and work commitment by amplifying the employee–organizational relationship of cultural emotion. Based on the research outlined above, this study proposed the following hypotheses:

**Hypothesis 2.** *Unemployment risk perception negatively moderates the relationship between cultural emotion and work commitment.*

**Hypothesis 2a.** *Technological unemployment risk perception negatively moderates the relationship between cultural emotion and work commitment.*

**Hypothesis 2b.** *Policy unemployment risk perception negatively moderates the relationship between cultural emotion and work commitment.*

**Hypothesis 2c.** *Individual differential unemployment risk perception negatively moderates the relationship between cultural emotion and work commitment.*

### 2.2.3. Work Commitment and Individual Personality Characteristics

Research has shown that an individual's commitment to work can be influenced by a variety of organizational and individual factors [13,14]. Work commitment represents the positive or negative performance of miners in their current position, job task, work team or their organization. Miners, who are a special group, have a unique identity in their own right, and miners' work commitment plays an important role in the economic and safety stability of coal mining enterprises and the country as a whole. To date, no study has yet explored the relationship between differences in work commitment and individual personality variables among miners. However, some current studies have analyzed the differences of the Big Five personality in employee work commitment and work performance, which provides a theoretical basis for this study. For example, Yang and Hwang [61] analyzed the relationship between personality traits and job performance in Chinese employee management, and found that the Big Five personality traits significantly affect job performance, of which agreeableness has the largest impact, followed by extraversion. Similarly, Sui et al. [62] analyzed the relationship between the Big Five personality traits and career exploration behavior, and found that extroversion and conscientiousness positively correlated with career expectations, and had a positive impact on job exploration behavior. Therefore, consistent with previous studies, this research concluded that miners' work commitment was significantly different due to individual personality characteristics. Based on the classic Big Five personality-traits theory, this study selected five personality traits, i.e., neuroticism, extraversion, openness, agreeableness, and conscientiousness,

as the main research variables to investigate whether miners' work commitment varies significantly according to their personality traits. The specific hypotheses are as follows:

**Hypothesis 3.** *Miners' work commitment varies significantly according to individual personality characteristics.*

**Hypothesis 3a.** *Miners' work commitment varies significantly according to differences in neuroticism.*

**Hypothesis 3b.** *Miners' work commitment varies significantly according to differences in extraversion.*

**Hypothesis 3c.** *Miners' work commitment varies significantly according to differences in openness.*

**Hypothesis 3d.** *Miners' work commitment varies significantly according to differences in agreeableness.*

**Hypothesis 3e.** *Miners' work commitment varies significantly according to differences in conscientiousness.*

In summary, the overall framework of this research is shown in Figure 2.

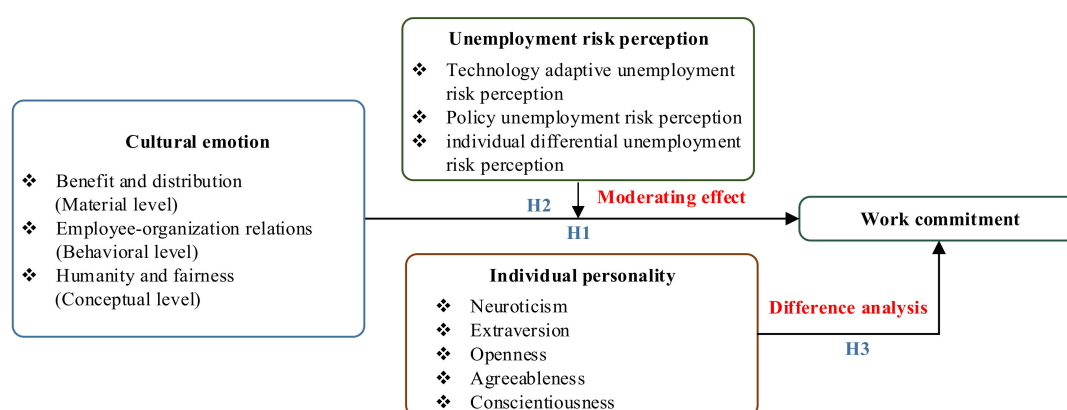


Figure 2. Research framework.

### 3. Methods

#### 3.1. Sample and Data

A questionnaire survey was used to collect data, and the research sample included coal miners from large coal enterprises in China. Taking into account the economic and geographical characteristics of the eastern, central and western regions, as well as the distribution characteristics of large state-owned coal enterprises, three cities were selected (i.e., Shandong Provinces, Anhui Province and Xinjiang Province) as the research area. The survey covered six different types of work including general defense, coal mining, tunneling, electromechanical, transportation, and ground, and involved miners of different genders, education, ages, marital status, and political ideology. The research sample reflected a real-world situation in terms of its social distribution.

The survey was mainly carried out by means of face-to-face interviews. The duration of the interview was approximately 40–50 min, and 12–14 people were allowed to be interviewed at the same time. The survey was conducted from May to July 2019. A total of 540 questionnaires were distributed and 521 were retrieved, of which 434 were deemed valid, producing an effective recovery rate of 80.37%. The specific distribution of the samples is shown in Table 1.

**Table 1.** Descriptive analysis of demographic variables.

Variable	Category	Frequency	Percentage (%)	Variable	Category	Frequency	Percentage (%)
Type of work	General defense	80	18.018	Monthly income	2000 yuan and below	114	25.676
	Coal mining	108	24.324		2000–4000 yuan	263	59.234
	Tunneling	46	10.360		4000–6000 yuan	62	13.964
	Mechanical	91	20.496		6000–8000 yuan	5	1.126
	Transport	67	15.090		8000–10,000 yuan	0	0
	Ground	52	11.712		10,000 yuan or more	0	0
Wage arrears	No arrears	432	97.297	Family monthly income	3000 yuan and below	100	22.523
	0–3 months	10	2.253		3000–5000 yuan	271	61.036
	4–6 months	1	0.225		5000–8000 yuan	63	14.189
	7–12 months	0	0		8000–10,000 yuan	6	1.351
	Above 12 months	1	0.225		10,000 yuan or more	4	0.901
Gender	Male	382	86.036	Education	Below elementary school	3	0.676
	Female	62	13.964		primary school	3	0.676
Age	Below 30 years old	79	17.793	Education	Junior high school	117	26.351
	31–35 years old	65	14.640		High school	170	38.288
	36–40 years old	70	15.766		Junior college	109	24.550
	41–45 years old	97	21.847		Undergraduate	41	9.234
	46–50 years old	69	15.540		Master degree and above	1	0.225
	Above 51 years old	64	14.414		2 years and below	14	3.153
Marital status	Unmarried	18	4.054	Working years	3–5 years	67	15.090
	Married	413	93.018		6–10 years	59	13.288
	Divorced	5	1.126		11–15 years	72	16.216
	Remarry	6	1.351		16–20 years	66	14.865
	Others	2	0.451		Above 21 years	166	37.388

### 3.2. Variable Measurement

To ensure the reliability and validity of variables, this research used mature scales employed in previous studies. To construct the scale developed in this study, five experts from professional fields, three coal mining enterprise leaders, and eight ordinary coal miners were invited to discuss the initial topics that should be included in the scale. The main variables involved in this study are culture emotion (CE), unemployment risk perception (URP), Big Five personality trait (BFP) and work commitment (WC). The detailed measurement items can be found in Appendix A.

(1) Cultural emotion. As there are no scales to assess cultural emotion, research on organizational culture and emotion still served as a reference for this study, such as Detert et al. [63], Flamholtz [64], and Hofstede [65]. Based on in-depth interviews and field research with miners performed by our team from April to September 2016, we designed and revised a cultural emotion scale. To ensure the applicability of the scale to state-owned enterprise miners, before conducting the formal survey, a pre-investigation was carried out and the items were revised according to miners' feedback and data results. The final cultural emotion scale consisted of 19 items. All items were measured using a 10-point Likert scale, which ranged from "very angry/disgusted/disappointed/rejected" to "very excited/liked/satisfied/welcome". The scores ranged from low (1) to high (10). Among them, the humanity and equity dimension (HED) consisted of nine items, the employee–organization relations dimension (EOD) included seven items, and the benefits and distribution dimension (BDD) consisted of three items.

(2) Unemployment risk perception. Fewer studies have been conducted on miners' unemployment risk perception, but some scholars have measured different dimensions of risk perception [66]. An unemployment risk perception scale designed by the team was used in this study [40]. In order to ensure the applicability and comprehensibility of the scale, a pre-investigation was conducted and the scale was revised based on the pre-investigation results and miners' suggestions. The formal scale consisted of three dimensions with 16 items, and a five-point Likert scale was used. The scale ranged from 1 to 5, in which "1 means very inconsistent, 2 denotes relatively inconsistent, 3 is



basically consistent, 4 refers to more consistent and 5 represents very consistent". Among them, technological unemployment risk perception (TURP) consisted of nine items, policy unemployment risk perception (PURP) included three items, and individual differential unemployment risk perception (IDURP) consisted of four items.

(3) Big Five personality trait. At present, the Big Five personality scale developed by McCrae and Costa is most commonly used [67], consisting of agreeableness, conscientiousness, extraversion, neuroticism, and openness. The scale is scored in the form of a five-point scale, and it has shown high reliability and validity. In view of the low education level among coal miners, this study further simplified the Big Five personality scale, which eventually included five dimensions and 28 items. Among them, neuroticism (NEU) consisted of seven items; extraversion (EXT) comprised six items; openness (OPE) included three items; pleasantness (PLE) consisted of five items; and conscientiousness (CON) had seven items.

(4) Work commitment. The design of the work commitment item mainly refers to the research of Chen and Zhang [15] and Wei et al. [16]. These studies were conducted in a Chinese context and were primarily based on coal miners. The work commitment scale consisted of a total of 10 items, which covered three levels of attitude, behavior, and results. A five-point Likert scale was used, and scores ranged from 1 to 5, which indicated "high nonconformity-high conformity". In addition, coal miners made assessments based on their actual experience.

## 4. Results

### 4.1. Reliability and Validity Analysis

In this study, reliability and validity analysis were carried out using SPSS21.0, and the specific results are shown in Table 2. Cronbach's  $\alpha$  coefficient is a commonly used reliability measurement method, and the larger the value, the stronger the internal consistency. Previous studies concluded that the consistency between items can be considered good if Cronbach's  $\alpha$  coefficient is greater than 0.7. It can be seen from Table 2 that the Cronbach's  $\alpha$  coefficients of variables and sub-dimension are all above 0.7, indicating that the scale is highly reliable. According to Table 2, the KMO of the variables were all greater than 0.8, and the Bartlett test was significant, indicating that the scale was suitable for factor analysis and has highly construct validity.

Table 2. Reliability and validity analysis.

Variable	$\alpha$ Coefficient	KMO	Bartlett Test	CR	AVE	Variable	$\alpha$ Coefficient	KMO	Bartlett Test	CR	AVE
CE	0.981	0.969	0.000	0.78	0.87	BFP	0.839	0.869	0.000	0.88	0.92
BDD	0.903					NEU	0.818				
EOD	0.788					EXT	0.808				
HED	0.940					OPE	0.775				
URP	0.892					PLE	0.773				
PURP	0.857					CON	0.841				
TURP	0.877	0.876	0.000	0.90	0.83	WC	0.842	0.903	0.000	0.83	0.82
IDURP	0.746										

In order to verify the fitness of the model, AMOS 21.0 was used for confirmatory factor analysis (CFA). The results in Table 2 show that the measured model's  $\chi^2/df = 1.85$ , CFI = 0.96, TLI = 0.94, IFI = 0.97, RMR = 0.03, RMSEA = 0.05, NFI = 0.93, which indicated that the model fits well. In addition, all composite reliability (CR) and average variance extracted (AVE) values were higher than the critical values of 0.7 and 0.5, indicating that the scale has good convergence validity.

### 4.2. Pearson Correlation Analysis

The correlation analysis among the model variables is the basis for testing the model, so before the data analysis of the relationship, the mean value and correlation analysis of each variable were carried out, and the Pearson correlation coefficient was adopted to

roughly describe the mean value of each variable and its interdependence. The results are shown in Table 3.

**Table 3.** Correlation analysis and descriptive statistics of variables.

Variable	CE	BDD	EOD	HED	URP	PURP	TURP	IDURP	WC
M	5.8228	4.4800	6.5541	5.5218	3.2	3.89	3.31	2.43	3.3649
SD	1.4142	2.5615	2.0486	2.3978	0.726	1.035	0.795	0.728	0.4746
CE	1								
BDD	0.815 ***	1							
EOD	−0.055	−0.166 ***	1						
HED	0.725 ***	0.575 ***	−0.127 ***	1					
URP	0.123 *	0.121	0.231	0.341	1				
PURP	−0.231	0.024	0.042	0.113	0.211 **	1			
TURP	0.221 *	0.322	−0.063	0.241	0.023 *	0.026 *	1		
IDURP	0.135	0.241	−0.045	0.231	0.142 *	0.152	0.173 *	1	
WC	0.264 ***	0.266 ***	−0.043 *	0.189 ***	−0.135 **	−0.025	−0.045 **	−0.213 **	1

Notes: CE denotes cultural emotion, BDD denotes benefits and distribution dimension, EOD denotes employees-organization relations, HED denotes humanity and fairness; URP refers to unemployment risk perception, PURP refers to policy unemployment risk perception, TURP refers to technological unemployment risk perception, IDURP refers to individual differential unemployment risk perception, BFP means Big Five personality trait, NEU means neuroticism, EXT means extraversion, OPE means openness, PLE means pleasantness, CON means conscientiousness, and WC means work commitment; \*\*\* means 1% level, \*\* means 5% level, and \* means 10% level.

Table 3 shows that miners' work commitments are significantly related to cultural emotion, benefits and distribution, employee–organization relationship, humanity and equity, unemployment risk perception, technological unemployment risk perception, and individual differential unemployment risk perception.

Considering the average value, the average score of the employee–organization relation was higher (6.5541), and that for benefits and distribution was lower (4.48). In terms of the employee–organization relationship dimension, the results reveal that miners exhibited emotions such as excitement, appreciation, satisfaction, and approval. In regard to the benefits and distribution dimension, miners displayed more anger, disgust, disappointment, and repulsion. In terms of unemployment risk perception, the average unemployment risk perception is 3.20. From the average score of each dimension of unemployment risk perception, it can be found that policy unemployment risk perception has the highest value (3.89), followed by the technological unemployment risk perception (3.31), and the individual differential unemployment risk perception is the lowest, which is 2.43.

#### 4.3. The Relationship between Cultural Emotion and Work Commitment

In order to further explore the causal relationship and correlation coefficients between cultural emotion and work commitment, a regression analysis was carried out to explore the relationship between the two. The regression results are shown in Table 4.

**Table 4.** Regression results of cultural emotion and work commitment.

Variable	Standard Coefficient	Hypotheses	Results
Cultural emotion	0.370 ***	H1	Supported
Benefits and distribution	0.100 ***	H1a	Supported
Employee-organization relation	0.001 ***	H1b	Supported
Humanity and equity	0.118 **	H1c	Supported

Notes: \*\*\* means 1% level, \*\* means 5% level.

Table 4 proves that, as Hypothesis 1 hypothesized, the positive correlation between cultural emotion and work commitment is supported ( $\beta = 0.37$ ,  $p < 0.01$ ). Similarly, the significant positive effect of benefit and distribution on work commitment is also verified ( $\beta = 0.100$ ,  $p < 0.01$ ), and Hypothesis 1a is established. The employee–organization

relationship has a positive effect on work commitment ( $\beta = 0.001, p < 0.01$ ), and Hypothesis 1b is verified. Hypothesis 1c assumes that there is a positive correlation between humanity and equity and work commitment ( $\beta = 0.118, p < 0.05$ ), and its influence is the greatest. The regression results show that in cultural emotion, humanity and fairness had an important impact on miners' work commitment, followed by benefits and distribution, and finally, the employee–organization relationship.

#### 4.4. Moderating Effect of Unemployment Risk Perception

This study used the hierarchical regression method to construct the regression model. In order to avoid multi-collinearity, the independent variables and moderating variables were firstly centralized before generating the interaction terms. The centered independent variables and the moderating variables were then multiplied to obtain the interaction terms which were gradually incorporated into the model. The hierarchical regression was divided into three levels. The first level added cultural emotion, the second level added moderating variables, and the third level added the interaction terms of cultural emotion and unemployment risk perception into the model. Model 1, Model 2, and Model 3 tested the moderating effect of unemployment risk perception. Model 1, Model 4, and Model 5 tested the moderating effect of policy unemployment risk perception. Model 1, Model 6, and Model 7 tested individual differential unemployment risk perception, Model 1, Model 8, and Model 9 tested the moderating effect of technological unemployment risk perception. The results are shown in Table 5.

**Table 5.** Moderating effect of unemployment risk perception on cultural emotion and work commitment.

Variable	Work Commitment								
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Independent variable									
CE	0.370 ***	0.290 ***	0.291 **	0.269 ***	0.273 ***	0.282 ***	0.283 ***	0.284 **	0.282 **
Moderator									
URP		0.213 **	0.212 **						
PURP				0.167 ***	0.154 **				
IDURP						0.087 **	0.093 **		
TURP								0.199 **	0.198 **
Interactive item									
CE * URP			−0.115 **						
CE * PURP					−0.130 ***				
CE * IDTURP							−0.044 *		
X* TURP									−0.067
$R^2$	0.254	0.261	0.268	0.356	0.375	0.277	0.324	0.315	0.337
$R^2$		0.007	0.025	0.102	0.019	0.023	0.047	0.061	0.022
F	3.886	3.581 ***	4.327 ***	4.027 ***	3.479 ***	4.058 ***	3.892 ***	4.057 ***	6.337

Notes: \*\*\* means  $p < 0.01$ , \*\* represents  $p < 0.05$ , \* indicates  $p < 0.1$ .

Table 5 shows that unemployment risk perception has a significant negative moderating effect, and Hypothesis 2 was verified ( $\beta = -0.115, p < 0.05$ ). The results of the hierarchical regression analysis reveal that policy unemployment risk perception had a significant negative moderating effect ( $\beta = -0.13, p < 0.01$ ), and Hypothesis 2b was verified. At the same time, the results prove Hypothesis 2c and individual differential unemployment risk perception has a significant negative moderating effect ( $\beta = -0.44, p < 0.1$ ). However, the results of the hierarchical regression analysis of technological unemployment risk perception show that the interaction coefficient was  $-0.067$ , which failed the significance test, indicating that the technological unemployment risk perception did not have a moderating effect, and as such, Hypothesis 2a was not verified.

#### 4.5. Difference Analysis of Work Commitment and Personality Characteristics

In order to explore the impact of individual personality differences on miners' work commitment, a one-way variance analysis was carried out to study the specific differences. The premise of variance analysis is that the population obeys a normal distribution and the variances are equal at each level. Therefore, it is necessary to test the homogeneity of variance. If the  $p$  value is greater than the significance level  $\alpha$  ( $\alpha$  is set as 0.05), it means that the variance is homogeneous, and the F test can be selected; if the  $p$  value is less than the significance level  $\alpha$  ( $\alpha$  is set as 0.05), this indicates that the variance is not homogeneous, and the F test cannot be selected. According to the research conducted by Welch [68] and Guo et al. [69], when the variances are not homogeneous, the Welch test can be selected to compare the differences between the means of each group. The homogeneity of variance test of individual personality characteristics is shown in Table 6.

**Table 6.** Homogeneity of variance test based on the characteristics of miners.

Variable	Levene	$p$	Homogeneity
Neuroticism	1.232	0.296	Homogeneous
Extraversion	4.995	0.000	Inhomogeneous
Openness	0.642	0.632	Homogeneous
Agreeableness	6.031	0.000	Inhomogeneous
Conscientiousness	3.495	0.007	Inhomogeneous

The difference analysis of the miners' personality traits was carried out to explore whether miners with different personality characteristics show significant differences in the area of work commitment. The results are shown in Table 7.

**Table 7.** Analysis of differences in work commitment based on the personality characteristics of miners.

Variable	1		2		3		4		5		F/Welch	P
	M	SD	M	SD	M	SD	M	SD	M	SD		
Neuroticism	3.92	0.71	3.42	0.49	3.34	0.44	3.34	0.46	3.40	0.50	3.32	0.011
Extraversion	2.73	0.52	2.74	0.67	3.27	0.39	3.45	0.38	3.61	0.48	16.18	0.000
Openness	3.46	0.59	3.54	0.43	3.32	0.44	3.30	0.49	3.27	0.53	4.77	0.001
Agreeableness	3.68	0.74	3.46	0.79	3.35	0.48	3.33	0.42	3.39	0.39	0.88	0.486
Conscientiousness	2.98	1.24	2.89	0.59	3.28	0.47	3.35	0.44	3.54	0.44	6.22	0.016

Notes: (1) neuroticism classification: 1—very unstable, 2—relatively unstable, 3—normal, 4—relatively stable, 5—very stable; (2) extraversion classification: 1—very introverted, 2—relatively introverted, 3—normal, 4—relatively extroverted, 5—very extroverted; (3) openness classification: 1—very not open, 2—less open, 3—normal, 4—relatively open, 5—very open; (4) agreeableness classification: 1—very unagreeable, 2—less agreeable, 3—normal, 4—more agreeable, 5—very agreeable; (5) conscientious classification: 1—very inconscientious, 2—less conscientious, 3—normal, 4—more conscientious, 5—very conscientious.

Table 7 shows that lower neuroticism among miners was associated with higher scores for work commitment ( $M = 3.92$  when neuroticism = 1,  $p < 0.05$ ), which validated Hypothesis 3a. Significant differences were found in work commitment due to extraversion among miners, and the highest score was observed among miners who were highly extroverted ( $M = 3.61$  when extraversion = 5,  $p < 0.01$ ), which validated Hypothesis 3b. In addition, the result proves that miners who were very open scored the lowest ( $M = 3.27$  when openness = 5,  $p < 0.01$ ), which means that Hypothesis 3c was validated. Moreover, the highest score was observed among miners who were very conscientious ( $M = 3.54$  when conscientious = 5,  $p < 0.05$ ), which validated Hypothesis 3e. However, agreeableness among miners was not associated with significant differences in work commitment ( $p > 0.1$ ), and thus Hypothesis 3d was not validated.

## 5. Discussion

### 5.1. Discussion of the Role of Cultural Emotion

The empirical analysis showed that cultural emotions and all three of its dimensions (i.e., benefit and distribution, employee and organization relations, humanity and fairness) significantly and positively influenced miners' work commitment, which was consistent with the findings of previous studies that highlighted how the organizational culture promotes behavior, while emotions also promote behavior [44,47].

Sagiv and Schwartz [70] hypothesized that well-being depends upon congruence between personal values and the prevailing value environment: if the cultural environment provides various opportunities to reach the goals embodied in cultural norms, and provides support and reinforcement for the importance of such cultural norms, then maintaining social norms that are consistent with that cultural environment should be positively associated with adaptive outcomes. The hypothesis illustrates the relationship between organizational culture and outcomes, and it can be expanded and applied in the case of miners. If miners identify with the organizational culture, and if they identify with and adopt social norms that are consistent with the organizational culture, the organizational culture will encourage supportive behavior among miners. Organizational culture encompasses "assumptions, values, beliefs" and it operates "beneath the surface of behavior" [71]. Organizational culture, as a "metaphorical" force in organizations, is constructed by borrowing the experience of one domain to understand another [72]. Thus, employees' identification with the organizational culture reflects their level of organizational social awareness. When an individual identifies with the organizational culture, it means that they relate to their organization's values, and they can deal with external problems in a way that reflects their organization's thinking. Furthermore, individual emotional expression is influenced by organizational culture [73] and the more positive the emotions, the more significant and positive the influence on miners' actions [74] and the higher the miner's job commitment.

### 5.2. Discussion of the Moderating Effect of Unemployment Risk Perception

Both external (e.g., changes in policy, times and technology, etc.) and internal factors (e.g., individual ability, experience, age, etc.) can cause unemployment stress. When dealing with internal factors that contribute to unemployment stress, miners react negatively, resulting in lower job commitment. The empirical analysis showed that unemployment risk perceptions, policy unemployment risk perceptions, and individual differential unemployment risk perceptions weakened the relationship between cultural emotions and job commitment, i.e., had significant negative moderating effects.

Specifically, unemployment risk perception is a type of risk perception that refers to the key elements of a series of emotional changes, cognition, and other mental processes that are produced by individuals in response to stimuli from external environments and things [38], which vary according to individual heterogeneity. Unemployment risk perception refers to the process by which miners objectively and subjectively perceive their risk of unemployment. The moderating mechanism of unemployment risk perception can be understood in two ways. On the one hand, against the backdrop of China's de-production policy, coal mining companies laid off a large number of employees, and miners have a higher perceived risk of policy unemployment. Research shows that 63% of individuals experienced emotional and attitudinal fluctuations when faced with risk, with the most obvious types of emotions being fear and anger [55], while negative emotions typically lead to lower organizational commitment [49]. On the other hand, given the real-world situation regarding increasing pressures in the area of environmental protection and carbon emission reduction, as well as the constant adjustment of the energy structure, miners tend to hold bleak psychological expectations about the future development of coal mines, which may have an adverse effect on the mental health of coal miners [58]. In addition, the miners' perceptions of unemployment risk weakened the positive relationship between cultural emotions and job commitment by causing employees to experience negative emotions such as anxiety and frustration.



### 5.3. Discussion of Individual Personality Differences

The empirical analysis revealed that there were significant differences in miners' work commitment due to neuroticism, extraversion, openness, and conscientiousness, although no significant differences in agreeableness were observed. Higher levels of emotional instability were associated with higher levels of extraversion, lower levels of openness, and higher levels of conscientiousness, which contributed to higher levels of work commitment among miners.

Miners showed high levels of neuroticism, which indicated that they were more likely to experience a wide range of positive and negative emotions, and to exhibit stronger responses to external stimuli in comparison with the general population. Most related studies have shown that neuroticism has a negative effect on organizational citizenship behavior and organizational commitment. In other words, the more emotionally unstable a person is, the more likely they are to engage in deviant behavior [75]. However, this study mainly dissected the work commitments of miners who worked in China's large SOEs from the viewpoint of de-production, which is unique. Miners who exhibit high levels of neuroticism are more likely to experience negative emotions in a stressful external unemployment situation, but combined with China's unique situation, the pressure to be genuinely unemployed will cause miners to adjust their emotions and make a greater effort to avoid unemployment. Extraverted individuals tend to be group-oriented, confident, and sociable. Individuals with a high level of extraversion tend to be enthusiastic, passionate, dominant, friendly, and communicative. They interact with more people, and they control relationships. Most studies have shown a positive correlation between extraversion and organizational commitment [76], which is consistent with the results of the present study. Extremely open-minded people are creative, curious, and artistically sensitive, and they are receptive to stimuli. They are open-minded because their level of insight is not only broad but deep [77]. Miners with higher levels of openness are more likely to learn new things to improve their job skills. They are more open to new perspectives about the risk of unemployment, and are more likely to change their behavior to increase their level of work commitment. Conscientiousness is a measure of reliability. Individuals with high levels of conscientiousness can control the social environment, think before they act, postpone having fun, follow the rules, plan, organize, and prioritize tasks [78]. Highly responsible miners are less affected by the risk of losing their jobs. They are more likely to adapt to their environment and maintain their original level of commitment, or to take on additional work responsibilities to avoid losing their jobs, which results in a higher level of commitment.

### 5.4. Limitations and Future Research

This study strived to ensure that the questionnaire survey and empirical testing were rigorous, standardized, and reasonable, but there were still some shortcomings which could be improved upon in the future:

(1) Cultural emotions and unemployment risk perceptions are a new category in the field of security psychology, and their connotations, structure, and measurement are controversial. By collecting, comparing, and summarizing relevant theories and literature, this study developed research scales that fit the cultural emotion, work commitment, and unemployment risk perceptions of coal miners in China. Although the preliminary research and formal research scales were tested for reliability and validity, it was difficult to fully overcome the subjectivity inherent to the study. This can be further explored in future research by carrying out behavioral experiments and other methods.

(2) Given the specificity of the object of this study, representative large state-owned coal mining enterprises were selected as the object of the research. Front-line miners from these enterprises were selected as the specific object of the research, and different types of jobs were included in the research. Although representative of the distribution of large coal miners, the sample was, nonetheless, inadequate in terms of regional distribution and

mine size. A follow-up study would allow us to broaden the scope of the research areas and enterprises in order to increase the sample size.

## 6. Conclusions and Policy Recommendations

### 6.1. Research Conclusions

In order to investigate the dynamic interrelationship between the dimensions of cultural emotion, work commitment, and unemployment risk perception, this study carried out an empirical analysis and simulated a scenario to reflect the microscopic changes in the work commitment of individuals as regulated by the parameters of cultural emotion and unemployment risk perception. The results are as follows:

(1) There was a “multi-layer gap” between the various dimensions of miners’ cultural emotion. Among the three dimensions of cultural emotion, the average scores of the employee–organizational relationship dimension and the scientific and rigorous dimension were relatively high, indicating that miners’ emotions in the employee–organizational relationship dimension included “excitement”, “appreciate”, “satisfaction”, and “approval”. Miners exhibited emotions such as “anger”, “disgust”, “disappointment”, and “rejection”, and this was primarily attributed to the benefit and distribution dimension.

(2) Commitment varied in accordance with miners’ individual personality variables. Significant differences were found in miners’ commitment, and such differences were associated with neuroticism, extraversion, openness, and conscientiousness, but no significant differences were observed in relation to agreeableness. Among miners, higher levels of work commitment were associated with higher levels of emotional instability, extraversion, and conscientiousness, and lower levels of openness.

(3) Cultural emotions had a significant impact on work commitment. Cultural emotions, the benefits and distribution dimension, the employee–organizational relationship dimension, and the humanity and fairness dimension positively and significantly contributed to miners’ work commitment.

(4) Miners’ unemployment risk perception had a partially negative moderating effect in respect to the influence of cultural emotions on work commitment. Unemployment risk perception, policy perception of unemployment risk, and individual differences in unemployment risk perception had a significant negative moderating effect on the relationship between cultural emotion and work commitment.

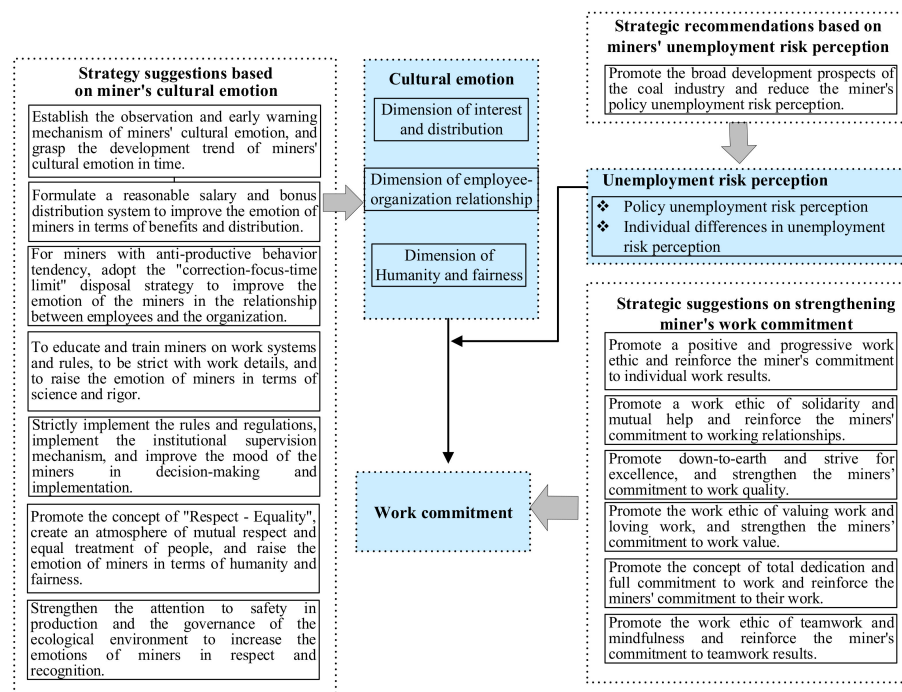
### 6.2. Policy Recommendations

In line with the research conclusions, this study designed a strategy system to enhance the level of work commitment of Chinese coal miners. This system was based on strategic measures of miners’ cultural emotions and strategic recommendations of miners’ unemployment risk perceptions (see Figure 3). In combination with the results of the analysis of existing policies, this study proposed strategies to improve the level of work commitment among Chinese coal miners.

#### (1) Strategic suggestions based on miners’ cultural emotions

First of all, it is necessary to establish an observation and early warning mechanism of miners’ cultural emotions, and to grasp the development of miners’ cultural emotions. Second, this study found that the benefits and distribution dimensions of cultural emotions were significantly positively correlated with work commitment. Therefore, a reasonable salary and bonus distribution system should be developed to improve miners’ emotions in terms of benefits and distribution, thereby enhancing their level of work commitment. Third, a strategy of “correction-focus-time limit” should be adopted to deal with miners who have a tendency to engage in anti-production behavior, and to improve miner’s emotions by considering the relationship between employees and the organization. In addition, miners should receive more education and training about the work system and detailed rules, and work details should be strictly required, so as to improve miners’ emotions in relation to science and rigor. Furthermore, this study found that miners who strictly adhered to rules and regulations had a higher level of commitment regarding the

results of team work. Therefore, it is necessary to strictly enforce rules and regulations, implement a system supervision mechanism, and enhance miners' emotions regarding decision-making and implementation. At the same time, it is essential to nurture the concept of "respect-equality", so as to create an atmosphere of mutual respect and equal treatment, and enhance miners' emotions in terms of humanity and fairness, thereby increasing the level of work commitment among miners.



**Figure 3.** Strategies to increase the work commitment among Chinese coal miners.

### (2) Strategic suggestions based on miners' unemployment risk perception

According to the research results, policy perceptions of unemployment risk had a moderating effect on cultural emotions in relation to work commitment. Therefore, it is necessary that coal mining enterprises publicize the broad development prospects of the coal industry and make this information available to miners in order to reduce their policy perceptions of unemployment risk, which will prevent a further decline in work commitment due to policy perceptions of unemployment risk. In addition, the results also reveal that individual difference unemployment risk perceptions also had a negative regulatory effect, and mine managers should guide "special" groups. Specifically, it is possible to establish a miners' information database, regularly update information relevant to miners, and implement targeted intervention measures for "special" groups of miners. Furthermore, customized publicity information should be pushed by using the coal mine media platform to imperceptibly influence the attitudes and behavior of different types of miners, so as to enhance the level of work commitment among miners.

### (3) Strategic suggestions for strengthening miners' work commitment

In order to strengthen the work commitment level of miners, coal mine enterprise managers should adopt different strategies for different dimensions of work commitment. Specific suggestions include: promoting a positive and progressive work ethic and reinforce the miners' commitment to individual work results; promoting a work ethic of solidarity and mutual help, and strengthening miners' commitment to working relationships; promoting a down-to-earth climate and strive for excellence, while also strengthening miners' commitment to work quality; promoting a work ethic of valuing work and loving work, while strengthening miners' commitment to work value; promoting the concept of total dedication and full commitment to work, and strengthening miners' commitment to

work; promoting teamwork and mindfulness work concepts, and strengthening miners' commitment to teamwork results.

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## Appendix A The Measurement Items

**Table A1.** The measurement items.

Variables	Items
Cultural emotion	<b>Benefits and distribution dimension</b>
	The attitude of our leaders towards their own interests makes me feel
	Our mine's consideration of economic and social benefits makes me feel
	The balance of overall interests, personal interests and team interests in mine makes me feel
	<b>Employee-organization relationship dimension</b>
	As a member of the mine, I feel
	If I work in our mine for a long time, I feel
	If someone says our mine is not good, I feel
	If there are difficulties in the mine, it is necessary to reduce the wages of employees to help the mine overcome the difficulties, I feel
	The relationship between our mine workers makes me feel
	In our mine, the cooperation between departments, teams or individuals makes me feel
	The way our superiors treat subordinates making decisions makes me feel
	<b>Humanity and fairness dimension</b>
	The protection of basic economic rights such as the right to remuneration, the right to rest and the right to health in the mine makes me feel
	When making major decisions, the participation of our mine employees makes me feel
	Our mine's respect for employees' religion/belief makes me feel
	In our mine, employees and leaders treat each other equally, which makes me feel
	In our mine, the fairness of the management staff makes me feel
	In mine, the personal privacy and freedom of employees are respected, which makes me feel
	The mine's attitude towards the safety of employees' lives makes me feel
	In our mine, everyone's importance to their own and others' lives and health makes me feel
	When the life safety of employees conflicts with the economic interests of the mine, our mine's attitude towards life safety makes me feel

Table A1. Cont.

Variables	Items
Unemployment risk perception	<b>Policy unemployment risk perception</b>
	At present, there is a huge excess capacity in the coal industry, and the whole industry is facing a large number of unemployment.
	The prospects of the coal industry are worrying, and continued unemployment will exist.
	The country is undergoing energy transition, and the employment situation in the coal industry is not optimistic.
	<b>Technological unemployment risk perception</b>
	My skill in the mine is difficult to apply across the industry to other fields.
	I have been working in mines for a long time. Due to the assimilation of work, my skills have become monotonous and my job options have become smaller and smaller.
	My skill in the mine is difficult to apply to other fields across majors, and my work ability and field are greatly restricted
	The employees laid off by mines are all in my age group
	Based on my working experience and habits in the mines, my career options became limited
	I have no technical advantage. When faced with layoffs, the mine will not leave me behind.
	Today's technology is changing with each passing day, and the technology I master is far behind the trend of the times
	As I get older and older, if I want to change jobs, I will be less and less likely to be re-accepted by a new company
	As I grow older, my ability to accept new technologies and things gradually weakens, and it is almost impossible to be competent for new jobs.
	<b>Individual differential unemployment risk perception</b>
	Working in the mine for a long time, my health is not as good as before, it is difficult to do other jobs if leaving my current job
	My coal company is facing bankruptcy and I am facing unemployment
	My company is layoffs in large numbers, and I may become the next in line
	I always feel that I will face unemployment soon
Big Five personality-traits	<b>Neuroticism</b>
	I often worry that something bad is going to happen
	I often feel afraid
	Sometimes I feel worthless
	I seldom feel depressed
	I often associate myself with the careless words of others
	I feel like I'm about to break down when faced with pressure
	I often worry about unimportant things
	<b>Extraversion</b>
	I like to attend social and recreational parties
	I get bored at crowded parties
	I try to avoid big parties and noisy places
	At a busy party, I often take the initiative and have fun
	Others think I am a warm and friendly person
	There's usually no silence in my presence



Table A1. Cont.

Variables	Items
	<b>Openness</b>
	I have a strong curiosity about many things
	I'm a risk-taker who breaks the rules
	I am eager to learn something new, even if it has nothing to do with my daily life
	<b>Agreeableness</b>
	Given the choice to cooperate or compete with others, I prefer to cooperate with others
	I often doubt the intentions of others
	I believe that if you allow others to take advantage of you, most people will
	Most of the people I know like me
	I am usually careful and considerate of others
	<b>Conscientiousness</b>
	I am good at arranging to get things done on schedule
	I'm not a very organized person
	I tried to earnestly finish all the work assigned to me
	I have a clear set of goals and move towards it in an organized way
	I work tirelessly to reach my goal
	When I start to do something or promise to do something, I always finish it
	I am an efficient person and always get the job done
<b>Work commitment</b>	I am very productive in my present job
	I am always active in learning and trying to improve my skills
	I am concerned about the long-term development of our mine
	At work, I am very willing to provide assistance to workers
	At work, I am very willing to actively cooperate with workers to complete tasks
	In my work, I pay attention to learning and summarizing, finding and solving problems
	I worked well with my workmates and everyone is satisfied
	I often help other workers with their work or suggest ways to improve it
	At work, I often communicate with my fellow workers
	The performance of the workers in my group is very good

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