INNOVATIVE BEHAVIOR MECHANISM OF KNOWLEDGEABLE TALENTS: AN EMPIRICAL ANALYSIS BASED ON PSYCHOLOGICAL CONTRACT

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Abstract

The innovative behaviors of knowledge talents have significant impacts on the development of their organization. The generation process of these behaviors has much to do with the psychological contract of knowledge talents. Therefore, this paper probes into the innovative behavior mechanism of knowledge talents from the perspective of psychological contract. Through a thorough review on the relevant literature, the influencing factors of innovative behavior are identified based on the theory of planned behavior. On this basis, the author put forward several hypotheses on the correlations between the dimensions of psychological contract, namely, emotional contract, subjective norms and perceptual behavioral control, and innovative behavior, as well as on the mediating roles of innovative willingness and the moderating role of organizational support. Next, a questionnaire survey was carried out among enterprises employees in Quanzhou and Xiamen, China, using the Likert 5-point scale. The survey data were analyzed deeply to verify the proposed hypotheses. The results show that the three dimensions of psychological contract have a positive influence on the innovative behavior of knowledgeable talents; this influence is mediated by innovative willingness and moderated by organizational support. The research results provide new insights into the innovation and mental health of enterprise employees.

Key words: Psychological Contract, Knowledgeable Talents, Innovative Behavior, Questionnaire Survey.

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INTRODUCTION

Currently, Chinese economy has entered a new stage of transformation. Self-dependent innovation, as a basic strategy for national development, is gaining rising attention. In 2004, it is the first time that China proposed innovation as a key link for promoting economic restructuring. The 18th CPC National Congress advanced the building of innovative country from a strategic height. And in the 18th National Congress, a clear proposition of “implementing a strategy of innovation-driven development” was put forward by the Party. Innovation has been emphasized as a strategic driving force in both promoting China’s economy development and enhancing comprehensive national strength. The National Medium- and Long-Term Plan for Education Reform and Development (2010-2020) clearly listed “the focus on producing innovative scientists and engineers” as one of the three main tasks of human resources developing. Competition between nations actually is the competition of national innovation ability, which has evolved into the competition of talented persons’ innovation achievements. The Global Innovation Index 2019 report shows that China ranks 14th. Although China’s innovation ability has improved, it is only in the middle position among the 30 major countries in the world. It is an urgent matter to strengthen investment in our innovation resources and improve our innovation ability. Today is the era of knowledge economy. Knowledge innovation, as a source of
knowledge economy, is an indispensable force to improve economic development. Knowledgeable talents, as the carrier of knowledge, their innovative behaviors are extremely important. Throughout previous researches, most scholars studied talents’ innovative behaviors mainly from the perspectives of individual factors, organization environments or job characteristics, etc, which is one-sided and fails to sort out a clear generating mechanism of knowledgeable talents’ innovative behaviors. From the perspective of psychological contract, the innovative behaviors of knowledgeable talents indirectly affects behaviors through behavioral intentions. Behavior intentions are mainly influenced by emotional contract, subjective norms and perceived behavioral control. There are three reasons why knowledgeable talents produce innovative behaviors. First, knowledgeable talents are influenced by positive emotional contract. Positive understanding of innovation is fundamental to innovative behaviors. Second, knowledgeable talents are influenced by subjective norms. Pressures caused by others’ expectation are also extremely important to their innovative behaviors. Third, knowledgeable talents are influenced by perceived behavior control. Individuals’ predictable control degree is another important factor to the success of innovative behaviors. According to the above analysis, psychological contract gives a comprehensive and fundamental interpretation of the generating mechanism and influencing factors of knowledgeable talents’ innovative behaviors. Therefore, this paper will introduce psychological contract to the study of knowledgeable talents’ innovative behaviors and use structural equation model to prove its influencing factors. On the one hand, few scholars study knowledgeable talents’ innovative behaviors from the perspective of staffs’ psychological contract. It does not arise enough attention from academic circle. So this paper analyzes the influences on knowledgeable talents’ innovative behaviors from three aspects, i.e. emotional contract, subjective norms and perceived behavior control. In addition, this paper also discusses innovation willingness’ mediating role and the regulating role of organization and team factors. Psychological contract provides a higher theoretical value for the study on knowledgeable talents’ innovative behaviors. On the other hand, this paper studies knowledgeable talents’ innovative behaviors from the perspective of psychological contract and deeply explores the generating mechanism of their innovative behaviors and researches how innovation willingness, organizations and teams function in the practice. This provides important application value for enterprises to stimulate knowledgeable talents’ innovative behaviors.

**LITERATURE REVIEW**

**Theory of Planned Behavior**

Organizational psychologist Argyris (1960) used the psychological work contract to describe the relationship between employees and organizations, pioneering the study of psychological contract. The concept of psychological contract was first proposed by Father of Psychological Contract Levinson Price, Munden et al. (1962). He believed that psychological contract refers to the implicit and unexplained sum of expectations between organizations and employees. Levinson’s concept mainly emphasized the implicitness and expectation of psychological contract, and at the same time believed that psychological contract was between the individual and the organization. Schein (1980) believed that psychological contract was a series of unspecified expectations that existed between individuals and organizations at all times. This study believes that the psychological contract of knowledgeable talents can be divided into three dimensions which include emotional contract, subjective norms and perceived behavior control. Psychological contracts have been applied to the research in retail industry (Sun & Li, 2019), technological talent innovation (Yi & Zhou, 2015) and other fields. It provides important theory support for many behavioral science studies.

**Influencing Factors of Innovative behaviors**

Currently, academic circle’s studies on the generating mechanism of workers’ innovative behaviors mainly focus on three aspects, i.e. workers’ individual factor, enterprises’ working characteristics and enterprises’ organization environments. First, individual factors. Seibert, Kraimer, & Crant, (2001) believed that active personality can accurately predict employees’ innovative behavior. Gu & Peng (2011) introduced the concept of self-efficacy in the
research theory of employees innovative behavior. Second, work characteristics. Amabile, Barsade, Mueller, et al. (2005) believes that there is a linear relationship between the timing of work and employee innovative behavior; Li (2013) proposed that when employees have a higher level of individual needs, they will meet their own achievement needs by challenging more difficult tasks. Third, the organizational environment. De Jong, & Kemp, (2003) argued that different strategies developed by enterprises, such as corporate innovation strategies, talent development strategies, and market-oriented strategies, have a greater impact on employees’ innovative behavior. Bai, Cai, & Wang. (2015) proposed the internal fairness of the organization, that is, the fairness of compensation, the fairness of competition and the fairness of related systems have positive incentives for employees’ innovative behavior.

RESEARCH HYPOTHESES

According to the theory of psychological contract, individual behaviors are influenced by emotional contract, subjective norms, and perceptual behavioral control. Therefore, this paper aims to explore the mechanism of knowledgeable talents’ innovative behavior. In the research, it is found that the innovative willingness and organizational support also have an impact on innovation behavior. This paper makes the following hypotheses to further explore different factors’ impact on knowledge-based talents’ innovative behavior.

Emotional contract and innovative behaviors

Emotional contract refers to the psychological and emotional tendency of an individual when performing an action. Phan, Wong, & Wang, (2002) pointed out that individual’s emotional attitudes can be divided into exogenous attitudes and endogenous attitudes. Both types of attitudes can affect individuals’ behavior. Wang & Zhou, (2018) proposed that emotional attitude is the core factor affecting farmers’ pesticide application behavior. When studying the mechanism of family water-saving behavior, Wang & Wu, (2016) proposed that the individuals’ water saving attitude can be divided into three-dimensions, i.e. value cognition, positive emotion and negative emotion. Through an empirical research, they found that positive emotions have the greatest impact on family water-saving behavior, followed by value perception and negative emotions. This result shows that the extension theory of positive emotions is also applicable to the response mechanism of family water-saving behavior. When investigating the influencing factors of the intention of parking behavior of shared bicycles, Yang & Zhu, (2018) proposed that the emotional attitude has a significant impact on behavioral intentions even behaviors. If people believe that standard parking is beneficial, the occurrence probability of the behavior will increase, and vice versa. Based on this, we propose the following research hypothesis.

H1a: Emotional contract has a direct and significant positive impact on innovation behavior.

Subjective norms and innovative behavior

Individual’s behavioral decision is influenced by the external environment. And that is the individual’s subjective norms. Cialdini, Kalgren, & Reno, (1991) divided subjective norms into two distinct types, i.e. injunctive norms and descriptive norms. Injunctive norms perceived by knowledgeable talents are from requirements greatly influenced by the external environment. Mi, Gu, Yang et al. (2016) proposed subjective norms have a significant positive effect on low carbon behavior of residents. They found that the current low-carbon behavior willingness of urban residents mainly comes from their compliance with surrounding groups and social norms. Gao (2018) puts forward that the subjective norms of consumers on green products mainly come from the social norms and social pressures. The stronger is subjective norm, the greater is the value of green perception, and the higher is the incidence of green consumer behavior. Zhang & Wang, (2018) divided the subjective norms into corporate environmental ethics and government environmental regulation. They found that corporate environmental ethics directly promotes the occurrence of green technology innovation behavior, and government environmental regulation indirectly promotes the generation of innovative behavior through their willingness. So this paper puts forward the following hypothesis.

H1b: Subjective norms have a direct and significant positive impact on innovative
behavior.

**Perceptual behavior control and innovative behavior**

Perceptual behavior control is divided into two types of variables including self-efficacy and locus of control. Of which, self-efficacy refers to individual’s anticipation of one’s ability after finishing an activity. And locus of control refers to individual’s control ability to finish an activity. Zhao, Luan, Li, et al. (2013) pointed out that only when scientific and technological personnel think that they can better control the process and results of a certain technological innovation activity will they stimulate the willingness to innovate in science and technology and increase the realization possibility of technological innovation activities. Guo & Su, (2017) proposed that when individuals have more abundant resource conditions and good opportunities, they are more willing to implement a specific behavior. Li, Xu, & Su, (2014) believed that perceptual behavior control mainly includes internal and external factors. When employees feel that they have creative ability to express, coordinate and transmit information, they will enhance their willingness to cooperate and innovate. At the same time, cooperative innovation will occur only if employees believe that they can control external resources and the adjustment of partnerships. So this paper puts forward the following hypothesis.

H1c: Perceptual behavioral control has a direct and significant positive impact on innovative behavior.

**Mediating role of innovative willingness**

Innovative willingness refers to the emotional intensity that an individual exhibit in order to complete an activity. Conner & Armitage, (2001) pointed out that emotional attitudes, subjective norms, and perceptual behavioral control directly act on behavioral will, while behavior is generated under the further action of behavioral willingness. Chinese scholars, Shen, Qi, & Huang, (2018), when studying the influencing factors of college students’ traffic safety behavior based on the theory of planned behavior, believe that the more positive the attitude of college students’ safety behavior, the higher the willingness to act safely. When college students perceive the influence or expectation of their relatives and friends on traffic safety behaviors, they will have a willingness to traffic safety behaviors; when college students have higher ability to control behaviors, they will adopt traffic safety behaviors. Wang, Fan, Zhao et al. (2016) investigated 443 Chinese urban residents by investigating the influencing factors of green car purchase behavior. Taking the factors of residents’ emotional attitude to the green car, the publicity of the green car, and the ease with which the residents can manipulate the green car, they found that in recent years, residents’ willingness to purchase green cars has increased, and green car purchasing behaviors continue to occur. Bin, Wen, & Zhou (2017) found that farmers’ emotional attitudes, subjective norms and cognitive behavioral control jointly affected farmers’ willingness to use livestock and poultry farming waste resources, and thus influence their behavior. Based on this, the following research hypotheses are made.

H2a: The innovate willingness mediates the relationship between emotional contact and innovative behaviors;

H2b: The innovate willingness mediates the relationship between subjective norms and innovative behavior;

H2c: The innovate willingness mediates the relationship between perceived behavioral control and innovative behavior.

**The moderating role of organizational support**

A large number of researches indicate that organizational support has great positive impact on the innovative behavior, and organizational support can be subdivided into tool support and emotional support. Zhao, Luan, Li et al. (2013) argued that affect support comes from both superiors and colleagues. If leaders attach importance to the opinions of scientific and technical personnel and pay attention to their feelings, colleagues will care for each other and form a good corporate atmosphere. Thus, employees’ sense of belonging will be enhanced, innovation willingness will be promoted, and the transformation of innovative behavior will also be greatly promoted. Tool support includes superiors’ support of equipment and fund, colleagues’ frequent information exchange and knowledge sharing, which can reduce scientific and technological personnel’s the uncertain thinking on innovative behavior, thus enhancing the possibility of transforming innovation willingness into behavior. Li, Xu, & Su, (2014) argued that cooperative innovation willingness
and cooperative innovation behavior are positively moderated by organizational citizenship behavior, that is, employees’ volunteer behaviors with emotional support and tool support stimulate the generating of cooperative and innovative behavior. Wang & Niu, (2018) found that when knowledge workers strongly feel the good working environment and welfare provided by the organization, they will keep positive emotion and actively and boldly put forward their suggestions. Therefore, based on the previous research, this paper adds the organizational support as the moderating variable. It includes organizational tool support and organizational emotional support. Based on this, the following research hypotheses are made.

H3a: Organizational tools support the regulation of the relationship between innovation willingness and innovative behavior. 
H3b: Organizational emotional support plays a regulatory role between emotional contact and innovative behaviors; 
H3c: Organizational emotional support plays a regulatory role between subjective norms and innovative behavior; 
H3d: Organizational emotional support plays a regulatory role between perceived behavioral control and innovative behavior.

RESEARCH PROCESS AND RESULT

Research Process

The questionnaire in this paper was designed based on the relative studies by Phan, Wong, & Wang (2002) and Cialdini, Kallgren, & Reno, (1991). The question items were designed by consulting Western maturity scale. Totally, this paper has three structural variables (emotional contact, subjective norm and perceptual behavioral control), one mediating variable (innovation willingness), and two moderating variables (organizational tool support and organizational affect support). Likert 5 degree scale was used in this paper and the answer options are “very important”, “comparatively important”, “not sure”, “comparatively unimportant” and “totally unimportant”. Then we did a pre-survey, of which the respondents were enterprises employees in Quanzhou, Xiamen. We collected 57 questionnaires of pre-survey. Then, the structural equation model analysis and reliability test were carried out on the pre-study samples. The results showed that the reliability was above 0.7, and RMSEA=0.0785<0.08 reflected the good fitness of the model. Therefore, the model is acceptable.

Next, the questionnaire was revised according the results of pre-survey so as to form a formal questionnaire, which can make the data more representative and decrease possible sample deviation. The formal questionnaires were released through the internet, at the scene and E-mail. Meanwhile, samples were released to different provinces such as Fujian, Jiangxi, Jiangsu, Guangdong and Zhejiang. Finally, 289 valid questionnaires were collected.

Analysis of Sample Data
Missing value test

In this paper, SPSS 18.0 was used to analyze the missing values of the sample data. The results show that many variables have some missing values. The results of Little’s MCAR test are: chi-square=882.335, DF=818, significance =.017, and the test results indicate that the data belonged to completely random missing. In order not to reduce the amount of sample obtained, this study used the EM estimate method in Lisrel 8.70 to fill the missing value.

Validity and Reliability Test

When calculating, it is found that the composite reliability of all variables is greater than 0.50, which shows that the test reliability of the model can be accepted. The test items are of good consistency.

In the structural equation, if the factor loading of the data is greater than 0.5, it means that the test has good content validity. In this paper, all the factor loadings of the model are greater than 0.60, which shows that our test has content validity. Theoretically, most of the question items are selected from maturity scale, so this test has good content validity in itself. Thus, overall, the content validity of the model is good.

Hypothesis Testing

Lisrel 8.70 is used to respectively construct the structural equation model of emotional contact and innovative behavior, the model of subjective norms and innovative behavior as well as the model of perceived behavioral control and innovative behavior. Goodness of fit of the
Table 1. Path analysis result of the model

| Model | Path | Standardized coefficient | Path significance |
|-------|------|--------------------------|-------------------|
| Emotional contact model | Emotional contact → innovative behavior | 0.19** | Significant |
| Subjective norms model | Subjective norm → innovative behavior | 0.55** | Significant |
| Perceived behavior control | Perceived behavior control → innovative behavior | 0.24** | Significant |

Note: *** p<0.001, ** p<0.01, * p<0.05

Table 2. Path analysis results of the mediation models

| Model | Path | Standardized coefficient | Path significance |
|-------|------|--------------------------|-------------------|
| M1    | emotional contact → innovative behavior willingness | 0.22** | Significant |
| M2    | Subjective norm → innovative behavior willingness | 0.39** | Significant |
| M3    | Perceived behavior control → innovative behavior willingness | 0.25** | Significant |

Note: *** p<0.001, ** p<0.01, * p<0.05

The above table shows that the standardized path coefficients in all of the above mediating models reach the 99% significance. The willingness to innovate acts as a mediating role. So, hypotheses H2a, H2b, and H2c are supported.

Mediating effect test
Lisrel 8.70 was used to construct a mediation model M1 between the emotional contact and the innovative behavior, the mediation model M2 of subjective norm and innovative behavior, and the mediation model M3 between the perceived behavior control and the innovative behavior. The model fit shows that RMSEA is less than 0.10, and both NNFI and CFI are greater than 0.90, indicating that M1, M2, and M3 are acceptable. The path analysis of the model is shown in Table 2.

The model shows that RMSEA is less than 0.08, and both NNFI and CFI are greater than 0.90. Therefore, this model’s goodness of fit is acceptable. The path analysis of this model is shown in Table 1.

From Table 1, the standardized path coefficient between emotional contact and innovative behavior is 99% significant, which means that emotional contracts have a significant positive impact on innovation behavior. So H1a is supported. The standardized path coefficient between subjective norm and innovation behavior is 99% significant, which means that subjective norm has a significant positive impact on innovation behavior. So H1b is supported. The standardized path coefficient between perceived behavior control and innovative behavior is 99% significant, which means that perceived behavior control has a significant positive impact on innovation behavior. So H1c is supported.

Moderating effect test
According to the method for testing the moderating variable suggesting by Wen, Zhang, & Hou, (2006) we construct a moderating effect model of organizational tool and a moderating effect model of organizational affect support:

(1) The moderating effect model of organizational tool
Model 1: Y = a1+b1M + e1;
Model 2: Y=a2+b2M+b3U1+b4M×U1+e2

(2) The moderating effect testing step model of organizational affect support
Step 1: M=a1+b1U2+b2X1+b3U2×X1+e1
Step 2: Y=a2+b4M+b5U2+b6X1+b7 U2×X1+e2

SPSS 18.0 was used to construct the moderating effect model of organizational tools in the relationship between innovation intention and innovation behavior; and the moderating effect model in emotional contact, subjective norm, perceptual behavior control and innovation behavior. The results of the data operation are shown in Table 3.
According to Table 3, the coefficient of $M \times U_1 \to Y$ in Model 2 is 0.215, $P<0.01$, indicating that the organization tool support plays a significant moderating role in the relationship of innovation willingness and innovation behavior. So, $H_3a$ is supported. In the second step, the coefficient of $U_2 \times X_1 \to Y$ is 0.092, $P<0.05$, indicating that the organizational affect support has a significant direct moderating effect in the relationship between emotional contact and innovative behavior. Since in the first step the coefficient of $U_2 \times X_1 \to W$ is 0.102, $P<0.01$, while the coefficient of $M \to Y$ in the second step is 0.193, $P<0.01$, indicating that the indirect moderating effect of organizational affect support is significant. So $H_3b$ is supported. In the second step, the coefficient of $U_2 \times X_2 \to Y$ is 0.102, $P<0.05$, indicating that the direct moderating effect is significant in the relationship between organizational normative and innovative behavior. Because the coefficient of $U_2 \times X_2 \to W$ is 0.142, and $P<0.01$ in the first step while the coefficient of $M \to Y$ in the second step is 0.196, $P<0.01$, indicating that the indirect moderating effect of organizational affect support is significant, so $H_3c$ is supported. In the second step, the coefficient of $U_2 \times X_3 \to Y$ is 0.110, $P<0.05$, indicating that organizational affect support has a significant direct moderating effect in the relationship between perceptual behavior control and innovative behavior. The coefficient of $U_2 \times X_2 \to W$ in the first step is 0.077, $P>0.05$, so the indirect moderating effect of organizational affect support is not significant. That is to say, organizational affect support does not moderate the relationship between perceptual behavior control and innovative behavior through innovation willingness. So $H_3d$ is supported.

**RESULTS AND DISCUSSION**

After basic analysis of the data, the structural equation model (SEM) and SPSS were used to verify the research on the innovation behavior mechanism of knowledgeable talents, and the following conclusions are drawn:

1. Emotional contracts, subjective norm, and perceptual behavioral control of psychological contract have a direct and significant positive impact on innovation behavior. $H_1a$, $H_1b$, and $H_1c$ are all supported. First of all, from the perspective of emotional contracts, knowledgeable talents are high-level talents with higher knowledge reserves. The generation of certain behaviors often depends on their tendency to think about something, that is, their emotional attitude towards the thing. Therefore, when intellectual talents produce emotional contracts, they will have the motivation to produce innovative behaviors. Second, from the perspective of subjective norm, knowledge workers will change their behaviors according to the requirements of social systems, regulations when they generate certain behaviors, and knowledgeable talents have high levels of their cognitive level, they will also need high compliance with social norms. Therefore, the society that pursues innovation and development today stimulates the innovative behavior of knowledge-based talents. Therefore, today’s society that pursues innovation and development stimulates the innovative behavior of knowledgeable talents. Finally, from the perspective of perceptual behavior control, knowledgeable talents often have higher knowledge and skill reserves, and their ability to innovate is relatively strong. They have a higher degree of confidence in controlling innovative behaviors. Therefore, knowledgeable talents’ perceptual behavior control can influence their innovative behavior.

Second, the willingness to innovate mediates the relationship between emotional contracts, subjective norm, perceived behavioral control, and innovative behavior. $H_2a$, $H_2b$, and $H_2c$ are supported. The emergence of innovative
behavior is based on the strong will of innovation. Having a positive emotional attitude, external innovation pressure and confidence in innovation control does not necessarily lead to innovative behavior. These factors only play a role in the individual's thinking and cannot directly affect the individual's behavior. So, the willingness to innovate is needed as a mediator. The three basic elements of the theory of planned behavior make the knowledgeable talents have a strong willingness to innovate by influencing the innovative willingness, thus further influencing their innovative behavior.

Third, organizational tool support play as the moderating role in the relationship between innovative willingness and innovative behavior. H3a is supported. Organizational affect support plays a regulatory role in the relationship among emotional contracts, subjective norms, perceived behavioral control, and innovative behavior. H3b, H3c, and H3d are supported. The emergence of knowledgeable talents' innovation behavior is influenced by its environment. When knowledgeable talents are innovating, if they feel that the material and spiritual support provided by the superior leaders and colleagues are sufficient, the behavioral stability will be correspondingly improved, and the possibility of innovation behavior will be improved. This validates the moderating role of organizational support in the creation of innovative behavior.

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