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Factors Influencing the Driving Force of Innovative Talents and the Optimization Matching of Talent Policies in Zhanjiang City

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Abstract: This article conducts a study on the relationship between internal and external driving forces of innovative talents and their innovative behavior in Zhanjiang City, using theories such as the theory of intrinsic motivation and social cognitive theory. It establishes and verifies a mediating model of internal driving force in the relationship between external driving forces and innovative behavior. The study focuses on innovative talents in industries such as education, research institutions, and key enterprises in Zhanjiang City, and distributes questionnaires to collect data. Descriptive analysis, reliability and validity testing, regression analysis, factor analysis, and structural equation modeling are conducted using SPSS 19.0 and AMOS 26.0 to study the influencing factors of talent's internal driving force in Zhanjiang City. The study concludes that innovative behavior is influenced by both external driving forces and internal driving force, and that internal driving force partially mediates the relationship between external driving forces and innovative behavior. Based on the analysis results, improvement measures and suggestions are proposed.

Keywords: Innovative Talents; Internal Driving Force; External Driving Force; Innovative Behavior; Policy Measures.

1. Introduction

With the deepening of a new round of technological revolution and industrial upgrading, technology and innovation are driving the development of the economy and society. Innovative talents have become the focus of competition for both companies and countries. The population competition among different provinces in China has intensified, leading to a plethora of incentive policies such as household registration access, cash subsidies, talent apartments, tax benefits, and children's enrollment, which pose greater challenges for talent retention in economically underdeveloped areas. As a third-tier city, we have also implemented a series of talent introduction plans, but compared to developed areas, talent retention still lacks competitiveness. Therefore, it is necessary for the government to optimize the talent introduction mechanism, create a dynamic employment carrier, and launch competitive talent policies.

2. Innovation Drivers and Influencing Factors and Soon be Interrelated Review of Research

The measurement indicators of innovation capability mainly focus on the evaluation of innovation outcomes. One type is based on static indicators, such as innovation input, innovation structure, innovation output, patent technology, and hardware scale. Another type is the relationship indicators that influence innovation drivers, such as the number of scientific and technological personnel, the proportion of R&D funding, and the number of patents. Regarding the influencing factors of driving innovation development capability, Hagedood believes that R&D, the number of patent applications, the number of authorized patents, and the number of new products is important factors that make up regional innovation efficiency [1]. Mischel. W and Shoda. Y (1995) proposed the Cognitive-Affective System Theory, which explores the impact of factors such as emotions, goal values, and self-regulation on individual behavior. They believe that events encountered by individuals interact with their complex cognitive-affective factors, ultimately determining behavior [2]. In addition to these quantifiable factors, some scholars approach from the perspective of motivation, including job stability and security, high salaries, knowledge updates, decision-making participation, leadership realization, job promotion, social status, job enrichment, and employee relations, among others. Whether these indicators of intrinsic motivation and external policy environment of innovative talents have an impact on regional technological innovation, the extent of the impact, and which factors play a key role in innovation need to be scientifically demonstrated. The above-mentioned innovation driving indicators are all static indicators, lacking research from the perspective of human intrinsic needs. Although there have been studies on the influencing factors of innovation driving force based on the characteristics of innovative talents, more focus has been on external factors that drive talent innovation, and there is less research on the relationship between intrinsic motivation and innovative behavior. In addition, in the evaluation indicators of innovation, there is a lack of indicators that evaluate innovation partner relationships, innovation humanities environment, and innovation management policies.

3. Relevant Theories and Model Construction

3.1. Conceptual Definition

This article defines innovative talents as individuals with a high level of professional knowledge, innovative spirit, and innovative ability. They actively engage in innovative

activities, create innovative achievements that meet the needs of economic and social production, and serve society with their innovative results.

Regarding internal driving force (drive), it usually refers to the internal state that is aroused by internal or external stimuli and can direct individuals towards a certain goal-oriented activity [3]. It was first proposed by American psychologist Woodworth in "Dynamic Psychology". He proposed that the causal mechanism of human thoughts and behaviors includes two basic variables: mechanism and drive. He believed that with these two variables, all behavioral phenomena can be perfectly explained. Mechanism is the external behavioral mode that satisfies the drive, and drive is the internal condition that stimulates the mechanism [4]. Most scholars divide drive into natural attributes and social attributes. The drive of natural attributes is the intrinsic driving force of individual behavior generated by lower-level physiological needs. The drive of social attributes is the high-level driving force that satisfies the individual's social life needs formed by postnatal education and experience. In addition, there is another type of drive that comes from external environmental stimuli, which individuals cannot control and is influenced by external forces. When individuals anticipate or have already made certain behaviors, they will receive rewards or punishments from the external environment. This type of drive is mainly influenced by external environmental stimuli. Some scholars may call this type of drive external driving force, but in essence, it is one of the internal drives.

3.2. Theoretical Basis and Model Construction

3.2.1. Theories Related to Internal Driving Force

Many scholars have conducted research on drive. Freud believed that human behavior is driven by one or more innate instincts, and these behaviors directly or indirectly satisfy human instinctual needs. Hull believed that drive is the motive force of human behavior, and drive arises from human physiological needs. When physiological needs are satisfied, the drive of individuals will decrease. To stimulate a certain behavior in individuals, the needs of individuals can be controlled to achieve the goal. McClelland believed that achievement motivation is closely related to a person's level of ambition. He believed that societies with high levels of achievement motivation have higher productivity compared to societies with low levels of achievement motivation [5]. Atkinson believed that individuals often estimate the value and possibility of success of a goal when doing something, and then decide whether to take action. He pointed out that the expectation of success will drive individuals to seek achievement, while the fear of failure will drive individuals to avoid failure situations [6]. In addition, some other foreign scholars have proposed self-value drive, primary drive (physiological needs), secondary drive (when primary drive weakens, certain stimuli in the environment become drives, such as recognition, belonging, love), and so on.

3.2.2. Social Cognitive Theory

The social cognitive theory, also known as the triadic reciprocal causation theory was proposed by Bandura in the late 1970s. He believed that people respond to events in the environment and learn various unique behaviors through rewards and punishments. However, people also possess unique abilities that are usually related to thinking and information processing This theory is widely applied in sociology, management, education, and other fields. The theory mainly studies the interaction among the external environment, individuals or groups, and behavior. The external environment mainly includes policy environment, organizational atmosphere, etc., while individual factors mainly include values, cognitive tendencies, emotional attitudes, etc. Bandura proposed three modes of interaction among the three elements: the environment has an influence on behavior, even exerting a decisive influence; individuals are not completely controlled by the environment, but they do not act arbitrarily based solely on interests, emotional attitudes, values, and other internal psychological characteristics. Individuals and the environment interact to determine behavior; behavior is the result of the interaction among the three elements. Regarding the influence of individual internal factors on behavior, Woodworth believed that curiosity affects perception and behavior, emphasizing the influence of personality traits on behavior choices. Izard pointed out that individuals are driven by interest to explore the work or activities they are engaged in. It can be seen that individual internal factors also have a significant impact on behavior.

In this article, internal driving forces that influence behavior and have social attributes are defined as drive, while external forces that individuals cannot control and influence behavior choices are defined as external driving force. The main research focuses on the relationship between drive and innovative behavior, the role of drive in the interaction between external driving force and innovative behavior, and which internal drive factors have a significant impact on innovative behavior.3. Analysis of talent policy and demand status in Zhanjiang City

4. Analysis of Talent Policies and Demand in Zhanjiang City

Zhanjiang City has been given a high urban positioning by the national and Guangdong provincial governments. In the future, Zhanjiang aims to become a major port and important marine service base in southern China, a central city in the northern part of the Beibu Gulf region, a sub-center city in Guangdong province, and an ecological bay city [7]. This presents a great opportunity for Zhanjiang. This article studies the factors influencing the internal driving force of talent in Zhanjiang, which can provide reference for the local government in formulating talent policies, offer new ideas and paths for optimizing existing talent policies, and have significant research significance for fully leveraging innovative human capital in the new development stage.

According to statistics from the Guangdong Provincial Bureau of Statistics, Zhanjiang's industrial structure has continuously improved over the past five years, and its investment attractiveness has greatly increased. China and world's top 500 companies such as BASF, Air Liquide Group, China Resources Group, China Communications Construction Group, China Merchants Group, and Overseas Chinese Town Group have continuously settled in Zhanjiang. Large-scale investments have been made in fine chemicals, biomedicine, high-tech, modern logistics, and coastal tourism projects with high overall strength and high intensity of integration. In particular, with the accelerated construction or completion of major projects such as Zhanjiang Steel Base, China National Offshore Oil Corporation (CNOOC) Zhanjiang Petrochemical Complex, BASF (Guangdong) Integrated Project, and Guangdong Lianjiang Nuclear Power, which all have investments exceeding 10 billion US dollars,

Zhanjiang has become a new highland for the modernization of port-related industries in South China [8]. This article reviews the existing talent policies in Zhanjiang and collects the talent demand of innovative talent-aggregating enterprises or institutions in Zhanjiang for one year to analyze the current situation of talent policies and demand in Zhanjiang.

4.1. Existing Policy Tools

This article collected a total of 40 talent policies in Zhanjiang City, Guangdong Province. Combining the talent introduction measures of Zhanjiang's work units and using Xia Yun's (2020) classification model of demand-policy matching [9], the existing talent policies were reviewed, as shown in Table 1.

Table 1. Summary of Policy Tools in Zhanjiang City

Demand for talents	Policy instrument	Specific measures for example
Personal Growth	Scientific research start-up funds, team scientific research funds, tax incentives, position setting, training and exchange, professional title evaluation, promotion, performance evaluation, equity incentive, etc.	• On the basis of reducing the R & D costs of enterprises and implementing the additional deduction of 75%, the prefecture level will encourage the listing to award small and medium-sized technology-based enterprises to the standard of 25% of their R & D expenses. •The high-level research and development institutions built in northwest Guangdong, a maximum subsidy of 20 million yuan.
Correlation	Reward achievement transformation, additional funding of special funds, superimposed funds, award of honorary titles, industry and research cooperation, etc.	• We will hold multi-level and multi-channel matchmaking meetings between major scientific and technological achievements and industries, and support industrial backbone enterprises and industrial technology innovation alliances to lead the transfer, transformation and application of major scientific and technological achievements in key areas of our province. •We will promote the effective connection between scientific and technological achievements and the needs of industries and enterprises, and realize the market value of scientific and technological achievements through research and development cooperation, technology transfer, and technology licensing.
Work Environment	Innovation and entrepreneurship platform, achievement transformation base, laboratory base, science and technology incubation base, Hong Kong and Macao innovation and entrepreneurship base, scientific research workstation, property rights protection, publicity and commendation, etc.	• Doctor workstations will be established in universities, scientific research institutions and third-class hospitals, and each doctoral research workstation will subsidize 500,000 yuan. •We will support doctoral and post-doctoral innovation and entrepreneurship projects through market mechanisms such as equity investment, loan guarantee and interest discount, and risk compensation.
Survival Needs	Salary and salary, household registration, children's enrollment, spouse employment, medical treatment, talent exit and entry visa, resettlement allowance, living allowance, "one-stop" platform service, one-time small car free registration indicators, etc.	• Pearl River Talent Plan: For the top 200 universities recognized by the industry to engage in postdoctoral work in Guangdong, the provincial finance will give them a annual living subsidy of 300,000 yuan per year, and leave the province to work, each person will be given a housing subsidy of 400,000 yuan. •The spouses and children of high-level talents move to the household with the other.

4.2. Empirical Analysis of Talent Demand in Zhanjiang City

This study investigated the recruitment needs of 35 different industries, different operational natures, and different scales of enterprises or institutions in one year, and conducted statistical analysis.

Among the 4,329 specific demands collected, 67.54% of the demand came from institutions, followed by state-owned enterprises. The demand from the healthcare and social work sector accounted for 46.32% of the total demand, followed by the energy/chemical/environmental protection and education industries, both accounting for 17.30% of the demand. Higher education institutions are the base for cultivating innovative talents, and scientific research institutes are the main force for technological innovation. Therefore, to enhance innovation capabilities, it is necessary to continuously introduce high-level and highly educated innovative talents. During the epidemic, there was a shortage of medical staff, and the demand for healthcare personnel accounted for nearly 50% of the total data surveyed. As it takes at least three to five years to train a doctor or healthcare technician, and with people's increasing emphasis on their own health and hygiene, the number of outpatient visits increases every year, and the demand for medical personnel is also growing. The supply from society cannot keep up with the demand, and the total number of recruitments demands remains at a relatively high level each year.

Based on the empirical analysis of talent demand in Zhanjiang, this article will focus on the education industry, healthcare and social work, and agriculture, forestry, and animal husbandry industries in Zhanjiang. Questionnaires will be distributed to innovative talents in Zhanjiang's universities, research institutes, public hospitals, and some state-owned and private enterprises to analyze the factors driving talent innovation behavior and propose optimized talent policies.

5. Analysis of Factors Affecting Talent's Internal Drive in Zhanjiang City

5.1. Model Construction

Based on social cognitive theory, individuals are influenced by internal factors and external environmental factors when making behavioral choices. Individual behavior is governed by cognitive, emotional, and conscious activities, as well as personal values, worldviews, and life perspectives. External factors such as policy environment, incentive measures, and organizational atmosphere also influence individual behavior. Social cognitive theory suggests that external environmental factors directly influence individuals' self, attribution, and perception, and mediate individual behavior through internal psychological processes. Based on this, an innovation-driven model is constructed, as shown in Figure 1.

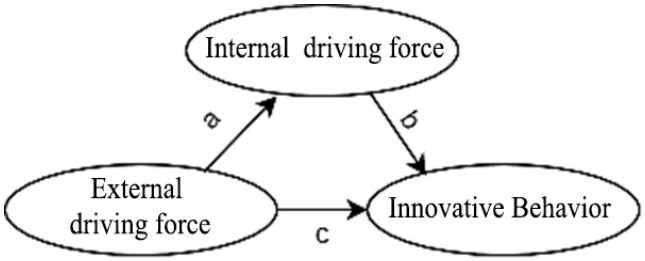

Figure 1. Innovation-driven model

5.1.1. Variable Selection

(1) External Driving Force

External driving force refers to external forces that are beyond the control of the entity itself, usually referring to work environment, policy measures, etc. This study mainly adopts the talent demand-policy tool classification model proposed by Xia Yun, and from the perspective of regional talent policies, divides external driving force into four dimensions: survival needs, personal growth, work environment, and interpersonal relationships. A total of 14 items were compiled for analysis.

(2) Internal Driving Force

Internal driving force usually refers to the internal state aroused by internal or external stimuli that can direct individuals towards a certain goal activity. Through literature analysis and expert consultation, this study initially identified 15 items as internal factors driving innovative behavior.

(3) Innovative Behavior

Innovative behavior refers to the generation of innovative ideas by talents in the work process, and the efforts to seek support for these ideas through different methods, apply them in practice, and test their effectiveness. This study refers to the revised Employee Innovation Behavior Scale by Zhang Zhengang et al. (2016) and formulates four items.

5.1.2. Research Hypotheses

Based on the influence of internal and external driving force on innovative behavior, this study constructs theoretical models and hypotheses, as shown in Figure 8.

H1: Internal driving force positively influences innovative behavior.

H2: External driving force positively influences innovative behavior.

H3: Internal driving force mediates the relationship between external driving force and innovative behavior.

5.2. Data Source and Reliability and Validity Test

5.2.1. Data Source

This study focuses on innovative talents in Zhanjiang City. Questionnaires were distributed to innovative talents in universities, hospitals, private enterprises, and research institutes in Zhanjiang City. A total of 232 questionnaires were collected, and 26 invalid questionnaires were removed based on the criteria of whether the respondents filled them seriously (duration <120s) and whether they provided regular answers. Finally, 206 valid questionnaires were obtained, with an effective response rate of 89%.

5.2.2. Sample Analysis

The basic characteristics of the collected data sample are shown in Table 2.

Table 2. Sample Collection Information

Individual Traits of Talent	Sample	Proportion (Ratio)	Individual Traits of Talent	Sample	Proportion (Ratio)
Sex			Sectors		
Male	90	43.69%	Agriculture, Forestry and Animal Husbandry	15	7.28%
female	116	56.31%	Education Industry	150	72.82%
Age			Health and Social Work	15	7.28%
Less than 25 years old	21	10.19%	Scientific research, technical services	14	6.80%
26-35 years old	76	36.89%	Manufacturing	5	2.43%
36-45 years old	87	42.23%	Others	7	3.40%
46-55 years old	21	10.19%	Type of organization		
Above 55 years old	1	0.49%	State-owned enterprises	11	5.34%
Academic qualifications			Institutions	101	49.03%
Doctoral student	54	26.21%	Private enterprise	77	37.38%
Master's degree	109	52.91%	Foreign-funded enterprise	4	1.94%
University undergraduate	40	19.42%	Other	13	6.31%
University college	1	0.49%	Introduction method		
High school and below	2	0.97%	Introduction through special talent policy	16	7.77%
			Work unit recruitment introduction	164	79.61%
Whether Zhanjiang household registration			Introduced by headhunting companies and other talent organizations	6	2.91%
	118	57.28%	Recommended by employees within the enterprise	12	5.83%
	88	42.72%	Others	8	3.88%

According to Table 2, among all the respondents, 43.7% were male and 56.3% were female. The age group was mainly concentrated in the 26-45 age range, accounting for 79.1% of the total sample. The education level was relatively high, with postgraduate and doctoral degrees accounting for 79.1% of the total sample, and undergraduate and below accounting for 1/5 of the total sample. The majority of the surveyed talents were engaged in the education industry, accounting for 72.8% of the sample, followed by the agriculture, forestry, animal husbandry, health, and social work industries, each accounting for 7.3% of the sample. The surveyed individuals were mainly from public institutions and private enterprises,

accounting for 49.0% and 37.4% of the total sample, respectively. In terms of talent introduction, 57.3% were registered residents of Zhanjiang City, and 42.7% were non-registered residents. The majority of talents were recruited through their work units, accounting for 79.6%, while a small number were introduced through special talent policies (7.8%) and internal referrals (5.8%).

5.2.3. Questionnaire Reliability and Validity

Reliability analysis, also known as consistency analysis, is mainly used to test the consistency of repeated measurements of the same object using the same method. The Cronbach's alpha coefficient is commonly used to test the reliability of questionnaires.

Validity analysis refers to the degree to which a measurement scale accurately measures the intended measurement. Validity analysis of the questionnaire can measure the rationality of item design. The KMO statistic and Bartlett's sphericity test are commonly used for validity analysis.

In this study, the SPSS software was used to analyze the reliability and validity of the questionnaire. The analysis results are shown in Table 3.

Table 3. Reliability and Validity Analysis Results

Dimension	Value	Value	Bartlett's Spherical Testing F-Value
internal driving force	0.892	0.888	<0.001
internal driving force	0.888	0.876	<0.001
innovative behavior	0.893	0.825	<0.001

As shown in Table 3, the Cronbach's alpha coefficients of the three latent variables in the questionnaire on factors influencing talent's internal driving force for innovation are all greater than 0.7, indicating high internal consistency of the questionnaire. The KMO values for the partial correlations between variables are all greater than 0.8, and the F values of Bartlett's sphericity test are all <0.001, indicating that the variables are highly correlated and have good structural validity, making the data suitable for factor analysis.

5.3. Analysis of Factors Affecting Talent's driving force for Innovation in Zhanjiang City

5.3.1. Factor Analysis

In this study, factor analysis was mainly conducted on the 15 influencing factors of internal driving force. The SPSS software was used, and the principal component analysis method was applied, followed by maximum variance rotation. Three factors with eigenvalues greater than 1 were extracted, and their cumulative eigenvalues explained 62.885% of the total variance (Table 4). The factor composition and factor loading matrix of the items are shown in Table 5.

Table 4. Eigenvalues and Contribution Rates

	Initial Eigenvalues			Sum of Squares of Rotated Loadings		
Component	Total	Variance Percentage	Cumulative %	Total	Variance Percentage	Cumulative %
1	6.447	42.980	42.980	4.165	27.764	27.764
2	1.833	12.222	55.202	3.578	23.854	51.618
3	1.152	7.683	62.885	1.690	11.267	62.885
4	0.923	6.152	69.037			
5	0.802	5.345	74.382			
6	0.678	4.519	78.902			
7	0.570	3.799	82.700			
8	0.511	3.404	86.104			
9	0.425	2.834	88.938			
10	0.384	2.560	91.498			
11	0.372	2.483	93.981			
12	0.278	1.852	95.833			
13	0.241	1.605	97.438			
14	0.207	1.380	98.819			
15	0.177	1.181	100.000			

Extraction Method: Principal Component Analysis (PCA).

From Table 5, it can be seen that the variable "originality" is positively correlated with the second factor and negatively correlated with the third factor, with factor loadings greater than 0.4.

Table 5. Factor Loading Matrix

	Components		
Factors	1	2	3
love	0.213	0.836	-0.029
patience	0.197	0.866	0.055
self-sacrifice	0.225	0.749	0.314
pursuit	0.246	0.848	0.175
Aspiration	0.738	0.242	0.097
Following	0.141	0.298	0.548
world outlook	0.608	0.071	0.280
cooperation, co-prosperity	0.342	0.099	0.786
Originality	0.167	0.439	-0.479
Sharing	0.545	0.176	0.485
Values	0.738	0.239	0.138
connection (way of thinking)	0.638	0.357	0.163
sense of existence	0.857	0.156	-0.002
Sense of Honor	0.818	0.193	0.087
Sense of Achievement	0.488	0.466	0.180

To facilitate the study, the "originality" variable was removed to improve data validity. The underlined factor loadings in the table are all greater than 0.45. Based on the maximum loadings of the factor variables, the 15 factors were classified into three common factors and explained. The first factor has higher loadings in terms of worldview, values, connections (thinking style), sense of existence, sense of honor, and sense of achievement, mainly reflecting individual self-awareness and self-perception. These factors serve as reference and motivation for individuals in making behavioral choices and are named cognitive-emotional factors. The second factor is characterized by love, patience, selflessness, and pursuit, mainly reflecting individual preferences and is named personality characteristic factors. The third factor is characterized by following, cooperation and mutual prosperity, and sharing, mainly reflecting the relationship between individuals and others and the collective, and is named communication desire factors. Among them, the variable "sharing" has factor loadings greater than 0.5 in both the first and second factors, and it was compared with other components for analysis. "Sharing" was included in the third factor.

5.4. Data Analysis Results

5.4.1. Model Fit Test and Modification

Through the above analysis, it was found that the structure validity of this survey questionnaire is good, and the structural equation can be used to test and analyze the factors influencing talent innovation internal driving force. This study divided the internal driving force factors into three common factors: cognitive emotion, personality traits, and communication desire. The average value of the observed variables in each common factor was used as the numerical value of the common factor. According to the research results of Xia Yun et al., the external driving force was divided into four variables: survival needs, personal growth, work environment, and interpersonal relationships. The average value of each observed variable was used as the numerical value of the four variables. According to the revised employee innovation behavior scale by Zhang Zhengang et al. (2016), innovation thinking, innovative methods, innovative applications, and effectiveness were used to measure innovation behavior and establish the initial conceptual model (Figure 2).

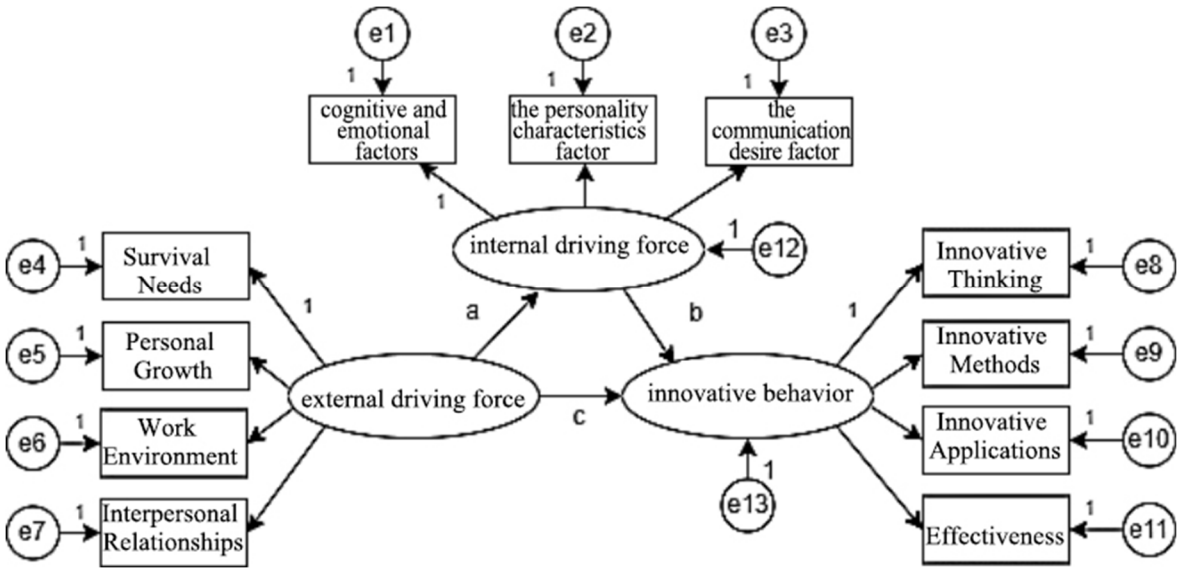

Figure 2. Initial conceptual model

After importing the data, AMOS was used to test the initial model, and the fit indices were obtained: $\chi 2/df=2.471$, GFI=0.941, CFI=0.952, RMSEA=0.85. In general, the ideal standard for the root mean square error of approximation (RMSEA) is less than 0.05, indicating excellent model fit, and less than 0.08, indicating acceptable model fit. In the initial model fit results, the RMSEA is 0.85, which means that the model has not reached the ideal level and some model parameters need to be modified [10]. According to the modification indices of each residual, it can be seen that the modification index of e6 and e7 is 22.855, corresponding to the observed variables of survival needs and personal growth. Although there is a hierarchical relationship between the two in the hierarchy of needs theory, meeting survival needs is for better growth, and there is a correlation between the two. Based on this, e6 and e7 were released and the fit indices were checked: $\chi 2/df=1.87$, GFI=0.94, CFI=0.972, RMSEA=0.065. All the indices reached the standard, and the model was run, and the fit results were obtained as shown in Table 6.

Table 6. Fit test and modification of structural equation model

Structural Equation Model Fit Indices		Ideal Standard	Initial Model Results	Model Results after Modification	Yes or No
$\chi 2/df$	Goodness of Fit Chi-Square Value	<3.00	2.471	1.87	Yes
GFI	Goodness of Fit Index	>=0.9	0.916	0.94	Yes
RMSEA	(Root Mean Square Error of Approximation)	<=0.08	0.085	0.065	Yes
TLI	Non-Normed Fit Index	>=0.9	0.936	0.962	Yes
CFI	(Comparative Fit Index)	>=0.9	0.952	0.972	Yes

5.4.2. Path Coefficient Analysis and Hypothesis Testing Results

Based on the above analysis, the path coefficients of three paths: external driving force →internal driving force, internal motivation→ innovation behavior, and external driving force → innovation behavior were obtained from Table 7. The output results are shown in Table7, 8 and Figure 3.

Table 7. Path test

Path		Unstandardized Coefficient	Standardized Coefficient	S.E.	C.R.	P	label
external driving force	Internal driving force	0.63	0.642	0.079	7.943	***	a
Internal driving force	innovative behavior	0.389	0.316	0.109	6.011	***	b
external driving force	innovative behavior	0.662	0.549	0.11	3.564	***	c

Note: *** indicates P<0.001

Table 8. Analysis of internal driving force mediating effect, direct effect, and total effect

Path	Effect Value	SE	Bias-corrected 95% CI			Effect Proportion (%)
			Lower	Upper	P	
Mediation Effect in Internal Motivation	0.245	0.104	0.071	0.503	0.01	37.01
Direct Effect	0.662	0.145	0.373	0.981	0.003	72.99
Total Effect	0.907	0.1	0.735	1.154	0.004	

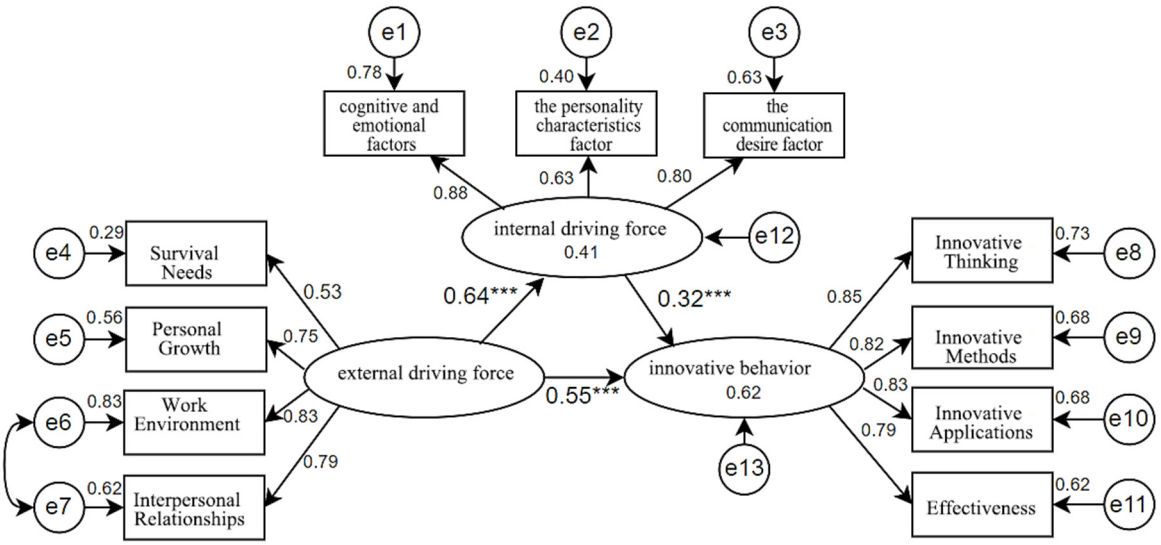

Figure 3. Modified standardized structural equation model

From Table 7, it can be seen that the three paths pass the significance test at the 5% level. That is, external driving force β (=0.642, P<0.001) has a significant positive impact on innovation behavior, verifying hypothesis H1. Internal driving force β (=0.316, P<0.001) has a significant positive impact on innovation behavior, verifying hypothesis H2. In this study, the Bootstrap method was used to sample 2000 times at a 95% confidence interval to test the mediating effect. The research results are shown in Table 8. The bias-corrected interval of the mediating effect and direct effect of internal driving force (0.071, 0.503) and (0.373, 0.981) does not include 0, indicating that both the mediating effect and direct effect of internal driving force are significant, and their respective proportions are 37.01% and 72.99%. This means that internal driving force plays a partial mediating role between external driving force and innovation behavior, verifying hypothesis H3.

5.5. Research Findings

5.5.1. Both Internal Driving Force and External Driving Force have a Significant Positive Impact on Individual Innovation Behavior

The study shows that external driving force (β=0.642, P<0.001) and internal driving force (β=0.316, P<0.001) have a significant positive impact on talent innovation behavior. Talent innovation is not only driven by external environment but also influenced by internal psychological motivation. When people are in an innovative environment, they are not only passively influenced by the environment but also actively driven by their inner desires and aspirations.

5.5.2. Internal Driving Force Acts as a Mediating Variable in the Effect of External Driving Force on Innovation Behavior

The direct effect of external driving force on innovation behavior is 0.662. Relying solely on external driving force can only achieve a qualified level of talent innovation behavior. However, to stimulate talent to innovate to a greater extent, the indirect effect of external driving force on innovation behavior through internal driving force can be utilized, resulting in a total effect of 0.907. This means that the positive effect of external driving force on individual innovation behavior is partially realized through internal driving force. Based on existing social cognitive theories, the environment determines behavior, and the environment indirectly influences behavior through individuals as mediators. When internal driving force is added as a mediating variable to the relationship model between external driving force and innovation behavior, the path coefficient of external driving force on behavior significantly decreases but remains significant. According to the standard for testing mediating effects, it is confirmed that internal driving force plays a mediating role in the relationship between external driving force and individual innovation behavior.

5.5.3. Individual Cognitive Emotion and Communication Desire have a Greater Impact on Internal Driving Force.

In the measurement model of internal driving force, the factor loadings of cognitive emotion and communication desire are higher than those of personality traits, indicating that cognitive emotion and communication desire have a greater influence on internal driving force. The study found that cognitive emotion and communication desire have a significant positive relationship with innovation behavior, indicating that when individuals make behavioral choices, their own cognitive emotions, including values, thinking characteristics, sense of achievement, sense of existence, and sense of honor, will influence whether they choose to engage in innovative activities or simply follow traditional tasks. Interaction and communication with others can also stimulate talent to generate innovative intentions.

5.5.4. Survival Needs are Not the Primary Driving Factor for Talent Innovation at the Current Stage.

In the measurement model of external driving force, the factor loading of survival needs is much lower than that of other variables. The increase in survival needs does not significantly stimulate individuals to have strong external driving force for innovation. Innovative talents pursue career achievements not only in terms of monetary rewards but also in terms of higher-level needs for self-realization. They are more concerned about whether their talents can be implemented in their work positions and whether they can achieve personal growth in their work. However, in terms of survival needs, salary level and welfare benefits have a great attraction for talent external driving force, followed by family care and household registration issues, which can enhance the attractiveness. The formulation, improvement, and implementation of these policies can better retain talents.

6. Strategies for Implementing Internal Driving Force for Talent Innovation in Zhanjiang

6.1. Strengthening Internal Driving Force of Talents to Enhance Innovative Vitality

While this may be easier for policymakers, it does not effectively drive innovation behavior. Human behavior is complex and variable, and external incentives alone cannot fully drive talent innovation. Based on the research findings, the following insights regarding internal drive are proposed:

6.1.1. Pay Attention to the Intrinsic Motivation of Talent and Enhance Their Enthusiasm and Creativity in Work

Talent's worldview, values, and outlook on life influence their choice of innovative direction. The sense of existence, achievement, and honor also affect the level of innovation in their work. Passion and pursuit of work in innovative tasks make individuals more engaged, thus influencing the quality of innovation. Furthermore, communication activities among talents can stimulate innovation vitality. Therefore, the government, enterprises, and organizations should regularly visit talents in Zhanjiang, understand their needs and difficulties in the innovation process, focus on the internal drive of talent, maintain interaction with innovative talents, and timely understand and meet their cognitive, emotional, and communication needs related to internal driving force. By understanding the driving forces and obstacles to talent innovation from the source of talent demand, the external environment can be adjusted to align with the internal driving force of talent, thereby maximizing the release of talent innovation vitality.

6.1.2. Fully Leverage the Mediating Role of Internal Driving Force to Enhance the Decisive Role of the External Environment in Innovation Behavior

External factors play a decisive role in innovation behavior, but relying solely on external incentives is not enough. Internal driving force emphasizes the joy and satisfaction that innovative work brings to talent, as well as the sense of existence, achievement, and honor gained during the process. Therefore, policymakers should not only rely on financial incentives to motivate talent for innovation but also satisfy their inner and spiritual needs based on external reinforcement. For example, although generous scientific research rewards can strengthen talent's innovative behavior, if the threshold for research funding is high, the conversion of research results is difficult, and the procedures are cumbersome, it can undermine talent's confidence and affect their value evaluation of success and failure, thereby reducing their innovation drive. Therefore, when standardizing external incentives, the internal needs of talent should be fully considered, and appropriate evaluation mechanisms should be established to focus on the process of innovation activities, rather than solely evaluating the innovation results.

6.2. Optimizing the Innovation Environment and Improving Incentive Mechanisms

6.2.1. Create a Free and Open Innovation Environment to Promote Communication among Talents.

Information exchange and sharing are important factors that influence talent's innovation drive and behavior, whether it is related to internal or external driving force factors. Knowledge information forms the basis of innovation, and the flow of knowledge within a region provides a continuous "nutrient" for innovation in that region. Specifically, the sparks generated by the collision of ideas during the sharing and communication process among talents can broaden their innovative thinking and have a positive impact on innovation behavior. Therefore, the government, enterprises, universities, research institutes, etc., should provide platforms for knowledge and skills exchange among talents, regularly organize various exchange activities, and expand the scope of talent's innovative thinking.

6.2.2. Improve the Incentive Mechanism for Innovation to Attract More Talents

The innovation behavior of talents in a region to some extent determines the level of innovation in that region, which in turn affects its economic development. Although Zhanjiang's talent policies have provisions regarding housing, education for children and spouses, professional title evaluation, and research transformation, which are attractive to certain high-level individuals, there are still issues with implementation. Attracting talents without reinforcing their innovative behavior is insufficient. In fact, talents are more concerned about opportunities and development than salary and benefits. Therefore, the government, enterprises, universities, and research institutes can consider improving incentive policies from the perspective of talent growth.

6.3. Improve and Implement Talent Policies

Most innovative talents are of working age, and their improved labor productivity can generate a population dividend that promotes economic growth. However, this requires the implementation of talent policies that utilize the population dividend. In terms of policies, the following suggestions are proposed based on the research findings:

6.3.1. Living Conditions

Standardize talent housing and provide various housing options; improve policies for the enrollment of talent's children in schools and provide better educational resources; address spouse-related issues and provide appropriate living allowances.

6.3.2. Talent Introduction

Establish a talent pool and pay attention to talent dynamics and needs. Provide corresponding preferential measures for master's students who come to work in Zhanjiang and subsidies for innovative talents from outside the region.

6.3.3. Research Platform and Work

Build more comprehensive platforms for talent exchange and scientific research, fully meet the information exchange needs of talents; strengthen cooperation between government, universities, and enterprises in research and development projects to promote the transformation of research results; provide flexible use of research funds and increase rewards for research achievements; relax the educational and institutional thresholds for research projects. Rewards should be given for research achievements that have social or economic benefits, with special attention to the needs of talents in research institutes.

6.3.4. Innovation and Entrepreneurship

Support not only college students but also young people in innovation and entrepreneurship through funding and subsidy policies to enhance market innovation vitality. Support innovation and entrepreneurial behavior of scientific and technological talents and provide certain personal income tax policies.

6.3.5. Government Work

Firstly, the government should establish a talent follow-up group to monitor talent dynamics and needs, rather than expecting talents to keep up with policy dynamics themselves. Secondly, the government should promote special regulations for scientific research work and ensure their popularization and implementation. Finally, the government should improve administrative efficiency, allowing talents to spend more time and energy on innovation work.

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