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From Attraction to Retention: Determinants of High-Level Talent Retention in Southwest China Based on the Kano Model

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Abstract: ***Talent, especially high-level talent, is a core element of a region's economic development. To enhance the region's ability to attract and retain high-level talent, it is crucial to meet their diverse needs. Based on the Theory of Amenities, this study constructs 17 influencing factor indicators for attracting high-level talent across four dimensions: natural environment, economic development, and others. Using the Kano model analysis method, it prioritizes the factors that influence the attraction and retention of high-level talent, identifying the needs that significantly impact them. The Kano model is a method for systematically categorizing talent requirements through preference classification techniques. A priority model was established ranking the factors influencing the satisfaction of high-level talent in underdeveloped regions of Southwest China. This study found that air quality is both a must and one-dimensional need. Salary, colleague relationships, social security, environmental sanitation, and prospects are categorized as one-dimensional needs. Learning opportunities, work environment, infrastructure, cuisine, talent policies, and regional economic development are identified as attractive needs. Work processes and promotions are classified as reverse needs, while incentive mechanisms, business environments, and educational resources fall under indifferent needs. The findings of this study have positive implications for optimizing resource allocation and enhancing the attraction and retention of high-level talent in Southwest China.***

Keywords: Underdeveloped region, Southwestern region, High-level talent, Kano model.

1. Introduction

High-level talent determines a region's capacity for technology absorption and knowledge diffusion. It plays a pivotal role in driving the efficient release of other capital elements during economic development, exerting a decisive influence on overall economic progress. For each province, region, or city, the ability to attract and retain high-level talent that matches its own development needs will have a direct bearing on the region's innovation capacity, development level, and overall social outlook [1, 2]. Especially in underdeveloped regions, talent is the key to overcoming development bottlenecks and driving urban growth [3]. However, attracting, developing, and retaining talent is one of the most critical challenges today [4].

Brain gain exhibits a certain duality: it involves not only attracting external talents to a region but also retaining and engaging existing local talent. This process encompasses all efforts by a region to enhance its economic and social environment, boost its appeal to talent, and thereby guide both external and internal talent to enter or remain in the area, ultimately contributing to local development [5].

In the past 40 years, the East China region has consistently been a net inflow area, with a strong ability to attract talent. In contrast, the Northeast and Western regions have experienced net outflows, with weaker talent attraction capabilities [6]. In 2023, the net talent inflow in the Eastern, Central, Western, and Northeastern regions accounted for 13.5%, -6.7%, -4.1%, and -2.6% respectively [6]. The Eastern region continues to experience sustained talent aggregation, while the Central, Western, and Northeastern regions face continued net outflows of talent [7]. Taking a young overseas high-level talent introduction plan as an example, the proportions of talent distributed in Eastern China, central China, western China, and Northeastern China are 70.33%, 16.99%, 9.84%, and 2.84%, respectively [6].

For the less developed regions, the relatively lagging economic and social development, along with significant locational disadvantages, not only hinder their ability to attract talent but also result in local talent outflow. This creates a challenging situation for talent aggregation in these areas, attracting and retaining talent has always been a problem in western China [8]. In the context of modern economics and society, the distribution of talent is generally proportional to the level of regional development. Developed economies and talent have a mutually attractive relationship, reflecting a phenomenon of mutual benefit and reinforcement [9, 10]. This trend is likely to lead to a polarization effect between talent and the economy, further placing underdeveloped regions in an increasingly passive situation [11]. Specifically, regions such as Guangxi, Guizhou, and Yunnan, located in southwestern China, have relatively low levels of economic development. Although their Gross Domestic Product (GDP) is in the mid-range, their per capita GDP is significantly lower in comparison, making them far less attractive to high-level talents compared to economically developed regions.

Take the comparison between Guangdong Province and the Guangxi region as an example. These two regions are geographically adjacent, share a similar climate, and have many commonalities in dietary habits. However, their levels of economic development differ significantly, as do their ability to attract and retain talent. In 2024, Guangxi's GDP ranked 19th nationwide, nearly six times lower than that of Guangdong Province, which ranked first. However, disparities in GDP ultimately manifest in the effectiveness of talent competition. A more direct indicator for measuring a region's ability to attract and retain talent is the 'net talent

inflow ratio', Taking Guangzhou, the capital of Guangdong Province, as an example, the net talent inflow ratios from 2019 to 2023 were 0.6%, 0.9%, 1.0%, 0.7%, and 1.0%, indicating a sustained concentration of talent. In contrast, Nanning, the capital of Guangxi Province, has never appeared on the list of cities with net talent inflow [7].

It can be seen that the less developed regions of Southwest China have a lack of high-level talent, low regional attraction, and face great challenges and significant gaps in attracting and retaining high-level talents. To implement effective talent attraction measures, it is crucial to address the actual needs of talent. Therefore, understanding why talent chooses to leave or stay and meeting the diverse needs of high-level talent is essential [12]. This study first constructs an indicator system based on the Amenities Theory and introduces the Kano model as a tool. Through the Kano questionnaire survey method, data is collected. The influencing factors for attracting and retaining high-level talent are then classified, and their priority is ranked using both traditional methods and the Better-Worse index. In summary, this research selects comprehensive and systematic indexes, uses the Kano model, and studies the influencing factors in China's Southwest region talent attraction and retention, aiming to make a marginal contribution to research in this field and provide decision-making references for improving the attraction and retention of high-level talent in these regions.

2. Literature Review

2.1 Overview of the Influencing Factors for Attracting and Retaining High-Level Talent in Underdeveloped Southwest Regions

Brain drain in less developed regions has long been a concern [6, 13, 14]. Research on brain gain in underdeveloped southwest regions mainly focuses on two directions: the macro perspective and the micro perspective. From a macro level, the research primarily concentrates on policy formulation and evaluation.

For example, studies have found that many local governments, especially those in underdeveloped areas, commonly face issues such as blindly following trends and content homogenization in policy formulation. As a result, these problems reduce the scientific basis of talent policies and weaken their effectiveness [15]. In some regions, policies for attracting talent failed to accurately focus on their unique characteristics and needs, neglecting a comprehensive consideration of local traits, geographical advantages, and future development plans. This has resulted in certain provisions being misaligned with local situations. Moreover, scholars have used factor analysis to evaluate the talent attraction policies of provincial governments in China, sharing the insight that comprehensive and well-designed talent policies can compensate for the inherent shortcomings of underdeveloped provinces [16].

However, a comparative analysis of policies across different regions indicates that standardized policies not only keep down the enthusiasm of existing high-level talent but also intensify unhealthy competition for talent among regions, ultimately leading to the weakening and failure of such policies [17]. The key to addressing policy imitation and convergence lies in each region emphasizing its development priorities and industrial characteristics, highlighting regional advantages in the fields of high-level talent introduction [2, 18, 19]. Regions should adopt a differentiated approach, accurately identify their unique characteristics and needs, leverage local resources, and fully support their advantageous industries. On this basis, they can determine effective methods for talent concentration.

Additionally, at the micro level, compared to macro-level policy arrangements, talent attraction exhibits intangible and cumulative characteristics, primarily focusing on aspects such as the environmental system, socio-cultural atmosphere, and living conditions [20]. Research on the factors contributing to the loss of high-level talent in underdeveloped southwest regions is relatively scarce. Some scholars believe that to retain high-level talent, countries or regions should strategically emphasize the role of incentive mechanisms. This involves not only offering higher compensation at the material level but also incorporating appropriate incentives in other areas [21, 22]. With the advancement of modernization and the evolution of individual needs, regional environment and welfare, including employment opportunities and development prospects, have also become key factors influencing talent concentration [23]. Studies have found that the limitations of traditional hard indicators, such as employment opportunities and income, in explaining talent concentration are becoming increasingly apparent. Scholars have begun to recognize that soft indicators, such as living environment, also play a significant role in talent mobility decisions. Talent relocation choices are not only about fulfilling survival needs but also about pursuing quality of life [24]. The higher the level of talent, the more dimensions they consider [25]. For example, high-level talent is more sensitive to superior natural ecosystems and shows a stronger willingness to choose cities with better environmental quality [10]. At the same time, a distinctive city culture can enrich an individual's cultural life, foster a sense of identity and belonging to the city, and play a positive role in attracting and retaining talent [26].

Summarizing existing research, the factors influencing regional talent attraction mainly include two aspects: one is human resource management, such as wage levels and career advancement paths; the other is regional development, including economic levels, industrial structure, and so on [27-29]. The above research can hardly fully explain the reluctance of high-level talents to stay in the less developed regions of Southwest China. At the micro level, to better understand high-level talent, it is necessary to explore more comprehensive influencing factors and categorize and prioritize the factors affecting the attraction and retention of high-level talent in underdeveloped southwest regions. This will help formulate more scientifically based talent attraction policies. It can enhance the ability of underdeveloped regions to attract and retain high-level talent, thereby effectively reducing the loss of such talent. Based on these considerations, this study focuses on exploring the factors at the micro level.

2.2 Indicators Selection

How can a region attract high-level talent? In the 1950s, American economists introduced the Amenities Theory, which provides a useful analytical perspective for answering the question of how to attract talent. Amenities refer to things, facilities, services, environments, or behaviors that are pleasurable and comforting [30, 31]. The Amenities Theory shifts the traditional view of regions as mere engines of material growth. The theory suggests that talent mobility is not only influenced by economic factors and work plans but also by the experience of life. Existing research has shown that amenities factors can significantly improve talent distribution levels, confirming that the amenities aspects of a region have an attractive effect on talent [24]. High work efficiency and pressure mean that talent has higher income levels and more freedom of choice. They are more concerned with aspects such as the air quality and public service levels, and they require better living experience to alleviate stress. With economic development and improvements in living standards, talent, especially high-level talent, will choose work areas based on their preferences for quality of life. The comfort level (the quality and quantity of amenities factors) increasingly influences high-level talent's choice of work location [25].

This study draws on the research findings of scholars such as Wang Ning, Ma Ling, and Ye Xiaoqian [25, 31, 32], Considering the demands of high-level talent in underdeveloped southwest regions and the availability of data, and following the principles of representativeness, scientific, and operability in indicator selection, this study constructs four primary indicators of the factors influencing regional attractiveness for high-level talent based on the Amenities Theory. These are: Firstly, natural ecological environment, specifically air quality and sanitation; Secondly, economic development level, specifically including regional development prospects, talent policies, regional economic development, and business environment; Thirdly, social living environment, specifically including food, social security, infrastructure, and educational resources; Lastly, work environment and experience, specifically including work processes, promotion channels, learning opportunities, salary and benefits, incentive mechanisms, colleague relationships, and work atmosphere.

In summary, the first step of this study is to construct the indicators based on the Amenities Theory and existing literature, which include 4 primary indicators and 17 secondary indicators. The second step is to use appropriate tools to prioritize these indicators.

2.3 The Kano Model and Its Applications

Different scholars have studied talent attraction in different regions and fields and the influencing factors by these methods, expert advice or the Delphi method to select a talent attraction evaluation index to construct a talent attraction evaluation index system [33], entropy method, principal component analysis method [34], and factor analysis method [35]. Finally, the outcomes of talent attractiveness can be determined [2]. In recent years, some new methods have been proposed in this field, such as the Kano model.

Noriaki Kan, a Japanese professor, based on two-factor theory to develop a tool for categorizing and prioritizing user needs, which is called the Kano model. The two-factor theory posits that factors influencing employee performance can be divided into two categories: motivators and hygiene factors. Motivators are factors that, when satisfied, can inspire employee enthusiasm, while hygiene factors are those that, when unmet, lead to employee dissatisfaction [36]. This model analyzes the impact of user needs on user satisfaction and reveals the nonlinear relationship between product performance and user satisfaction [37]. The Kano model can be applied to different types of users and accurately categorizes user needs into various attribute categories. This helps identify the factors that most influence user satisfaction, thereby providing targeted suggestions based on actual needs. Since its inception, the model has been widely applied in fields such as online shopping [38], and customer satisfaction [39]. However, research on the application of the Kano model in the field of human resources is relatively limited

The logic of the Kano model is to help collect feedback and opinions from high-level talent on various aspects of a region through standardized questionnaire surveys, thereby establishing an effective communication channel between high-level talent and the region. As shown in Figure 1, based on the Kano model theory, the factors influencing the attraction and retention of high-level talent can be divided into five categories [40, 41].

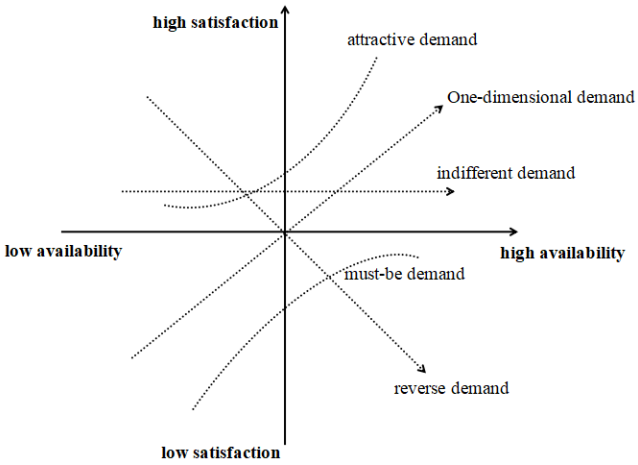

Figure 1: Kano Model

(1) Must-be demand(M): When this type of demand factors are satisfied, the effect on the satisfaction of high-level talents is not significant, but when it cannot be satisfied, the satisfaction of high-level talents is greatly reduced.

(2) One-dimensional demand(O): When that type of needs are met, the satisfaction of high-level talent increases, and vice versa.

(3) Attractive demand(A): Contrary to Must-be demand, high-level talents are much more satisfied when such needs are met and dissatisfied when they cannot be met.

(4) Indifferent demand(I): None of the effects of whether or not this type of needs is met are significant on the satisfaction of high-level talents.

(5) Reverse demand(R): In contrast to One-dimensional

demand, meeting such needs reduces the satisfaction of high-level talent, and conversely increases satisfaction.

3. Methodology

3.1 Questionnaire Design

The questionnaire was developed for the Kano model developed by Kano Noriaki et al. The questionnaire included two parts, the first part involves a basic investigation into the essential information of high-level talents, including gender, age, educational background, professional title, academic qualifications, nature of work, and preferred work location; the second part focuses on the Kano questionnaire, with the design of items related to the factors influencing the attraction and retention of high-level talents in underdeveloped regions. Each question is designed with both positive and negative aspects, for instance, "How do you feel if there are good prospects for career development?" and "How do you feel if there are poor prospects for career development?". The answers, based on the Likert five-point scale, consist of "strongly dislike," "reluctantly accept," "indifferent," " should be so" and "strongly like.

According to the practical situation in underdeveloped regions of China, high-level talents are defined as individuals with a master's degree or higher, or those with advanced professional titles. They may also include high-skilled leaders who possess advanced knowledge in their respective academic or professional fields, as well as individuals who are considered essential talents in key areas facing shortages [42]. Given this, the present study defines the selection criteria for representative high-level talents in underdeveloped regions as candidates and working professionals possessing a master's degree or higher, or holding advanced professional titles. In the selection of factors influencing the attraction and retention of high-level talents, this paper adopts certain initial concepts as research elements. Using SPSS software, factor analysis, and item discrimination analysis are conducted on the survey results, with the removal of items lacking discriminative power. The questionnaire ultimately includes 17 representative influencing factors.

3.2 Data Collection

This study initially utilized the Questionnaire website to create a well-designed survey, which was subsequently distributed online. Guangxi was chosen as the pilot region, being located in the southwestern part of China with a relatively underdeveloped economy. During the pilot phase, a portion of the samples were distributed by colleagues and friends through social media, sharing the QR code of the survey with individuals holding master's or doctoral degrees, or possessing advanced professional titles, and currently working in Guangxi. Another portion of the samples was collected during the research team's participation in the China-ASEAN Human Resources Cooperation and Development Forum (a national-level and international economic and trade exchange event co-hosted by China and the economic and trade authorities of the 10 ASEAN countries, as well as the ASEAN Secretariat, held annually in Nanning, Guangxi Region.). The researcher conducted brief interviews with high-level talents and doctoral candidates interested in seeking employment in underdeveloped regions at the forum's high-level talent and doctoral negotiation area. Subsequently, these individuals were invited to scan the QR code and fill out the questionnaire. The analysis of these sample data revealed favorable results, indicating good data quality and questionnaire reliability. Following this, the survey was further distributed through colleagues and friends, leveraging social media, to individuals with master's or doctoral degrees, or advanced professional titles, working in other underdeveloped regions in southwestern China, including Yunnan, Guizhou, and Sichuan.

The survey was conducted from October 31, 2024, to November 30, 2024, and a total of 526 questionnaires were collected. To ensure the scientific validity of the survey results, the following data exclusions were made: samples with identical answers were deleted; samples with only a bachelor's degree and no senior professional titles were removed; samples with logical contradictions between age and years of work experience (e.g., age over 50 but only 5 years of work experience) were excluded; and samples with a total answering time of less than 70 seconds were excluded. After exclusions, 7 samples were removed, resulting in 519 valid questionnaires, with an effective response rate of 98.66%. The basic statistical results of the information collected from the survey are summarized in Table 1.

Descriptive statistics of the sample show a slight male majority. The age concentration was between 30 and 40 years old, an age group that usually has earned a master's or doctoral degree or a higher professional title in their field, thus increasing the accuracy of the information collected. The majority of respondents held a master's or doctoral degree, which is consistent with the scope of our study. Overall, the survey seems to be well designed and the results are representative.

Table 1: Descriptive statistical analysis of the sample (N=519)

Statistical Category	Option	Quantity and Percentage /%
Gender	Male	264(50.9)
	Female	255(49.1)
Age	20-30	118(22.7)
	31-40	172(33.1)
	41-50	149(28.7)
	50 and above	80(15.4)
Length of Service	Less than 5 years	150(28.9)
	5-10 years	109(21.0)
	11-15 years	124(23.9)
	16-20 years	104(20.0)
	More than 20 years	32(6.2)
Qualification	Bachelor's Degree	1(0.2)
	Master's Graduate	311(59.9)
	Doctoral Graduate	207(39.9)
Professional Title	Junior Professional	115(22.2)
	Intermediate Professional	123(23.7)
	Senior Professional	281(54.1)
Studied Abroad	Have studied abroad before	233(44.9)
	Have not studied abroad before	286(55.1)
Job Nature	Civil servant	85(16.4)
	University/College teacher	133(25.6)
	Enterprise employee	88(17.0)
	Doctor	81(15.6)
	Self-employed	78(15.0)
	Awaiting employment	54(10.4)
Total		519(100)

4. Data Analysis

4.1 Validity and Reliability

In this paper, the data were tested for reliability and validity with the help of SPSSS22.0. The results are presented in Table 2. In terms of reliability, the overall Cronbach's α for the entire questionnaire is 0.942, the Cronbach's α for positively-worded questions is 0.926, and for negatively-worded questions, it is 0.853. A Cronbach's α greater than 0.8 indicates excellent reliability for the scale, suggesting that the questionnaire is valuable for use. Regarding validity, the overall KMO value for the entire questionnaire is 0.962, with KMO values of 0.966 for positively-worded questions and 0.933 for negatively-worded questions. Bartlett's sphericity test for both sets of questions is significant (P<0.001), indicating good validity for this survey.

Table 2: The results of the reliability and validity tests for the questionnaire

	Cronbach'sα	KMO	Bartlett
Positive questions	0.926	0.966	0.000
Negative questions	0.853	0.933	0.000
Kano questionnaire	0.942	0.962	0.000

4.2 Categorizing the Influencing Factors of Talent Attraction

This study classifies various influencing factors on the attraction and retention of high-level talents in underdeveloped regions of Southwest China, referencing the Kano Evaluation Table as the basis for attribute classification. Specifically, as shown in Table 3, "M" represents must-be demand, "O" represents one-dimensional demand, "A" represents attractive demand, "I" represents indifferent demand, "R" represents reverse demand, and "Q" represents questionable responses.

Table 3: Kano Assessment Form

Positive questions	**Negative questions**				
	Strongly like	Should be so	Indifferent	Reluctantly accept	Strongly like
Strongly like	Q	A	A	A	O
Should be so	R	I	I	I	M
Indifferent	R	I	I	I	M
Reluctantly accept	R	I	I	I	M
Strongly like	R	R	R	R	Q

According to the Kano Assessment Table, this study individually assessed the attributes of influencing factors related to attraction and retention in the collected 519 questionnaires. The factors were classified into five categories: Must-be Needs (M), One-dimensional Needs (O), Attractive Needs (A), Indifferent Needs (I), Reverse Needs (R), and questionable responses (Q). Then, conduct a statistical analysis of the frequency of occurrence for each attribute. The specific results are shown in Table 3. The average occurrence of questionable responses (Q) is 7 times, accounting for 0.013% of the total number of questionnaires. This indicates that the overall expression of the questionnaire is relatively clear, and the questionnaire is generally effective.

Classification of Attributes. The Kano model attributes classification is based on the Kano Evaluation Table in Table 3. A statistical analysis is performed on the questionnaire results for each item, and the attribute with the highest proportion in each question is selected as the attribute for the impact factors of attracting and retaining high-level talents in underdeveloped areas. The specific classification and statistics of demand attributes for influencing factors are shown in Table 4. The influencing factors for high-level talents in underdeveloped areas can be classified into 5 categories, including 1 must-be need factor (M), 5 one-dimensional need factors (O), 6 attractive need factors (A), 2 reverse need factors (R), and 3 indifferent need factors (I).

Better-Worse Index Classification Results. The Kano model classification method focuses solely on categorizing influencing factors and classifying their attribute characteristics. However, it still unable to reflect the level of satisfaction or dissatisfaction of high-level talents with a specific need. To address this, the user satisfaction coefficient formula is applied to calculate the user satisfaction index (Better index) and dissatisfaction index (Worse index) for each requirement (Berger, C 1993). Through these indices, the specific satisfaction and dissatisfaction levels of high-level talents in underdeveloped areas regarding the influencing factors of attraction and retention can be accurately reflected.

Better indices=(A+O)/(A+O+M+I);

Worse indices=(-1)*(O+M)/(A+O+M+I)

The Better indices range from 0 to 1, with a higher value indicating a greater impact of the factor on improving the satisfaction of high-level talents. The Worse indices range from -1 to 0, and the larger the absolute value, the more severe the impact of the factor in causing dissatisfaction among high-level talents. According to Table 5, there are six factors with Better indices greater than 0.5 and Worse indices with absolute values greater than 0.4. These are talent policies, colleague relationships, air quality, diet, environmental hygiene, and development prospects. These six factors have the most significant impact on the satisfaction of high-level talents in underdeveloped southwestern areas. When planning organizational and urban development, special attention should be paid to these six factors. If high-level talents perceive a lack of development prospects in their work, are dissatisfied with talent recruitment policies, cannot manage colleague relationships effectively, or believe that the urban air quality and environment are not conducive to their lives, they may become greatly dissatisfied with the underdeveloped southwestern region. This dissatisfaction could lead to reduce satisfaction with the local area, ultimately prompting them to choose to leave the underdeveloped southwestern region and seek new job opportunities elsewhere.

Table 4: The classification and categorization of need attributes for influencing factors

Number	Indicator	Frequency of attribute statistics (%)						Classifi-cation	Better indices	Worse indices
		A	O	M	I	R	Q			
1	Work Processes	8.67	18.88	18.11	21.77	25.05	7.51	R	40.86	-54.86
2	Promotion Pathway	10.21	22.16	14.84	22.93	23.12	6.74	R	46.15	-52.75
3	Learning Opportunities	26.01	16.38	16.57	24.47	13.87	2.70	A	50.81	-39.49
4	Incentive Mechanism	21.00	21.00	18.30	24.08	13.87	1.73	I	49.77	-46.58
5	Salary and Benefits	19.27	22.54	20.62	22.16	13.10	2.31	O	49.43	-51.03
6	Colleague Relationships	20.04	22.74	16.57	22.35	17.15	1.16	O	52.36	-48.11
7	Work Atmosphere	24.47	18.11	15.99	23.51	15.41	2.50	A	51.88	-41.55
8	Infrastructure	24.47	15.99	19.65	21.97	15.22	2.70	A	49.30	-43.43
9	Air Quality	21.00	22.74	22.74	17.15	15.80	0.58	M+O	52.30	-54.38
10	Diet	26.40	18.30	16.38	21.58	14.84	2.50	A	54.08	-41.96
11	Business Environment	23.70	17.15	18.11	26.01	13.10	1.93	I	48.07	-41.50
12	Talent Policies	28.32	17.34	16.57	21.39	14.26	2.12	A	54.61	-40.55
13	Social Security	11.56	27.94	20.62	21.77	15.22	2.89	O	48.24	-59.29
14	Environmental Hygiene	17.92	24.86	20.62	21.97	12.72	1.93	O	50.11	-53.27
15	Educational Resources	21.00	22.74	16.57	23.31	13.29	3.08	I	52.30	-47.00
16	Regional Economic Development	24.28	16.57	20.04	22.74	14.45	1.93	A	48.85	-43.78
17	Development Prospects	20.04	24.08	19.65	18.88	15.03	2.31	O	53.38	-52.91

5. Attribute Analysis of Influencing Factors on Attraction and Retention of High-level Talents in Underdeveloped Regions in Southwest China

5.1 Analysis Based on Kano Classification Results

In the factors influencing the attraction and retention of high-level talents in underdeveloped regions in the southwest, Air Quality is classified as a Must-be need. Moreover, this factor falls into both Must-be and One-dimensional needs categories. In other words, from the perspective of high-level talents, among the factors that attract them to come and stay for work in underdeveloped regions in the southwest, air quality is considered a “taken for granted” factor. Good air quality does not increase the satisfaction of high-level talents, but once it is not met, their satisfaction will significantly decrease. This is a fascinating discovery, this finding echoes the conclusions of the 2024 Talent-Friendly Cities Research Report [1]. High-level talent choosing to work in southwest regions, and giving up the advanced urbanization of developed regions, instead opting for relatively underdeveloped areas, places greater emphasis on factors such as air quality and the environment. This distinguishes them from high-level talent in other regions.

Factors falling under One-dimensional need include Salary and Benefits, Relationships with colleagues, Public safety, Environmental hygiene, and Prospects for development. One-dimensional demand factors have a positive correlation with the satisfaction of high-level talents. If underdeveloped regions in the southwest possess these factors, it can enhance the satisfaction of high-level talents and increase the likelihood of retaining them. However, if these factors are lacking, the satisfaction of high-level talents will decrease.

The influencing factors of Attractive needs include Talent Policies, Infrastructure, Learning Opportunities, Work Environment, Regional Economic Development, and Dietary. For high-level talents in underdeveloped regions in the southwest, even if talent policies are less satisfactory, urban infrastructure is incomplete, and dietary conditions are average, the impact on their satisfaction is not significant. They are willing to endure these environments for the sake of work. However, once these factors are satisfied, it greatly enhances their satisfaction with the city and organization. Of course, if the working conditions in the city are superior to those in other cities, their satisfaction will increase even more significantly.

Factors related to Indifferent Needs include Incentive Mechanism, Business Environment, and Educational Resources. For high-level talents in underdeveloped regions in the southwest, since they are willing to choose to work in these underdeveloped areas, the business environment, incentive mechanisms, and educational resources in these regions are not highly valued by them. Choosing to work in underdeveloped regions implies that they have already given up the advantages of developed areas. Therefore, these factors are perceived as undifferentiated for them. Therefore, these factors are perceived as undifferentiated for them. However, if there are good business environments, incentive mechanisms, and educational resources, they would not refuse them.

Factors falling under Reverse needs include Work Processes and Promotion Channels. For example, a long work process can lead to dissatisfaction among high-level talents, and they tend to prefer jobs with shorter work processes.

5.2 Analysis based on Better-Worse Indices

To further analyze the impact of factors influencing the satisfaction of high-level talents in attracting and retaining in the southwest, and to facilitate the rational allocation of resources in the future, this paper uses the absolute value of the Worse indices as the horizontal axis and the Better indices as the vertical axis. Based on the Better-worse indices from

Table 5, a four-quadrant chart is established with the average values of the two indices as the origin, as shown in Figure 2. According to the concept of the Better-Worse indices, it is understood that factors with a greater distance from the origin have a more significant impact on the satisfaction and dissatisfaction of knowledge-based talents.

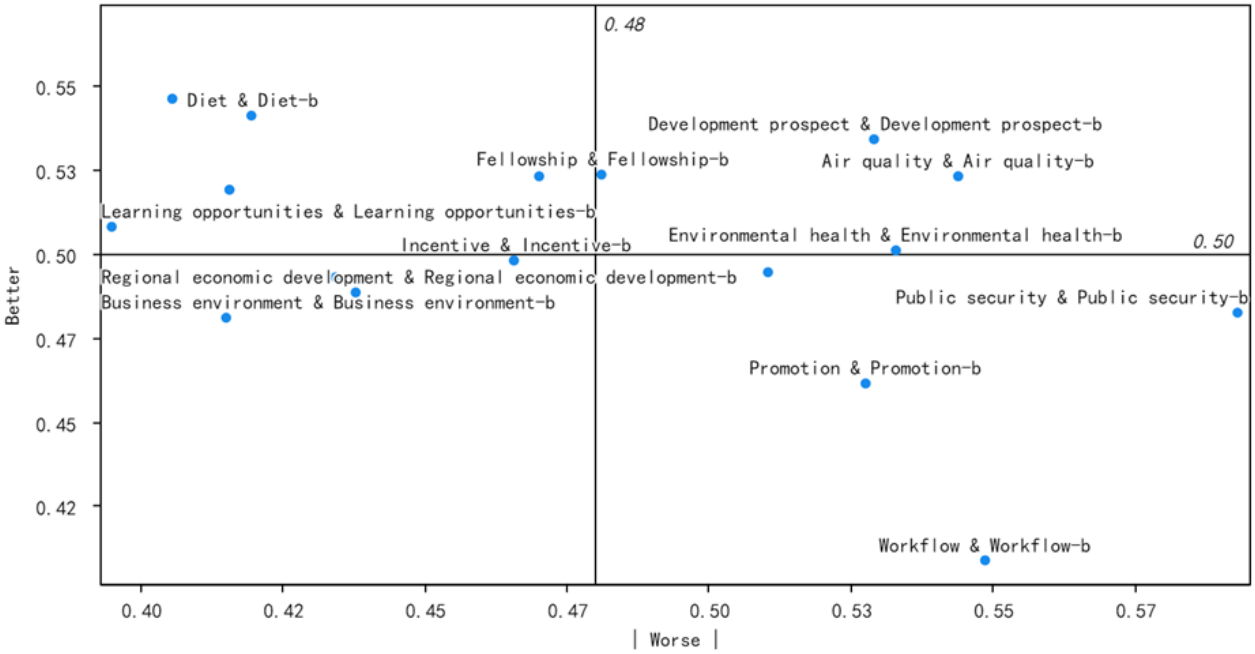

Figure 2: Better-Worse Indices

In the first quadrant, the influencing factors on the attraction and retention of high-level talents in underdeveloped regions in the southwest include Colleague Relationships, Air Quality, Environmental Hygiene, and Development Prospects. The characteristics of these four factors are high Worse indices and high Better indices. If underdeveloped regions in the southwest possess these attraction and retention factors, the satisfaction of high-level talents will significantly increase; conversely, satisfaction will markedly decrease if these factors are lacking. Due to limited resources for regional development, underdeveloped regions in the southwest should prioritize the development of these influencing factors when allocating resources. The order of resource allocation for developing these influencing factors in underdeveloped regions in the southwest should be development prospects, colleague relationships, air quality, and environmental hygiene.

In the second quadrant, the factors include Dietary, Learning Opportunities, Work Environment, Talent Policies, and Educational Resources. The characteristics of these five factors are low Worse indices and high Better indices. If underdeveloped regions in the southwest have these factors, it will significantly enhance the satisfaction of high-level talent. However, if these factors are not met, the satisfaction of high-level talents will not decrease significantly. Therefore, underdeveloped regions in the southwest should allocate resources to develop these factors as much as possible when conditions permit. This aims to improve the satisfaction of high-level talents and enhance the advantages of attracting and retaining these talents. The resource allocation order for developing these influencing factors in underdeveloped regions in the southwest should include talent policies, dietary, educational resources, work environment, and learning opportunities.

In the third quadrant, the factors include Regional Economic Development, Business Environment, Infrastructure, and Incentive Mechanism. The characteristics of these four factors are relatively low Worse and Better indices. These factors, whether present or not in underdeveloped regions in the southwest, do not have a significant impact on the satisfaction of high-level talents. Generally, in situations where resources are scarce, it may be possible to save costs by not investing resources in these factors. However, it is important to note the dynamic evolution of these influencing factors. Once their attributes change, underdeveloped regions in the southwest should adjust their resource allocation strategy accordingly.

In the fourth quadrant, the influencing factors include Social Security, Promotion Channels, Work Flow, and Salary and Benefits. The characteristics of these four factors are high Worse indices and low Better indices. When underdeveloped regions in the southwest lack these factors, the dissatisfaction of high-level talents will decrease. If these factors are present, satisfaction will not change significantly. Therefore, underdeveloped regions in the southwest should maintain these factors at a baseline level. This approach can save input costs while still effectively providing similar factors, ensuring that the dissatisfaction of high-level talents does not increase.

6. Discussion and Implication

6.1 Discussion

High-level talents play a crucial role in ensuring the continuous high-quality development of a region. This study, through a review of the literature on talent research in underdeveloped regions in the southwest, reveals that most studies approach issues and strategies from a macro perspective. In contrast, this paper takes a micro perspective

and employs the Kano model to explore the priority model of influencing factors for the introduction and retention of high-level talents in underdeveloped regions in the southwest.

The study finds that air quality is considered both a Must-be and One-dimensional need. Salary and Benefits, Colleague Relationships, Social Security, Environmental Hygiene, and Development Prospects are categorized as One-dimensional needs. Learning Opportunities, Work Environment, Infrastructure, Dietary, Talent Policies, and Regional Economic Development are identified as attractive needs. On the other hand, Work Processes and Promotion Channels are classified as reverse needs, while Incentive Mechanisms, Business Environment, and Educational Resources fall under Indifferent needs. The paper also analyzes the attribute characteristics of different types of factors.

Regarding the allocation of resources in underdeveloped regions in the southwest, the priority order is to first reduce the dissatisfaction of high-level talents and then increase their satisfaction. Therefore, the priority sequence is as follows: Quadrant IV > Quadrant I > Quadrant II > Quadrant III. Based on the above study, it is advisable to first consider maintaining factors belonging to Quadrant IV at a baseline level. Subsequently, efforts should be made to develop factors in Quadrant I as much as possible, concurrently developing factors in Quadrant II when conditions permit.

Finally, to save costs, the development of factors in Quadrant III may be omitted.

In the future, the resource allocation order for talent attraction and retention in underdeveloped regions in the southwest is as follows: Salary and benefits > Social security > Promotion channels > Work processes > Development prospects > Colleague relationships > Air quality > Environmental hygiene > Talent policies > Dietary> Educational resources > Work environment > Learning opportunities > Incentive Mechanism> Infrastructure > Regional economic development > Business environment.

6.2 Implication

Over time, an attribute may evolve into another attribute [43]. Therefore, underdeveloped regions in the southwest must constantly monitor the evolution of various influencing factors. Once Must-be needs emerge, they should be maintained above a certain threshold. Otherwise, it may have a significant negative impact on the satisfaction of high-level talents, and in severe cases, become a direct cause of the departure of high-level talents from underdeveloped areas in the southwest. At the same time, attention should also be paid to other attributes, and management strategies need to be adjusted promptly if changes occur.

6.2.1 Phase One: High-Quality Satisfaction of One-dimensional Demands

One-dimensional demands are the explicit needs of high-level talents and the primary factors for attracting and retaining them in underdeveloped regions in the southwest. Both the government and enterprises need to pay attention to this, as continuous optimization can significantly enhance their satisfaction. It is important not only to provide as many factors related to expected demands as possible but also to deliver them in high quality.

Firstly, establish a scientifically reasonable salary package to ensure that the compensation for high-level talents is proportional to their job performance and contributions. Various components of compensation can be adopted, such as basic salary, performance bonuses, stock incentives, and training programs. Basic salary can be stable and predictable, performance rewards can be given based on actual performance, stock incentives can motivate high-level talents closely tied to organizational interests, and training programs can enhance the abilities and competitiveness of high-level talents. Secondly, assist high-level talents in fostering harmonious interpersonal relationships within the organization. Encourage acceptance and appreciation of individual differences and backgrounds among team members, avoid discrimination and bias, create an inclusive and equal work environment, and establish informal communication spaces, rest areas, etc., to increase the frequency of informal communication among high-level talents, facilitating relationship-building.

Thirdly, continuously optimize social stability and public safety in underdeveloped regions in the southwest. Consider social security factors in regional planning, strengthen the prevention and control of security issues, increase video surveillance facilities and security measures, and enhance the safety performance of communities, business districts, public places, etc. Fourthly, provide career development planning for high-level talents, helping them understand their strengths and career interests, and achieve self-improvement through training, and collaboration, thus promoting career development. Fifthly, address environmental hygiene and air quality in underdeveloped regions in the southwest. The government needs to take concrete actions to maintain the cleanliness of urban environments, focus on urban greening, improve air quality, and make the natural environment more in line with human needs.

6.2.2 Phase Two: Make Every Effort to Enhance Attractive Demands

The majority of attractive demand factors fall within the category of urban appeal. Once these factors are present, they significantly enhance the satisfaction of high-level talents. Failing to provide them does not have a significant impact on the dissatisfaction of high-level talents. Therefore, after addressing Must-be and One-dimensional demands, the government and enterprises in underdeveloped regions in the southwest should actively focus on and maintain these factors above a general threshold.

Firstly, provide diversified learning opportunities. High-level talents need exposure to various fields and forms of learning opportunities, such as academic conferences, internship opportunities, cross-industry exchanges, etc. Secondly, good hardware infrastructure conditions can also influence the choices of high-level talents. The basic layout needs to consider balanced development between the city center and

the suburbs. When planning infrastructure, it is essential to consider the sustainability of environmental protection, adopt energy-efficient and environmentally friendly construction methods, and regularly maintain and promptly repair damaged infrastructure to ensure the operation of facilities. Thirdly, optimize policies for high-level talents, implement new initiatives for open talent attraction, shift the focus from attracting individual talents to attracting talent teams, reduce the difficulties and costs associated with restructuring new teams. Fourthly, continuously promotes economic development in underdeveloped regions in the southwest. With its beautiful landscape and unique cultural resources, the region possesses favorable conditions for developing the tourism industry. By using tourism as a leading industry, implementing industrial rolling, and creating an integrated development model of tourism, industry, and trade, it can drive regional economic development. Fifthly, create a positive organizational work atmosphere, fostering equal communication and free exchange with high-level talents. This can be achieved through regularly holding team meetings, establishing feedback mechanisms, and listening to the opinions and suggestions of high-level talents. Additionally, creates a comfortable office atmosphere.

6.2.3 Phase Three: Keep Pace with the Times, Optimize Resource Allocation

The traditional Kano model suggests that indifferent needs should not be included in the development plan, but indifferent needs may transform in future development, potentially evolving into attractive demand factors [44].

Given this, it is important to keep an eye on such factors. Once there is a change in the attributes of influencing factors, new development strategies should be promptly implemented for better resource allocation. In this study, factors classified as indifferent needs include the Business Environment, Educational Resources, and Incentive Mechanism. Among these, incentive mechanisms and educational resources are considered important by human resource management professionals and are also a method for organizations to enhance employees' willingness to stay. However, for high-level talents willing to stay in underdeveloped areas in the southwest, their willingness to forgo job opportunities in developed regions may mean relinquishing the incentive mechanisms of high-quality educational resources and higher salaries in developed regions. After weighing these factors, they may comparatively care less about them.

Belonging to reverse demands are the Work Processes and Promotion Channels, indicating that in both corporate organizations and government institutions, high-level talents hope for streamlined work procedures by eliminating unnecessary parts and simplifying office processes. Similarly, promotion channels are also a factor; high-level talents prefer a flatter and more efficient organizational structure, with promotion paths not overly complex. They are more inclined towards creating economic value with the knowledge they have acquired.

6.3 Limitations and Future Prospects

High-level talent is key to driving regional development. This study primarily explored the factors influencing the attractiveness of underdeveloped southwest regions to high-level talent. The limitations of this research are as follows:

Firstly, to obtain a sufficient number of valid questionnaires, the focus was placed on Guangxi and Guizhou. The number of questionnaires collected from Sichuan and Yunnan was relatively small. Conducting more extensive data collection in Sichuan and Yunnan could improve the external validity of the study. Future research could include a broader sample and supplement it with interviews to further refine the conclusions.

Secondly, the selection of indicators was relatively limited. Future studies could include more indicators to explore the factors influencing talent attraction and retention in underdeveloped southwest regions more comprehensively.

Lastly, this study focused on underdeveloped regions in southwest China. Future research could apply the same methodology to explore the specific influencing factors in other underdeveloped regions, such as northeast and northwest China. This would provide a better understanding of the overall situation in underdeveloped areas of the country, to effectively achieve a balanced distribution of high-level talent.

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