TALENT INCENTIVE POLICY, INNOVATION PERFORMANCE, ORGANIZATIONAL INNOVATION CLIMATE, AND ORGANIZATIONAL IDENTIFICATION: EMPIRICAL EVIDENCE FROM HIGH-TECH ENTERPRISES

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Abstract

This article delved into the intricate dynamics of talent incentive strategies, with a special focus on those implemented in free trade ports, and their profound impact on the innovation performance of employees. The research adopted a dual-focused approach, scrutinizing both the mediating role of the climate of organizational innovation and the moderating influence of organizational identification. The study integrated the organizational innovation climate category by merging classical scales, focusing on individual performance in employee innovation, and the organizational identification category (Acosta-Prado et al., 2021; Han et al., 2007; Mael & Ashforth, 1992). The research encompassed 58 high-tech firms in the Hainan Free Trade Port (HFTP), disseminated 1817 questionnaires, retrieved 1666, and validated 1262, achieving a 74.8 percent validity rate. The employed methodology was hierarchical regression analysis, a potent statistical tool enabling a nuanced comprehension of the variable relationships. The analysis findings revealed that employees' perceptions of talent incentive policies could positively impact their innovation performance, highlighting the significance of these perceptions in determining policy effectiveness. The study uncovered that talent incentive policies influenced innovation performance, mediated by the organizational climate and amplified by employee identification with the organization. These insights can inform strategies to optimize talent incentives, cultivate an innovative culture, and boost overall performance.

Keywords: Free Trade Port, Talent Incentive Policy, Organizational Innovation Climate

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1. INTRODUCTION

Since 2013, the China Free Trade Zone, now encompassing 21 zones, has been instrumental in economic reforms and global openness, bolstering China's economy's foreign trade (United Nations, 2023). During the initial three months of 2023, foreign trade and investment in these zones witnessed an increase (Wei, 2022). The Hainan Free Trade Port (HFTP) has implemented policies to attract global talent, particularly in high-tech fields, with comprehensive plans and tax policies for talent development (Liu et al., 2019; Xiu & Li, 2023). The construction of the HFTP not only aids Hainan's economy but also propels China's economic reform (Zhao, 2021). A robust talent pool is vital, and the port has instituted talent incentive policies, with 787 items related to "innovation". These policies have stimulated innovation in high-tech companies within the zone. However, the actual outcomes do not always align with expectations, suggesting that individuals may not fully comprehend these policies, thereby affecting their effectiveness (Zhao, 2021; Zhongyuan, 2022).

A growing body of academic literature is increasingly focusing on the understanding of talent incentive policies (Yaxu et al., 2021; Zhang et al., 2022). However, the conclusions drawn from these studies vary. Several researchers highlight the beneficial impacts of incentive policies on the innovative capability, enthusiasm, and professional advancement of research personnel (Yaxu et al., 2021). This includes the correlation between the perception of the policy target group and the innovation outcomes of the employees, thereby affirming the positive influence of talent incentive policies on innovative competence, proactive conduct, and career progression (Ritala et al., 2020). Talent incentive policies have been shown to augment scientific research outcomes. Financial backing, talent initiatives, and technological reward policies serve as pivotal elements in talent development, effectively igniting their innovative drive and significantly enhancing their innovative results (Yuan & Liu, 2022).

On the contrary, some scholars argue that certain incentive policies may hinder the innovative contributions of employees. The "research priority promotion" policy could potentially induce psychological discomfort in incentivized individuals, resulting in a decline in researchers' enthusiasm towards academic pursuits (Miah & Hafit, 2021). While material rewards can effectively motivate researchers to innovate proactively, they could also diminish the efficiency of teamwork, leading researchers to prefer methods that yield the highest rewards (Aggarwal et al., 2024; Srirahayu et al., 2024).

This study scrutinizes the effect of talent incentive policies on individual innovation shows, acknowledging that these policies may induce psychological fluctuations. It recognizes the complexity of this relationship, noting that individual responses to these policies can vary due to personal differences (Stan, 2022). The research also emphasizes the importance of the organizational innovation climate, an aspect that has often been overlooked in previous studies. Using employees from high-tech enterprises in the HFTP as subjects, the study aims to elucidate the interrelationships between talent incentive policies, the culture of innovation in the organization, and the creative performance of the employees. The ultimate goal is to refine talent incentive policies and enhance the innovative performance of technological workers.

Specifically, during the research, the research questions were formulated:

RQ1: What is the perception of talent incentive policies among employees of high-tech enterprises in the HFTP?

RQ2: Does the perception of talent incentive policies by employees of high-tech enterprises in the HFTP positively affect their innovative performance?

RQ3: What is the mechanism through which the perception of talent incentive policies affects innovative performance? Specifically, what part does the atmosphere of innovation in the organization have in this connection? Does the employee's identification with the organization moderate the impact of the perception of talent incentive policies and the climate of organizational innovation on employee innovative performance?

The subsequent structure of this article is as follows: Section 2 encompasses a comprehensive review of the relevant literature. The research methodology utilized in this study is scrutinized in Section 3. The empirical findings of the investigation are delineated in Section 4. An in-depth discussion of these outcomes is encapsulated in Section 5. Lastly, Section 6 provides the conclusion of the article and proffers concluding observations.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Related literature

2.1.1. Incentive theory

The concept of "incentive", derived from the Latin term "*movere*", signifies the drive for an entity to perform a specific task. Corporate incentives are bifurcated into macro-policy incentives, provided by the state, and micro-incentives, specific to the company (Hanif et al., 2022; Rong et al., 2021). The expansion of corporations necessitates macro-guidance in the form of government policies due to market, capital, production, and technology uncertainties. The government influences corporate activities through various policies and systems (Hansmann & Binder, 2023), including tax benefits, government subsidies, procurement, financial services, and talent incentives. These policies support corporate survival and development and enhance the economic environment. Talent incentive policies, a type of macro incentive, stimulate talent development and encourage contributions to corporate growth (Zhang et al., 2021). Micro-incentive studies within corporations have focused on the impact on individual behavioral processes, incentive components, and the relationship between individual behavior and structure. Internal incentives are categorized into internal vs. external, material vs. spiritual, and positive vs. negative incentives. Herzberg's two-factor theory suggests that satisfaction stems from motivational factors, while dissatisfaction arises from hygiene factors

(Ma & Hanrahan, 2020). This information provides a theoretical foundation for ongoing research in corporate-level incentive theory.

2.1.2. Perception of talent incentive policy

Talent incentive policies, designed to attract and retain skilled individuals, are prioritized in regions like the Hainan Free Trade Zone for promoting innovation and entrepreneurship (Liu et al., 2023; Yaxu et al., 2021; Zhang et al., 2022). Research on these policies covers macro and micro dimensions, including a five-stage policy process analysis (Shang et al., 2023; Xu, 2023). These government-instituted policies aim to stimulate talent development and magnify their sector-wide impact, focusing on job allocation, incentive processes, measurement methodologies, compensation design, and training plans (Hanif et al., 2022; Satjawathee et al., 2023). The research direction has shifted towards a comprehensive and innovative management approach, emphasizing the influence of these policies on innovation (Basili & Rossi, 2020). Scholars have explored the effects of these policies on various stages of talent development, the importance of policy encouragement and a scientific talent system, and the contribution of talent policy to industry advancement (Zhang et al., 2021). The effectiveness of these policies depends on employees' perceptions, characterized by capability, degree, familiarity, satisfaction, and attitudes, which influence attitudes, behaviors, and benefits (Abu-Shanab & Subaih, 2019). Misconceptions can hinder policy outcomes. This study defines the "perception of talent incentive policies" as employees' understanding and satisfaction with the policy and investigates its impact on employee innovation performance.

2.1.3. Organizational innovation climate

The organizational innovation climate, a cultural milieu within entities that promotes and facilitates innovative activities, is shaped by factors such as the ecological environment, policy landscape, and cultural atmosphere (Farazmand, 2020). This climate, characterized by an open, unrestricted, inclusive, proactive, and forward-looking social environment, stimulates creativity, encourages risk-taking, and fosters collaboration to drive innovation. The concept of an "innovative atmosphere" influences individual behavior and is associated with conditions that affect an individual's innovative capacity (Ritala et al., 2020). Recent studies have focused on the organizational innovation climate, with five factors related to this climate in high-tech companies significantly correlating with the formation and execution of innovative ideas, and a clear connection found between the team's innovation climate and employees' innovative outcomes (Acosta-Prado, 2020; Newman et al., 2020; Sheffield, 2018).

2.1.4. Performance of employee innovation

Employee innovation performance, encompassing product and technology innovation, knowledge discovery, innovation processes, and changes in corporate culture, is a valuable action at the organizational level and a manifestation of individual thoughts (Rong et al., 2021). It is not just limited to production, manufacturing, and sales areas, but also enhances economic added value. It can be split into innovation related to products and innovation related to processes. It is seen as the benefits and outputs of innovative behaviors, focusing on individual innovative consciousness, and is perceived as a ratio related to innovation outputs or demonstrated through innovative achievements (Globocnik et al., 2020; Ritala et al., 2020). This study examines key factors such as technology, government influence, research and development (R&D) investment, and human resources on employee innovation performance, with technological advancements enhancing R&D effectiveness and government measures significantly promoting innovation (Atanassov & Liu, 2020). However, the impact of government subsidies on innovation outcomes varies with the environment (Galy, 2020). R&D investment creates favorable innovation environments and promotes innovative results, but its relationship with employee innovation performance is an inverted U-shape, while the efficient allocation of human resources and an improved organizational innovation climate enhance employee innovation performance (Yuan & Liu, 2022).

2.1.5. Organizational identification

Organizational identification is an employee's sense of belonging to their organization, influenced by its values, culture, and work environment, fostering loyalty, trust, collaboration, and creativity. Rooted in social identity theory, it involves cognitive and emotional aspects, leading to a self-concept based on organizational membership, and is segmented into job positioning, organizational branding, working environment, and organizational culture (Cai & Bae, 2023; Francis et al., 2023). It is an individual's self-definition based on their organizational membership, resulting from self-awareness and internalization of organizational values, and is seen as a purely cognitive phenomenon at the individual level (Erkutlu & Chafra, 2022; Galy, 2020). This identification is embodied when the core values of organizational members align with individual core values, integrating corporate values into their personal identification system, and manifesting in a sense of belonging, pride, and loyalty towards the organization.

2.2. Hypotheses development

2.2.1. The impact of perceived talent incentive policies on employees' performance in innovation

Innovation system theory suggests that innovation is influenced by technology, entrepreneurship, infrastructure, networks, and both macro and micro factors such as government strategies, industry composition, and a company's R&D and training. The theory underscores the significance of government policy incentives in propelling innovation, with recent studies concentrating on policy perception and talent incentive policies (Acosta-Prado et al., 2021; Decker Sparks

et al., 2021). Scholars have begun to explore the relationship between talent incentive policy perception and innovative behavior, finding that policy perception can significantly impact innovation outcomes (Yaxu et al., 2021; Zhang et al., 2022). This paper concludes that the perception of talent incentive policies, which involves complex processes from policy perception to innovation performance, is a crucial factor in innovation performance.

Considering the dimensions of talent incentive policy perception, this paper proposes the following hypotheses based on the previous research:

H1: Talent incentive policy perception has a positive bearing on personnel's inventive productivity.

H1a: Awareness of policies exerts a positive influence on the innovative output of employees.

H1b: The perception of policy acquisition positively impacts the innovative output of employees.

H1c: Satisfaction with policies has a positive effect on the innovative output of employees.

2.2.2. The influence of perceptions of talent incentive policies on the climate of innovation within the organization

Employees' perception of incentive policies can stimulate their enthusiasm for innovation, thereby enhancing the entrepreneurial climate and improving company performance, particularly in China's high-tech firms. These perceptions, which are guided by talent development goals, foster an innovative organizational culture and motivate proactive innovative behavior, especially when incentives related to promotions, bonuses, and benefits are clearly perceived (Liu et al., 2023). Furthermore, talent plays a moderating role between policy perception and policy implementation effectiveness, with individuals adjusting their innovative behavior based on their perception of incentive policies, thereby shaping a positive innovation culture (Chen et al., 2023; Zhang et al., 2022). Lastly, varying perceptions of policies among talents lead to different reactions, significantly influencing the innovation culture in different regions and positively driving the innovation climate.

Given the tripartite division of the perception of talent incentive policies into policy awareness, policy acquisition perception, and policy satisfaction, the subsequent hypotheses are postulated:

H2: The perception of talent incentive policies exerts a positive influence on the innovative climate within the organization.

H2a: Awareness of policies positively impacts the innovative climate within the organization.

H2b: The perception of policy acquisition positively influences the innovative climate within the organization.

H2c: Satisfaction with policies exerts a positive effect on the innovative climate within the organization.

2.2.3. The association between the organizational innovation climate and the performance of employee-driven innovation

Numerous scholars have investigated the connection between the creative output of staff and the innovative atmosphere in the workplace. The creative climate within the organization significantly influences employee innovation outcomes (Waheed et al., 2019). The positive impact of the creative climate within the organization on employee innovation output. A positive connection between the climate of organizational innovation and the effectiveness of employee innovation, with the latter emphasizing that a good climate fosters emotional identification among employees, enhancing innovation outcomes. The organizational novelty climate can indirectly impact employee innovation outcomes through employee self-efficacy. The climate of organizational innovation has the most substantial effect on employee innovation effectiveness (Aggarwal et al., 2024; Díaz Tautiva et al., 2024).

Therefore, this study puts forth the third hypothesis:

H3: The climate of innovation inside an organization exerts a positive influence on the innovative performance of its employees.

2.2.4. The mediating role of organizational innovation climate

Research indicates that organizations can stimulate employee innovation by providing opportunities and platforms, thereby granting greater resource allocation authority. This enhances innovation awareness and skills, benefiting the organization (Klimchak et al., 2019). Establishing an innovation-friendly climate and providing resources for innovation practice can foster employee innovation initiatives and improve overall innovation performance. Innovative behavior requires interaction within the organization and is influenced by the innovation climate. An environment that fosters supportiveness acts as a catalyst for the inception of innovative ideas, stimulates the manifestation of innovative conduct, and has a significant impact on the results of innovation. In accordance with this perspective, the present study proposes the fourth hypothesis*:*

H4: The organizational innovation climate mediates the connection amid the perception of talent incentive policies and the performance of employee innovation.

2.2.5. The influence of organizational identification as a moderating variable

Moderating role of organizational identification in talent incentive perception and employee innovation performance

Organizational identification, the extent to which employees align with their company, is a crucial component of a firm's innovation environment, influencing the perception of talent incentive policies and leading to increased innovation engagement (Batool et al., 2024; Kaltiainen

et al., 2024). The degree of identification differs across various employee cohorts, suggesting the necessity for tailored incentive schemes. Enhanced identification correlates with heightened loyalty, diminished attrition rates, and a more positive response to perceptions of talent incentive policies. Employees who demonstrate a superior degree of organizational acknowledgement are more inclined to support and maintain the organization's talent incentive initiatives, consequently bolstering the company's innovative capacity and competitive advantage (Loan, 2020).

Therefore, we put forth the fifth hypothesis, labelled as *H5a*:

H5a: Organizational identification moderates the connection between talent incentive policy perceptions and the performance of employee innovation.

Organizational identification's moderating role in organizational innovation climate and employee innovation performance

Employees' organizational identification can help shape the organizational climate. A strong organizational identification can stimulate employee innovation behavior and improve innovation performance (Batool et al., 2024; Kaltiainen et al., 2024). Organizational identification is a moderating factor in the relationship between organizational support and employee service innovation behavior. Organizational identification can influence employees' behavior and thoughts, affecting the internal climate of organizational innovation and performance. Organizational identification takes a regulatory role in the link between civil servants' innovation willingness as well as the organizational climate (Liu et al., 2023).

Therefore, we offer the hypothesis *H5b*:

H5b: Organizational identification serves as a moderating variable in the relationship between the climate of organizational innovation and the performance of employee innovation.

3. RESEARCH METHODOLOGY

3.1. Research design, population, and samples

This investigation, with the objective of objectively substantiating and generalizing the relationships among various factors, aligns with the attributes of quantitative research. Consequently, the methodology chosen for this research was quantitative in nature. The overall population under study comprises employees of high-technology companies located in the HFTP, with a preliminary estimate of approximately 3000 individuals.

The study incorporated a selection of 58 high-technology companies situated within the HFTP. These companies span a diverse range of sectors, including information technology, advanced equipment manufacturing, new materials, biopharmaceuticals, cloud computing, big data, and artificial intelligence. They employ a substantial number of high-technology professionals, have extensive coverage, and exhibit significant representativeness.

This study employed Yamane's formula to determine an appropriate sample size, ensuring a confidence level of 95%.

$$n = N/(1 + Ne^2) \quad (1)$$

by n = the sample scope, N = the population, and e = tolerable error value.

It is suggested that in instances where the population size is exceedingly large or uncountable, a minimum sample size of 400 should be considered for the study to maintain statistical significance (Adam, 2020). In this study, 1817 questionnaires were disseminated, 1666 were collected, and after thorough evaluation, 1262 were validated, yielding a 74.8% validity rate.

3.2. Sampling method

To ensure that the respondents possess the requisite knowledge and capability to answer the questions in the questionnaire, this research, when conducting enterprise surveys, primarily chose technical personnel who are more familiar with talent incentive policies as survey subjects. Given the unique identity of the respondents involved in this research topic and the considerable challenge of accessing them, combined with constraints such as time costs, it is difficult to uniformly distribute questionnaires off-line within a single company. If the questionnaires are rashly distributed via regular e-mail, it's challenging to guarantee the response rate and the valid response rate. Therefore, in selecting samples, we mainly adopted "simplified" and "stratified" methods for distribution (McCusker & Gunaydin, 2015).

3.3. Data collection

The data for this research was primarily amassed via the distribution channels of WeChat and professional electronic correspondence, with the focus being on high-technology corporations situated within the HFTP. Response rates for spontaneous questionnaires should be between 80% to 90%, with a valid response rate above 67%. For e-mail-distributed questionnaires, the response rate is around 20%, with a valid response rate around 10%. For questionnaires distributed to the general public, the response rate should be around 25%, with a valid response rate of approximately 50%.

The questionnaire, based on scales from various studies and expert opinions, includes six sections with 40 questions. It covers personal information, perception of talent incentive policies, organizational innovation climate, employee innovation performance, and organizational identity. The latter four are measured utilizing a Likert five-point scale. The perception of talent incentive policies is divided into three dimensions: policy awareness, perceived policy gain, and policy satisfaction, with a total of 11 questions.

The questionnaire employed in this study incorporates a variety of scales to evaluate the climate of organizational innovation, the efficacy of employee innovation, and the degree of organizational identification. The organizational innovation climate scale, which is an integration of

classic scales based on the work of Acosta-Prado et al. (2021) comprises 15 items. The employee innovation performance scale, which emphasizes individual performance, adopts the eight-item scale developed by Long (2007). The organizational identification scale, formulated by Mael and Ashforth (1992), encompasses six items. All the scales utilize the Likert five-point method, with responses ranging from "strongly disagree" to "strongly agree". The study's control variables include gender, age, and education level, each represented by a corresponding item: "What is your gender?", "What is your age?", and "What is your education level?".

3.4. Data analysis techniques

This study employs SPSS 29.0 software for data analysis, incorporating methods such as descriptive statistics, correlation coefficients, reliability and validity tests, and regression analysis. The validity and reliability of the questionnaire were ascertained through a pilot test and various analyses. The pilot survey, conducted to refine the questionnaire wording, was disseminated to 66 high-tech company staff online, yielding 81 valid responses. The talent incentive policy perception scale demonstrated high data reliability and satisfactory internal consistency, while the organizational innovation climate scale indicated good internal consistency and high reliability.

The research employed principal component analysis (PCA) for the extraction of factors, establishing a criterion for an eigenvalue greater than one. Prior to rotation, the cumulative variance contribution was 74.548% for the climate of organizational innovation scale and 79.842% for the scale of employee innovation performance. All items had a factor loading greater than 0.5 after rotation. The organizational innovation climate scale, employee innovation performance scale, and organizational identification scale all exhibited good reliability and validity, with Cronbach's alpha coefficients indicating internal consistency and Kaiser-Meyer-Olkin (KMO) values suggesting strong interrelation among factors. Following adjustments to the questionnaire based on preliminary survey feedback, a comprehensive survey was conducted. Of the 1817 questionnaires distributed, 1262 were valid, with a response rate of 74.8%. The data underwent another round of validity and reliability tests, effectively reducing dimensionality.

The survey data from a total of 1,817 employees, spanning across 58 high-tech enterprises located within the Hainan Free Trade Zone. From the pool of responses, 1,262 were deemed valid. The gender distribution of the respondents was skewed towards males, with 77.5% male and 22.5% female respondents. A significant majority of the respondents (90.4%) were under the age of 45. In terms of educational qualifications, a substantial proportion of the respondents (69.7%) held either a master's degree or a doctoral degree. The surveyed companies were predominantly private entities (79.5%), with a workforce ranging from 51 to 300 employees (58.4%). A notable percentage of these companies (44.8%) had been established within the preceding five years.

4. RESULTS

4.1. Relations of variables

Descriptive statistical analysis scrutinizes the attributes of the sample data, encompassing fundamental respondent details and statistical measures of variables such as standard deviation, mean, and correlation coefficients. Correlation analysis employs the Pearson correlation coefficient as a metric to ascertain the degree of correlation between variables. The study's results show correlations between the independent, intermediate, and moderator variables, and employee innovation performance. The means for policy awareness, policy perception, policy satisfaction, organizational innovation climate, employee innovation performance, and organizational identification are 3.921, 4.217, 3.541, 3.942, 4.213, and 3.129 respectively. All standard deviations are below one, indicating reliable data with minimal variation (Table 1).

Table 1. Descriptive analysis of main variables

Variable	*Mean*	*Std. dev.*	*1*	*2*	*3*	*4*	*5*	*6*
1. Policy awareness	3.921	0.562	1					
2. Policy acquisition	4.217	0.635	0.721**	1				
3. Policy satisfaction	3.541	0.724	0.745***	0.719*	1			
4. Organizational innovation climate	3.942	0.612	0.533**	0.496**	0.412*	1		
5. Employee innovation performance	4.213	0.813	0.226***	0.236**	0.284***	0.249***	1	
6. Organizational identification	3.129	0.575	0.172**	0.158**	0.103***	0.225*	0.313*	1

*Note: ***, **, * represent: $p < 0.001$, $p < 0.010$, $p < 0.050$, $p < 0.100$, respectively.*

Significant positive correlations exist between policy awareness, policy satisfaction, policy perception, organizational innovation climate, employee innovation performance, and organizational identification. Specifically, policy awareness and policy perception correlate with organizational innovation climate and organizational identification. Policy satisfaction correlates with organizational innovation climate and organizational identification. Policy perception and organizational innovation climate correlate with employee innovation performance. Organizational innovation climate and the performance of employee innovation correlate with organizational identification.

Model 3, Table 2 has an adjusted R-squared of 0.236, indicating strong explanatory power. The F-statistic is 9.973, with a p-value < 0.001, signifying the model's significance. The variables Policy awareness, Policy acquisition, and Policy satisfaction all positively impact employee innovation performance, supporting hypotheses *H1, H1a, H1b,* and *H1c.*

Model 4 in Table 2 shows that the organizational innovation climate positively impacts innovation performance, with an attuned R-squared of 0.221 and an F-statistic of 4.245 ($p < 0.010$), supporting hypothesis *H3*.

In Model 5, Table 2, the climate of organizational innovation remains significant, but the impact of policy awareness, policy perception, and policy satisfaction on employee innovation performance weakens, suggesting that organizational innovation climate partially intervenes in the connection between perceived talent policy perception and employee innovation performance, confirming hypothesis *H4*. The outcomes of the hierarchical regression analysis, which was executed to evaluate the mediation effect, are concisely encapsulated in the ensuing Table 2.

Table 2. Hierarchical regression analysis results for a mediation effect test

Variable	*The climate of organizational innovation*		*The performance of employee innovation (DV)*		
	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*
Constant	0.362	0.309	0.309	0.071	0.074
Gender (0,1)	0.059	0.247	0.05	0.012+	0.008*
Age	-0.003	0.187	0.002	0.008*	0.005*
Level of education	0.034***	-0.132***	0.032***	0.057***	-0.054***
Policy awareness		0.226*	0.316***		0.209***
Policy acquisition		0.323**	0.323**		0.224***
Policy satisfaction		0.241**	0.321**		0.233**
Organizational innovation climate				0.219***	0.161***
Adjusted R^2	0.229	0.236	0.236	0.221	0.115
F-value	19.906***	29.973***	9.973***	4.245***	4.642***

*Note: ***, **, *, + correspondingly denote the following significance levels: $p < 0.001$, $p < 0.010$, $p < 0.050$, $p < 0.100$.*

Organizational identification positively moderates the relationship between perceived talent incentive policy perception and employee innovation performance. This is evident in Model 8, Table 3, where perceived talent policy perception significantly impacts employee innovation performance. In Model 9, Table 3, the interaction term between perceived talent policy perception and organizational identification is statistically significant ($\beta = 0.234$, $p < 0.01$), thereby affirming hypothesis *H5a*. The positive moderating effect, which is uniformly discernible across all three dimensions of policy perception, is exhaustively illustrated in the forthcoming Table 3.

Table 3. Outcomes of hierarchical regression analysis for the examination of moderation effect

Variable	*Employee innovation performance (DV)*			
	Model 6	*Model 7*	*Model 8*	*Model 9*
Constant	0.334	0.317	0.063	0.069
Gender (0,1)	0.078	0.071	0.029+	0.024*
Age	0.008	0.004	0.009*	0.006*
Cultural level	0.045**	0.039***	0.067***	0.064***
Talent policy perception			0.255***	0.216***
Organizational identification	0.143***	0.12***	0.235***	0.203***
Organizational innovation climate	0.343***	0.345***		
*Organizational innovation climate * organizational identification*		0.342***		
*Talent policy perception * organizational identification*				0.234***
Adjusted R^2	0.229	0.236	0.221	0.253
F-value	31.906***	28.953***	27.845***	26.045***

*Note: ***, **, *, + respectively represent: $p < 0.001$, $p < 0.010$, $p < 0.050$, $p < 0.100$.*

As illustrated in Table 3, a positive moderating influence of organizational identification is observed on the relationship between the climate of organizational innovation and the manifestation of employee innovation. This is substantiated in Model 6, where the climate of organizational innovation significantly influences the performance of employee innovation ($\beta = 0.343$, $p < 0.001$). In Model 7, the interaction term between the climate of organizational innovation and organizational identification is significant ($\beta = 0.342$, $p < 0.001$), thereby corroborating hypothesis *H5b*.

The research scrutinizes the impacts of control variables on both independent and dependent variables from a dual perspective: the individual attributes of the respondents and the organizational context of their respective workplaces. Personal characteristics, including age, gender, and educational attainment, are taken into account. The analytical approach incorporates a one-way analysis of variance and the independent samples T-test.

In the T-test executed with an emphasis on gender, the p-values corresponding to policy awareness, policy perception, policy satisfaction, and employee innovation performance are 0.111, 0.225, 0.094, and 0.068, respectively. Given that each of these values exceeds the threshold of 0.05, it signifies an absence of statistical significance, as illustrated in Table 4. This infers that gender does not exert a significant impact on the perception of talent incentive policies and the performance of employee innovation.

Table 4. Variance analysis table for the influence of gender on independent and dependent variables

Variable		Mean difference (male-female)	F-value	Homogeneity of variances test		Significance probability	Is it significant?
				Sig. value	Is it homogeneous?		
Perception of talent incentive policy	Policy awareness	0.10872	0.913	0.091	Yes	0.111	No
	Policy acquisition	0.05563	1.658	0.085	Yes	0.225	No
	Policy satisfaction	0.08427	2.680	0.004	No	0.094	No
Employee innovation performance		0.07481	0.764	0.032	No	0.068	No

Note: The significance level for the homogeneity of variances test is 0.05.

The one-way analysis of variance indicates that the respondents' age does not exert a significant impact on the perception of talent incentive policies and the performance of employee innovation. The p-values corresponding to policy awareness, policy perception, policy satisfaction, and employee innovation performance are 0.533, 0.391, 0.418, and 0.134, respectively, all surpassing the threshold of 0.05, as illustrated in Table 5.

Table 5. Variance analysis table for the influence of age on independent and dependent variables

Variable	Total variance	F-value	Homogeneity of variances test		Significance probability	Is it significant?
			Sig. value	Is it homogeneous?		
Policy awareness	1270.511	1.654	0.764	Yes	0.533	No
Policy acquisition	1176.235	1.241	0.854	Yes	0.391	No
Policy satisfaction	1130.254	1.987	0.768	Yes	0.418	No
Employee innovation performance	0.08996	0.680	0.004	No	0.134	No

Note: The significance level for the homogeneity of variances test is 0.05.

The educational attainment of respondents does not significantly impact policy awareness, policy satisfaction, or the performance of employee innovation. This is substantiated by the p-values of 0.269, 0.374, and 0.226, respectively, all surpassing the significance level of 0.05, as depicted in Table 6. However, there is a significant difference in policy perception based on education level (significance probability value of 0.001). Multiple comparisons show significant differences in policy perception among respondents with different education levels. Respondents possessing doctoral and master's degrees exhibit the most robust policy perception. This is followed by individuals with bachelor's and junior college degrees, and lastly, those with educational attainment below junior college, as delineated in Table 7.

Table 6. Variance analysis table for the influence of education level on independent and dependent variables

Variable	Total variance	F-value	Homogeneity of variances test		Significance probability	Is it significant?
			Sig. value	Is it homogeneous?		
Policy awareness	1182.342	9.154	0.000	No	0.269	No
Policy acquisition	1165.421	8.215	0.061	Yes	0.001	Yes
Policy satisfaction	1146.341	8.842	0.000	No	0.374	No
Employee innovation performance	1299.102	7.329	0.001	No	0.226	No

Note: The significance level for the homogeneity of variances test is 0.05.

Table 7. Multiple comparison results based on education level

Variable	Analysis method	Education (I)	Education (J)	Mean difference (I-J)	Sig.
Policy acquisition	Tamhane	Junior college and below	Doctorate and above	4.3322*	0.000
			Master's	2.6684*	0.013
			Bachelor's	2.1651*	0.031
			Junior college	2.0487*	0.037
			Junior college and below	1.9957*	0.042

*Note: * $p < 0.05$.*

4.2. Summary of hypothesis test results

In this investigation, the methodology employed encompassed a questionnaire survey, with mathematical statistics and regression analysis serving as analytical instruments. Upon examination of the sample data procured in this study, all 12 hypotheses were corroborated. The relevant specifics are exhaustively delineated in the ensuing Table 8:

Table 8. Research hypotheses test results

No.	*Hypothesis*	*Hypothesis content*	*Test outcomes*
1	*H1*	Talent incentive policy perception has a positive bearing on personnel's inventive productivity.	Supported
2	*H1a*	Awareness of policies exerts a positive influence on the innovative output of employees.	Supported
3	*H1b*	The perception of policy acquisition positively impacts the innovative output of employees.	Supported
4	*H1c*	Satisfaction with policies has a positive effect on the innovative output of employees	Supported
5	*H2*	The perception of talent incentive policies exerts a positive influence on the innovative climate within the organization.	Supported
6	*H2a*	Awareness of policies positively impacts the innovative climate within the organization.	Supported
7	*H2b*	The perception of policy acquisition positively influences the innovative climate within the organization.	Supported
8	*H2c*	Satisfaction with policies exerts a positive effect on the innovative climate within the organization.	Supported
9	*H3*	The climate of innovation inside an organization exerts a positive influence on the innovative performance of its employees.	Partially supported
10	*H4*	The organizational innovation climate mediates the connection amid the perception of talent incentive policies and the performance of employee innovation.	Partially supported
11	*H5a*	Organizational identification moderates the connection between talent incentive policy perceptions and the performance of employee innovation.	Supported
12	*H5b*	Organizational identification serves as a moderating variable in the relationship between the climate of organizational innovation and the performance of employee innovation.	Supported

5. DISCUSSION

This investigation scrutinized the influence of employees' understanding of talent incentive policies and the innovation climate on innovation performance within high-tech firms located in the HFTP. A theoretical model was constructed and empirically validated using a survey instrument and SPSS 29.0 for data interpretation. The findings revealed a positive correlation between policy perception and innovation climate with innovation performance, with the latter functioning as an intermediary. The role of organizational identification as a moderating variable was, however, challenged. The study affirmed the reliability and validity of the scales used to measure the perception of talent incentive policies, innovation performance, and innovation climate, as indicated by high Cronbach's alpha values and KMO measures. All scales exhibited robust internal consistency and significant outcomes. The survey disclosed a high level of awareness among employees in Hainan Free Trade Zone's high-tech firms regarding talent incentive policies, which positively impacts their innovation performance. The study underscored the necessity for enhancing innovation performance and pinpointed personnel support as a crucial element. These insights are consistent with prior research (Liu et al., 2023; Zhang et al., 2022).

The model's tripartite dimensions — awareness, perception, and policy satisfaction — substantially augment its explanatory capacity (adjusted $R^2 = 0.236$). These dimensions exert a positive influence on the innovation climate, as evidenced by β values of 0.161, 0.233, and 0.224, respectively, and p-values < 0.050. This climate is moulded by individual and environmental determinants, inclusive of the perception of talent incentive policies. Such perception propels innovative behaviors, amplifies work zeal, and fosters a conducive innovation climate, corroborating previous research (Acosta-Prado, 2020; Liu et al., 2019).

The investigation uncovers no association between gender and innovation performance, yet discerns a positive correlation between age, education, company size, nature, and innovation performance. In contrast, company age inversely impacts innovation performance. The integration of the innovation climate into the model enhances its explanatory prowess and positively influences innovation performance, corroborating prior research that an innovative climate promotes vitality, communication, collaboration, knowledge sharing, and innovation support (Findik & Beyhan, 2017; Globocnik et al., 2020).

The model elucidates that cognizance, perceived achievement, and policy satisfaction considerably augment both innovation performance and climate. The innovation climate exerts a positive influence on innovation performance, serving as an intermediary between the perception of talent incentive policies and innovation performance. Talent incentive policies and innovation platforms in the Hainan Free Trade Zone have cultivated an innovation climate, bolstering talent's innovative awareness and autonomous capabilities, thereby enhancing innovation performance. This aligns with preceding research (Theodorsson et al., 2022; Zhang et al., 2022).

The investigation discloses no substantial influence of gender, age, and education on talent incentive policies and innovation performance, barring policy attainment perception. Education profoundly impacts policy attainment perception, most pronounced in doctorate and master's degree recipients, succeeded by bachelor's and junior college graduates, and least in those with lower education.

6. CONCLUSION

This study delves into the relationship between non-material incentives, organizational identification, and innovation performance, a domain with limited extant research. It scrutinizes the influence of talent incentive policy perception and organizational innovation climate on innovation performance, offering a novel perspective on policy and organizational factors that shape employees' innovation performance. The research corroborates that a positive organizational innovation climate is integral for augmenting employee innovation

performance. It also unveils that individual behavioral performance emanates from a blend of perceived external environments and individual psychological factors, echoing Lewin's field theory in psychology.

The study juxtaposes the impact of talent incentive policy factors and organizational factors on employee innovation performance. It amalgamates these factors into a unified research framework, bridging the chasm between macro and micro perspectives. The findings suggest that the perception of talent incentive policies exerts a more noteworthy outcome on employee innovation performance than the organizational innovation climate, indicating that external perceptions are a more potent precursor to innovation performance.

This paper probes into the impact of talent incentive policy perception and organizational innovation climate on employee innovation performance. It reveals that these factors positively influence innovation performance, with the organizational innovation climate playing a mediating role. This research not only enriches academic comprehension but also offers practical insights. It suggests that a favorable organizational innovation climate can accelerate positive innovative behavior, leading to superior performance. The findings can guide the HFTP management committee and high-tech companies in policy formulation and implementation, fostering a conducive organizational climate, and enhancing organizational identification to stimulate employees' innovative potential and improve performance.

This study provides empirical evidence of the interplay between the perception of talent incentive policies, innovation performance, organizational innovation climate, and organizational identification, thereby highlighting the imperative for businesses to augment these facets to elevate innovation performance. It accentuates the necessity of advocating talent policies, fortifying their execution, and nurturing an innovation-friendly environment steered by remuneration and advancement systems, which are vital for organizational survival and growth. Moreover, it encourages businesses to support employee innovation within a tolerable risk spectrum, foster an entrepreneurial ethos, and amplify employees' organizational identification and innovative performance through effective communication, strengthened faith and trust, and communal activities.

To amplify employees' organizational identification and innovation performance, enterprises should institute effective communication, reinforce trust, and encourage collective activities. This includes the creation of a comprehensive communication platform and fostering emotional connections with the enterprise. The enhancement of the internal communication mechanism is also essential, necessitating clear protocols, regular assessments, and a reward system based on communication results. Furthermore, employee career development training is crucial, assisting employees in planning their career paths and boosting their work enthusiasm.

This empirical study scrutinizes the influence of talent incentive policies at the HFTP on the innovative performance of high-tech employees, acknowledging limitations such as geographical constraints, Likert scale-induced variability in survey responses, and sample selection limitations due to the focus on high-tech company employees. The nascent research into the impact of talent incentive policy perception on employee innovation performance suggests future studies could broaden the scope to encompass various organizational climates, extend to non-high-tech companies, employ diverse research methodologies, differentiate based on employee roles, and fortify theoretical foundations.

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APPENDIX

Table A.1. Policy perception

Variable	*Measurement dimension*	*Serial number*	*Measurement items*	*Strongly disagree – strongly agree*				
				1	*2*	*3*	*4*	*5*
Perception of talent incentive policy	Policy awareness	A1	I am very familiar with the national policies formulated and introduced for skilled talents.					
		A2	I often pay attention to various skilled talent policies promoted by the government.					
		A3	I believe that if I achieve certain results in my job position, I can obtain rewards from government departments through various channels.					
	Policy acquisition	A4	The enterprise I work for has fair and reasonable systems for talent training, promotion, and salary distribution.					
		A5	I have participated in various training and competition events organized by the government or my unit and have received certain recognition and material rewards.					
		A6	I am aware of and have participated in the evaluation of various honorary titles from the government.					
		A7	Seeing skilled talents being commended and publicized by the government through the media serves as a role model and motivation for me.					
		A8	Various talent policies stimulate my work enthusiasm, improve my skills, and provide certain assistance for my future work and personal development.					
	Policy satisfaction	A9	My overall satisfaction level with the content of the talent policy					
		A10	My satisfaction level with the publicity and execution process of the policy.					
		A11	My view on the policy implementation results is my satisfaction level with the policy's impact on my work enthusiasm, elevation of social status, etc.					

Note: 1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, 5 = strongly agree.

Table A.2. Organizational innovation climate

Variable	*Serial number*	*Measurement items*	*Strongly disagree – strongly agree*				
			1	*2*	*3*	*4*	*5*
Organizational innovation climate	B1	At work, my colleagues help and encourage each other.					
	B2	At work, my colleagues are willing to share their work methods and techniques.					
	B3	My colleagues often communicate and discuss issues related to work.					
	B4	When I have a new idea, my colleagues actively comment and offer constructive suggestions.					
	B5	My supervisor respects and tolerates subordinates who present different opinions and objections.					
	B6	My supervisor encourages subordinates to propose different solutions to improve production or service.					
	B7	My supervisor supports and assists subordinates in implementing innovative ideas or new approaches to their work.					
	B8	My supervisor is an excellent model of innovation.					
	B9	The company advocates for employees to try new things and learn lessons from mistakes.					
	B10	The company appreciates and recognizes employees with innovative and entrepreneurial spirit.					
	B11	The company often rewards employees who can come up with innovative ideas.					
	B12	The company advocates freedom, openness, and innovative changes.					
	B13	Work tasks have clear, challenging, and achievable goals.					
	B14	Work tasks are assigned to fully utilize employees' interests and expertise.					
	B15	Under the overall task requirements, employees can freely set their own work goals and progress.					

Note: 1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, 5 = strongly agree.

Table A.3. Employee innovation performance survey

Variable	*Serial number*	*Measurement items*	*Strongly disagree – strongly agree*				
			1	*2*	*3*	*4*	*5*
Employee innovation performance	C1	I offer new ideas to improve existing situations.					
	C2	I proactively support innovative ideas.					
	C3	I seek new methods, skills, or tools through learning.					
	C4	I often receive praise from superiors for innovative ideas.					
	C5	I can transform innovative ideas into practical applications.					
	C6	Through learning, I propose some original solutions to problems.					
	C7	I can introduce innovative ideas in a systematic way.					
	C8	I can prompt key organizational members in the company to focus on innovative thinking.					

Note: 1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, 5 = strongly agree.

Table A.4. Organizational identity survey

Variable	*Serial number*	*Measurement items*	*Strongly disagree – strongly agree*				
			1	*2*	*3*	*4*	*5*
Organizational identity	D1	When people criticize my company, I feel ashamed of myself.					
	D2	I care a lot about what people say about my platform.					
	D3	When talking about my company, it's usually "we" rather than "they".					
	D4	The success of my company is my success.					
	D5	When someone praises the company I work for, I feel like I'm praising myself.					
	D6	When my company is criticized by the media for something, I feel embarrassed.					

Note: 1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, 5 = strongly agree.

Table A.5. Scale of control variables

Variable	*Serial number*	*Content*	*Answer*
Control variables	E1	What is your gender?	
	E2	Your age?	
	E3	What is your education level?	