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The Influencing Factors on the Growth of Economic and Management Talents Based on Structural Equation Model — A Case Study of Sichuan Province

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Abstract To analyze the influencing factors on the growth of economic and management talents in China's Sichuan Province, this paper constructs an analysis framework for the growth of economic and management talents, takes 340 economic management scholars in 53 higher education institutions in Sichuan Province as the research objects, uses CV analysis to organize their CVs and information, and constructs an evaluation index system combined with system science theory for the influencing factors from five dimensions: Educational experience, work experience, research experience, part-time experience, and award experience. Correlation analysis and structural equation model are used to systematically analyze the influencing factors on the growth of economic and management talents. The experimental results show that work experience, research experience, and award experience have a direct positive significant influence on talent growth; research experience and award experience play mediating roles in the influence of talent growth. This paper enriches the theoretical dimensions of this research field and explores the interactions among these factors. It also helps to improve the cultivation and development mode of economic and management talents in the western region. Furthermore, it provides guidance and reference for the role of talents in promoting economic growth, industrial upgrading, and sustainable development.

Keywords economic and management talent growth; influencing factors; CV analysis; structural equation model

1 Introduction

At present, the world's century-old changes accelerated evolution, the process of economic globalization further accelerated, bringing both opportunities and new challenges to the development of China's economy[1]. In the post-epidemic era, high-quality development remains the primary task for comprehensively building a socialist modernized country, and it is necessary

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to unswervingly implement the new development concept and accelerate the construction of a new development pattern[2]. The development of society cannot be separated from the support of talents, who are the core force of socialist modernization construction. At the 20th National Congress of the Communist Party of China, General Secretary Xi Jinping pointed out, "Education, science and technology, and talents are the basic and strategic support for the comprehensive construction of a socialist modernized country." China's 14th Five-Year Plan also emphasizes the need to implement the policy of respecting labor, knowledge, talent, and creativity, deepening the reform of the system and mechanism for the development of talent, cultivating, introducing, and utilizing talent on all fronts, and giving full play to the role of the first resource of talent.

Sichuan Province is the hub of opening up and cooperation in the west. It is located in the overlapping area of "The Belt and Road Initiative" and "Yangtze River Economic Belt", and it is at the intersection of "Western Section of Yangtze River-Sichuan-Tibet Corridor" and "Baokun Corridor" of the new round of Western Development, and plays an important role in carrying the south and connecting to the north, connecting to the east and reaching to the west, and servicing the development of the whole western part[3−5]. The rapid development of Sichuan Province cannot be separated from the support of talents[6]. Sichuan Province has issued a series of policies to promote the development of talents, focusing on cracking the difficulties and blockages in the institutional mechanism for the development of talents, through continuous exploration and summarization of experience, and gradually forming a replicable and extendable experience and practice in the province of Sichuan. From a national perspective, the growth of economic and managerial talents has a bearing on the overall situation of the country's economic development, and the promotion of the development of economic and managerial talents is the key to promoting China's economic and social development.

The growth paths and influencing factors of talents have been the focus of research by scholars in various countries. Kreider studied the development and utilization of management talents in manufacturing enterprises in Columbus, Ohio[7]. Through in-depth interviews and surveys with management personnel in local manufacturing enterprises, he analyzed the current situation, constraints, and development strategies of management talents in the manufacturing industry. Quek used a questionnaire survey method to study 155 students participating in scientific research programs, investigating the impact of personal and environmental factors on their development in the scientific field, and evaluating the impact of scientific research programs on students[8]. Al Aina and Atan collected data from a study sample of 306 real estate company managers in the United Arab Emirates to study the impact of talent attraction, retention, learning and development, and career management on organizational performance[9]. Mohammed, et al. conducted personal interviews with six talents from the Australian higher education sector and qualitatively studied their development and cultivation factors[10]. Verginer and Riccaboni analyzed the career paths of about 2 million researchers in more than 2000 cities around the world over the past decade and analyzed the flow of talent between Global cities[11]. Subotnik, et al. identified the most favorable and important key factors for children's growth through discussions with some European and American researchers attending the first US Europe Research Summit in Washington[12]. The above studies have made an important contribution to

the talent development of enterprises and governments in relevant countries, but they have paid little attention to the growth paths and influencing factors of outstanding talents, and have not considered the connection between the growth of outstanding talents and the development of the country from a macro point of view.

In the domestic research, Qu, et al. used the academicians of the Chinese Academy of Engineering as the representative group of Chinese strategic scientific and technological talents to explore the flow pattern of academician talents in different growth stages by using the social network analysis method[13] and used the survival analysis method to dynamically examine the career growth path of academician groups, and to explore the influence of different influencing factors on the survival risk of the academician groups in different growth stages[14]. Xiao and Tang took the distinguished professors of the "Changjiang Scholars Program" of the Ministry of Education in the field of philosophy and social sciences as the sample, and used the resume analysis method to verify and analyze the influencing factors and assumptions of the growth one by one[15]. Zhang took the National Outstanding Young Scientists Fund recipients of the Department of Management as the research object, and carried out a characterization study of individual attributes and research trajectories by research methods such as resume analysis and bibliometrics[16]. Tang, et al. used 283 National Outstanding Young Scientists Fund recipients of Peking University since 1994 as the subjects of empirical research, and measured the influencing factors of talent growth by combining qualitative and quantitative research methods and relying on structural equation model[17]. Cui and Shen took the first batch of 2012 National Excellent Young Scientists Fund recipients as the research object, analyzed the research output, the change of research cooperation role, and the growth and mobility characteristics through resume analysis, bibliometrics, and statistical analysis, and discussed the influence of the "National Outstanding Young Scientists Fund" program in supporting and promoting the growth of talents[18]. Chen selected 4048 young talents funded by China's Excellent Young Scientists Fund of the National Natural Science Foundation Program from 2012 to 2020 as research samples, and used the resume analysis method to outline the group characteristics of the young scientific and technological talents, to explore the characteristics of the young scientific and technological talents' early career stages in the process of their growth, and then put forward reflections and suggestions[19]. Gao and Wang took the recipients of the "Scientific Exploration Award" as the research object, and used the resume analysis method to analyze the growth process of China's outstanding scientific and technological talents, and revealed their common growth characteristics[20]. Bai and Huang studied the factors affecting the growth effectiveness of the selected candidates under the "Hundred Talents Program" of the Chinese Academy of Sciences by using questionnaires and regression analysis[21].

The above research results have made important contributions to China's innovative talent cultivation and deepening the reform of talent development system and mechanism, but there are still some shortcomings in their research: Firstly, most of the research focuses on the growth path and influencing factors of academicians or the National Outstanding Young Scientists Fund and other individual talent program recipients, and cannot reveal the common growth influencing factors among the recipients of the various talent programs that exist; secondly, the research object only includes talent recipients, without highlighting the differences between

the growth paths of talents and non-talents; thirdly, most of the studies use qualitative or simple quantitative analysis methods to draw superficial conclusions, unable to reveal the deep relationship between various types of influencing factors; fourthly, most studies have not paid attention to the differences in the field of talent research and the regions where talents are located. However, it cannot be denied that there are differences in talent growth paths and influencing factors among different research fields and regions.

In summary, this paper combines system science theory and related methods to systematically study the influencing factors on the growth of economic and management talents in Sichuan Province. At the same time, this paper chooses a number of national and Sichuan Province's talent program recipients as the research object and joins the research object that has not been awarded the title of talent, so as to make the research sample more comprehensive. Finally, this paper uses methods such as correlation analysis and structural equation model to conduct a more in-depth quantitative analysis systematically, to excavate the hidden associations between the various influencing factors, and then to put forward targeted and operable policy recommendations for the relevant departments in Sichuan Province and implement them nationwide, to promote the development of national economic and management talents, and to cultivate more economic and management talents for the economic development of China's new era and support the cause of socialist modernization in China.

The contribution of this article to expanding our knowledge lies in advancing the research on the growth factors of a single type of economic and management talent to the research on the common factors of growth of multiple types of economic and management talents, building upon a research paradigm that focuses on the comparison of differences in the growth paths of talents and non-talents, advancing a research method that combines qualitative and quantitative methods when studying the influencing factors of talent growth, building upon a research paradigm that focuses on the impact of geographical location factors on talent growth.

The research contributions of this paper are summarized as:

1) Unlike previous studies that focused on only one type of talent growth factor, this paper extends the research object to multiple types of high-level economic and management talents such as academicians, national-level talents, and provincial-level talents, revealing the common growth influencing factors among the recipients of each type of economic management talent program.

2) In order to make the research sample more comprehensive, unlike previous studies which only take talent recipients as the research object to explore the important factors affecting the growth, this paper also adds the group without the title of talent to explore the differences between the growth paths of talents and non-talents, with a view to searching for the key factors affecting the growth of economic and management talents, so as to make the conclusions of the study more scientific and reasonable.

3) This paper adopts a variety of research methods to comprehensively analyze the influencing factors on the growth of economic and management talents in Sichuan Province, and on the basis of correlation analysis, adopts the methods of structural equation model to deeply investigate the influence of various influencing factors on the growth of talents, to dig out the potential correlation between the factors, and to deeply analyze the necessary conditions for

the growth of economic and management talents in Sichuan Province.

4) To control for the confounding effects of the diversity in talent research fields and geographical locations on talent development, this paper chooses the economic and management talents in Sichuan Province as the research object and comprehensively analyzes which factors play a vital role in the growth of economic and management talents, so as to make the research conclusions more accurate.

2 Research Hypotheses

2.1 Hypotheses on the Impact of Educational Experience on Talent Growth

Educational experience can improve the subject knowledge and skill level of talents, and enhance their innovation ability and practical ability, so as to promote the growth and development of talents. At the stage of doctoral graduate education, superior research conditions and a favorable academic environment are of great significance to the cultivation of scientific and technological innovation talents[15]. Overseas study can provide a more internationalized learning environment and cross-cultural exchange opportunities, broaden the international vision and language communication ability of talents, improve their ability of transnational cooperation and communication, thus contributing to the diversified development of education level[22]. The economic, cultural, and social environment of the city where the school is located also affects the quality and effect of the education received by the talents, and the city with the highest ranking will have better economic and social resources.

Educational experience can influence a talent's academic background and knowledge base, which are necessary to be a great talent. Educational experiences can also influence one's academic interests and research directions, often providing additional ideas and directions for the selection and development of part-time experiences. Based on this, the following hypotheses are proposed in this paper:

Hypothesis A1: Educational experience has a significant effect on talent growth;

Hypothesis A2: There is a significant effect of educational experience on part-time experience.

2.2 Hypotheses on the Impact of Work Experience on Talent Growth

Work experience allows people to accumulate rich work experience and skills, and its impact on talent growth has been widely noticed. Among them, overseas work experience and postdoctoral experience are considered to be able to expand the international perspective of scientific researchers, which in turn is important for the career development of talents[20]. Postdoctoral and overseas work experience can not only provide more academic research opportunities but also expose talents to advanced technology and management experience in the industry, thus accelerating their career growth. In addition, after the accumulation of the advantages of higher educational experience, choosing to work in an organization that matches the accumulation of the advantages to engage in their career is a "booster" for talent growth[17,23]. Talents choose to work in the higher-ranked units and the specialty of the school's first-class disciplines, which can help them get more career opportunities and development space. After receiving higher education, some economic and management talents will choose to teach in their schools in order

to have better access to academic resources and practice opportunities inside and outside the school, and to improve their academic research and teaching skills. At the same time, they can train more talents for the school and improve their own popularity and influence. Serving in administrative positions provides exposure to more industry information and management experience, and enhances management and leadership skills. In addition, work experience also affects the direction and content of the talents' research in the field of research, based on which the following hypotheses are proposed in this chapter:

Hypothesis B1: Work experience has a significant impact on talent growth;

Hypothesis B2: Work experience has a significant impact on research experience.

2.3 Hypotheses on the Impact of Research Experience on Talent Growth

As society develops, technological innovation has become a crucial indicator of national progress and an important criterion for assessing an individual's talent. Research experience refers to an individual's involvement in research projects or studies, including independent or collaborative completion of research tasks, participation in research projects or studies, and publication of papers or monographs, among others. Research experience plays a positive role in various aspects of an individual, such as academic proficiency, research direction, academic influence, innovation capability, and career development[14]. According to related research, early academic experience has a significant impact on later research outcomes. Based on the trajectory of technological talent growth, the quality of the early published papers might not be high. However, after a certain accumulation of knowledge and experience, with increasing age and a deeper exploration of research problems, individuals may gradually publish high-quality papers. This phenomenon is known as the "growth effect"[24]. The age at which an individual publishes their first paper is correlated with talent growth. In addition, the quantity and quality of academic accomplishments, as important outputs of scientific research, can reflect an individual's level of scientific research and research capacity and is also one of the important indicators for evaluating an individual's career achievement and development. In modern society, academic accomplishments are also a primary basis for evaluating an individual's academic status and influence[25]. Empirical research has found that the "h-index", a metric proposed by Hirsch for assessing scholars' contributions, is positively correlated with an individual's research ability and academic reputation[26]. Therefore, this article believes that the quantity, quality, and h-index of academic achievements are significantly positively related to talent growth.

Furthermore, diverse work experience can help individuals better understand various research directions and hot issues in different fields, thus enabling them to make more informed choices regarding their research direction. It also benefits research talent by exposing them to more practical problems and challenges, thereby enhancing their practical and problem-solving abilities. Simultaneously, during the work process, research talents gain a better understanding of the importance of teamwork and develop their teamwork skills. Ultimately, work experience provides research talents with more opportunities for academic exchanges, thereby improving their academic communication abilities and influence, which, in turn, facilitates further enhancement of their research capabilities. Additionally, research experience lays the groundwork for research achievements and awards. Based on this, the specific hypotheses proposed in this article are as follows:

Hypothesis C1: Research experience has a significant impact on talent growth;

Hypothesis C2: Research experience plays an intermediary role in the impact of work experience on talent growth;

Hypothesis C3: Research experience has a significant impact on talent growth award achievements.

2.4 Hypotheses on the Impact of Part-Time Experience on Talent Growth

Scientific and academic talents with more prestige are more likely to get more attention from academic institutions, groups, and organizations and social organizations[15,27]. Studies have shown that part-time experience is beneficial for talent growth, especially in terms of career development and skill acquisition. Part-time experience can not only provide individuals with the opportunity to learn skills, acquire knowledge, and develop competencies, but also help individuals build personal networks, gain experience in different work environments, and understand different work cultures. In addition, having a part-time position at a senior level can enrich individuals' resumes and make them more competitive in the job market[28]. Academic part-time jobs and periodical part-time jobs play an important role in promoting personal academic ability and achievements, which can help individuals deepen their understanding and knowledge in professional fields, expand opportunities for academic exchanges and collaborations, and promote their influence and status in the academic community. It also helps individuals to establish a wide range of contacts in the academic world, thus laying the foundation for future career development. Part-time jobs in corporate or government can help individuals learn about industry trends and patterns, improve their knowledge and understanding of policy formulation and implementation, and expand their social networks and resources. Based on this, this paper proposes the following hypothesis:

Hypothesis D: Part-time experience has a significant impact on talent growth.

2.5 Hypotheses on the Impact of Award Experience on Talent Growth

Award experience is regarded as one of the important factors in the process of talent growth. According to the social cognitive theory, getting awards is the recognition and affirmation of individual ability, knowledge, skills, and performance, which helps individuals form positive self-cognition and self-evaluation, further stimulate work motivation and innovation, and promote better performance in career development[29,30]. It has been shown that academic awards are an important external motivation for the operation of the modern academic system. The awards given to scholars who have already achieved academic results are intended to encourage and promote the further development of their academic research while fully affirming their academic achievements and academic value[31]. Talents who have won national scientific and technological awards and provincial and ministerial awards may be more likely to be hired and favored by universities and research institutes, and more likely to have easier access to funding and cooperation opportunities, which will enhance their professional status and income level, and further promote their career development and growth. Therefore, this paper hypothesizes that there is a significant positive relationship between the number of national awards and the number of provincial and ministerial awards received and talent growth. In addition, through interviews with experts in the field, it is found that the more research experience, the more

Award experience. This paper makes the following assumptions:

Hypothesis E1: Award experience has a significant impact on talent growth;

Hypothesis E2: Award experience plays an intermediary role in the influence of research experience on talent growth;

Based on the above assumptions, the theoretical model of this paper is shown in Figure 1.

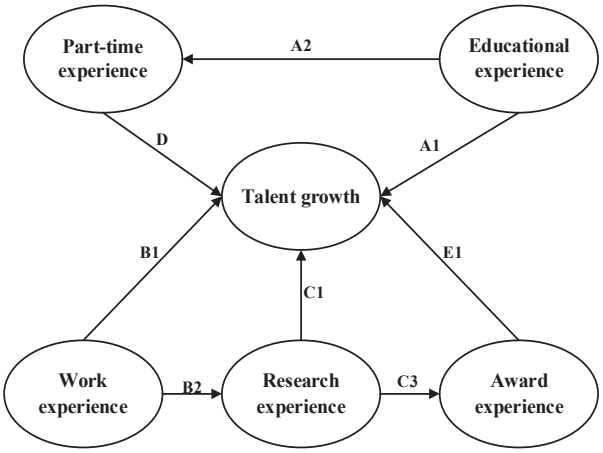

Figure 1 An empirical model of the influencing factors on the growth of economic and management talents in Sichuan Province

3 Research Design

3.1 Research Sample

The subjects analyzed in this paper are economic and management talents in Sichuan Province, mainly comprising 340 scholars from 53 higher education institutions in the province. These scholars include high-level economic and management talent such as academicians from the Chinese Academy of Sciences (CAS), national-level talents, and provincial-level talents. The data analysis primarily relies on their individual CVs, encompassing their educational background, work experience, research experience, part-time positions, and awards received. The data is organized and recorded in a self-developed database called "Brief information form for economic and management talent in Sichuan Province". The data collection mainly involves utilizing publicly available information resources such as the Internet.

3.2 Variable Measurement

1) Quantification of talent growth

This paper defines the quantitative standard of the growth of economic and management talents in Sichuan Province as the highest talent title obtained by the talents, which is quantified by assigning a value to the highest talent title obtained. The larger the value is, the better the growth is. Indicators of talent growth and quantification are shown in Table 1.

Table 1 Indicators of talent growth and quantification

Dependent variable	Quantitative criteria	Quantitative methods	Value	Reference
Talent growth	The highest talent award/title received	Academician of the Chinese Academy of Sciences	6	References [32, 33]
		National-Level Talent (National Science Fund for Outstanding Young Scholars, Changjiang ScholarNational Thousand Talents Program, National Ten Thousand Talents Program, State Council Special Allowance Expert, Foreign Academicians)	5	
		National-Level Young Talent (Young Thousand Talents Program, Young Leading Talents Program, Young Changjiang Scholars Program, Outstanding Youth Talents Program)	4	
		Provincial-Level Talents (Sichuan Province Distinguished Young Scholars Program, Academic Leaders, and Outstanding Contribution Expert)	3	
		Tianfu Talent Program, Qingcheng Talent Program, Emei Talent Program and New Century Talents Program	2	
		Sichuan Province Reserve Candidates	1	
		not awarded any talent title	0	

2) Quantification of influencing factors

This paper simplifies the influencing factors of talent growth in Sichuan province's economic management field into five dimensions: Educational experience, work experience, research experience, part-time experience, and award experience. Specific quantifiable indicators have been selected for each dimension.

① Indicators and quantification of educational experience

Higher education can be divided into undergraduate education and graduate education, where graduate education can further be categorized into Master's and Doctor's programs. Compared with undergraduate education, the quality of doctoral education is considered more crucial for talent growth[15]. Therefore, based on expert consultation, this article takes indicators such as doctoral school, doctoral major, location of doctoral school, overseas learning experience, and location of highest degree as a part of the educational background[34,35]. Indicators and quantification of educational background are shown in Table 2.

② Indicators and quantification of work experience

The postdoctoral experience of economic and management talents in Sichuan Province, the grade of the employing institution, the status of teaching in this university, the status of holding administrative positions, the specialties where they are currently working, and the overseas work experience are taken as the indicators of the impact of work experience on the growth of economic and management talents. Based on the relevant data compiled by the Ministry of Education's Science and Technology and social science statistics and the results of the expert consultation, the indicators were quantified and assigned scores, as shown in Table 3.

Table 2 Indicators and quantification of educational experience

Latent variable	Manifest variable	Quantitative criteria	Quantitative methods	Value	Reference
Educational experience	Doctoral School	Grade of school for doctoral studies	QS World Ranking Top 100 (Domestic: Tsinghua University, Peking University, Fudan University, Shanghai Jiao Tong University, Zhejiang University, and University of Chinese Academy of Sciences)	4	The 2023 QS World University Rankings
			QS World Ranking 101∼400+ Remove the top 100 QS World Ranking "985 Project" Universities	3	
			QS World Ranking 401∼800+ "211 Project" Colleges and Universities	2	
			QS World Ranking 801 or above + general universities in China	1	
	Major of doctoral studies	Whether the major of the doctoral degree is a first-class discipline of the university	Yes	1	"Double First-Class" discipline list
			No	0	
	Overseas study experience	Length of time studying abroad	In units of years		References [22, 23]
	The city where the doctoral degree school is located	Level of the city where the doctoral degree school is located	First-tier cities in China and the top 50 cities among the world's top 500 cities	4	2023 Global Top 500 Cities List, 2023 China City Classification List
			First-tier cities in China and the top 50 cities among the world's top 500 cities	3	
			Second-tier cities in China and cities ranked 200th to 500th among the world's top 500 cities	2	
			Other cities	1	
	The city where the highest qualification was studied	Yes	Whether the highest qualification was studied in Sichuan	1	Developed by the author
		No		0	

Table 3 Indicators and quantification of work experience

Latent variable	Manifest variable	Quantitative criteria	Quantitative methods	Value	Reference
Work experience	Postdoctoral experience	Postdoctoral or not	Yes	1	Developed by the author
			No	0	
	Current workplace	The grade of the employing institution	QS World Ranking Top 100 (Domestic: Tsinghua University, Peking University, Fudan University, Shanghai Jiao Tong University, Zhejiang University, and University of Chinese Academy of Sciences)	4	The 2023 QS World University Rankings
			QS World Ranking 101∼400+ Remove the top 100 QS World Ranking "985 Project" Universities	3	
			QS World Ranking 401∼800+ "211 Project" Colleges and Universities	2	
			QS World Ranking 801 or above + general universities in China	1	
	Teaching in schools	Whether or not teaching at the school of graduation	Yes	1	Developed by the author
			No	0	
	Participation in administrative posts	Whether or not holding an administrative position	Yes	1	Reference [32]
			No	0	
	Major in which you are currently working	Whether the major is a firstclass discipline of the university	Yes	1	List of "double firstclass" construction disciplines, Reference [19]
			No	0	
	Overseas work experience	Whether ever worked overseas	Yes	1	References [22, 23]
			No	0	

③ Indicators and quantification of research experience

Indicators of research experience[34] include the age of publishing the first academic paper as the first author, the publication of Chinese journals, the publication of English journals, the publication of academic monographs, the presidency of national major projects, the presidency of

national projects, the presidency of provincial and ministerial projects, academic achievements, the policy reports receiving instructions from national leaders, and the policy reports receiving instructions from provincial and ministerial leaders. The details are shown in Table 4.

Table 4 Indicators and quantification of research experience

Latent variable	Manifest variable	Quantitative criteria	Quantitative methods	Value	Reference
Research experience	Age at which the first academic paper is published as the first author	Age	In terms of units of years		Reference [34]
	Publication in Chinese journals	Number of publications in Chinese journals	In terms of the number of articles		Reference [34]
	Publication in foreign journals	Number of publications in English journals	In terms of the number of articles		Reference [34]
	Publication of academic books	Number of published academic monographs	In terms of the number of books		Reference [34]
	Hosting of major projects at the national level	Total number of national-level major projects hosted	In terms of the number of projects		Reference [36, 37]
	Hosting of national-level projects	Total number of hosting national-level projects	In terms of the number of projects		Reference [36, 37]
	Hosting of provincial and ministerial-level projects	Total number of provincial and ministerial level projects hosted	In terms of the number of projects		Reference [36, 37]
	Academic achievements	H-index			Reference [34]
	Policies reports receive endorsement by leaders at the national level	Whether policy reports have been approved by the national leaders	Yes	1	Developed by the author
			No	0	
	Policies reports receive endorsement by provincial and ministerial leaders	Whether policy reports have been approved by the provincial and ministerial leaders	Yes	1	Developed by the author
			No	0	

④ Indicators and quantification of part-time experience

Part-time experience, including three dimensions such as society, periodicals, and social part-time work. Among them, social part-time jobs can be further divided into corporate part-time jobs and government part-time jobs. In addition, this paper assigns a comprehensive cumulative value in the form of fixed-order variables according to the part-time level of societies and journals, combined with the corresponding part-time grades, as shown in Tables 5∼7.

Table 5 Indicators and quantification of part-time experience

Latent variable	Manifest variable	Quantitative criteria	Quantitative methods	Value	Reference
Part-time experience	Top societies' part-time jobs	Academic rank and corresponding position (See Table 6)	Society Assessment Value = Society Rank Score * 2 + Position * 1		
	Top journals' part-time jobs	Journal rank and corresponding position (see Table 7)	Journal Adjunct Assessment Value = Journal Grading Score * 2 + Position * 1		
	Part-time employment in a listed company	Whether previously held a part-time position in a listed company	Yes No	1 0	Developed by the author
	Participation in the administration of the Government	Whether previously held a part-time position in the government	Yes	1	Developed by the author

Table 6 Indicators and quantification of society ranks and positions

Ranks	Value	Positions	Value
National first-level societies	4	President (Chairman of the Board)	3
National first-level society sections	3	Vice-PresidentVice Chairman of the Board	2
Provincial societies	2	DirectorExecutive Director	1
Other	1		

Table 7 Indicators and quantification of journal grades and positions

Journal ranks	Value	Positions	Value
JCR Q1	4	Editor-in-chief	3
JCR Q2, CSSCI, and CSCD	3	Deputy Editor-in-chief	2
JCR Q3, Chinese Core Journals	2	Editorial Board Member	1
JCR Q4, Other Chinese Journals	1		

⑤ Indicators and quantification of award experience

In this paper, national and provincial awards are included in the quantitative indicators of award experience, as shown in Table 8.

To facilitate the use of influencing factors in the subsequent content, they are replaced with symbols, and the comparison is shown in Table 9.

3.3 Research Methods

This paper adopts a quantitative research method to explore the influencing factors on the growth of economic and management talents in Sichuan Province, mainly using the CV analysis method, correlation analysis, and structural equation model. The specific steps are as follows: Firstly, the CVs of 340 scholars are selected as the source of research data, then the data are analyzed using SPSSAU, then Pearson correlation coefficient is used to exploratively analyze the influencing factors of the growth of talents, and finally, structural equation model is used to carry out descriptive and correlation analyses on the influencing factors of the growth of talents in the economic management category in Sichuan Province and to validate the research hypotheses.

3.3.1 CV Analysis Method

Curriculum Vitae (CV) analysis method is a technique that has been applied more in research talent policy research in recent years, and it first originated from a research project named "Research Value Mapping (RVM)" carried out by Georgia Tech University in the United States. For researchers, CV records the growth history of scientific and technological talent, and the CV analysis method takes the curriculum vitae of scientific and technological talent as the data source, codes, and analyses it, and at the same time, with the help of corresponding relevant descriptive statistics and other analytical methods, it analyzes the career trajectory of scientific and technological talent, mobility mode, and the evaluation of scientific and technological talent

Table 8 Indicators and quantification of award experience

Latent variable	Manifest variable	Quantitative criteria	Quantitative methods
Award experience	Receipt of national-level awards	Number of national-level awards received	In terms of the number of awards
	Receipt of awards at the provincial and ministerial levels	Number of provincial and ministerial level awards received	In terms of the number of awards

Table 9 Correspondence of influencing factors and variables used

Variable	Influence factors
x_1	Grade of school for doctoral studies
x_2	Whether the major of the doctoral degree is a first-class discipline of the university
x_3	Overseas study experience
x_4	Level of the city where the doctoral degree school is located
x_5	Whether the highest qualification was studied in Sichuan
x_6	Postdoctoral or not
x_7	The grade of the employing institution
x_8	Whether or not teaching at the school of graduation
x_9	Whether or not holding an administrative position
x_{10}	Whether the major is a first-class discipline of the university
x_{11}	Overseas working experience
x_{12}	Age at which the first academic paper is published as the first author
x_{13}	Number of publications in Chinese journals
x_{14}	Number of publications in English journals
x_{15}	Number of published academic monographs
x_{16}	Total number of major national projects hosted
x_{17}	Total number of national-level projects hosted
x_{18}	Total number of provincial and ministerial level projects hosted
x_{19}	H-index
x_{20}	Whether policy reports have been approved by the national leaders
x_{21}	Whether policy reports have been approved by the provincial and ministerial leaders
x_{22}	Highest professional association part-time positions
x_{23}	Highest journal part-time positions
x_{24}	Whether previously held a part-time position in a listed company
x_{25}	Whether previously held a part-time position in the government
x_{26}	Number of national-level awards received
x_{27}	Number of provincial and ministerial level awards received
y_1	Talent title score

and organization and other issues based on the CV analysis method. In the existing research, the use of the CV analysis method to research science and technology policy or scientific research evaluation is mainly at three levels: The national level - scientific and technological personnel mobility mode research, the scientific community level - scientific and technological personnel career profiling and funding mode research, the individual level of researchers - scientific and

technological personnel career development research. Research on career development of scientific and technological personnel. In this paper, the biographical information of economic and management talents in Sichuan Province was collected, and specific information was selected and analyzed, including educational experience, working experience, research experience, part-time experience, as well as award experience, and the correlation between them[38].

3.3.2 Correlation Coefficients

Three major correlation coefficients statistically measure the correlation between data, which are Pearson, Spearman, and Kendall. These three correlation coefficients apply to the study of datasets of different natures, where Pearson's correlation coefficient is applied to the correlation analysis of continuous variables, and Spearman and Kendall correlation coefficients are applied to the correlation analysis of the categorical variables or the variables whose distribution is significantly non-normal or whose distribution is not known.

In this paper, we choose the commonly used Pearson correlation coefficient to measure the degree of linear correlation between variables. Pearson correlation coefficient was first designed by the statistician Karl Pearson as a statistical index to study the degree of linear correlation between variables, and it is measured from -1 to $+1$, reflecting the direction of the trend of the change and the degree of the change between the two variables, with 0 indicating that the two variables are not correlated, and the positive value indicating positive correlation, and the negative value indicating negative correlation. Pearson correlation coefficient is the ratio of covariance to standard deviation, and its formula is:

$$r = \frac{\sum_i (x_i - \hat{x})(y_i - \hat{y})}{\sqrt{\sum_i (x_i - \hat{x})^2 (y_i - \hat{y})^2}}, \tag{1}$$

where x_i represents the value of the first variable for the ith sample, y_i represents the value of the second variable for the ith sample, $\hat{x}$ is the mean of the first variable, and $\hat{y}$ is the mean of the second variable.

3.3.3 Structural Equation Model

The structural equation model is a factor analysis method that combines qualitative and quantitative methods, consisting of measurement equations and structural equations[39–41]. The measurement equations reflect the relationships between latent variables and observed variables, while the structural equations reflect the relationships between latent variables. The specific form of the structural equation model is as follows:

1) Measurement Model

The relationship between observed variables and latent variables can be represented by measurement equations: The measurement equation for x is:

$$x = \Lambda_x \xi + \delta. \tag{2}$$

The measurement equation for y is:

$$y = \Lambda_y \eta + \varepsilon, \tag{3}$$

where x represents a vector of exogenous variables and y represents a vector of endogenous variables. Λ_x represents the factor loading matrix of exogenous indicators on the exogenous latent variable, while Λ_y represents the factor loading matrix of endogenous indicators on the endogenous latent variable. δ represents the error term of the exogenous variable x, and x represents the error term of the endogenous variable y.

2) Structural Model

The relationship between latent variables can be represented by structural equations:

$$A = (I - B) - I\eta = B\eta + \Gamma\xi + \varsigma, \tag{4}$$

where η represents the endogenous latent variables, η represents the exogenous latent variables, B represents the relationships between endogenous latent variables, Γ represents the relationships between exogenous and endogenous latent variables, and ς represents the residual term, which represents the unexplained portion in the structural equation.

The above model must satisfy the following conditions: (i) ε and η are uncorrelated; (ii) δ and ξ are uncorrelated; (iii) ς and ξ are uncorrelated; (iv) ς, ε, and δ are uncorrelated.

4 Research Results Analysis

4.1 Correlation Analysis

Through data collection and processing, this paper obtained resume information from 340 economic management professionals in Sichuan Province. Based on the research hypothesis, 27 factors influencing the growth of economic management professionals were collected. In this paper, all economic management professionals were quantified and scored based on the highest talent title they obtained. A higher score indicates better growth and greater development potential. Subsequently, this paper used the CV analysis method to obtain rating data and classified the data into five levels based on the Likert five-point scale, with scores of 0, 1, 2, 3, and 4. For binary variables (0-1), the level assumption for variable 0 is 0, and for variable 1 is 5[42]. Furthermore, correlation analysis was conducted to explore the relationship between these 27 influencing factors and talent growth. A higher correlation indicates a greater impact of the factor on talent growth. The correlation results, calculated using the Pearson correlation coefficient, are presented in Table 10.

Based on the results shown in Table 10, it can be observed that talent growth has a significant positive correlation at the 0.01 level with the following factors: 'Whether or not holding an administrative position', 'Whether the major is a first-class discipline of the university', 'Number of publications in Chinese journals', 'Number of publications in English journals', 'Number of published academic monographs', 'Total number of major national projects hosted', 'Total number of provincial and ministerial level projects hosted', 'H-index', 'Whether policy reports have been approved by the national leaders', 'Highest professional association part-time positions', 'Highest journal part-time positions', 'Number of national-level awards received', and 'Number of provincial and ministerial level awards received'. Furthermore, talent growth has a significant positive correlation at the 0.05 level with the following factors: 'Whether the major of the doctoral degree is a first-class discipline of the university', 'Level of the city where the doctoral degree school is located', 'The grade of the employing institution', 'Age at which the

Table 10 Pearson correlation coefficients

Factors influencing	Correlation coefficient with talent growth
Grade of school for doctoral studies	0.090
Whether the major of the doctoral degree is a first-class discipline of the university	0.114*
Overseas study experience	0.085
Level of the city where the doctoral degree school is located	0.109*
Whether the highest qualification was studied in Sichuan	−0.106
Postdoctoral or not	0.004
The grade of the employing institution	0.116*
Whether or not teaching at the school of graduation	0.083
Whether or not holding an administrative position	0.194**
Whether the major is a first-class discipline of the university	0.226**
Overseas working experience	0.066
Age at which the first academic paper is published as the first author	0.125*
Number of publications in Chinese journals	0.379**
Number of publications in English journals	0.241**
Number of published academic monographs	0.355**
Total number of major national projects hosted	0.353**
Total number of national-level projects hosted	0.353**
Total number of provincial and ministerial level projects hosted	0.142**
H-index	0.243**
Whether policy reports have been approved by the national leaders	0.221**
Whether policy reports have been approved by the provincial and ministerial leaders	0.134*
Highest professional association part-time positions	0.454**
Highest journal part-time positions	0.192**
Whether previously held part-time position in a listed company	0.011
Whether previously held part-time position in the government	0.092
Number of national-level awards received	0.351**
Number of provincial and ministerial level awards received	0.379**

Note: $*$, $**$ indicate statistical significance at $p < 0.05$ and $p < 0.01$, respectively, based on significance tests.

first academic paper is published as the first author', and 'Whether policy reports have been approved by the provincial and ministerial leaders'. This suggests that for talent in the field of economic management, the major and the city where the doctoral institution is located have a significant impact on talent growth. The better the major and the more developed the city, the more beneficial it is for talent growth. In the work experience stage, the quality of the employing institution and the discipline it belongs to also have a positive impact on talent growth. Additionally, holding administrative positions helps develop personal abilities, so it is also beneficial for talent growth. Research ability is the most direct criterion for evaluating talent, and it can be seen from the correlation analysis results that for talent in the field of economic management, publishing high-quality papers and monographs as early as possible and in greater quantities, undertaking more and larger projects, actively participating in policy consultation, and writing policy reports to support government decision-making are all helpful for talent growth. At the same time, serving as part-time positions in relevant academic societies and journals, and actively engaging in academic exchanges are beneficial for understanding the forefront of research and expanding research perspectives, which also contribute to talent growth. Finally, receiving provincial or even national awards for personal research is a recognition and encouragement for individual research, which also helps in further talent growth.

According to the results of the correlation analysis, it can also be seen those seven factors, namely, 'Grade of school for doctoral studies', 'Overseas study experience', 'Postdoctoral or not', 'Whether or not teaching at the school of graduation', 'Overseas working experience', 'Whether previously held part-time position in a listed company' and 'Whether previously held part-time position in the government' do not have a significant effect on the growth of economic and management talents. There is no significant positive correlation between these seven factors and the growth of economic and management talents, which indicates that in the education stage, the grade of doctoral institutions or overseas study experience will not significantly help the growth of talents, and the key is to develop research horizons and choose the right research direction in the work experience stage. Postdoctoral and overseas work experience does not help the growth of talents, and staying in the university to work after graduation will not promote the growth of talents, which indicates that the growth of talents mainly depends on individual research. This indicates that the growth of talents mainly depends on individual research direction and efforts, not on the choice of workplace. In addition, working part-time in enterprises or the government does not significantly help the growth of talents. The possible reason is that working part-time in enterprises or the government compresses the time for personal research, which is more detrimental than beneficial to the growth of talents. Finally, the correlation coefficient between the factor 'Whether the highest qualification was studied in Sichuan' and the growth of talents is negative, indicating that studying for a doctoral degree in the province has a negative impact on talent growth. There are two possible reasons for analyzing this. Firstly, the talents themselves. Those who have studied their highest degree in the province may be less likely to make the decision to step out of their comfort zone, which is not conducive to expanding their research horizons. This may hinder their progress after reaching a certain goal. Secondly, the impact of talent attraction policies in Sichuan Province. It is possible that a large number of top talents are being attracted from outside the province,

resulting in a negative correlation in the statistical analysis. The highest degree of talent not enrolled in Sichuan tends to be higher, while a large number of local talents in Sichuan have a lower level. Therefore, a negative correlation is observed.

4.2 Analysis of Talent Influencing Factors Based on Structural Equation Model

4.2.1 Structural Equation Model and Adjustment

Based on the correlation analysis of influencing factors in the previous two sections, this section selects educational background, work experience, research experience, part-time experience, and award experience as latent variables influencing the growth of economic and management talents in Sichuan Province. Combining the causal relationship hypotheses proposed in Subsection 2.1 and the correlation analysis of influencing factors in the previous two sections, significant correlation factors are incorporated into the structural equation model. However, the initial model does not pass the goodness-of-fit test, as shown in Table 11. In each attempt

Table 11 Indicators for evaluating the overall fitness of the model

Specific indicators	Description of indicators	Evaluation criteria	First test results	Second test results	Third test result	Fourth test result
χ^2/df	Cardinality/ degrees of freedom	<3.00	3.353	2.412	2.284	2.609
GFI	Goodness-of-fit index	>0.900	0.87	0.924	0.921	0.935
RMSEA	Root mean square error of approximation	<0.050	0.083	0.065	0.062	0.069
RMR	Root mean square residual	<0.050	0.076	0.074	0.072	0.08
CFI	Comparison of fit indices	>0.900	0.667	0.828	0.819	0.84
NFI	Normed fit index	>0.900	0.596	0.748	0.728	0.774
NNFI	Non-normed fit index	>0.900	0.584	0.768	0.764	0.765
TLI	Tucker-lewis index	>0.900	0.584	0.768	0.764	0.765
AGFI	Adjusted goodness -of-fit index	>0.900	0.819	0.884	0.884	0.89
IFI	Incremental fit index	>0.900	0.678	0.835	0.827	0.847
SRMR	Standardized root mean square residual	<0.100	0.074	0.059	0.059	0.058

to build the structural equation, the indices, including χ^2/df, RMSEA, RMR, CFI, NFI, NNFI, TLI, AGFI, and IFI, fail to meet the standard requirements. Since the structural equation demands that there be at least two factors in each latent variable for model building, adjustments can only be made based on the influencing factors from work experience and research experience, as educational background, part-time experience, and award experience have only two relevant factors. Consequently, factors x_6, x_{12}, x_{14}, x_{17}, x_{18}, x_{19}, and x_{20} were removed based on the magnitudes of their path coefficients. Finally, the last test results show that while the CFI, NFI, NNFI, and TLI indices have not yet reached the standard level, they are close to the standard values. Thus, the M.I adjustment method is considered. The test results of the adjusted model are shown in Table 12, where all the indices meet the standard requirements. Based on the remaining influencing factors x_2, x_4, x_7, x_{10}, x_{13}, x_{15}, x_{16}, x_{22}, x_{23}, x_{26}, and x_{27}, the interaction paths between variables in this chapter's structural equation are formed. This is done to explore the effects and mechanisms of different influencing factors on talent growth in various experiences. Furthermore, an analysis of the observed variables for each latent variable is conducted to determine the observed variables of the latent variables and construct measurement paths. The resulting structural equation model to be tested is shown in Figure 2.

Table 12 Indicators for evaluating overall model fit

Specific indicators	Initial test results	M.I. Modified Test Results
χ^2/df	2.235	1.416
GFI	0.957	0.973
RMSEA	0.060	0.035
RMR	0.087	0.042
CFI	0.899	0.968
NFI	0.838	0.904
NNFI	0.845	0.948
TLI	0.845	0.948
AGFI	0.921	0.947
IFI	0.903	0.970
SRMR	0.054	0.041

4.2.2 Validation Factor Analysis

This section comprehensively examines the overall fit of the constructed model in this paper using various indicators such as χ^2/df, GFI, RMSEA, RMR, CFI, NNFI, TLI, AGFI, IFI, and SRMR. From Table 12, it can be observed that before adjustment, the initial test results did not meet the model fit criteria for the CFI, NFI, NNFI, and TLI indicators. Using the M.I. model, the initial model was adjusted by introducing correlations among the manifest variables and allowing for residual covariances during this process. After the adjustment, the four indicators that did not meet the standards achieved satisfactory model fit: CFI was 0.968, RMR was 0.042,

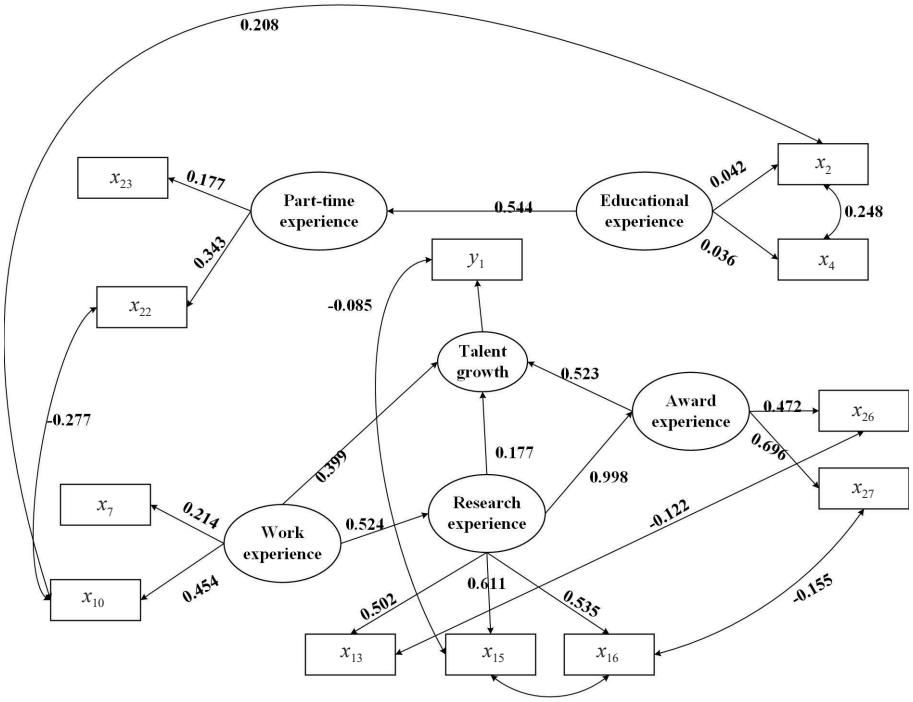

Figure 2 Path coefficients for the growth influence mechanism of economic and management talents in Sichuan Province

NNFI was 0.948, and TLI was 0.948. These values meet the criteria proposed by Browne and Cudeck[43]. Additionally, both GFI and AGFI were greater than 0.90, meeting the requirements for absolute fit. SRMR and RMSEA were both less than 0.05, indicating that the model complexity was reasonable and met the fit criteria. NNFI, TFI, CFI, RFI, IFI, and AGFI were all greater than 0.90, indicating that the maximum likelihood estimation was well-evaluated and stable, particularly for small samples, in line with the parameter estimation method used in this paper. With other fit indicators meeting the criteria, an RMSEA less than 0.05 confirms a reasonable model fit, implying a good alignment between the theoretical model proposed in this paper and the collected sample data.

4.2.3 Talent Growth Path Result Analysis and Hypotheses Testing

According to the adjusted structural equation model settings, the non-standardized parameter estimates, standardized parameter estimates, standard errors (S.E.), critical ratios (C.R.), and significance (P) values of each dimension's path are shown in the table. The standard error (S.E.) reflects sampling errors, and smaller values indicate more representative sample statistics and higher credibility of the estimated parameter values. The critical ratio (C.R.) represents the ratio of the parameter estimate to the standard error. When C.R. (1.96, 2.58), the parameter estimate is significant at the 0.05 level, and when C.R. exceeds 2.58, the parameter estimate is significant at the 0.01 level. From the model parameter estimation results in the table, it can be observed that some parameter values have standard errors at an unreasonable level, and both their C.R. and P values did not pass the significance test. In the preliminary structural

equation model, the significance test results for the impact of different factors on talent growth mechanisms are shown in Table 13. The path coefficient for research experience to talent growth was 0.03, which did not pass the significance test, indicating that there is no significant correlation between research experience and talent growth. Similarly, the path coefficient for award experience to talent growth was 0.466, which also did not pass the significance test, indicating no significant relationship between award experience and talent growth. In other words, these two factors have no impact on talent growth, which is inconsistent with the actual situation. Therefore, the structural equation model was adjusted based on the results in the table, and the M.I. method was used for adjustment. The significance test results for the impact of different factors on talent growth mechanisms are shown in Table 14. The path coefficient diagram of the talent growth influence mechanism model, along with significance test results, is presented in Figure 2.

Table 13 Significance test of the model of the mechanism of influence of different influencing factors on the growth of talents (before adjustment of structural equations)

X	→	Y	Unstandardized regression coefficients	SE	z (CR value)	p	Standardized regression coefficients
Educational experience	→	Part-time experience	11.947	6.217	1.922	0.055	0.488
Work experience	→	Research experience	0.873	0.289	3.018	**	0.599
Work experience	→	Talent growth	3.621	1.384	2.615	*	0.583
Research experience	→	Awards experience	1.145	0.203	5.652	***	0.947
Research experience	→	Talent growth	0.127	4.346	0.029	0.977	0.03
Awards experience	→	Talent growth	1.640	3.454	0.475	0.635	0.466
Educational experience	→	x_4	1.000	-	-	-	0.034
Educational experience	→	x_2	4.081	2.056	1.985	0.047	0.058
Work experience	→	x_{10}	3.178	1.072	2.965	**	0.333
Work experience	→	x_7	1.000	-	-	-	0.228
Research experience	→	x_{16}	1.599	0.266	6.015	***	0.569
Research experience	→	x_{15}	2.119	0.311	6.813	***	0.627
Research experience	→	x_{13}	1.000	-	-	-	0.491
Part-time experience	→	x_{23}	0.317	0.076	4.156	***	0.175
Part-time experience	→	x_{22}	1.000	-	-	-	0.315
Award experience	→	x_{27}	3.102	0.453	6.846	***	0.724
Award experience	→	x_{26}	1.000	-	-	-	0.456
Talent Growth	→	y_1	1.000	-	-	-	0.749

Note: → indicates regression effect relationship or measurement relationship. *, **, *** indicate that each measure of the measurement equation passes the significance test when $p < 0.05$, $p < 0.01$, $p < 0.001$, respectively.

Table 14 Significance test of the model of the mechanism of influence of different influencing factors on the growth of talents (after adjustment of structural equations)

X	→	Y	Unstandardized regression coefficients	SE	z (CR value)	p	Standardized regression coefficients
Educational experience	→	Part-time experience	13.749	7.259	1.894	*	0.544
Work experience	→	Research experience	0.831	0.255	3.263	***	0.524
Work experience	→	Talent growth	2.485	0.887	2.800	**	0.399
Research experience	→	Awards experience	1.227	0.221	5.545	***	1.000
Research experience	→	Talent growth	0.695	0.202	3.443	**	0.177
Awards experience	→	Talent growth	1.673	0.248	6.755	***	0.523
Educational experience	→	x_4	1.000	-	-	-	0.036
Educational experience	→	x_2	2.780	1.647	1.688	0.091	0.042
Work experience	→	x_{10}	4.628	1.621	2.855	**	0.454
Work experience	→	x_7	1.000	-	-	-	0.214
Research experience	→	x_{16}	1.470	0.240	6.118	***	0.535
Research experience	→	x_{15}	2.022	0.291	6.953	***	0.611
Research experience	→	x_{13}	1.000	-	-	-	0.502
Part-time experience	→	x_{23}	0.293	0.068	4.295	***	0.177
Part-time experience	→	x_{22}	1.000	-	-	-	0.343
Awards experience	→	x_{27}	2.876	0.400	7.183	***	0.696
Awards experience	→	x_{26}	1.000	-	-	-	0.472
Talent growth	→	y_1	1.000	-	-	-	0.705

Note: → indicates regression effect relationship or measurement relationship. *, **, *** indicate that each measure of the measurement equation passes the significance test when $p < 0.05$, $p < 0.01$, $p < 0.001$, respectively.

By summarizing and analyzing the path coefficients in the previous path diagrams, the following conclusions are drawn:

1) Various factors → direct effect test on different experiences

From the test results of the direct effect of various factors on different experiences in the growth of talents in the model run: In educational experience, the standardized path coefficient of whether the major of the doctoral degree is the first-class discipline of the school and educational experience is 0.042, which is higher than the standardized path coefficient of the city of the school where the doctoral degree is located (a few tiers) and educational experience with the value of 0.036. However, compared with the city where the doctoral degree is located, whether the doctoral degree is a first-class discipline does not pass the test of significance. However, the test of significance was not passed for whether the major was a top-tier discipline in the school. In work experience, the standardized path coefficient between whether the major of the university is a first-class discipline and work experience is 0.454, which is significant at 0.05 level, indicating that whether the major of the university is a first-class discipline significantly and positively affects work experience. The path coefficient of the work unit is 0.214, which is lower than the value of whether the major is a first-class discipline of the school, indicating that its influence on work experience is weaker than the latter. In research experience, the standardized path coefficient between the number of published academic monographs and work experience is 0.611, which has a significant positive effect at the 0.001 level. The standardized path coefficient between the total number of national major projects and work experience is 0.535, which passes the significance test at the 0.001 level, indicating that it also has a significant positive effect on work experience. Meanwhile, the path coefficient of the number of published Chinese journals is 0.502. Comparing the path coefficients of the above three factors, the path coefficient of the number of published academic monographs is the largest, the path coefficient of the total number of national major projects is the second largest, and the path coefficient of the number of published Chinese journals is the smallest, which indicates that the publication of academic monographs has the greatest impact on research experience. In part-time experience, the path coefficient of part-time status of the highest journal and the part-time experience is 0.177, and it passes the significance level test of 0.001, which indicates that it has a significant positive influence on part-time experience, but since its path coefficient is smaller than that of part-time status of the highest institute, part-time status of the highest institute has the greatest positive influence on part-time experience. Among the award experiences, the standardized path coefficient of provincial and ministerial award situation and award experiences is 0.696 and passes the significance test of 0.001, indicating that it has a significant positive influence on award experiences, while the standardized path coefficient of national award situation and award experiences is 0.472, whose value is lower than that of the path coefficient of the national award situation, which indicates that the growth of the economic and management talents in Sichuan Province may be more easily influenced by the influence of provincial and ministerial level award situation.

2) Different experiences → Talent growth direct effect test

From the model to run the direct effect test results of the impact of different experiences on the growth of talent: Before the model adjustment, only work experience had a significant pos-

itive impact on talent growth, and the impact of other experiences did not pass the significance test. After the adjustment, the impact of different experiences is mainly analyzed from three dimensions: Work experience, research experience, and award experience. The standardized path coefficient of work experience on talent growth is 0.77, and it passed the significance test at the 0.05 level. The standardized path coefficient of research experience on talent growth is 0.70, and it passed the significance test at the 0.05 level. The standardized path coefficient of award experience on talent growth is 0.523, and it passed the significance test at the 0.001 level, indicating that award experience had a significant positive effect on talent growth. However, this does not mean that there is no relationship between educational experience and part-time experience, and talent growth. Specifically, educational experience is related to the number of papers and academic monographs published in research experience and the reward situation in award experience. Part-time experience is also related to award experience. In addition, the standardized path coefficient between educational experience and part-time experience is 0.544, and it passed the significance test at the 0.01 level, indicating that educational experience had a significant positive effect on part-time experience. By comparing the standardized path coefficients of three kinds of experiences on talent growth, it can be seen that work experience has a relatively large impact on talent growth. Based on the above analysis, this section tests the research hypotheses in Section 2, and the results are shown in Table 15.

Table 15 Results of research hypotheses testing

Coding	Hypotheses	Test results
A1	Educational experience has a significant impact on talent growth	Reject
A2	Educational experience has a significant effect on part-time experience	Accept
B1	Work experience has a significant effect on talent growth	Accept
B2	Work experience has a significant effect on research experience	Accept
C1	Research experience has a significant effect on talent growth	Accept
C2	Research experience mediates the effect of work experience on talent growth	Accept
C3	Research experience has a significant effect on award experience	Accept
D	Part-time experience has a significant effect on talent growth	Reject
E1	Award experience has a significant effect on talent growth	Accept
E2	Award experience mediates the effect of research experience on talent growth	Accept

4.3 Discussion of Results

From the above results, the structural equation model used in this section has high reliability and validity, and there is a clear mutual influence relationship between the selected primary latent variables (educational experience, work experience, research experience, part-time experience, and award experience) and the selected manifest variables. All research hypotheses were supported, the model fits well with the real data, and a unique growth path for Sichuan's economic and management talents is obtained:

Firstly, work experience, research experience, and award experience are the main factors affecting the growth of Sichuan's economic and management talents, and economic and management talents are mainly trained by Sichuan Province itself. As can be seen from Figure 2 of path coefficients, the coefficient of work experience on talent growth is 0.77, that of research experience on talent growth is 0.70, and that of award experience on talent growth is 0.52. These data indicate that work experience, research experience, and award experience have direct and significant positive effects on the growth of Sichuan's economic and management talents, work experience has the greatest impact, followed by research experience, and award experience has the smallest impact. This is related to the fact that western regions vigorously support the development of higher education, although award experience has the smallest impact, but it can also bring some reputation and opportunities. Moreover, work experience also positively affects research experience. And due to Sichuan Province's weaker economic situation than eastern developed regions, its advantages in terms of cultural atmosphere, infrastructure, and governance environment are not obvious enough, which leads to weak attraction for talents with better education background, while two-thirds of Sichuan's economic and management talents stay in Sichuan after obtaining their highest degree, which also reflects that Sichuan's economic and management talents mainly rely on their own cultivation.

Secondly, working in double first-class universities and working in first-class disciplines of their own schools are conducive to the growth of Sichuan's economic and management talents. According to the experimental results, the grade of work unit and whether the work discipline is a first-class discipline are important factors in measuring work experience. In samples of different levels of talent, 72.59% of talents work in double first-class universities in Sichuan Province, and talents whose work discipline is first-class have higher talent titles. This is because although Sichuan Province's overall education development level ranks among the upper middle level in China, there are only eight double first-class universities, which is far fewer than the eastern developed regions. However, most talents are concentrated in these universities, leading to increased competition among talents. Furthermore, Sichuan Province combines its university characteristics with special policies and precise resource support to build characteristic economic management disciplines such as management science and political economy at Sichuan University, economics at Southwestern University of Finance and Economics, and business administration at Chengdu University of Technology. These are all products of this model, and Sichuan Province and universities continue to invest resources in these characteristic disciplines, which also provides more resources for economic and management talents, thus facilitating their growth.

Thirdly, the more academic monographs published and the more major national projects

presided over, the easier it is for Sichuan's economic and management talents to grow into national talents. However, the greater the number of published papers, the better the economic and management talents in Sichuan Province do not necessarily grow. The experimental results show that the number of academic monographs published, the number of major national projects presided over and the number of Chinese journals published are the main factors affecting research experience. This is because publishing academic monographs is a reflection of the achievements of talents in-depth research and discussion in a certain field or discipline, and the number of major national projects presided over reflects a high level of scientific research innovation ability, which is an important manifestation of their scientific research level. According to the size of path coefficients, the number of Chinese journals published is not as important as the former two, indicating that the number of papers published is not an important indicator to evaluate a talent's growth, and there is no "only SCI papers", because in the experimental results, the number of English journals published is not a main factor affecting talent growth either. Among the 370 research samples, 153 talents published more than nine academic monographs, 23 talents undertook more than two major national projects, and these two factors basically meet the more the number, the better the talent growth. It is worth noting that there are 288 people who have published more than 30 Chinese journals, among which 53 are not talents, and the more papers published, the better the talent may not grow. Therefore, under the current background of "breaking five only", Sichuan's economic and management talents pay more attention to comprehensive growth. This is also consistent with the policy requirements of the Sichuan Provincial Department of Human Resources and Social Security that high-skilled talents will no longer be restricted by academic qualifications, papers, and foreign languages for professional title evaluation.

Fourthly, the more times Sichuan's economic and management talents win provincial and ministerial level or above awards, the better their growth. According to our research results, winning national awards and provincial and ministerial awards are especially important for talent growth, and winning provincial and ministerial awards can better affect talent's award experience. Only 66 people have won national awards, four of whom are not talents. Compared with universities in developed eastern regions, Sichuan's economic and management talents may be limited by scientific research and social resources in western regions, resulting in fewer people with different levels of talent winning national awards in research samples, which makes it impossible to analyze the impact of national awards on talent growth in depth. However, the higher level of economic and management talents win more national awards. Among 66 people who have won provincial and ministerial awards five times or more, only two are not talents, and winning more awards makes it easier to grow into higher-level talents. At present, there are many talent projects in Sichuan Province, which may have a negative social impact of excessive profit-seeking: universities' introduction of talents, performance rewards, and other aspects of the "only hat" phenomenon is still very common, making it very urgent for talents to return to scientific research and education.

Fifthly, although educational experience and part-time experience do not significantly affect the growth of Sichuan's economic and management talents, the better their educational experience is, the easier it is to positively affect their part-time experience. The educational

experience of Sichuan's economic and management talents does not significantly affect their growth. This is because most of Sichuan's economic and management talents graduated from double first-class universities in Sichuan Province, and there is not much difference in school level. Part-time experience did not pass the significance test either, but this does not mean that these two latent variables have any impact on talent growth at all. The experiment shows that whether the doctoral major is a first-class discipline of school and city level where the doctoral school is located are main factors affecting talent educational experience. This is because the city level where the school is located determines the city's economic conditions, cultural atmosphere, infrastructure, and governance environment, which provide material, institutional and cultural guarantees for talent growth. Moreover, first-class disciplines are more likely to affect talent growth than first-class universities. In addition, the highest academic association part-time situation and highest journal part-time situation are main factors affecting talent part-time experience. Talents' academic part-time work in academic associations and academic journals brings them more academic opportunities and recognition, which helps them expand their own academic influence and positively affects their own growth. The possible reason why these two latent variables do not have a significant impact on talent growth is that talent resumes are not standardized, resulting in incomplete information collection about these two latent variables, thus affecting test results. Furthermore, experimental results show that educational experience positively affects part-time experience. This is because the growth of Sichuan's economic and management talents is deeply influenced by Sichuan Province's building of characteristic economic management disciplines. Economic and management talents have received more infrastructure and resource support, which also means that economic and management talents have more opportunities to communicate and cooperate with more academic associations and journals, thus expanding their own academic influence and enriching their part-time experience. Besides, talent's award experience cannot be separated from the support of educational experience, work experience, and research experience.

5 Conclusions

In the context of the national implementation of the strategy to strengthen the country with talents and the strategy of innovation-driven development, this paper synthesizes the theoretical basis of previous research and system science theory, combines correlation analysis and structural equation model to systematically investigate the factors influencing the growth of economic and management talents in Sichuan Province. The study findings are as follows: 1) Work experience, research experience, and award experience all exhibit significant positive effects on talent growth, with the impact on talent growth ranked in the following order: Work experience, research experience, and award experience. 2) Research experience acts as a mediator in the relationship between work experience and talent growth, while award experience serves as a mediator in the relationship between research experience and talent growth. 3) Work experience significantly influences research experience, and research experience significantly impacts educational experience. 4) Educational experience and part-time experience do not significantly affect talent growth, but educational experience significantly influences part-time experience.

5.1 Theoretical Contributions

This paper examines the impact of educational experience, work experience, research experience, part-time experience, and award experience on the growth of economic and management talents, providing further validation of previous findings regarding talent growth. Regarding educational experience, although previous studies have highlighted its significant role in talent growth[44], the empirical results of this paper indicate that this factor does not exhibit a significant influence. Further analysis suggests that this outcome may be influenced by the sample data used in this paper. The participants in our sample are talented individuals who have received various accolades in different higher education institutions in Sichuan Province. Due to their career trajectories, a majority of these individuals are scholars who have obtained doctoral degrees from prestigious universities. As a result, the data within our sample demonstrates a high level of consistency regarding educational experience, which ultimately leads to the non-significant impact of educational experience on talent growth.

In terms of work experience, it is widely acknowledged that work experience plays a crucial role in the growth process of economic and management talents[17]. The empirical results of this paper also confirm the direct positive impact of work experience on talent growth. Additionally, research experience has been identified as an important factor in the growth and development of talents[15], and our empirical findings support this assertion. Regarding part-time experience, many researchers have highlighted its potential for providing developmental opportunities and fostering talent growth[15,19]. However, our experimental results indicate that part-time experience did not pass the significance test. We speculate that this outcome may be influenced by our sample data. This paper utilized CV analysis to collect talent data, and during the data collection process, we observed an inverse relationship between the richness of CV content and talent level, particularly in terms of part-time experience. Many high-level talents did not provide detailed descriptions of their part-time experience on their CVs. This discrepancy between the collected data and the actual situation may have affected the empirical results of this paper. Regarding award experience, our empirical results demonstrate a significant positive impact on talent growth. This finding supports the notion that receiving awards has a beneficial effect on the growth of economic and management talents.

Starting from the perspective of the growth of economic and management talents in Sichuan Province, this paper simultaneously explores the influence of educational experience, work experience, research experience, part-time experience, and award experience on the development of economic and management talents. This research enriches the existing literature on the antecedents of talent growth, as most previous studies have focused on specific job titles or winners of funding projects to identify factors that positively impact talent growth. Few studies have specifically examined the growth of economic and management talents, and even fewer have explored growth factors in a provincial administrative region. Recognizing this gap, our study focuses on economic and management talents as the research subject and investigates the key factors affecting their growth in Sichuan Province, using relevant data from the region. By constructing a model of the factors influencing the growth of economic and management talents in Sichuan Province, we find that work experience, research experience, and award experience have a significant positive impact on talent growth. Additionally, educational experience

and part-time experience also contribute positively to the growth of economic and management talents in Sichuan Province. These findings enhance the existing empirical research in this field.

This paper also examines the mediating effects of research experience and award experience to further explore the mechanisms through which various influencing factors impact the growth of economic and management talents in Sichuan Province. Some studies have concluded that research experience effectively promotes talent growth, while a few have explored the mediating effect of research experience between work experience and talent growth, specifically from the perspective of academic awards. However, very few studies have analyzed the mediating effect of award experience between research experience and talent growth, again from the perspective of academic awards. This paper not only verifies the positive effect of research experience on the growth of economic and management talents but also investigates the impact of work experience and award experience, finding that they do not significantly influence talent growth. Furthermore, the mediating effects of research experience and award experience are discussed. It is discovered that research experience influences the growth of economic and management talents in Sichuan Province through work experience, while award experience affects talent growth through research experience. These findings further enrich our understanding of the mechanisms underlying talent growth by exploring the impact of different factors.

This paper also analyzes the causal relationships between different variables to explore the role and influence mechanisms of each influencing factor in different dimensions on talent growth. Previous studies have examined the effects of educational experience, work experience, research experience, part-time experience, and award experience on talent growth[17,19]. However, they have not delved into how the various factors within each dimension specifically contribute to talent growth. This paper employs path analysis to investigate the direct effects of these factors on different dimensions of experience. The findings reveal that within educational experience, the most crucial factor is whether the doctoral major belongs to a top university discipline, as it exhibits the largest standardized path coefficient. Within work experience, the major being a top university discipline significantly and positively influences work experience. In terms of research experience, the number of published academic monographs has the most significant effect on work experience, with the highest standardized path coefficient. Among part-time experience, the part-time position within the highest-ranked society has the most positive influence. Regarding award experience, provincial and ministerial awards emerge as the most important influencing factors, exerting a significant positive impact. These findings contribute to a better understanding of the relative importance of different factors within various dimensions on the growth of economic and managerial talents. They enrich the existing research on talent growth.

5.2 Policy Implications

First and foremost, it is crucial to strongly support the development of first-class disciplines in universities in western regions. The status of a doctoral program as a first-class discipline is a significant factor that influences talent cultivation. Therefore, the government should increase financial investments in the establishment of first-class disciplines in western universities. Special funds or grants can be allocated to support research projects, faculty recruitment, and equipment upgrades, thereby enhancing the research capabilities and academic strength of these

disciplines. Furthermore, it is important to continue promoting educational collaboration and support between eastern and western regions. The existing program that fosters partnerships between universities in the eastern and western regions should be sustained and expanded. This will expedite the establishment of first-class disciplines in universities located in western regions. These measures will contribute to improving the academic quality and competitiveness of universities in western regions, fostering a favorable environment for talent growth and development.

Secondly, it is crucial to encourage universities in the western region to engage in extensive academic exchanges. Part-time involvement in academic societies and journals plays a significant role in talent growth. Therefore, strong support should be provided to researchers in economic and management fields in western universities and colleges to actively participate in both domestic and international academic exchange activities. To facilitate this, financial support can be allocated to establish special funds or projects dedicated to supporting academic exchange activities in western universities. These funds can be utilized to sponsor scholars' participation in academic conferences, seminars, lectures, and other events, as well as to support collaborative research projects conducted by academic teams. Additionally, appropriate incentives can be provided to researchers in economic and management fields who have made significant contributions to important societies and journals over an extended period. Such incentives will encourage researchers to actively engage in the work of societies and journals. By implementing these measures, academic collaboration and exchange will be enhanced, fostering a vibrant intellectual environment that nurtures the growth and development of talents.

Thirdly, it is important to further eliminate the "SCI-only theory". Research findings indicate that the number of publications in Chinese journals is a crucial factor in talent growth, while the number of publications in English journals does not have a significant effect. Therefore, in the current context of moving beyond the narrow focus on "publishing in top-tier international journals," it is necessary to shift towards a more comprehensive assessment of talent and establish a diversified evaluation system for scientific research. This evaluation system should consider various indicators such as paper quality, academic influence, innovation, and social impact to comprehensively assess the value and contribution of research results. Moreover, it is essential to encourage and support the development of Chinese academic journals in the fields of economics and management. This can be achieved by providing more publishing opportunities for Chinese papers and promoting the academic caliber and international influence of Chinese journals. Furthermore, when evaluating scientific research outcomes, importance should be given to their impact on society and practical applications. The government can establish incentive mechanisms to encourage research projects and researchers who have achieved significant results in addressing real-world economic management challenges and promoting social progress. By adopting these measures, we can foster a more inclusive research evaluation system that recognizes the value of diverse publications and the societal impact of research, ultimately promoting the advancement of economic and managerial knowledge.

5.3 Shortcomings and Prospects

Firstly, regarding the research subjects, we focused solely on economic and management scholars from the 53 higher education institutions in Sichuan Province. This group primarily

includes high-level economic and management talents such as academicians of the Chinese Academy of Sciences, national talents, provincial talents, and other esteemed individuals in the field. As such, the conclusions drawn may not be universally applicable to all economic and management talents. In future studies, it would be beneficial to expand the scope to include research institutes, state-owned enterprises, and well-known corporations. This broader approach would provide a more diverse range of findings.

Secondly, in terms of data collection, this paper utilizes the CV analysis method to obtain CV information of economic and management talents due to limitations in survey channels and costs. However, this method has certain limitations, such as the difficulty in collecting complete information on educational experience and award experience from online sources. In the future, as statistical capabilities strengthen and big data progresses, more accurate, reasonable, and comprehensive data collection methods can be adopted. These may include the use of questionnaire surveys or interviews, which could enhance the reliability and validity of the research findings. Additionally, it is worth considering the introduction of a time dimension for long-term tracking and comparative analyses. This approach would provide a better understanding of the dynamic changes and trends in the growth of economic and management talents. Overall, by adopting more advanced data collection methods and incorporating a time dimension, future research can enhance the accuracy and depth of analysis in examining the growth of economic and management talents.

Thirdly, in terms of the selection of influencing factors, although common and key factors affecting talent growth have been identified through the literature review process, it is possible that some influencing factors have been overlooked. In future research, it is important to explore other potential influencing factors more comprehensively, considering the policy context and theoretical foundation. This will allow for the improvement and validation of the influencing factors system, further enriching our understanding of the growth of economic and managerial talents.

References

[1] Huang Q. The theoretical logic, strategic implication and policy system of the new development pattern: An economic modernization perspective. Economic Research Journal, 2021, 56(4): 4–23.

[2] Tang D, Liu X, Ni H, et al. The changing global economic land scape and China's potential growth rate and high-quality development in the post-epidemic era. Economic Research Journal, 2020, 55(8): 4–23.

[3] Yang Y, Xu J, Wang Y. The global status and core strategic path of the development of western China from the geographical perspective in the new era. Economic Geography, 2023, 43(2): 22–32.

[4] Li N, Shi M, Zhang Z, et al. Analysis on policy effects of integration of Yangtze River economic belt based on a multi-regional CGE model. Chinese Journal of Management Science, 2020, 28(12): 67–76.

[5] Wu W. Strategies and opportunities for the western development 2.0 edition. Practice (Education Version of the Party), 2020, 704(7): 29–30.

[6] Wang K, Xiong Y, Li J. Research on the evaluation of talent policy competitiveness between Sichuan and other economic big provinces of China. Science & Technology for Development, 2019, 15(8): 825–832.

[7] Kreider L E. The development and utilization of managerial talent: A case study of manufacturing managers in Columbus, Ohio. The Ohio State University, 1968.

[8] Quek C G. A national study of scientific talent development in Singapore. The College of William and Mary, 2005.

[9] Al Aina R, Atan T. The impact of implementing talent management practices on sustainable organizational performance. Sustainability, 2020, 12(20): 8372.

[10] Mohammed A A, Hafeez-Baig A, Gururajan R. A qualitative research to explore practices that are utilised for managing talent development in the higher education environment: A case study in six Australian universities. Journal of Industry-University Collaboration, 2019, 1(1): 24–37.
[11] Verginer L, Riccaboni M. Talent goes to global cities: The world network of scientists' mobility. Research Policy, 2021, 50(1): 104127.
[12] Subotnik R F, Stoeger H, Olszewski-Kubilius P. Talent development research, policy, and practice in Europe and the United States: Outcomes from a summit of international researchers. Gifted Child Quarterly, 2017, 61(3): 262–269.
[13] Qu Q, Gao S, Niu P. Research on the flow law of Chinese strategic scientific and technological talents in different growth stages — Taking 281 academicians of Chinese academy of engineering as an example. Forum on Science and Technology in China, 2023(3): 104–114.
[14] Qu Q, Gao S, Wang P, et al. Research on the growth path of strategic science and technology talents based on the perspective of survival analysis. Forum on Science and Technology in China, 2022(7): 157–166.
[15] Xiao M, Tang X. How to evaluate talents in philosophy and social sciences: An empirical study based on the factors affecting the growth of Changjiang Scholars. Administrative Tribune, 2018, 25(5): 106–116.
[16] Zhang Y. A study on the academic growth characteristics of high-level talents from the perspective of bibliometrics. Southeast University, 2016.
[17] Tang L, Cai X, Wang W. Empirical analysis of winners of Peking University's outstanding young scholars fund: Measurement of factors influencing the growth of academic elite based on SEM model. Chinese University Science & Technology, 2021(Z1): 10–14.
[18] Cui Y, Shen L. Career performances of the first excellent young scientists fund winners in 2012. Forum on Science and Technology in China, 2022(10): 157–168.
[19] Chen J. Relationship between group characteristic and growth of young scientific and technological talents: Based on winner's resume analysis of the Excellent Young Scientists Fund of the National Natural Science Foundation of China from 2012 to 2020. Science and Technology Management Research, 2022, 42(14): 111–122.
[20] Gao D, Wang B. The growth process and characteristics of outstanding young scientific and technological talents in China — Based on the resume analysis of the winners of "Scientific Exploration Award". Scientific Management Research, 2022, 40(2): 139–146.
[21] Bai X, Huang Z. Influencing factors of growth effectiveness of high-level young talents by taking the Hundred Talents Program of CAS as an example. Science Research Management, 2015, 36(12): 138–145.
[22] Lan Q, Huang J, Li F. Research on the influence mechanism of overseas high-tech talents reflux on China's regional economic development: An empirical analysis based on the threshold effect. Science and Technology Management Research, 2019, 39(10): 114–119.
[23] Huo M. Research on the influence of overseas experience on the academic internationalization of local university teachers — Based on the analysis of 27 financial colleges and universities in China. Dongbei University of Finance and Economics, 2021.
[24] Li X, Wang B, Gan G. Research on the quality evaluation system for talent cultivation of doctoral tutors: From the perspective of the quality of academic achievements of science and engineering doctoral students. Academic Degrees & Graduate Education, 2017, 294(5): 28–33.
[25] Zhou J, Yan H, Sun L. A study of career development path and the influencing factors of researchers in China. Science Research Management, 2019, 40(10): 126–141.
[26] Hirsch J E. An index to quantify an individual's scientific research output. Proceedings of the National Academy of Sciences, 2005, 102(46): 16569–16572.
[27] Ma Y. The effects of administrative position on Chinese scientist's paper publications. Studies in Science of Science, 2017, 35(11): 1614–1622.
[28] Allen T D, Golden T D, Shockley K M. How effective is telecommuting? Assessing the status of our scientific findings. Psychological Science in the Public Interest, 2015, 16(2): 40–68.
[29] Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 1977, 84(2): 191.
[30] Colbert A E, Mount M K, Harter J K, et al. Interactive effects of personality and perceptions of the work situation on workplace deviance. Journal of Applied Psychology, 2004, 89(4): 599.
[31] Zuo Y. Establishment of Chinese modern academic awarding system. Historical Research in Anhui, 2008(2):

58–67.

[32] Wang Y H, Zhang G, Liu X, et al. Research on the boosting role of funds and rewards in the growth of young S&T talents: Take the winners of the Excellent Youth Scientist Fund as an example. Science and Technology Talents of China, 2022, 65(3): 9–21.

[33] Yuan B. An empirical study on the influence of the "One Hundred Project" on the development of philosophy and social science talents in Beijing. Beijing: Beijing Jiaotong University, 2017.

[34] Zhang Y Z, Zhao W, Peng J. The impact of educational experiences on the growth of high-level technology talents in China — Taking energy field as an instance. Forum on Science and Technology in China, 2012, 28(3): 118–123.

[35] Zong L. Exploring the growth patterns of outstanding top talent: Starting from the higher education experiences of two academy members graduated from universities after the reform and opening. China Higher Education, 2005, 41(Z2): 15–16.

[36] Tang C Y, Xu J B, Mao S B. Fuzzy configuration analysis of the differences in growth environments for two types of scientific and technological talents. Studies in Science of Science, 2023: 1–15.

[37] Jiang L, Dong W C, Liu X G. Research on the growth patterns of outstanding academic talent in innovation: A quantitative analysis based on the status of young "Yangtze Scholars" group. China University Teaching, 2018, 34(1): 87–91.

[38] Xia Y. Research on the advantage accumulation role of "Double First Class" doctoral tutors in science and engineering based on CV analysis. Changchun: Jilin University, 2021.

[39] Zhang E, Yang W. Empirical analysis in the relationship between the consumption and economic growth based on the structural equation model. Journal of Systems Science and Information, 2016, 4(5): 419–427.

[40] Zhang G, Wang Z, Zhao H. Relationships among perceived value, satisfaction, and e-Trust: An e-CRM view of online restaurant consumption. Journal of Systems Science and Information, 2020, 8(5): 458–475.

[41] Fan Q, Zhong W. Variable selection for structural equation with endogeneity. Journal of Systems Science & Complexity, 2018, 31(3): 787–803.

[42] Zhang N, Tian F. Talent ecological environment, growth expectation and willingness of overseas talents' backflow. Human Resources Development of China, 2022, 39(9): 114–128.

[43] Browne M W, Cudeck R. Alternative ways of assessing model fit. Sociological Methods & Research, 1992, 21(2): 230–258.

[44] Qu Q, Wang J, Tang M, et al. Research on the growth law and impact factors of scientific and technological talents based on logical growth model: Taking the marine scientific and technological talents as an example. Science and Technology Management Research, 2021, 41(12): 157–164.