A Study on the Difference of College Students' Perception of Social Recognition of Entrepreneurship in Guangdong-Hong Kong-Macao Greater Bay Area

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Abstract: Whether the society recognizes the entrepreneurship of college students in the Guangdong-Hong Kong-Macao Greater Bay Area can affect their willingness to carry out entrepreneurial activities. By dividing the social recognition of entrepreneurship into three dimensions: society, school and family, this paper explores the social recognition of entrepreneurship perceived by university students in Guangdong-Hong Kong-Macao Greater Bay Area. First, SPSS and AMOS were used to test the reliability and validity of the collected questionnaires, then Chi-square test was used to analyze the differences of sample individuals, and the difference analysis method was used to analyze the data. Then Logistic regression was used to analyze the influencing factors of the perception of social recognition of entrepreneurship. The results show that there are differences in the perception of social recognition of entrepreneurship among college students in Guangdong-Hong Kong-Macao Greater Bay Area. The perception of social recognition of entrepreneurship among rural college students is lower than that of urban college students. Training level and family members' experience are also the reasons for the difference, but they involve different dimensions.

Keywords: Social recognition of entrepreneurship; Guangdong-Hong Kong-Macao Greater Bay Area; College student

1. Introduction

The Guangdong-Hong Kong-Macao Greater Bay Area, comprising the two Special administrative regions of Hong Kong and Macao and the nine Pearl River Delta cities in Guangdong Province, is a model for high-quality development in China and a leader in Chinese-style modernization. It plays a strategic role in China's development pattern. To

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promote the construction and development of the Guangdong-Hong Kong-Macao Greater Bay Area, the Central Committee of the Communist Party of China and The State Council issued the Outline of the Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area. The Outline mentions the word "innovation" 139 times, mentions the word "entrepreneurship" 25 times, and proposes three modules: building an open regional collaborative innovation community, creating a high-level scientific and technological innovation carrier and platform, and optimizing the regional innovation environment. While providing more practical opportunities and development space for innovation and entrepreneurship activities in the Guangdong-Hong Kong-Macao Greater Bay Area, it also indirectly shows that innovation and entrepreneurship activities are an important part of the construction of the Guangdong-Hong Kong-Macao Greater Bay Area. The Guangdong-Hong Kong-Macao Greater Bay Area has a number of institutions of higher learning with important influence in China and even in the world, and actively responds to the call of "innovation and entrepreneurship" to pay attention to the cultivation of students' innovative and entrepreneurial ability. The number of university students and graduates has increased, which has provided a reserve army of high-quality talents for entrepreneurial activities in the Greater Bay Area. In recent years, the research topic of social recognition has gradually attracted the attention of scholars. Wang Yuan, Zhou Liujun (2023) and Ma Jun (2023) studied the social recognition of current vocational education from the perspectives of social psychology and social identity threat interpretation respectively[1][2]. Sun Fengshan (2022) studied the social recognition of higher vocational colleges from the aspect of social service function[3]. However, there are few researches on social recognition in the field of entrepreneurship. For example, Yunchuan Chen and Jingjing Chen (2019) took college students as subjects to study the impact of social recognition on entrepreneurial self-efficacy[4]. Pan Bingru (2018) constructed a relational model to explore how social recognition affects college students' entrepreneurial passion[5]. All of the above studies took social recognition as the antecedent variable to conduct the research, that is, the follow-up analysis and research were carried out on the premise of a high degree of social recognition. This paper focuses on the social recognition itself to study the social recognition of entrepreneurship of college students in the Guangdong-Hong Kong-Macao Greater Bay Area, that is, to study whether college students in the Guangdong-Hong Kong-Macao Greater Bay Area have a high degree of social recognition of entrepreneurship, and whether the society can recognize the entrepreneurship of college students in the Guangdong-Hong Kong-Macao Greater Bay Area, which has an important impact on college students' entrepreneurial self-efficacy and entrepreneurial passion. The country vigorously calls for "mass entrepreneurship and innovation" and encourages young talents and college students to innovate and start businesses. If the society recognizes and supports their entrepreneurial behavior, it will have a great promotion effect, encourage them to better realize entrepreneurship and add new impetus to China's economic development, which is also the significance and value of this study.

2. Literature review and research hypothesis

2.1 Literature Review

Social recognition is also social identity. Tafel and Turner (1986) defined social identity as the concentrated embodiment of common beliefs and values owned by members of a social group,

and believed that social identity is a part of self-concept and will affect individual social attitudes and social behaviors[6], such as the public's behavior toward college students' entrepreneurship. We refer to the degree of social recognition or recognition as social recognition. Simply put, social recognition refers to the public's recognition of a certain social phenomenon and social event, including the recognition of career choice, personal ability and self-concept at the individual level. The influence of social recognition on individuals is mainly based on cognitive theory. The core idea of the theory is the subjective initiative view of human beings, that is, people are capable of self-organization, self-control and self-reflection, which is driven by the external environment and internal driving force. Bandura (1989) believes that individuals' recognition of the environment can enable them to regulate themselves according to their environment and exercise self-control over their actions[7], that is to say, individuals' cognition of the social attitude toward college students' entrepreneurship will affect their behavior.Therefore, social recognition has an important impact on individual self-cognition and can form an internal driving force for subsequent entrepreneurial behavior(Heise,1982)[8]. Generally speaking, the higher the degree of self-recognition, the stronger the sense of self-efficacy and the more confidence in self-realization.

Most of the existing studies involve social recognition of entrepreneurship in the study of entrepreneurial willingness, entrepreneurial passion, entrepreneurial self-efficacy and other topics, and scholars measure this variable through a scale. Different scales have different design questions and subdivision dimensions, but in general, they mainly cover three major dimensions: society, school and family. In a society that recognizes entrepreneurship, individuals can feel great entrepreneurial happiness and emotional support, and get entrepreneurial resources to a certain extent, which is also true for college students. When individuals feel the rationality of entrepreneurial behavior in the society, the social entrepreneurial atmosphere is strong, and the government also issues supportive policies, they will feel the recognition of their entrepreneurial behavior by others and the society, improve their entrepreneurial happiness, and be more willing to choose entrepreneurship and make greater efforts (Li Huihui et al., 2020)[9]. Pan Bingchao and Lu Genshu (2020) believe that entrepreneurship education can impart entrepreneurial knowledge to students, form a theoretical foundation, and enable students to master entrepreneurial practical skills and turn theories into practice[10]. In the context of "mass entrepreneurship", major schools have responded to the call of the state and the government to carry out entrepreneurship education and entrepreneurship competitions for college students, formulate rules and regulations such as entrepreneurship support for college students, and escort college students' entrepreneurship. The investment of such educational resources and the formulation of regulations create a good entrepreneurial atmosphere on campus, which shows that the school attaches great importance to and recognizes entrepreneurship to a certain extent. According to Krueger et al. (1993), therefore, college students will be more confident and bold in choosing the direction of entrepreneurship[11]. Entrepreneurship has certain resource requirements, complexity and risks. College students are not completely independent and need family support, and the prerequisite for obtaining such support is that family members, especially parents, recognize and affirm entrepreneurial behavior. Zhong Yunhua, Wu Libao and Xia Jiao (2016) believe that family members' attitude towards college students' entrepreneurship will directly affect their mentality, and college students who are recognized and supported by their parents will show more confidence and determination[12].

2.2 Research Hypothesis

College students have not achieved complete independence and have no stable income. The initial funds for starting a business mainly come from their parents. When facing challenges and difficulties, they also hope to seek support and help from the closest people (Zhong Yunhua et al,2016)[12]. Zhang Jianhua and Chen Baofeng (2007) found in their research that the degree of economic development in the region where individuals live will affect their entrepreneurial intention. Cities have more entrepreneurial resources than rural areas, and families will give more support[13]. Although the National Bureau of Statistics shows that the relative income gap between urban and rural residents in China has continued to narrow over the past decade, there is still a significant income gap between urban and rural residents. Compared with urban households, rural households have less income to cover daily living expenses or to save money on a normal basis. In addition to capital, there is also a certain gap in the concept of entrepreneurship. Parents of rural families are exposed to fewer new things, and their thoughts are relatively closed. They have insufficient knowledge and understanding of entrepreneurship. They usually hold negative emotions towards entrepreneurship and are unwilling to let their children choose such risky behaviors. Urban parents often do the opposite. Therefore, the first hypothesis is proposed:

H1: Rural college students' social recognition of entrepreneurship is lower than that of urban college students.

Junior college students and undergraduates can be referred to as college students, and graduate students include master's students and doctoral students. Katz J A (2003) pointed out that entrepreneurship education in universities can actively guide college students' entrepreneurial behavior[14]. At the same time, Guo hong et al (2009) believe that college students' experiences in school actually affect their individual characteristics, from entrepreneurial education to entrepreneurial knowledge accumulation to entrepreneurial ability[15]. In this process, students' entrepreneurial mentality will gradually change. School experience is not limited to educational courses, but also includes participation in practical activities, extracurricular exchanges and so on. The individual characteristics of students with different school experiences are different, especially among students with different training levels. Therefore, this paper holds that the different ways and depth of entrepreneurship education in colleges and universities at different levels, as well as the different learning focus and research pressure of students at different training levels, may lead to different perceptions of social recognition of entrepreneurship among college students. Therefore, the second hypothesis is proposed:

H2: There are differences in the perception of social recognition of entrepreneurship between college students and postgraduates.

Entrepreneurship means facing the society and needs to accept the test from the society. Being in the society, college students can perceive the social attitude towards entrepreneurship from the aspects of policies formulated by the government, the implementation results of the policies, and the repercussions caused by the society, etc., and affect the social recognition of entrepreneurship. It should be noted that the main scope of college students' life is the school campus, and they only stay in the stage of knowing the policies that appear and are implemented in society, and have fewer opportunities to personally feel the implementation effects and social effects of policies. When someone indirectly conveys these messages to

college students through their actual experience, and this person is a member of their family, they have a higher degree of trust, and thus perceive more social recognition of entrepreneurship. Therefore, a third hypothesis is proposed:

H3: The presence or absence of family entrepreneurship experience will cause the difference in the perception of social recognition of entrepreneurship.

3. Research design

3.1 Data collection

Based on the research of existing literature, this paper divides the social recognition of entrepreneurship into three dimensions, namely society, school and family, designs questions according to each dimension, and uses the Likert 5-point scale to measure the perceived degree of social recognition of entrepreneurship among college students in the Guangdong-Hong Kong-Macao Greater Bay Area. Each item is a positive view about entrepreneurship, and the respondents are asked to choose the corresponding recognition degree according to their own views, 1-5 indicates very disapprove - very approve.

The social dimension and the school dimension are mainly adjusted based on the scale developed by Du Yueping, Ma Yuankai, Wang Linxue(2016)[16] to meet the purpose of this study. The social dimension items include four items: "The government provides supportive measures for college students to start their own businesses" and "the social effect brought by entrepreneurship policies is relatively positive". The school dimension item includes four items, such as "the school offers relevant entrepreneurship courses" and "the school creates a good atmosphere for students to start businesses". The family dimension mainly adopts the scale developed by Huang Yutao (2021)[17], which includes four items, including "My family will provide me with practical and specific help for starting a business" and "I can get emotional help and support from my family when I need it". After the questionnaire passed the pre-survey, we distributed and recovered it on the network. A total of 400 questionnaires were recovered, and 383 valid questionnaires were obtained after eliminating invalid data, with a recovery rate of 95.75%. After the collection is completed, the data is coded and the average of each score is calculated as the social recognition perceived score of the survey object, so as to facilitate the subsequent further research.

3.2 Research Methods

Scholars have adopted a variety of methods to conduct research on differences, including Chi-square test (Hu Xiumei et al, 2012)[18], independent sample T-test (Ding Zeling, 2020)[19], analysis of variance (Ding Zeling, 2020)[19], quadrant analysis(Katz J A, 2003)[14], factor analysis(Guo hong et al, 2009)[15], multiple regression(Zhang Jianhua et al, 2007)[13], etc. In order to comprehensively analyze the different characteristics of the survey objects and draw on the research methods of other scholars(Zhou Lingyuan et al,2019; Zheng Dejun et al,2016)[20][21] , this study will use a combination of various methods to analyze the perceived differences in social recognition of entrepreneurship among Guangdong, Hong Kong and Macao university students. Descriptive statistical analysis method is used to summarize the distribution characteristics of data samples and summarize the overall characteristics

represented by the calculated data. The Chi-square test analysis method was used to compare the differences of sample individuals. Variance analysis and independent sample t test were used to analyze the differences in entrepreneurial social recognition perception. Logistic regression was used to analyze the influencing factors of social recognition perception of entrepreneurship. The perceived scores of entrepreneurial social recognition of college students in Guangdong-Hong Kong-Macao Greater Bay Area were determined by the average of the overall scores of each dimension.

3.3 Reliability and validity test

This paper mainly uses SPSS and AMOS software to test the reliability and validity of the questionnaire. The α coefficient of social dimension was 0.764, that of school dimension was 0.847, and that of family dimension was 0.868, which passed the reliability test. KMO values were 0.775, 0.784, and 0.832, respectively, all greater than 0.7, and Bartlett sphericity test all passed the significance test, indicating a high degree of correlation between each item and a good questionnaire structure. The factor load of each variable in each dimension is greater than 0.5, indicating that each item can better measure its dimension content. The CR of school dimension was 0.8482 and CR of family dimension was 0.869, both greater than 0.7; the AVE of school dimension and family dimension were 0.5854 and 0.624, respectively, both greater than 0.5, indicating that the scale had good convergence validity. Reference was made to Fornell and Larcker (1981) that the convergent efficiency of the structure is still sufficient when AVE is slightly less than 0.5 but CR is higher than 0.6[22]. Therefore, even if AVE of the social dimension is 0.461, slightly less than 0.5, but CR is 0.7732 > 0.6, the scale of this dimension still shows sufficient convergence. Specific data are shown in Table 1. Through calculation, the data fitted by the confirmatory factor analysis model of the questionnaire are as follows: CMIN/DF was 2.629, RMSEA was 0.065, GFI was 0.947, NFI was 0.935, RFI was 0.915, IFI was 0.958, CFI was 0.958, all of which passed the fitting criteria, indicating a good degree of questionnaire fitting. Specific data are shown in Table 2.

Table 1. Reliability and validity test of scale

Variable dimension	Item	Factor loading	α	KMO	Significance	CR	AVE
Social dimension	Q1	0.700	0.764	0.775	0.00	0.7732	0.461
	Q2	0.730					
	Q3	0.622					
	Q4	0.659					
School dimension	Q5	0.660	0.847	0.784	0.00	0.8482	0.5854
	Q6	0.708					
	Q7	0.826					
	Q8	0.850					
Family dimension	Q9	0.746	0.868	0.832	0.00	0.869	0.624
	Q10	0.808					
	Q11	0.815					
	Q12	0.789					

Table 2. Model fitting parameter table

Fitting index	CMIN/DF	RMSEA	GFI	NFI	RFI	IFI	CFI
Fitting standard	<3	<0.08	>0.90	>0.90	>0.90	>0.90	>0.90
Result of operation	2.629	0.065	0.947	0.935	0.915	0.958	0.958
	Pass	Pass	Pass	Pass	Pass	Pass	Pass

4. Result Analysis

4.1 Descriptive analysis

The sample included 125 males and 258 females, mainly college students from Guangzhou, Shenzhen, Foshan, Dongguan and other cities in the Guangdong-Hong Kong-Macao Greater Bay Area as well as non-Bay Area cities, covering many majors such as business management, law, philosophy, history and undergraduate and postgraduate degrees. The specific samples are shown in Table 3.

Table 3. Sample descriptive statistics

Variable	Category	Frequency	Percent
Sex	Male	125	32.6%
	Female	258	67.4%
Age	Age 20 and under	108	28.2%
	21-25 years old	264	68.9%
	26-30 years old	6	1.6%
	Age 31 and older	5	1.3%
Source	Urban	244	63.7%
	Rural	139	36.3%
Profession	Economics and management law	140	36.6%
	Literature, history and philosophy	66	17.2%
	Science and engineering	114	29.8%
	Agricultural medicine	18	4.7%
	other	45	11.7%
Level of education	College student	329	85.9%
	Postgraduate	54	14.1%
Whether family members have entrepreneurial experience	Yes	208	54.3%
	No	175	45.7%
Household registration location	Guangzhou	101	26.4%
	Shenzhen	51	13.3%
	Zhuhai	6	1.6%
	Foshan	31	8.1%
	Huizhou	20	5.2%

	Dongguan	30	7.8%
	Zhongshan	17	4.4%
	Jiangmen	10	2.6%
	Zhaoqing	7	1.8%
	Hong Kong	3	0.8%
	Macau	0	0%
	Non-guangdong-hong Kong-Macao Greater Bay Area	107	27.9%
Parental occupation	Heads of Party organs, state organs, mass organizations and social organizations, enterprises and institutions	42	11%
	Professional technical personnel	44	11.5%
	Clerical and related personnel	25	6.5%
	Social production service and life service personnel	74	19.3%
	Agriculture, forestry, animal husbandry, fishery production and auxiliary personnel	40	10.4%
	Manufacturing and related personnel	50	13.1%
	Military personnel	0	0%
	Other practitioners who cannot be classified	108	28.2%

4.2 Logistic regression analysis

Refering to the study of Li Yawen et al. (2022)[23], this study analyzed and studied the influencing factors of entrepreneurial social recognition perception through binary Logistic regression model. In order to ensure the smooth completion of Logistic regression analysis, the perceived score of entrepreneurial social recognition is coded as 0 if it is less than or equal to 3, that is, it is considered that there is no perceived entrepreneurial social recognition. If the score is greater than 3, it is coded as 1, that is, it can perceive the social recognition of entrepreneurship.

Distribution function:

$$logit(Y) = \ln(\frac{p}{1-p}) = \beta_0 + \beta_1\chi_1 + \beta_2\chi_2 + \beta_3\chi_3 + \cdots\cdots + \beta_i\chi_i + \mu \qquad (1)$$

In formula (1), $\ln（\frac{p}{1-p}）$is the dependent variable. It represents the natural logarithm of the ratio of the probability of perceived social recognition of entrepreneurship to the

probability of not perceiving social recognition of entrepreneurship. p is the occurrence probability of perceived entrepreneurial social recognition, β_0 is the intercept, χ_1, χ_2, χ_3,……, χ_i 和 β_1, β_2, β_3,……, β_i represent the independent variable and regression coefficient respectively. The results are shown in Table 4.

The origin of college students in Guangdong-Hong Kong-Macao Greater Bay Area and whether their family members have entrepreneurial experience can affect their social recognition of entrepreneurship. College students from cities have a higher perception of social recognition of entrepreneurship, and college students with family members have a higher perception of social recognition of entrepreneurship. In addition, due to the fact that the subjects of the questionnaire are concentrated in undergraduates, which is significantly more than the samples of students at other training levels, there are fewer samples of graduate students, and there may be a large error in the regression calculation of this data. However, the comparison of all the collected data of college students' social recognition through analysis of variance shows that there are still significant differences. This conclusion still provides an academic basis for subsequent recommendations.

Table 4. Logistic regression model of influencing factors of entrepreneurial social recognition perception

Independent variable	B	Standard error	Exp(B)
Gender (female)			
Male	-0.006	0.333	0.994
Source (rural)			
City	0.211*	0.318	0.810
Level of education (postgraduate)			
College student	0.071	0.414	1.074
Major (other)			
Economic,management and law	-0.292	0.547	0.747
Literature, history and philosophy	-0.423	0.603	0.655
Science and engineering	-0.462	0.550	0.630
Agriculture and medicine	-0.310	0.802	0.733
Family members have any entrepreneurial experience (none)			
Yes	1.022*	0.315	2.778
Constant	1.712	0.673	5.538

Note: The parentheses are for the control group.

4.3 Chi-square test analysis

Chi-square test and calculation of mean and variance(Mo Zuying et al, 2023)[24]were performed on 383 data. From the average point of view, college students in Guangdong-Hong Kong-Macao Greater Bay Area have a good perception of the social dimension, school dimension and family dimension of social recognition of entrepreneurship, with the average value ranging from 3.475-3.825, among which the social dimension has the highest perception

evaluation, followed by school dimension and family dimension. Chi-square test was used to obtain the social recognition of entrepreneurship and its sub-dimensions, Chi-square value, degree of freedom and progressive significance, and all P-values were less than 0.05, indicating that the respondents had different scores for each item. Therefore, it can be considered that college students in the Guangdong-Hong Kong-Macao Greater Bay Area have certain differences in their perceptions of each measurement item of social recognition of entrepreneurship. From the perspective of variance and standard deviation, there are certain fluctuations in the sample data, but they are still in a reasonable range, which is reasonable to a certain extent. As shown in Table 5.

Table 5. Statistical test

Dimension	Mean value	Standard deviation	Variance	Chi-square test		
				Chi-square value	Df	Progressive significance
Social dimension	3.825	0.628	0.394	173.670	12	0.000
School dimension	3.713	0.882	0.778	33.567	12	0.001
Family dimension	3.475	0.974	0.948	53.549	12	0.000
Perception of social recognition of entrepreneurship	3.671	0.625	0.391	446.033	44	0.000

4.4 Difference Analysis

The difference analysis in this paper is mainly carried out by using variance analysis and t test, including inter-group and intra-group. These two methods use mathematical calculation methods to consider the influence of various factors on the results of the studied dependent variables. However, the prerequisite of ANOVA is that the sample data should meet the conditions of independent same-distribution and homogeneity of variance. If it does not meet the conditions, the follow-up research will be conducted through t test.

Statistical model:

$$\begin{cases} Y_{ij} = \mu + a_i + \varepsilon_{ij}; \\ \overline{Y_i} = \mu + a_{i+} \overline{\varepsilon_i}; \\ \overline{Y} = \mu + \overline{\varepsilon}; \end{cases} \tag{2}$$

$$\text{within } \overline{\varepsilon_i} = \frac{1}{m}\sum_j^m \varepsilon_{ij}, \ \overline{\varepsilon} = \frac{1}{n}\sum_i^r \sum_j^m \varepsilon_{ij}$$

$$\begin{cases} SSt = \sum_{i}^{r}\sum_{j}^{m}(Y_{ij}-\overline{Y})^2, \ f_t = n-1; \\ SSe = \sum_{i}^{r}\sum_{j}^{m}(Y_{ij}-\overline{Y}_i)^2, \ f_e = r(m-1) = n-r; \\ SSa = m\sum_{i}^{r}(\overline{Y}_i-\overline{Y})^2, \ f_a = r-1; \end{cases} \tag{3}$$

$$\begin{cases} MSe = \dfrac{SSe}{f_e} \\ MSa = \dfrac{SSa}{f_a} \end{cases} \tag{4}$$

$$F = \frac{SSa/df_a}{SSe/df_e} = \frac{MSa}{MSe} \sim F(r-1, \ n-r) \tag{5}$$

In Formula (2), Y_{ij} represents the j sample value of the i-th level of a specific single factor (where i= 1,2 ⋯⋯, r, and r is different when the number of category levels set by each consideration factor is different; j= 1,2 ⋯⋯, m, m=383, the total number of samples for specific single factors n=r×m); μ is the total mean, μ_i is the mean under the i level, a_i is the deviation of sum; ε_{ij} is the random deviation term, Equation (3) is used to calculate the difference. MSe and MSa in Formula (4) is the mean square within groups and between groups, respectively. Formula (5) gives the F-value.

4.4.1 Difference analysis about source

Among all the collected samples, 244 people came from urban areas and 139 people came from rural areas. The results of Levene test of variance homogeneity, difference analysis and statistical description of sample data are shown in Table 6.

Observing Table 6. According to the results of Levene test, the P-value of the double-tailed probability of entrepreneurial social recognition perception is 0.057, and the P-value of the double-tailed probability of school dimension and family dimension are 0.734 and 0.237 respectively, both of which are greater than 0.05, indicating that entrepreneurial social recognition and the above two dimensions pass the test of variance homoticity. Analysis of variance can be used to investigate. The double-tailed probability P value of the social dimension is 0.031, and P is less than 0.05, indicating that this dimension rejects the hypothesis of homogeneity of variance, and the variance analysis method cannot be used to conduct the difference study, and the independent sample t test of heteroscedasticity can be chosen for the study.

The results of statistical description show that the Greater Bay Area college students from urban areas have greater entrepreneurial social recognition perception and sub-dimension perception than those from rural areas; The data results show that the P-value of ANOVA for the perception of social recognition of entrepreneurship is less than 0.05, indicating that there are significant differences in the perception of social recognition of entrepreneurship among college students from different sources in the Greater Bay Area, confirming H1. The P-value of social dimension and school dimension is greater than 0.05, and the P-value of family dimension is less than 0.05. It can be concluded that the source difference mainly affects the perceived difference of family dimension.

The intra-group difference analysis was carried out for Guangdong, Hong Kong and Macao university students from urban and rural areas respectively. In the city group, the significance of social recognition of entrepreneurship and its sub-dimension social dimension perception, school dimension perception and family dimension perception are 0.019, 0.316, 0.472 and 0.147 respectively, and only the social recognition perception of entrepreneurship reaches the significance level. In the rural group, the significance of entrepreneurial social recognition perception and its sub-dimension social dimension perception, school dimension perception and family dimension perception were 0.500, 0.232, 0.400 and 0.715, respectively, and none of the variables reached the significance level. According to the data, we can conclude that there are certain differences in the perception of social recognition of entrepreneurship among urban Guangdong-Hong Kong-Macao Greater Bay Area college students, but there are no differences in the perception of various dimensional variables among rural Guangdong-Hong Kong-Macao Greater Bay Area college students. The results are shown in Table 7.

Table 6. Analysis of perceived differences of entrepreneurial social recognition about source

Dimension	Statistical description				Test for homogeneity of variance		Analysis of variance		T-test	
	Source	Sample size	Mean value	Standard deviation	F-value	P-value	F-value	P-value	T-value	P-value
Social dimension	Urban	244	3.859	0.667	5.757	0.017	——	——	1.462	0.145
	Rural	139	3.766	0.547						
School dimension	Urban	244	3.718	0.888	0.03	0.864	0.025	0.873	——	——
	Rural	139	3.703	0.873						
Family dimension	Urban	244	3.587	0.978	0.528	0.468	9.044	0.003	——	——
	Rural	139	3.279	0.934						
Perception of social recognition of entrepreneurship	Urban	244	3.721	0.650	3.643	0.057	4.379	0.037	——	——
	Rural	139	3.583	0.568						

Table 7. Analysis of in-group differences from sources

Group classification	Variable	F-value	Significance
City	Social dimension	1.153	0.316
	School dimension	0.985	0.472
	Family dimension	1.392	0.147
	Perception of social recognition of entrepreneurship	1.634	0.019
Rural	Social dimension	1.299	0.232
	School dimension	1.061	0.400

	Family dimension	0.771	0.715
	Perception of social recognition of entrepreneurship	0.985	0.500

4.4.2 Difference analysis about the level of education

The survey subjects were divided into four groups according to their educational level: undergraduate, undergraduate, postgraduate and doctoral. Then, one-way analysis of variance was conducted on the social recognition of entrepreneurship and its three sub-dimensions, and the results were shown in Table 8. According to the homogeneity test results, the P-values of social dimension, school dimension and family dimension are all greater than 0.05, and the hypothesis of homogeneity of variance is accepted. According to the results of ANOVA, the P-value of social recognition of entrepreneurship and sub-dimension of school dimension is less than 0.05, indicating that college students in Guangdong-Hong Kong-Macao Greater Bay Area with different educational backgrounds have different perceptions of social recognition of entrepreneurship, among which there are significant differences in the perception of school dimension, confirming H2.

Intra-group difference analysis was carried out between the samples of college students and postgraduates. Among the students, the significance of entrepreneurial social recognition perception and its sub-dimension social dimension perception, school dimension perception and family dimension perception were 0.040, 0.069, 0.670 and 0.436, respectively, and only the P-value of entrepreneurial social recognition perception was less than 0.05. Among graduate students, the significance of entrepreneurial social recognition perception and its sub-dimensions social dimension perception, school dimension perception and family dimension perception are 0.079, 0.970, 0.598 and 0.277, respectively. Therefore, we can know that there are differences in the perception of social recognition of entrepreneurship among students, and there are no differences in the perception among postgraduates. The results are shown in Table 9.

Table 8. Analysis of perceived differences of entrepreneurial social recognition about cultivation levels

Dimension	Statistical description				Test for homogeneity of variance		Analysis of variance	
	Educational background	Sample size	Mean value	Standard deviation	F-value	P-value	F-value	P-value
Social dimension	Below undergraduate level	49	3.82	0.577	1.216	0.304	1.424	0.235
	Undergraduate	280	3.828	0.641				
	Postgraduate	51	3.848	0.560				
	Doctoral candidate	3	3.083	0.773				
School dimension	Below undergraduate level	49	3.342	0.946	0.758	0.518	5.924	0.001
	Undergraduate	280	3.799	0.848				
	Postgraduate	51	3.667	0.835				
	Doctoral candidate	3	2.5	1.137				

Family dimension	Below undergraduate level	49	3.429	1.000	0.907	0.438	1.734	0.160
	Undergraduate	280	3.533	0.950				
	Postgraduate	51	3.235	1.042				
	Doctoral candidate	3	2.917	0.514				
Perception of social recognition of entrepreneurship	Below undergraduate level	49	3.534	0.609	0.649	0.584	3.547	0.015
	Undergraduate	280	3.720	0.626				
	Postgraduate	51	3.583	0.573				
	Doctoral candidate	3	2.833	0.544				

Table 9. Analysis of intra-group differences in educational level

Group classification	Variable	F-value	Significance
College student	Social dimension	1.642	0.069
	School dimension	0.814	0.670
	Family dimension	1.020	0.436
	Perception of social recognition of entrepreneurship	1.519	0.040
Postgraduate	Social dimension	0.344	0.970
	School dimension	0.860	0.598
	Family dimension	1.253	0.277
	Perception of social recognition of entrepreneurship	1.730	0.079

4.4.3 Difference analysis about family members' entrepreneurial experience

In order to improve the rationality and usability of the results of the difference analysis, the entrepreneurial experience of the family members of the survey respondents was classified and summarized, and the perception of the Greater Bay Area college students with and without entrepreneurial experience was analyzed differently. According to the results of variance homogeneity test in Table 10, the P-values of entrepreneurial social recognition perception, social dimension of its sub-dimension and school dimension are all greater than 0.05, reaching the significance level of variance homogeneity, and ANOVA method can be used. The family dimension does not pass the variance homogeneity test, and heteroscedasticity T-test is performed. The P value of the family dimension is less than 0.05, reaching the significance level of 0.05, and the t value is greater than 0, indicating that the perception of the family dimension of the Greater Bay Area college students with family members who have entrepreneurial experience is higher than that of the Greater Bay Area college students without experience, confirming H3. In the analysis of variance for social dimension, it is found that the P-value of this dimension also reaches the significance level, and this factor also causes the perception difference of social dimension. To further analyze the difference impact on social dimension and family dimension, this paper continues to conduct independent sample t test for social dimension, and selects t values and P values assuming equal variance. The results

showed that the difference effect of social dimension was still significant, and then compared with the T-value size, 2.404 < 6.366, indicating a greater difference in the perception of family dimension.

The university students from Guangdong, Hong Kong and Macao with and without entrepreneurial experience were divided into two groups and the difference between the two groups was analyzed. In the group of family members with entrepreneurial experience, the significance of entrepreneurial social approval perception and its sub-dimension social dimension perception, school dimension perception and family dimension perception were 0.474, 0.546, 0.624 and 0.424, respectively, all of which failed the significance test. In the group whose family members have no entrepreneurial experience, the significance of the perception of entrepreneurial social recognition and its sub-dimension social dimension perception, school dimension perception and family dimension perception are 0.187, 0.315, 0.179 and 0.090, respectively, which also fail to pass the significance test. Therefore, there is no difference in the perception of entrepreneurial social recognition and its sub-dimensions between the two groups of Greater Bay Area college students. The results are shown in Table 11.

Table 10. Analysis of perceived differences of entrepreneurial social recognition about family members' entrepreneurial experience

Dimension	Statistical description				Test for homogeneity of variance		Analysis of variance		T-test	
	Whether family members have entrepreneurial experience	Sample size	Mean value	Standard deviation	F-value	P-value	F-value	P-value	T-value	P-value
Social dimension	Yes	208	3.895	0.603	0.455	0.501	5.777	0.017	2.404	0.017
	No	175	3.741	0.646						
School dimension	Yes	208	3.784	0.834	1.381	0.241	2.945	0.087	——	——
	No	175	3.629	0.929						
Family dimension	Yes	208	3.756	0.843	9.704	0.002	——	——	6.366	0.000
	No	175	3.141	1.012						
Perception of social recognition of entrepreneurship	Yes	208	3.811	0.560	2.163	0.142	24.407	0.000	——	——
	No	175	3.504	0.657						

Table11. Analysis of intra-group differences in family members' entrepreneurial experience

Group classification	Variable	F-value	Significance
Family members have entrepreneurial experience	Social dimension	0.907	0.546
	School dimension	0.847	0.624
	Family dimension	1.032	0.424
	Perception of social recognition of entrepreneurship	0.999	0.474
Family members have no entrepreneurial experience	Social dimension	1.159	0.315
	School dimension	1.340	0.179
	Family dimension	1.546	0.090
	Perception of social recognition of entrepreneurship	1.248	0.187

5. Conclusions

5.1 There are differences in the overall perception of social recognition of entrepreneurship among college students in Guangdong-Hong Kong-Macao Greater Bay Area

According to Table 4, college students in Guangdong-Hong Kong-Macao Greater Bay Area have a good perception of social recognition of entrepreneurship, but there are differences in the perception of social recognition of entrepreneurship among individuals surveyed. According to the social identity theory, college students can judge what can be recognized by referring to the language, attitude and behavior of others in the society, and form a self-concept, so as to consider whether they will take certain specific behaviors. Due to differences in family background, living environment, education level and experience, individuals have different feelings and cognition of the same behavior or the same thing(Hou Yueting, 2022)[25]. Therefore, different college students generally have different perceptions of social recognition of entrepreneurship.

5.2 Rural college students in the Greater Bay Area have a lower family dimension perception of social recognition of entrepreneurship than urban college students

The difference in source will cause the difference in the perception of the family dimension of social recognition of entrepreneurship of college students in the Greater Bay Area, and also cause the difference in the overall perception of social recognition of entrepreneurship. Where the source is directly related to the family, can indirectly show the family's living standard and consumption level. College students from rural areas have a lower perception of this aspect than those from urban areas. Generally speaking, rural families have less funds and resources than urban families, and they do not show obvious recognition and support for their own college students' entrepreneurship, which may be due to their parents' thoughts, family economy and other reasons. Therefore, Greater Bay Area college students from rural areas have a lower perception of family dimension than those from urban areas, and there is no difference in perception between rural college students. However, even if they all come from cities, there will be gaps in economic and resource support between families, resulting in differences in the perception of social recognition of entrepreneurship among urban college students.

5.3 Greater Bay Area students at different educational levels have different perceptions of the school dimensions of social recognition of entrepreneurship

There are significant differences between students and postgraduates in their perceptions of the school dimensions of social recognition of entrepreneurship, resulting in differences in the overall perception of social recognition of entrepreneurship. After comparison, it is found that there are differences in the perception of the two groups, and the perception of college students is higher than that of graduate students, but there are also differences in the perception of college students, but not between graduate students. This may be because colleges and universities attach different importance to entrepreneurship, invest different resources in entrepreneurship education, teach different degrees of entrepreneurship knowledge and skills, publicize and support measures for entrepreneurship, or concentrate different levels of students.

5.4 Whether or not the experience of family entrepreneurship leads to the perceived difference between the family dimension and the social dimension of college students' social recognition of entrepreneurship in the Greater Bay Area

University students in the Greater Bay Area whose family members have entrepreneurial experience and those who do not have such experience have different perceptions of the family dimension and social dimension of social recognition of entrepreneurship, which results in the difference in the overall perception of social recognition of entrepreneurship. Family members have entrepreneurial experience indirectly indicates the economic strength of the family, the degree of entrepreneurial support, etc. Children growing up in such families feel the degree of entrepreneurial recognition is higher than children growing up in other families. In addition, when a family member tells about their own entrepreneurial experience or provides entrepreneurial experience, the listener will have a deeper understanding of the specific entrepreneurial behavior, feel the rationality of the behavior and the degree of social tolerance and support for entrepreneurship, and then be more able to accept entrepreneurship and feel the recognition of entrepreneurial behavior, which also improves their recognition perception in the social dimension. Although this factor can cause the perception difference between the two sub-dimensions of social recognition of entrepreneurship, according to the research data, the perception difference of family dimension caused by this factor is larger than that of social dimension.There was no difference in perception among Greater Bay Area university students whose family members had entrepreneurial experience, and this difference did not exist among Greater Bay Area University students who did not have entrepreneurial experience.

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