

# Nature or nurture: Influencing factors of entrepreneurial behavior from the perspective of university entrepreneurial ecosystem

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**Abstract:** Most existing studies believe that entrepreneurial willingness is the prerequisite for entrepreneurial behavior but ignores the interdependence of other factors and entrepreneurial readiness. The primary purpose is to explore how college students' characteristics, family entrepreneurship background, attitudes towards entrepreneurship education, and other factors work together with entrepreneurial willingness to promote college students' entrepreneurial practice. A comprehensive analysis found that college students' entrepreneurial behavior is related to their innate characteristics and inseparable from acquired cultivation. The combination of college students' inherent characteristics and acquired cultivation is more conducive to improving college students' entrepreneurial behavior.

**Keywords:** University entrepreneurial ecosystem, Entrepreneurial behavior, fsQCA, entrepreneurial behavior, entrepreneurial intention

## 1. Introduction

For a long time, entrepreneurial activity becomes the driving force of economic growth (Acs, Estrin, Mickiewicz & Szerb, 2017; Nightingale & Coad, 2014). In addition to the pursuit of excellence in education and research, academic entrepreneurship and entrepreneurship education have become the third mission of universities. Entrepreneurship education builds a bridge linking the teaching mission and entrepreneurial ability (Roessner 2013; Ebersberge & Altamann, 2012). The University entrepreneurship ecosystem is the cornerstone of promoting academic entrepreneurship and entrepreneurship education to achieve sound and sustainable development. Under the guidance of China's innovation and entrepreneurship strategy, maker space, incubation base, entrepreneurship college, and other organizational forms have developed rapidly in Chinese universities. To explore how to promote the successful entrepreneurship of college students has become an urgent problem for the government, academics, and enterprises. There are many studies on entrepreneurship focusing on the influence of variables such as personal traits, socio-economic environment, and policy factors on entrepreneurial attitudes and intentions, as well as the influence of entrepreneurial beliefs and intentions on entrepreneurial behaviors. Scholars mostly adopt the method of regression analysis to identify the key factors and influence mechanism, to understand the entrepreneurial behavior of the impetus has made a significant contribution. Regression analysis needs independent variables that are entirely separate. However, in reality, factors influence each other. Multiple variables will form one or more configuration and bring different paths of outcome variables. For this research gap, this study to college students' entrepreneurial ecosystem in the college students as the research object, from the personal traits, entrepreneurship education attitude, entrepreneurial intention and entrepreneurial behavior such as variables, Qualitative Comparative Analysis(QCA) method to explore and clear the relationship between the independent variable and dependent variable mechanism, in promoting college students' entrepreneurial behavior in entrepreneurial ecosystem optimization path.

## 2. Literature review

Dunn (2005) described the entrepreneurial ecosystem's outline based on the study of MIT's entrepreneurship system. Cohen (2006) defined the entrepreneurial ecosystem as a multi-agent linkage group that supports the innovation of new enterprises and provides physical facilities within a specific

geographical scope. Most international institutions and researchers adopt the definition of Isenberg and Feld. The entrepreneurial ecosystem promotes entrepreneurial behavior in industrial society (Isenberg, 2010; Feld, 2012; Mason & Brown, 2014). The entrepreneurial ecosystem, supported by various resources, policies, and funds, improves the competitiveness of start-ups and contributes to the high-quality development of start-ups (Spigel, 2015).

Fayolle (2006) defines entrepreneurship education as any teaching project or educational process that promotes entrepreneurship attitudes and skills. Ozaralli and Rivenburgh (2016) conducted a comparative study of 589 junior students from an American university and a Turkish university. They pointed out that entrepreneurship education was significantly positively correlated with students' perceived subjective norms related to entrepreneurship and degree of control over entrepreneurship behavior and could further improve students' willingness to start businesses. Some scholars believe that entrepreneurship education will reduce their willingness to start a business (Matlay, 2010). Shinnar et al. (2014) pointed out that entrepreneurship education had no significant impact on entrepreneurial intention through empirical research. Rauch and Hulsink (2015) believe that entrepreneurship education will positively affect students' entrepreneurial attitude and self-efficacy.

The definition of entrepreneurial behavior in the early stage focuses on the description of behavioral characteristics, such as risk-taking, innovation, and forward-looking behaviors (Gartner, 2001). In a general sense, entrepreneurial behavior includes various activities such as entrepreneurship, opportunity identification, business plan, and enterprise creation. Thompson (2009) regarded entrepreneurial willingness as a kind of entrepreneurial belief, which believes that individuals plan to establish new enterprises and consciously fulfill these plans in the future. Having unique personal characteristics is the core characteristic of entrepreneurs and has become a vital issue in entrepreneurship research (Miller, 2015). The individual characteristics of entrepreneurs are considered a significant factor affecting start-ups' success, which is closely related to the entrepreneurial process and output (Young & Kim, 2015). Compared with individuals with an external locus of control, individuals with an internal locus of control are more proactive, optimistic and confident, and have stronger entrepreneurial intention and action (Asante and Affum-osei, 2019).

Although the research on the consistency of entrepreneurial intention and behavior has achieved fruitful results, it still has obvious deficiencies. Empirical studies on the relationship between entrepreneurial intention and behavior focus on the independent net effect on entrepreneurial behavior, without considering the interdependence between different elements and entrepreneurial intention, and analyze the specific role of individual characteristics, culture, and environmental factors in isolation (Shirokova, 2016). Willingness is the key factor to induce behavior, but in actual entrepreneurship, many individuals with strong entrepreneurial willingness do not produce entrepreneurial behavior. In this regard, what factors lead to the difference between entrepreneurial intention and entrepreneurial action consistency? Or, what elements work together with entrepreneurial intention to promote entrepreneurial behavior? It will be affected by the will of entrepreneurship and will be affected by other leading factors like personal characteristics, family background, and attitude towards entrepreneurship education. Entrepreneurship from the three kinds of the dependent variable, this study will also explore the combination of them and entrepreneurial intention for entrepreneurship promotion effect.

### **3. Theoretical model construction and research methods**

#### ***3.1. Research method variable selection and conceptual model***

There is a significant correlation between variables, but they are not independent of each other. In traditional analysis, the "net effect" of independent variables on dependent variables is often studied by controlling other variables. Affecting a single factor does not cause the entrepreneurial behavior of college students but is caused by combined factors, and the different combinations of precondition can produce the same function, can also express different functions, or is not a balanced relationship between independent variables. In the planned behavior theory proposed, attitude will impact on behavior through intention. Meanwhile, through literature review and previous data analysis, it is found that many factors considered as control variables will have a significant impact on entrepreneurial behavior. Because of this, this research constructs a two-stage configuration analysis model. The first stage model involves advance variables for family entrepreneurial background, self-esteem, proactive personality and attitude towards entrepreneurial education, and explores the ways in which these factors affect entrepreneurial behavior and entrepreneurial intention. The second stage model clarifies

the paths that effectively influence entrepreneurial behavior in the combination of entrepreneurial willingness and personal characteristic factors, so as to better explore the true role of entrepreneurial willingness in entrepreneurial activities. The research model of this paper is shown in Figure 1.

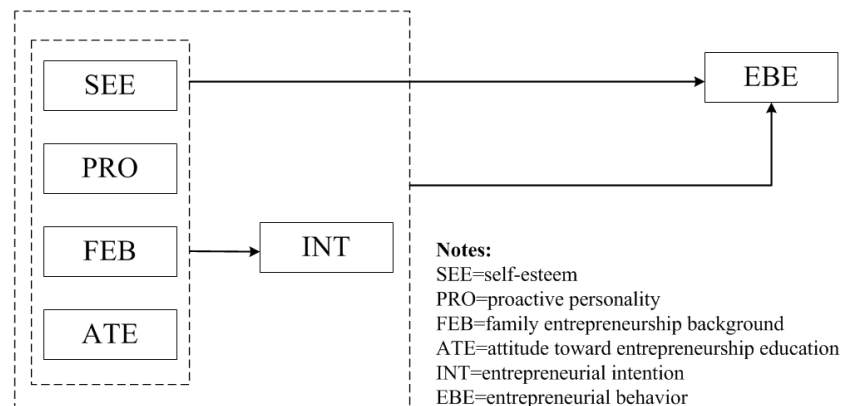


Figure 1. Research model

### 3.2. Research methods

Charles Larkin proposed qualitative comparative analysis based on set theory, analyzes, and processes a limited number of cases using configuration (Rihoux & Ragin, 2009). In contrast to the strict assumptions of regression analysis that independent variables are independent, QCA can identify specific causal paths in different contexts that lead to the same outcome by multiple concurrent causal relationships. The value of some variables involved in this study does not conform to the conditions of the precise set and multi-value set, but it conforms to the application conditions of fuzzy-set QCA. Therefore, it is relatively better to select fsQCA to conduct empirical analysis and test the theoretical model. Compared fogged and multi-value sets analysis, fuzzy qualitative comparative analysis (fsQCA) to implement a more strict and precise set theory of conformity assessment, thus effectively study complex causality, fsQCA methods including calibration model, variable, build a truth table, truth table analysis, evaluation and interpretation of results, such as five steps, the entrepreneurship and innovation organization management is widely applied in the fields of (Misangyi & Acharya, 2014).

## 4. Variable measurement and data processing

### 4.1. Questionnaire design

The questionnaire consists of six parts, including family entrepreneurship background, attitude towards entrepreneurship education, self-esteem, proactive personality, entrepreneurial willingness, and entrepreneurial behavior. The questionnaire used a 5-point Likert scale.

**Family entrepreneurship background.** The measurement item of the family entrepreneurship background variable is "has your family member started business or an individual business?", the answer is yes or no. The variable name is FEB.

**Entrepreneurial education attitude.** According to Phan (2002) research, entrepreneurial education can influence one's entrepreneurial attitude and intention. We used six items to measure the respondents' opinions on entrepreneurial education. To analyze college students' attitudes towards entrepreneurship education in China, we bi-directionally translated these six items to ensure the veracity of verbal expression. The variable name is ATTE.

**Self-esteem.** We adopted the world's most commonly used scale for measuring personal self-esteem, which was developed by the American psychologist Rosenberg, namely, the Rosenberg self-esteem scale (Rosenberg, 1965). It includes a total of 10 measurement questions, in order to measure the degree of a personal feeling of good or bad, has the characteristics of easy to operate, high credibility. The variable name is SEES.

**Proactive personality.** We used the 10 items scale specified by Bateman and Crant (1993) to measure the proactive personality. The variable name is PROA.

**Entrepreneurial intention.** According to the measurement of entrepreneurial intention by Botsaris and Vamvaka (2016), we used items to measure entrepreneurial intention. The variable name is INTE.

**Entrepreneurial behavior.** Based on the measurement of entrepreneurial behavior by Ning (2017), we adopted four measurement questions: market opportunity search, team building, resource integration and registration operation to describe entrepreneurial behavior. The variable name is EBEH.

#### 4.2. Sample description and test

**Sample description.** After the questionnaire design, 280 valid questionnaires were first distributed and recovered on a small scale through wjx.com. We used these questionnaires for exploratory factor analysis, the reliability and validity were excellent. Then a large-scale survey conducted 388 valid questionnaires for confirmatory factor analysis. A total of 668 valid questionnaires were collected in two periods.

**Reliability test.** Reliability refers to the consistency of the results obtained when repeated measurements are made on the same object, which is a measure of the Scale's consistency or stability. Meanwhile, reliability is also a necessary condition for constructing validity. We use SPSS for reliability analysis. The KMO values of variables were all greater than 0.8. Cronbach's Alpha values were all greater than 0.7, as shown in Table 1, indicating that the selected variables had excellent reliability.

Table 1. Reliability test of variables

Variable	KMO	Cronbach's Alpha
ATTE	0.807	0.801
SEES	0.833	0.723
PROA	0.893	0.895
INTE	0.943	0.968
EBEH	0.851	0.954

**Validity test.** Based on the second group of sample data (N=388), we used AMOS24.0 for confirmatory factor analysis to test the factor structure of the inventory of entrepreneurial education attitude, self-confidence, proactive personality, entrepreneurial willingness, and entrepreneurial behavior. All the indicators of the variables met the requirements, as shown in Table 2.

Table 2. Validity test of variables

Variable	CMIN/DF	GFI	RMR	RMSE	NFI
ATTE	0.846	0.996	0.013	0	0.996
SEES	1.35	0.985	0.024	0.03	0.985
PROA	2.028	0.98	0.022	0.052	0.983
INTE	1.835	0.982	0.012	0.046	0.993
EBEH	1.975	0.995	0.008	0.05	0.997

## 5. Empirical results analysis

### 5.1. Correlation analysis

We used SPSS to determine the interaction influence and correlation. The variables correlation relationship is shown in Table 3. All variables have significant correlations except self-esteem and entrepreneurial behavior. Which suggests that the entrepreneurial behavior influence between variables are not independent, so the fuzzy-set qualitative comparative analysis (fsQCA) can be used to explore the influence of different combinations of entrepreneurship paths.

Table 3. Variables correlation coefficient table

Variable	ATTE	SEES	PROA	INTE	EBEH
ATTE	1				
SEES	.134* (.046)	1			
PROA	.375** (.000)	.314** (.000)	1		
INTE	.381** (.000)	.147* (.029)	.527** (.000)	1	
EBEH	.240** (.000)	-.018 (.789)	.315** (.000)	.712** (.000)	1

Note: We used SPSS to calculate the data, and the values in brackets are sig. "\*\*\*" indicates a significant correlation at the 0.01 level.

### 5.2. Data calibration

The calibration function in fsQCA 3.0 can use to calibrate non-0/1 variables. That is to transfer the original data into 0 between 1. Family entrepreneurship background does not need to be calibrated because the answer is yes or no. According to the practice of Lee and Chen (2018), the thresholds of complete subordination and complete insubordination of related variables were set at 95% and the 5% of each variable, respectively. The intersection point was set as the average value of the variables. The specific data are shown in Table 4.

Table 4. Variable data calibration anchor point setting

Variable	complete subordination threshold	Crosspoint threshold	complete insubordination threshold	New Variable
ATTE	5	3.47	2.25	ATE
SEES	4	3.26	2.6	SEE
PROA	4.58	3.51	2.82	PRO
INTE	4.38	2.85	1.22	INT
EBEH	4	2.39	1	EBE

Note: the data in the table are calculated by SPSS20.0.

### 5.3. Necessary conditions analysis

The necessary conditions were analyzed by taking the increase (EBE) and the decrease (~EBE) of entrepreneurial behavior as dependent variables, respectively. The results are shown in Table 5. Verweij (2013) argues that previous dependent variables are considered to be the result of the necessary conditions, so the consistency must score than 0.9. All the previous dependent variables in the samples of this study are not meet this requirement and belong to the unnecessary conditions. Consistency of family business background is most minimum (0.355/0.337). In the analysis of entrepreneurial behavior increase, the consistency of entrepreneurial intention is biggest (0.834).

Table 5. Necessary conditions analysis

Variable	EBE		~EBE	
	Consistency	Coverage	Consistency	Coverage
FEB	0.355	0.486	0.337	0.514
ATE	0.697	0.677	0.596	0.645
SEE	0.595	0.587	0.638	0.702
PRO	0.633	0.669	0.553	0.653
INT	0.834	0.786	0.516	0.543

Note: the data in the table are calculated and summarized by fsQCA 3.0

#### 5.4. fsQCA analysis

To validate the first stage of model, we set entrepreneurial behavior (EBE) and entrepreneurial intention (INT) as the dependent variables, family entrepreneurship background (FEB), attitude toward entrepreneurship education (ATE), self-esteem (SEE), and proactive personality (PRO) as the previous variable analysis. We also set acceptable case number as 1, and the threshold of consistency as 0.8. After standardizing analysis, we got three different kinds of solutions: complex solution, parsimonious solution, and intermedia solution. The overall consistency of solutions was more than 0.7. The consistency of the conditional configuration was also above 0.7, indicating that all previous condition configurations were sufficient conditions for the results. The results are shown in Table 6. To validate the second stage of model, we set entrepreneurial behavior (EBE) increase as the dependent variable, indicating that all previous condition configurations were sufficient conditions for the results. The results are shown in Table 7.

Refer to Fiss (2011), the solid black dot (●/●) means the existence of conditions, the circle with a cross (⊗/⊗) means the deficiency of conditions, blank means the condition has nothing to do with the configuration. The big solid black dot with the cross circle (●/⊗) indicates the core condition, the small solid black dot with the cross circle (●/⊗) indicates the auxiliary conditions.

Table 6. Analyzed the conditional configuration

	High INT			High EBE	
	M1	M2	M3	N1	N2
FEB		●		⊗	●
ATE		●	●		●
SEE			●	⊗	●
PRO	●			●	⊗
Consistency	0.782	0.831	0.815	0.767	0.856
Raw coverage	0.697	0.015	0.523	0.28	0.137
Unique coverage	0.205	0.274	0.045	0.28	0.137
Solution consistency	0.741			0.794	
Solution coverage	0.785			0.417	

Note: the data in the table are calculated and summarized by fsQCA 3.0 software

As shown in Table 6, in the first stage of model verification, three paths can improve college students' entrepreneurial intention and two ways to improve entrepreneurial behavior through the combination of family entrepreneurial background, entrepreneurial education attitude, self-esteem, and proactive personality.

Three patterns promote increased willingness to start a business. The first type of configuration (M1)'s core conditions is a vital proactive personality (PRO). The consistency ratio is 0.782, which means that 78.2% of college students with a robust, aggressive character have a strong entrepreneurial will. The second type of configuration (M2) core conditions are as follows: Family entrepreneurship background (FEB) and active treatment of entrepreneurship education (ATE), indicating that college students who have been exposed to entrepreneurship since childhood and later recognize and actively participate in entrepreneurship education have a strong desire to start a business, and the consistency rate is as high as 83.1%. The core conditions of the third type of configuration (M3) are as follows: positive attitude to entrepreneurship education (ATE) and healthy self-esteem (SEE), indicating that college students who recognize and actively participate in entrepreneurship education and have strong self-confidence will have a more robust entrepreneurial will, and the consistency ratio is as high as 81.5%.

There are two modes to promote the increase of entrepreneurial behaviors. Among them, the core conditions of the first type of configuration (N1) are as follows: No family entrepreneurship background (~ FEB), weak self-esteem (to SEE) and strong proactive personality (PRO), however, the attitude of entrepreneurship education is lack. This configuration shows that though the entrepreneurs do not have family business background and have weaker confidence. However, outstanding proactive personality contributes to the development of entrepreneurial activity. The consistency ratio is 0.767 which means that 76.71% of respondents with this condition do have entrepreneurial activities. The core conditions of the second type of configuration (N1) are as follows: with family entrepreneurship background (FEB), actively treat entrepreneurship education (ATE), healthy self-esteem (SEE) and the passive personality. This configuration indicates that the individuals with passive personality, but if

they are in the entrepreneurship environment since childhood and actively participate in entrepreneurship education, and coupled with strong self-confidence, can effectively promote the implementation of the entrepreneurship, the consistency ratio as high as 85.63%.

*Table 7 Analyzed the conditional configuration*

	High EBE				
	P1	P2	P3	P4	P5
FEB			⊗		⊗
ATE				●	●
SEE		⊗			⊗
PRO	⊗				●
INT	●	●	●	●	
Consistency	0.846	0.857	0.798	0.811	0.814
Raw coverage	0.566	0.606	0.529	0.627	0.247
Unique coverage	0.009	0.011	0.021	0.055	0.009
Solution consistency	0.787				
Solution coverage	0.822				

Note: the data in the table are calculated and summarized by fsQCA 3.0 software

The data in table 7 show that there are five modes in the analysis results with EBE as the dependent variable. The overall solution consistency ratio is 0.787, and the overall coverage rate is 0.822. Among the four models from P1 to P4, strong entrepreneurial intention (INT) appears in the core conditions, and all the four models' consistency is above 0.79, these results highlight the role of entrepreneurial intention in promoting entrepreneurial behavior.

Non-proactive personality (~PRO), low self-esteem (~SEE), and no family entrepreneurial background (~FEB) all have one negative core variable in the P1-P3 configuration except entrepreneurial intention. In the P4 model, positive entrepreneurial education attitude (ATE) also adds to the core variable. In the P5 model, the variable of entrepreneurial willingness is absent, indicating a path to promote entrepreneurial behavior: individuals without family entrepreneurial background (~FEB) and low self-confidence (~SEE) actively participate in entrepreneurial education (ATE) and develop proactive personality (PRO), which contribute to the realization of entrepreneurial behavior.

## 6. Conclusion & Contribution

### 6.1. Conclusion

The author uses SPSS and Amos software analysis to find that there is a significant positive correlation between college students' entrepreneurial behavior and college students' entrepreneurial willingness, college students' attitude towards entrepreneurship education, college student self-esteem, college student initiative personality, and other variables, indicating that the variables are not independent of each other. This paper takes entrepreneurial willingness as an explained variable. It uses the fsQCA method to find that under the interaction of college students' characteristics, family entrepreneurial background, and active participation in entrepreneurship education, college students' entrepreneurial willingness will increase. There are three ways to enhance college students' desire to start a business. College students with strong initiative personalities are more willing to start a business. Since childhood, college students who have been affected by family entrepreneurship and actively participate in entrepreneurship education are more inclined to start a business. College students who have healthy self-esteem and actively participate in entrepreneurship education are more willing to start businesses.

The article takes entrepreneurial behavior as an explained variable. Without considering the variable of entrepreneurial willingness, through fsQCA analysis, it is found that two variable combination paths can help promote individual entrepreneurial behavior. The first path highlights the context of no family entrepreneurship, the importance of personal initiative personality. In the second path, if the individual's initiative personality score is low, early entrepreneurial exposure, active participation in entrepreneurship education, and fostering healthy self-esteem can help promote individual entrepreneurial behavior.

Taking entrepreneurial behavior as an explained variable and considering the variable of entrepreneurial willingness, the article uses the fsQCA method to analyze college students'

entrepreneurial behavior's promotion path under multivariate interaction. The study found five ways to improve college students' entrepreneurial behavior, four of which contain entrepreneurial willingness. The variables that function together with the strong entrepreneurial willingness are undergraduates' low initiative personality, low self-esteem, no family entrepreneurship background, and a positive attitude toward entrepreneurship education. In the absence of entrepreneurial willingness variables, college students who have not experienced family entrepreneurship since childhood, have low self-esteem, and have strong initiative personality can actively participate in entrepreneurial practice activities after actively participating in university entrepreneurship education.

## 6.2. Contribution

Based on a systematic review of the entrepreneurial ecosystem and college students' entrepreneurial behavior, this research explores the impact of the interaction of college students' traits, family entrepreneurial background, and attitudes towards entrepreneurship education on college students' entrepreneurial willingness and entrepreneurial behavior. The research analyzes the impact of college students' characteristics, family entrepreneurial background, attitude towards entrepreneurship education, and college students' entrepreneurial willingness on entrepreneurial behavior. The research results verify the correlation between college students' characteristics, family entrepreneurial background, attitude towards entrepreneurship education, entrepreneurial willingness, and entrepreneurial action in existing research. With a configuration perspective, this paper uses planned behavior theory and fsQCA empirical study to explore the concurrent synergy and matching model of college students' personal characteristics, family entrepreneurial background, attitude towards entrepreneurship education and other variables. This research enriches the theory of university entrepreneurial ecosystems and reveals the "black box" of college entrepreneurial behavior and increased entrepreneurial willingness.

Optimizing the innovation and entrepreneurship ecosystem for college students can gather social capital and promote the growth of innovative enterprises and expand employment and increase residents' income. Building a university's entrepreneurial ecosystem, enhancing college students' entrepreneurial willingness, and enhancing college students' entrepreneurial behavior have become hot issues of concern to business schools worldwide. The research conclusions of this thesis can be used by relevant universities to carry out targeted entrepreneurship education. Based on students' innate personal characteristics and whether they have been affected by family entrepreneurship, etc., they can enhance college students' entrepreneurial willingness and entrepreneurial behavior and operate the university entrepreneurship ecosystem virtually.

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