Research Article

A Study on College Students’ Cognitive Intention and Path Choice of Entrepreneurship from the Perspective of Individual and Group Cooperation

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Received 27 May 2022; Revised 9 July 2022; Accepted 26 July 2022; Published 16 September 2022

Academic Editor: Qiangyi Li

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In order to study the overall low entrepreneurial enthusiasm of college students, a method was proposed based on the cognitive intention and path choice of college students’ entrepreneurship from the perspective of individual and group cooperation. The method briefly introduces the achievement motivation theory, entrepreneurial intention theory, entrepreneurial cognition theory, classical game theory, computer simulation, and experimental methods. Then, the research hypothesis and model construction method are elaborated, and a questionnaire is designed to study the cognitive intention and path of entrepreneurship of college students. Finally, data analysis and hypothesis testing are described to provide a guarantee for college students’ entrepreneurship. The results show that the fundamental driving force for the great progress of entrepreneurship education in colleges and universities is to meet the needs of both the collective and the individual in the top-level design and to realize the mechanism through which entrepreneurship education can achieve common development.

1. Introduction

As the number of college graduates increases year by year, China’s job market tends to be saturated. Developing innovation and entrepreneurship, encouraging entrepreneurship, and absorbing employment have become important driving forces for China’s economic development. College students have a good knowledge reserve and are the main forces of national innovation and entrepreneurship. The government has taken a number of measures to promote the entrepreneurship of college students, but the entrepreneurial enthusiasm of college students in China is generally low [1]. Therefore, it is of certain practical significance to study the relevant content of college students’ entrepreneurial activities. This study aims to put forward suggestions to improve college students’ entrepreneurial intentions by analyzing the impact of college students’ entrepreneurial cognition, achievement motivation, and entrepreneurial support on their entrepreneurial intentions [2].

1.1. Research Background. China is in a great historical period of developing an innovation-oriented economy and building an innovation-oriented country. One of the important characteristics of an innovation-oriented economy is that it relies on knowledge and talents, takes knowledge innovation as the main body, and emphasizes the close cooperation of innovation subjects from all walks of life, such as government, industry [3], university, and research institute. An important characteristic of an innovation-oriented country is the high input and output of innovation, which usually requires that the contribution rate of scientific and technological progress be above 70% and the external technology dependence be below 30%. It can be seen that high-level innovative and entrepreneurial talents are indispensable supporting conditions in China’s current major development strategies [4]. As the main source of high-level talents (Figure 1), the cultivation of the entrepreneurial ability of college students has become an inevitable requirement of the times.
According to the statistics on college students’ employment by relevant national departments, the number of college graduates reached 7.7 million in 2016, a new record high (Figure 2). It is widely expected that in the next few years, college students still have to face a complex and severe employment situation. According to Okun’s law, if China’s gross national product grows by 1 percentage point, about 1 million people can find employment. However, the growth of GDP is limited. While providing jobs as far as possible, it must also rely on improving the overall entrepreneurial level of college students. According to the investigation and research conducted by specialized institutions [5], it is found that the multiplier effect of entrepreneurship promoting employment in China can reach about 1:6. From this context and from the perspective of both individual and group cooperation, this paper explores the model and questionnaire design method of college students’ entrepreneurial cognitive intention and path choice, so as to improve their entrepreneurial ability [6].

2. An Introduction to the Theories Related to College Students’ Entrepreneurial Cognitive Intention and Path Choice under the Cooperation of Individuals and Groups

2.1. Achievement Motivation Theory. The method of measuring achievement is to deeply explore the psychological characteristics of individual achievement motivation and put forward this theory in the 1950s on the basis of previous research on individual needs and motivation. They will, according to their own actual situation, in the range of difficulty to bear [7], set goals for themselves, and then, through their own efforts, complete the task. In this theory, he proposed two types of achievement motivation: the...
motivation to pursue success (Ms) and the motivation to avoid failure (Maf). The tendency to pursue success motivation (Ts) is determined by the motivation to pursue success (Ms), the likelihood of success in a task, the expectation of success (Ps), and the incentive value of success (Is). Atkinson believes that the tendency to pursue success motivation can be expressed by the following formula:

\[ Ts = Ms \times Ps \times Is. \]

The propensity to avoid failure (Taf) is determined by the motivation to avoid failure (Maf), the likelihood of failure (Pf), and the inducement value of failure (If) [8]. Atkinson’s propensity to avoid failure is expressed by the following formula:

\[ Taf = Maf \times Pf \times If. \]

According to Atkinson, individual achievement motivation (Ta) is determined by the tendency to pursue success (Ts) minus the tendency to avoid failure (Taf), which can be expressed by the following formula:

\[ Ta = Ts - Taf. \]

Because Atkinson assumed that Is and Ps were inversely related, If and Pf were inversely related, that is, Is = 1 Ps, If = 1 Pf. At the same time, Atkinson also believed that the sum of the probability of failure and the probability of success of a task was 1, that is, Ps + Pf = 1, thus Pf = 1 Ps. Therefore, the above formula can be simplified into the following formula:

\[ Ta = Ms \times Ps \times (1 - Ps) - Maf \times Ps \times (1 - Ps) \]
\[ = (Ms - Maf) \times [Ps(1 - Ps)]. \]

According to this formula, we can see that individual achievement motivation is determined by three aspects: motivation intensity of pursuing success (Ms), motivation intensity of avoiding failure (Maf), and expectation of the possibility of success (Ps). The motivation to pursue success (Ms) and the motivation to avoid failure (Maf) determine the positive and negative values of individual achievement motivation (Ta). Ms is greater than Maf, that is, the tendency to pursue success is greater than the tendency to avoid failure; at this point, the motivation to pursue success dominates individual behavior, and individuals are more inclined to choose tasks of medium difficulty and risk. Ms is less than Maf; in this case, the motivation to pursue success is less than the motivation to avoid failure, which determines the direction of individual behavior. Individuals are more willing to choose tasks with a certain level of success or certain level of failure [9].

2.2. Entrepreneurial Intention Theory. Intention is the only best predictor of any planned behavior, and the generation of individual behavioral intention is influenced by three factors: subjective norms of individual behavioral attitude, and sense of behavioral control. The behavior occurs only after the behavioral intention is produced. Individual behavioral attitude refers to whether a person’s evaluation of the behavior in question is good or bad; subjective norms refer to social pressures perceived by individuals to perform or not perform behaviors; perceived behavioral control refers to the perceived ease with which an act is performed and is assumed to reflect past experience as well as expected and actual barriers [10]. As a general rule, the more favorable the attitude and subjective norms toward behavior and the stronger the sense of control over behavior, the more positive the attitude should be. The relative importance of subjective norms and perceived behavioral control in intention prediction varies from behavior to behavior and situation to situation. They interact with each other internally and interact with behavioral intention externally, thus influencing actual behavior, as shown in Figure 3.

The entrepreneurial event model takes individual entrepreneurial intention as the research subject and individual perception of entrepreneurship and action tendency as independent variables. It also points out that external factors such as economic support, cultural atmosphere, and regional distribution will influence individual entrepreneurial intention through influencing the individual perception of entrepreneurship. The entrepreneurial event model shows that the generation of entrepreneurial intention depends on the individual’s perception of entrepreneurship and action tendency. The entrepreneurial event theory holds that entrepreneurial intention is influenced by the perception of desirability, feasibility, and action tendency. Desirability perception refers to the attraction of entrepreneurial activities to individuals at the beginning, including internal influence and external influence. Feasibility perception refers to the degree to which individuals perceive that they are capable of completing entrepreneurial tasks. Action tendency refers to an individual’s intention to take practical action. The three factors jointly affect the entrepreneurial intention of individuals [11], and the entrepreneurial environment factors affect the entrepreneurial intention through the perceived action tendency of individuals, as shown in Figure 4.

2.3. Cognitive Theory of Entrepreneurship. Social cognitive theory is one of the important theories in psychology. Bandura’s (1986) social cognitive theory is the basis for the study of entrepreneurial cognition. This theory emphasizes the description of a system consisting of three elements, called triadic interactive determinism. He defined the concept of interaction as the interaction between things and determinism as the product of the influence of things. Bandura pointed out that the individual factors of behavior and the external environment are essentially interacting with each other. There are three modes of interaction among the three. The environment is the underlying factor that determines behavior [12]. Recognize that other individual factors and environmental interactions influence behavior. Behavior is the result of all three. Individual factors mainly include cognition, expectation, attitude, and knowledge. Environmental factors include resource behavior consequences of others and other physical conditions. Behavioral
2.4. Classical Game Theory. Game theory (Figure 6) is a theory in which two or more intelligent and rational decision-makers use each other’s strategies to transform their own antagonistic strategies into equal matches to achieve the goal of victory.

In 1950, Nash published his seminal work on equilibrium point noncooperative games entitled N-man Games and proposed the concept of strategic equilibrium in non-cooperative games, which became an important milestone in the history of game theory[13]. Noncooperative game strategy equilibria, also known as Nash equilibria, are expressed in the form of a combination of players’ strategies in which no player can gain more or even suffer a loss by unilaterally changing his strategy. To put it simply, neither of the two or $n$ players in the game is willing to change their strategy to maximize their own interests. A standard form of the game usually has three elements. They are as follows:

1. At least two players: also known as a participant with decision-making power;
2. Strategy sets: the strategy available to players in a game is also known as a course of action;
3. Revenue function: after selecting the strategy, players get their own returns according to the return function.

Depending on the criteria, games can often be classified into different categories: whether there is a binding agreement between the players interacting with each other, whether it is a cooperative game or whether it is a non-cooperative game. In terms of the time series of players’ actions, a game in which players choose strategies at the same time or not at the same time but do not know what the other is doing is called a static game, whereas a dynamic game is a game in which players choose strategies in order, and the latter can observe the former’s strategy, right. In terms of the extent to which information is obtained from participants, if each participant has fully mastered the relevant information about the characteristic strategy space and return function of other participants during the game[14], it is a complete information game; otherwise, it is a non-complete information game.

The standardized description of the prisoner’s dilemma game model can refer to the following payoff matrix:

$$
\begin{pmatrix}
C & D \\
R & S \\
T & P
\end{pmatrix}
$$

(5)

If both players cooperate, they will get $R$ of the reward, if both players betray, they will get $P$ of the punishment, if one partner chooses to cooperate and one partner chooses to betray, the collaborator will get $S$ for the deception, and the

| ![Figure 3: Theoretical model of planned behavior.](image1.png) |
| ![Figure 4: Entrepreneurial event model.](image2.png) |
| ![Figure 5: A theoretical model of entrepreneurial cognition.](image3.png) |
betrayer will get $T$ of the temptation of higher betrayal. At the same time, the four income parameters should meet the unequal conditions of $T > R > P > S$ and $2R > T + S$. The Nash equilibrium point of the model is $(D, D)$ [15].

2.5. Evolutionary Game Theory (Coevolution Dynamics Based on Individual Characteristics in Structured Populations, Liu Chengwei). In the long development course of game theory, there are two main research methods: classical game theory based on the hypothesis of a perfectly rational individual and evolutionary game theory based on the hypothesis of a finite rational individual [16].

The evolutionary game theory differs from this view in the following four main aspects: (1) Participant: Classical game theory mainly studies the influence of interaction between two individuals on cooperation and conflict, while evolutionary game theory studies groups composed of many individuals and mainly explores the evolution process of group strategies under selection and mutation. (2) Strategy: In classic game theory, strategy refers to the actions of the individual, whereas in evolutionary game theory, strategy refers not only to the actions of the individual but also to the manifestation or behavior attributes of the individual. (3) Earnings: In the classical game theory, the income is calculated based on the specified once or repeated interactions between individuals. In the evolutionary game theory, the individuals choose individual and group repeated interactions, resulting in revenue as its fitness from the perspective of natural selection, high fitness individuals reproduce faster, easier to occupy the whole group. (4) Equilibrium: In classical game theory, participants who have reached Nash equilibrium will not have the idea of changing their strategies, while in evolutionary game theory, through the method of trial and error, strategies between participants are constantly imitative and finally reach an evolutionarily stable strategy (ESS). However, even when a steady state is achieved, the choice of strategy will be biased.

The snowbank game, also known as a hawk-dove game or chicken game, is another noncooperative two-person game model. It can be described as follows: On a snowy night, two cars are driving in opposite directions and are blocked by a snowbank [17]. The two people in the car are faced with two choices: they can either get out of the car to clear the snowbank themselves (cooperate C) or they can wait in the car (betray D) to clear the snowbank. Assume that the cost of clearing the snowbank and making the road clear is $c$ and the benefit to the participants of making the road clear is $b$. Therefore, the profit obtained by two people shoveling snow together is $R = (b-c)/2$. If only one person shovels snow and the other party evades labor, the profit obtained by the person shoveling snow is $S = B C$, and the profit obtained by the person evading labor is $T = b$.

If neither of them shovels, they cannot get home because of the snowdrift, and the return matrix $P = 0$ can be expressed as follows:

$$
\begin{pmatrix}
C & D \\
C & \frac{(b-c)}{2} & b-c \\
D & b & 0
\end{pmatrix}
$$

The satisfying conditions of the four income parameters are adjusted as $T > R > S > P$, and the Nash equilibrium point is $(C, D)$ or $(D, C)$. In contrast to the prisoner’s dilemma game, when the collaborators meet defectors, they can get higher returns than mutual defection, that is, one’s best strategy depends on the opponent’s decision, and always taking the opposite strategy can ensure the maximization of their own interests.

In the public goods game model, $N$ participants holding fixed capital $c$ decide whether to invest their own capital in the common pool at the same time. At this point, there are two types of participants in the group: cooperators who invest a fixed amount of money in the common pool ($c = 1$) and defectors who do not invest anything ($c = 0$) (also known as free-riders). When all participants have invested, the total amount of funds in the common pool becomes $R$ times the original ($R 1$ is the gain factor of the partners). Regardless of the contribution of the participants in the group, the final
total amount of funds will be equally distributed to each participant. The following formula can be used to represent the calculation process of benefits:

\[
\begin{align*}
PC &= Pd - 1, \\
PD &= r \times \frac{n_c}{N}.
\end{align*}
\]

The returns of collaborators and defectors are represented by \(PC\) and \(PD\), respectively, and \(N_c\) represents the total funds in the public pool. Obviously, each participant faces the temptation of free-riding and can obtain benefits even without making contributions, which is also in line with the behavior of rational individuals to maximize benefits.

2.6. Complex Network Model. Nearest neighbor coupled network: a network in which each node is connected only to its neighbors is called the nearest neighbor coupled network. For example, when all the students in a class join hands in a circle on the playground to play sports games, direct contact between two students indicates that there is a link between them. The network consists of a ring of \(N\) nodes, each of which is connected to \(K/2\) neighbors on its left and right sides. \(K\) in the figure is even. For a large \(K\) value, the clustering coefficient of the nearest neighbor coupling network is \(C_{nc} = 3(K-2)/(4(K-1))\). For a fixed \(K\) value, when the number of nodes is \(N \rightarrow \infty\), the average path length is \(L = N/2K \rightarrow \infty\). It is easy to see that the two-dimensional grid network, which is widely used and has a simple network structure, is a simple nearest neighbor coupling network [18]. The central node is only connected to the four surrounding neighbors (called the von Neumann neighborhood), and the degree of each node is the same as that of the nearest neighbor coupling network shown in Figure 7.

2.7. Updating Rules of Classical Strategies. The unconditional imitation rule is an individual imitating the performance of the best. It is a deterministic rule that each individual calculates his own and each of his nearest neighbors’ benefits. If his own returns are the highest, he will maintain the current strategy; otherwise, he will imitate the strategy of his neighbor with the highest returns [19]. For example, instead of learning the unconditional imitation rule algorithm from the last person in the class, we all learn from the person who comes first in school, as shown in Table 1:

In the replicator dynamics rule, each individual chooses a neighbor at random and tries to imitate it. If the neighbor has a lower payoff, he will stick to his own strategy or adopt the neighbor’s strategy with a probability proportional to their payoff difference. The algorithm is as follows:

(1) Pick an individual \(x\) and a random neighbor \(y\) out of its \(n\) neighbors
(2) Calculate the payoff \(P_y\) of neighbor \(y\)
(3) In the case of \(P_x < P_y\), formula to find \(F\) is as follows:

\[
F = \frac{P_y - P_x}{\max\{k_x, k_y\}D}.
\]

(4) Random data were derived: \(r \in [0, 1]\)
(5) If \(r \leq F\), copy the neighbor policy, otherwise leave it unchanged.

2.8. Computer Simulation Experiment Method. In the field of evolutionary games, early research usually uses the game theory method to analyze. However, the complexity and variety of network topology caused that the calculation of the theoretical method is too much, so it is not convenient to get the result [20]. Therefore, Monte Carlo simulation provides a powerful calculation method for evolutionary game theory. All experiments in this paper are realized by Monte Carlo simulation. Before the experiment, the game theory and complex network theory are used to build the model and analyze the model. The model is realized by a computer program and the Monte Carlo method is used to calculate the results.

3. Research Hypothesis and Model Construction

3.1. Research Hypothesis. Based on the above theories, the following hypotheses are proposed:

(1) Achievement motivation has a positive influence on entrepreneurial intention
(2) Achievement motivation has a positive influence on entrepreneurial cognition
(3) Achievement motivation has a positive influence on entrepreneurial readiness script, entrepreneurial intention, script entrepreneurial ability, and script entrepreneurial intention
3.2. Research Model Construction. In order to explore the research mechanism affecting entrepreneurial intention, this paper builds a theoretical model of the influence mechanism of achievement motivation on entrepreneurial intention based on the previous research hypothesis discussion and social cognition theory of achievement motivation theory and entrepreneurial intention theory (independent variable: achievement motivation; dependent variable: entrepreneurial intention; mediating variables: entrepreneurial cognition; moderating variable: entrepreneurial support), as shown in Figure 8.

![Figure 8: The cognitive intention and path choice model of college students' entrepreneurship under the cooperation of individual and group.](image)

4. Study Design

4.1. Questionnaire Design. The overall framework of the questionnaire in this paper consists of five parts. The first part is the preface, which mainly states the purpose of the questionnaire and expresses gratitude to the participants. The first part is the content of universal control variables, including gender, professional education background, and household registration. The second to the fifth part is the measurement content of the four variables in this paper, which is compiled according to the measurement items of the maturity scale of achievement motivation, entrepreneurial intention, entrepreneurial support, and entrepreneurial cognition.

4.2. The Questionnaire to Collect. A total of 406 questionnaires were collected by collecting online and offline questionnaires, and 40 invalid questionnaires with missing data were removed in the process of questionnaire entry and collation [21]. Finally, 366 valid questionnaires were retained, with an effective questionnaire recovery rate of 90.14%.

4.3. Distribution of Samples. SPSS 21.0 analysis software was used to analyze the characteristic variables, and the sample distribution characteristics are shown in Table 2.

5. Data Analysis and Hypothesis Testing

5.1. Descriptive Statistical Analysis. SPSS 21.0 analysis software was used to conduct a descriptive statistical analysis of achievement motivation, entrepreneurial cognition, entrepreneurial support, and entrepreneurial intention, as shown in Table 3.

5.2. Reliability and Validity Test. SPSS 21.0 statistical analysis software was used to test the reliability of the four variables of achievement-motivated entrepreneurial cognition, entrepreneurial support, and entrepreneurial intention. Cronbach’s α coefficient was used as the standard reliability test results, as shown in Table 4.
Cronbach’s α value of the achievement motivation factor was 0.623, greater than 0.6, indicating that the scale reliability of achievement motivation was good. Cronbach’s α values of entrepreneurial readiness script and entrepreneurial ability script are 0.932, 0.936, and 0.901, respectively. Cronbach’s α values of the entrepreneurial cognition total table are 0.942, both greater than 0.6, so the entrepreneurial cognition scale has good reliability [22].

5.3. Influence of Characteristic Variables. Gender has no significant impact on entrepreneurial cognition, achievement motivation, entrepreneurial support, and entrepreneurial intention. There is no significant difference in the impact of different majors on entrepreneurial cognition. The level of entrepreneurial cognition of junior college students is higher than that of graduate students [23]. The entrepreneurial support of junior college students is higher than that of undergraduates and postgraduates. The entrepreneurial intention of junior college students is higher than that of undergraduates and postgraduates. The entrepreneurial intention of undergraduates is higher than that of postgraduates.

6. Conclusion and Prospect
To sum up, the innovation of the entrepreneurial talent cultivation system lies in the top-level design and path selection of entrepreneurial education. Colleges and universities should build a complementary entrepreneurial education model based on the characteristics of running a school and scientific mechanism, leading teaching, leading training, guiding practice, and guiding. In order to cultivate high-quality innovative and entrepreneurial talents, colleges and universities must first put the idea and concept of entrepreneurial ability cultivation through the whole process of talent cultivation and construct a scientific and reasonable talent cultivation system, based on general course modules and subject courses based on the professional course module, guided by the quality and ability expansion module, and supplemented by the practical teaching module, the talent training program is formulated to promote the overall linkage of modules, closely focusing on the characteristics of innovative and entrepreneurial talents with a strong foundation, strong ability, and high quality. The top-level design focuses on meeting the collective and individual development needs of the school and the realization of the
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mechanism that entrepreneurship education can achieve common development are the fundamental motivation for universities’ great progress in entrepreneurship education. In cooperation with organizations such as the business personage women’s federation and the association of small and medium enterprises of local administrative areas, we have carried out matching meetings between business personage and college students’ entrepreneurial enterprises, provided in-depth guidance for the market-oriented operation of student entrepreneurial enterprises, helped college students transform research results, and attracted government departments and cooperative enterprises to participate in the university’s research on innovation and entrepreneurship. Colleges and universities should actively introduce mass media resources, sum up their own successful experience, condense the characteristics and highlights of work, and create successful entrepreneurial models. They should also actively promote to the whole society to reach a general consensus that entrepreneurs have status in society, honor in politics, benefit in the economy, and create a good social environment for the development of college students’ entrepreneurial ability. Practical and innovative entrepreneurial culture permeate into every corner of the campus life, with some close to the practice of press close to life, close to the student’s education guide way, some colorful for the education of college teaching means, traits of college students on the job in the future, innovative undertaking, and create successful entrepreneurial models. College students transform research results, and attracted government departments and cooperative enterprises to participate in the university’s research on innovation and entrepreneurship. Colleges and universities should actively introduce mass media resources, sum up their own successful experience, condense the characteristics and highlights of work, and create successful entrepreneurial models. They should also actively promote to the whole society to reach a general consensus that entrepreneurs have status in society, honor in politics, benefit in the economy, and create a good social environment for the development of college students’ entrepreneurial ability. Practical and innovative entrepreneurial culture permeate into every corner of the campus life, with some close to the practice of press close to life, close to the student’s education guide way, some colorful for the education of college teaching means, traits of college students on the job in the future, innovative undertaking, and combined with the professional expertise of high-level business philosophy.

Data Availability

The dataset used to support the findings of this study is available from the corresponding author upon request.

Conflicts of Interest

The author declares that there are no conflicts of interest.

Acknowledgments

This work was supported by Northeast Petroleum University.

References

