

Factors influencing entrepreneurial intentions of Chinese secondary school students: an empirical study

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Received: 24 October 2015 / Revised: 23 May 2016 / Accepted: 5 June 2016 / Published online: 11 June 2016
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Abstract The ideal stage to learn about and foster positive attitudes toward entrepreneurship is believed to be during childhood and adolescence. However, most entrepreneurial studies examine college rather than secondary school students (SSS). Based on a modified theory of planned behavior (TPB), this study used stratified cluster sampling and a questionnaire to review current entrepreneurship education in secondary schools. In addition, the effects of entrepreneurship education, personal traits, and demographics on attitude, subjective norm, perceived behavioral control (PBC), and entrepreneurial intentions (EI) on 1018 SSS in China were studied. Differences, correlations, and structural equation modeling analysis indicated the following. (1) Most SSS had never received entrepreneurship education, likely resulting in lowered entrepreneurial intention and perception of entrepreneurial behavioral performance as unrealistically easy. (2) Cognitive bias existed in SSS's perceptions of entrepreneurship, and entrepreneurial behaviors were regarded as external cause-oriented activities. (3) Gender and entrepreneurial experience of family member also influenced EI and related variables. (4) Entrepreneurship education and personal traits (locus of control and innovativeness) were significantly positive predictors of EI, and (5) their effects on EI were completely mediated by PBC. The findings supported

the TPB predictions, and the results offered some implications for entrepreneurship education in Chinese secondary schools: (1) developing entrepreneurial personal traits while eliminating examination-oriented education, (2) enhancing SSS's entrepreneurial confidence so entrepreneurial behaviors are perceived as easier and more achievable, and (3) constructing systematic entrepreneurship courses to guarantee transition from secondary to higher education.

Keywords Entrepreneurial intention · Secondary school students · Entrepreneurship education · Theory of planned behavior · Personal traits

Introduction

Entrepreneurship education and development in primary and secondary schools have been gaining increasing attention from major international organizations and several governments (UNESCO 2008; World Economic Forum 2009) because students have expressed a desire to participate in these programs (Kourilsky 1995). It is believed that the ideal stage to acquire basic knowledge about and foster a positive attitude toward entrepreneurship is during childhood and adolescent years (Filion 1994). Unfortunately, there is a paucity of deeper research targeting secondary education as a cornerstone of entrepreneurship education since most research to date has focused on college students (Xu 2010). Generally, entrepreneurship education has not yet been involved in secondary schools in China (Li and Zhu 2009). One survey of 696 high school students in China, involving the cities of Beijing, Shanghai, Chengdu, Xi'an, and Guangzhou, revealed that 71 % showed interest in entrepreneurial

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learning, while few opportunities for that resulted in only 18 % receiving some entrepreneurial learning experience (Junior Achievement China 2013). Based on the gap between the supply of and demand for entrepreneurship education for secondary school students (SSS), this study aimed to review the status of entrepreneurship education in secondary schools and discover the determinants of entrepreneurial intention (EI) in SSS.

Entrepreneurial intention and its determinants

Bird (1988) defined EI as the entrepreneur's state of mind that directs attention, experience, and action toward a business concept and sets the form and direction of organizations at their inception. Although there is a considerable amount of literature on the factors influencing individual EI, early reports concentrated on personal traits and demographic variables (Koh 1996; Raab et al. 2005), such as need for achievement (Begley and Boyd 1987; Koh 1996; Gürol and Atsan 2006), internal locus of control (Gürol and Atsan 2006), risk-taking propensity (Begley and Boyd 1987; Koh 1996; Gürol and Atsan 2006), problem-solving ability (Raab et al. 2005), self-confidence (Koh 1996; Ferreira et al. 2012), tolerance of ambiguous situations (Begley and Boyd 1987; Koh 1996; Gürol and Atsan 2006), individual creativity (Zampetakis et al. 2011), and family entrepreneurial background (Liñán and Santos 2007; Ye 2009). A report by Davidsson (1995) also revealed that variables such as age, gender, education, and experiences of vicarious and/or radical change influence entrepreneurial conviction and EI. However, other studies contend that no one personality trait will ever have a strong relationship with any outcome variable, such as making a decision to become an entrepreneur (Rauch and Frese 2000). Overall, early EI studies focused more on individual personal factors and demographic variables, and many have demonstrated their influence.

In recent years, EI research has covered a wider range of topics. Entrepreneurship education (Martin et al. 2013; Bae et al. 2014), entrepreneurial cognitive style (Dutta and Thornhill 2014), entrepreneurial social networks (Xiao and Fan 2014), self-efficacy (Levenburg et al. 2006; Ding et al. 2009; Culbertson et al. 2011), entrepreneurial alertness (Tang et al. 2012), knowledge context (Dohse and Walter 2012), and psychological well-being (Zhang et al. 2015) were some of the factors found to have an effect on college students' EI. Among those factors, entrepreneurship education has received much attention. Bae et al. (2014) found a significant but small correlation between entrepreneurship education and EI ($\rho = 0.143$). Walstad (1997) argued that the impact of entrepreneurship education is a crucial factor that helps youths understand and foster an entrepreneurial attitude (Opoku-Antwi et al. 2012). Empirical

research from Du and Wang (2015) indicated that entrepreneurship education helps raise students' overall intentions with entrepreneurial aspiration and sense of innovation having the greatest effects. Sense of innovation also has some indirect effects on entrepreneurial intention through the intermediary role of entrepreneurial attitude. Furthermore, the more frequently college students engaged in entrepreneurship education, the more their entrepreneurial intentions are strengthened (Li 2013). Zhang et al. (2014) found that entrepreneurship education has a significant positive impact on EI among 494 university students.

Theory of planned behavior and entrepreneurial intention

Stemming from the theory of reasoned action, the theory of planned behavior (TPB) is the best-known attitude-behavior theory in social psychology. In the TPB framework, intention is a function of three antecedents: a favorable or unfavorable evaluation of behavior (attitude), perceived social pressure to perform or not perform a behavior (subjective norms), and the perceived ease or difficulty of performing the behavior (perceived behavioral control; Kautonen et al. 2013). The TPB has been applied widely and successfully in many behavior research fields to predict and explain results with high accuracy (Duan and Jiang 2008). In general, entrepreneurial behaviors are well planned, which means they are behaviors with intention and will be influenced by an individual's perception of the behaviors, subjective norms, and perceived behavior control (PBC) (Krueger and Carsrud 1993; Kautonen et al. 2013). However, researchers have also determined that the TPB cannot fully explain some actions, and implementation of intention may act as a moderator between intention and behavior (Gollwitzer 1999), which may explain why few college students set up their businesses after graduation, though their EI is relatively high (Ye 2009).

Recently, the TPB has emerged in research related to entrepreneurship. Kautonen et al. (2013) provided a full test of the TPB in the prediction of business start-up intention and subsequent behavior based on two-wave survey data (2006 and 2009) from the working-age population in Finland. The econometric results supported the predictions outlined in the TPB; attitude, PBC, and subjective norms are significant predictors of EI, and EI and PBC are significant predictors of subsequent behavior. Thus, their research supported the application of the TPB and the concept of behavioral intention to understand the emergence of complex economic behavior such as entrepreneurship prior to the onset of any observable action.

To further verify and enrich the TPB, Zhang et al. (2015) explored two additional contextual determinants:

short-term risk-taking preference and psychological well-being. Short-term risk-taking preference refers to the fact that some entrepreneurs are willing to bear the risk for 1 year or less, and psychological well-being describes individuals' positive emotions about their overall human functioning (Aldwin and Revenson 1987). Results from 275 survey responses from students at a large southern university in the US showed that social norms, controlled behavior, and short-term risk-taking preference were positively associated with EI. However, attitude failed to generate a significant impact on EI, which was also negatively associated with psychological well-being. Based on the TPB, Krueger et al. (2000) built a cognitive influence model of EI that indicated that expected values, normative beliefs, and perceived self-efficacy significantly influence EI while attitude toward the act, subjective norms, and perceived feasibility play roles as mediating variables.

Entrepreneurial intention of secondary school students

It is important to note that the above-mentioned studies targeted college students, who differ greatly from SSS in terms of learning states, cognitive competences, and subjective norms. There are limited studies on EI among SSS as those reported in Ferreira et al. (2012) and Ayodele (2013). Ferreira et al. (2012) investigated EI using several constructs related to psychological and behavioral characteristics in a 14–15-year-old student population and reported that need for achievement, self-confidence, and personal attitude positively affected EI. Furthermore, they found that subjective norms and personal attitude both affected PBC. In a sample of 210 randomly selected students from seven secondary schools in the Remo Educational Block of Ogun State (Nigeria), Ayodele (2013) revealed that locus of control, entrepreneurial self-efficacy, and socioeconomic status were significantly correlated with adolescent EI, while age and sex were not. Therefore, the need for school counselors to build into the school termly guidance programs and motivational strategies capable of raising entrepreneurial intention or attitude in their students was discussed.

Theoretical model and research questions

From the existing literature, demographic variables such as gender and family entrepreneurial background may affect EI. The literature also indicated that entrepreneurship education and personal traits, such as internal locus of control, individual creativity, need for achievement, and risk-taking propensity, may have an impact on EI. Furthermore, although attitude, PBC, and subjective norms

may also influence EI, they are more likely to act as mediating variables (Krueger et al. 2000) (Fig. 1).

Yet, to date, few studies have been conducted with adolescent Chinese students. The current study aimed to fill that gap by obtaining data on EI and its influencing factors from Chinese SSS. Based on the studies referenced above, we proposed a theoretical model of factors influencing EI in 12–18-year-old SSS. The aforementioned variables and traits influencing SSS EI were analyzed, and the influence of entrepreneurship education and personal traits and whether it is consistent with the widely accepted TPB were discussed. Thus, the results of the present study aim to elucidate effective interventions/schemes that promote entrepreneurship education for SSS.

After the preliminary investigation of the current status of entrepreneurship education among SSS, the current study focused on the following issues:

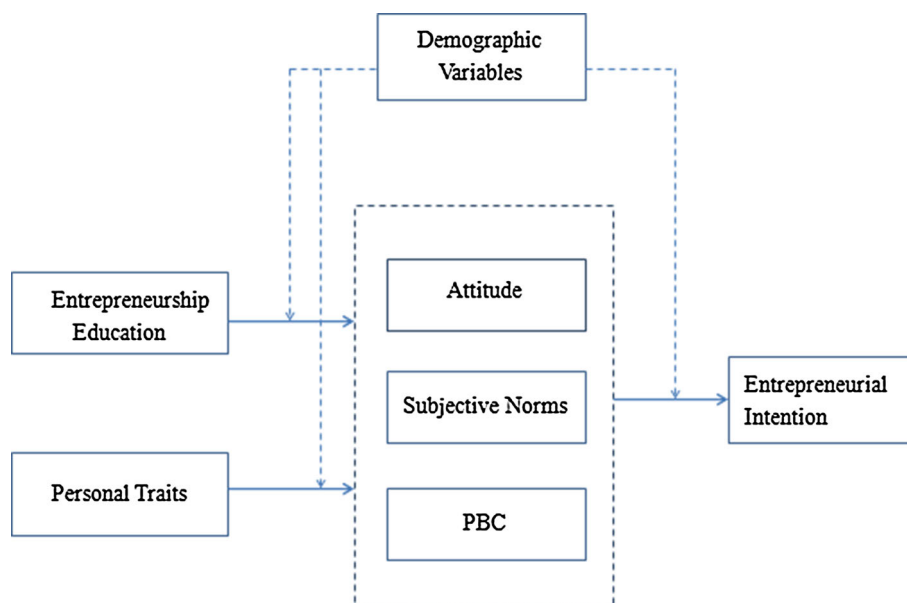
- (a) Do personal traits and entrepreneurship education influence SSSEI?
- (b) Do attitude, subjective norms, and PBC affect SSSEI?
- (c) Are attitudes, subjective norms, and PBC the mediating variables between the relationship among entrepreneurship education, personal traits, and EI?
- (d) Do any of the research variables have demographic differences?

Methods

Participants

A total of 1034 SSS aged 12–18 years old were recruited for the current study, which employed the stratified cluster sampling method. Stratified cluster sampling combines stratified random sampling and cluster sampling. The former refers to a sampling method dividing an overall population into several subpopulations and sampling each subpopulation independently and randomly; the latter refers to a sampling technique in which the total population is divided into these groups (or clusters), and a simple random sample of the groups is selected (Wang 2000). One study argued that the combination of the above two methods is more efficient than cluster sampling or stratified random sampling used individually, especially when the individual difference appears small within and among groups (Yan and Fan 1999). In this research, schools were stratified according to their types, and then, cluster sampling was adopted. According to school type (middle/high), students taking elective entrepreneurship education courses at Zhejiang University (Hangzhou, China) were asked to

Fig. 1 Theoretical research model



distribute questionnaires at their secondary schools of graduation. Based on school size, one to four whole classes were chosen as participants. Sixteen participants were excluded due to incomplete questionnaires. The 1018 remaining SSS participants (522 boys, 496 girls) came from seven different secondary schools in China: Ningbo Fenghua High School (96), Hangzhou Xuejun High School (199), Hangzhou Baochu Pagoda Experimental School (166), Hangzhou Fifteenth Middle School (200), Rugao Middle School of Jiangsu (93), Zhengzhou Foreign Language Middle School (34), and Hangzhou Fengfan Middle School (230). Among the participants, 624 were middle school students (12–15 years old), and 394 were in high school (15–18 years old). Other demographics were as follows: presence of siblings (only child, 806; SSS with siblings, 212), place of residence (rural, 136; urban, 882), academic performance (top 27 %, 382; middle 46 %, 466; bottom 27 %, 170), student leadership role (leaders, 392; nonleaders, 626), and close family members with entrepreneurial experience (some, 567; none, 451).

Dependent variable

Entrepreneurial intention

EI is the desire to own or start a business (Bae et al. 2014). Herein, the scale developed by Liñán and Chen (2009) was used to measure SSS EI with slight alterations. We used this questionnaire in the present study to measure SSS EI since all items in this questionnaire were based on Ajzen's TPB, and the questionnaire is reliable and valid when tested on different samples (Liñán and Chen 2009). Liñán

and Chen's original scale consists of six items; however, two items were removed in the current study due to their similar meanings. The remaining four items included "My professional goal is to become an entrepreneur," "I am determined to create a firm in the future," and so on. The questionnaire was measured on a seven-point Likert scale ranging from 1 (totally disagree) to 7 (totally agree). The same scoring method was employed in the present study without any modification. Confirmatory factor analysis showed that this scale had good structural validity. Fit indices of the single factor structure were $\chi^2/df = 3.394$, GFI = 0.997, AGFI = 0.983, NFI = 0.997, IFI = 0.998, and RMSEA = 0.049; Cronbach's alpha was 0.887.

Independent variables

Entrepreneurship education

Entrepreneurship education consists of "any pedagogical process of education for entrepreneurial attitudes and skills" (Bae et al. 2014, p. 219). The measure of entrepreneurship education in the present study was largely based on the results of a meta-analysis by Bae et al. (2014) about "the relationship between entrepreneurship education and intention." Four of the most common items used to measure entrepreneurship education in previous reports were selected for use in the present study. These items included "Did you attend any entrepreneurial theory course in the school?" and "Did you attend any entrepreneurial awareness or attitude course in the school?" The questionnaire was measured on a three-point scale where 1 meant "no," 2 meant "unclear," and 3 meant "yes."

Table 1 Fit indices of the personal traits scale ($n = 1018$)

	χ^2/df	GFI	AGFI	NFI	IFI	RMSEA
Locus of control	1.216	0.996	0.992	0.988	0.998	0.015
Innovativeness	3.989	0.996	0.980	0.968	0.976	0.054
Need for achievement	2.416	0.998	0.991	0.994	0.996	0.037
Short-term risk-taking	2.637	0.998	0.990	0.997	0.998	0.040
Total scale (four factors)	3.953	0.951	0.932	0.875	0.903	0.054

χ^2/df of 1–5, GFI/AGFI/NFI/IFI >0.8 (the closer to 1, the better these indices were), and RMSEA <0.08 (or <0.1; the closer to 0, the better the RMSEA) indicated that the model fit well with the data (Wu 2008)

Confirmatory factor analysis was conducted to test the structural validity of the scale. The results supported a one-factor model of this scale with good fit indices: $\chi^2/df = 3.64$, GFI = 0.997, AGFI = 0.983, NFI = 0.992, IFI = 0.994, and RMSEA = 0.051; Cronbach's alpha was 0.910.

Personal traits

Traits are defined as basic, endogenous, relative stable, hierarchically structured basic dispositions (Romero et al. 2009). Based on previous reports, the five main personal traits associated with entrepreneurship are internal locus of control, propensity to take risks, self-confidence, need for achievement, tolerance of ambiguity, and innovativeness (Ferreira et al. 2012). In the present study, we selected locus of control, need for achievement, innovativeness, and short-term risk-taking as predictors of EI since the research conducted by Opoku-Antwi et al. (2012) showed that these personal traits do influence the EI of senior high school students. The measurement items come from the research instrument used in the research conducted by Zhang et al. (2015). The locus of control scale included six items (e.g., "I feel that what happens in my life is mostly determined by people in powerful positions"); higher scores indicated an external locus of control, and lower scores indicated an internal locus of control. Additionally, innovativeness included four items (e.g., "I often surprise people with my new and different ideas"), need for achievement included three items (e.g., "I will try hard to perform better than my friends"), and short-term risk-taking included three items (e.g., "Doing what I enjoy is more important than planning for the long-term"). Higher scores of these three variables indicated higher levels of innovativeness, need for achievement, and short-term risk-taking. The questionnaire was measured on a three-point scale where 1 meant "disagree," 2 meant "unclear," and 3 meant "agree"; the internal consistency coefficient was 0.720. We conducted confirmatory factor analysis to test the structural validity of each factor of the personal traits and total scales. Fit indices appear in Table 1. The results indicated that the personal traits scale had good validity.

Mediating variables

Attitude, subjective norms, and PBC

Attitude means a favorable or unfavorable evaluation of behavior, subjective norms means perceived social pressure to perform or not perform a behavior, and PBC means the perceived ease or difficulty of performing the behavior (Kautonen et al. 2013). Based on the TPB, these three factors can effectively predict people's behavior (Duan and Jiang 2008). In the present study, these three factors were measured with 14 items based on the scale developed by Liñán and Chen (2009). Attitude included five items (e.g., "A career as an entrepreneur is attractive for me"), subjective norms included three (e.g., "If you decided to create a firm, would your close family members approve of that decision?"), and PBC included six (e.g., "I know the necessary practical details to start a firm"). A seven-point Likert scale was used here, ranging from 1 (totally disagree) to 7 (totally agree). Confirmatory factor analysis showed that the scale had good structural validity ($\chi^2/df = 9.340$,¹ GFI = 0.910, AGFI = 0.872, NFI = 0.927, IFI = 0.934, and RMSEA = 0.090); Cronbach's alpha was 0.885.

Control variables

Demographic variables served as controls in the present study. Differential analyses were conducted based on gender, grade, and entrepreneurial experience of close family members.

Data collection

Using the stratified cluster sampling method (a combination of stratified random sampling and cluster sampling), questionnaires were distributed by students taking an *entrepreneurship education* course at Zhejiang University by

¹ χ^2 is easily affected by sample size; when the sample is bigger, χ^2 will also get bigger. Therefore, in addition to the reference of the rate of χ^2 and $df(\chi^2/df)$, we also need to consider other fit indices to determine whether the model and data fit (Wu 2008).

school type (middle/high). These students came from all over China and chose one secondary school of graduation in their hometown randomly as the sample. A team of three to five students completed the survey at each secondary school; based on school size, one–four whole classes were selected as participants. Finally, seven secondary schools (three middle schools and four high schools) were selected to complete the final survey. Paper–pencil testing was employed.

Data analysis

SPSS version 17.0 and AMOS version 5.0 were used for data analysis. Descriptive statistics and testing of the theoretical research model were completed as follows. First, descriptive statistics results for each research variable were reported (e.g., entrepreneurship education), and demographic difference analysis was conducted using *t* and *F* test. Secondly, correlations between researches variables were then examined using Pearson's correlation; structural equation modeling was used to explore the predictive effects of independent and dependent variables, mediating and dependent variables, and independent and mediating variables. Finally, changes in the predictive effects of independent variables on the dependent variable were verified after adding the mediating variables.

Results

Descriptive and correlation results

Descriptive and correlational results of each research variable are depicted in Table 2.

As shown in Table 2, most of the participants have not yet received any type of entrepreneurship education (mean = 1.41). In addition, SSS showed a high level of need for achievement (mean = 2.51). Entrepreneurial intention scores for SSS were low (mean = 3.75), as was their perceived ease of entrepreneurship (PBC, mean = 3.25). Furthermore, their attitude scores were higher than the middle score of “3.5” (mean = 4.67), which means that these SSS liked entrepreneurship. Correlational results showed that entrepreneurial intention had a significantly positive correlation with entrepreneurship education, personal traits, attitudes, subjective norms, and PBC.

To further understand the state quo of entrepreneurship education in secondary schools in China, this study considered each item measuring entrepreneurship education. Frequency analysis of the four entrepreneurship education scale items showed that a larger proportion of participants had never received entrepreneurship education before

(Table 3). In fact, independent courses about entrepreneurship are absent in secondary education in China. Courses titled “Career Development Guidance” were provided by the secondary schools, which included modules about entrepreneurship. Therefore, even students themselves were not clear (10, 11, 14, and 12 % in Table 3) enough about whether they had received or not.

Demographic differences in each variable

t and *F* tests were used to find differences in the research variables (such as entrepreneurship education and EI) based on entrepreneurial experience of close family members (yes vs. no), gender (M vs. F), school type (high vs. middle), academic performance (top, middle, or bottom), and being an only child (only child vs. with siblings) (Table 4).

The entrepreneurial experience of close family members and gender both had significant effects on SSS EI. Participants with close family members who had entrepreneurial experience scored higher on four factors (attitude, subjective norms, PBC, and EI) than those without entrepreneurial family members. Male students had higher scores than female students for locus of control, innovativeness, short-term risk-taking, attitude, PBC, and EI. Entrepreneurship education enrollment scores for high school students were higher than those in middle schools. There were no statistically significant differences in the factors between other demographic variables, such as academic performance and being an only child.

Mediating analysis

In general, three conditions must be met for mediation. (1) Independent and mediating variables significantly predict the dependent variable. (2) Independent variables significantly predict mediating variables. (3) The effect of independent variables on the dependent variable tends to be weakened when mediating variables are added; at the same time, the effect of mediating variables on the dependent variable is still significant.

Predictive effect of independent and mediating variables on the dependent variable

We adopted the above-mentioned structural equation modeling approaches to explore the effect of entrepreneurship education and personal traits on EI and established two models for fit indices and standard regression coefficients (Table 5). Fit indices of the models were all quite high, indicating that these two theoretical models were reasonable. We then tested the standard regression coefficients in these models and found that locus

Table 2 Descriptive and correlational analyses of each research variable ($n = 1018$)

	Mean	SD	1	2	3	4	5	6	7	8	9
1. Entrepreneurship education	1.41	0.54	1								
2. Locus of control	1.74	0.49	0.09**	1							
3. Innovativeness	2.19	0.45	0.09**	0.24**	1						
4. Need for achievement	2.51	0.47	-0.01	-0.05	0.39**	1					
5. Short-term risk-taking	2.10	0.69	0.02	0.31**	0.18**	0.04	1				
6. Attitude	4.67	1.50	-0.05	0.03	0.21**	0.23**	0.07*	1			
7. Subjective norms	5.06	1.58	-0.07*	-0.11**	0.11**	0.16**	0.05	0.44**	1		
8. PBC	3.25	1.66	0.07*	0.13**	0.23**	0.12**	0.10**	0.36**	0.17**	1	
9. EI	3.75	1.79	0.06*	0.12**	0.20**	0.10**	0.06*	0.55**	0.26**	0.68**	1

SD standard deviation

* $P < 0.05$; ** $P < 0.01$ (two-tails)

Table 3 Frequency analysis of entrepreneurship education items ($n = 1018$)

Did you enroll...in your school?	N	Unclear	Yes
Entrepreneurial theory course	821 (81 %)	105 (10 %)	92 (9 %)
Entrepreneurial practice course	690 (68 %)	113 (11 %)	215 (21 %)
Entrepreneurial awareness or attitude course	730 (72 %)	144 (14 %)	144 (14 %)
Courses related to economics	749 (75 %)	122 (12 %)	147 (15 %)

Table 4 Demographic differences in the scores for each research variable ($n = 1018$)

	Entrepreneurial experience of close family members (t) (Yes vs. no)	Gender (t) (M vs. F)	School types (t) (high vs. middle)
Entrepreneurship education	No difference	No difference	High > middle***
Locus of control	No difference	Male > female*	No difference
Innovativeness	No difference	Male > female*	No difference
Need for achievement	No difference	No difference	Middle > high***
Short-term risk-taking	No difference	Male > female**	No difference
Attitude	Yes > no***	Male > Female*	No difference
Subjective norms	Yes > no**	No difference	Middle > high**
PBC	Yes > no***	Male > female***	No difference
EI	Yes > no***	Male > female***	No difference

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$

of control ($\beta = 0.098^*$), innovativeness ($\beta = 0.247^{***}$), and entrepreneurship education ($\beta = 0.089^*$) significantly predicted entrepreneurial intention. In addition, the need for achievement and short-term risk-taking had no significant effect on entrepreneurial intention.

We then constructed a predictive model to test the effect of mediating variables (attitude, subjective norms, and PBC) on the dependent variable (EI; Table 5). Model fit indices were all quite high, indicating that this theoretical model was reasonable. The predictive effect of attitude ($\beta = 0.375^{***}$) and PBC ($\beta = 0.596^{***}$) on

entrepreneurial intention was significant, while the effect of subjective norms was not.

Predictive effect of independent variables on mediating variables

Based on the above predictive results, need for achievement, short-term risk-taking (independent variables), and subjective norms (mediating variable) had no significant effect on EI (dependent variable). Therefore, we removed these independent and mediating variables from the

Table 5 Fit indices and β (independent and mediating variables on dependent variable)

	β	χ^2/df	GFI	NFI	IFI	RMSEA
Independent variables						
Locus of control \rightarrow EI	0.098*	4.624	0.929	0.864	0.890	0.060
Innovativeness \rightarrow EI	0.247***					
Need for achievement \rightarrow EI	0.006					
Short-term risk-taking \rightarrow EI	0.026					
Entrepreneurship education \rightarrow EI	0.089*	2.451	0.989	0.986	0.982	0.038
Mediating variables						
Attitude \rightarrow EI	0.375***					
Subjective norms \rightarrow EI	-0.024	8.201	0.892	0.918	0.928	0.080
PBC \rightarrow EI	0.596***					

Locus of control, innovativeness, need for achievement, and short-term risk-taking were the personal traits
EI entrepreneurial intention

following mediating analysis. We constructed two models to test the predictive effect of locus of control, innovativeness, and entrepreneurship education on attitude and PBC; standard regression coefficients and fit indices are shown in Table 6.

Fit indices of these two theoretical models were good, indicating that they were reasonable. In addition, the effects of the two predictive variables on PBC were all significant; however, locus of control and entrepreneurship education did not have a significant effect on attitude.

Mediating analysis of PBC

According to the above path analysis results, the effects of the three predictive variables on PBC were all significant. Therefore, PBC was a main mediating variable in the mediating analysis. Two mediating models were constructed for this analysis, and the standard regression coefficients and fit indices of these two models are shown in Table 7.

The effect of locus of control, innovativeness, and entrepreneurship education (independent variables) on EI (dependent variable) tended to weaken (not significantly) when the mediating variable (PBC) was added to the analysis. At the same time, the effect of PBC on EI was still significant (Table 7). Thus, PBC had a complete mediating effect on the relationships among locus of

control, innovativeness, entrepreneurship education, and EI. The two mediating models are shown in Fig. 2.

Conclusions and implications

This study explored the relationship among entrepreneurship education, entrepreneurial personal traits, and EI of SSS as well as the mediating effect of attitude, subjective norms, and PBC. Most SSS had not received any type of entrepreneurship education before. The scores for entrepreneurial intention and PBC were low, whereas scores for attitudes toward entrepreneurship were high (>4.5 on a seven-point scale). In a study on EI of Chinese undergraduates, EI of 15,922 Chinese undergraduates was higher with 75 % hoping to be self-employed (Jiang 2009).

EI showed significantly positive correlations with entrepreneurship education, personal traits, attitude, subjective norms, and PBC. EI also had significantly positive correlations with external locus of control, which is inconsistent with results of previous studies showing a significantly positive correlation with an internal locus of control (Gartner 1988; Ferreira et al. 2012; Ayodele 2013). In other words, Chinese students more easily regarded external factors as the reason of entrepreneurial success since they were less exposed to entrepreneurial activities and entrepreneurship education. Additionally, EI, attitude,

Table 6 Fit indices and β for independent and mediating variables

Variables	β_1	β_2	χ^2/df	GFI	NFI	IFI	RMSEA
Personal traits							
Locus of control	0.051	0.073*	4.948	0.919	0.900	0.918	0.062
Innovativeness	0.393***	0.396***					
Entrepreneurship education	-0.046	0.098*	8.139	0.915	0.915	0.925	0.081

β_1 refers to the standard regression coefficients of independent variables on attitude, β_2 refers to the standard regression coefficients of independent variables on PBC

Table 7 Fit indices and β for the two mediating models

	Independent ↓ Mediating	Mediating ↓ Dependent	Independent ↓ Dependent	χ^2/df	GFI	IFI	RMSEA
Locus of control → PBC → EI	0.090*	0.705***	0.043	4.398	0.932	0.939	0.058
Innovativeness → PBC → EI	0.319***		0.032				
Entrepreneurship education → PBC → EI	0.101**	0.719***	0.018	6.830	0.931	0.951	0.076

Locus of control and innovativeness were the personal traits
PBC perceived behavioral control, *EI* entrepreneurial intention

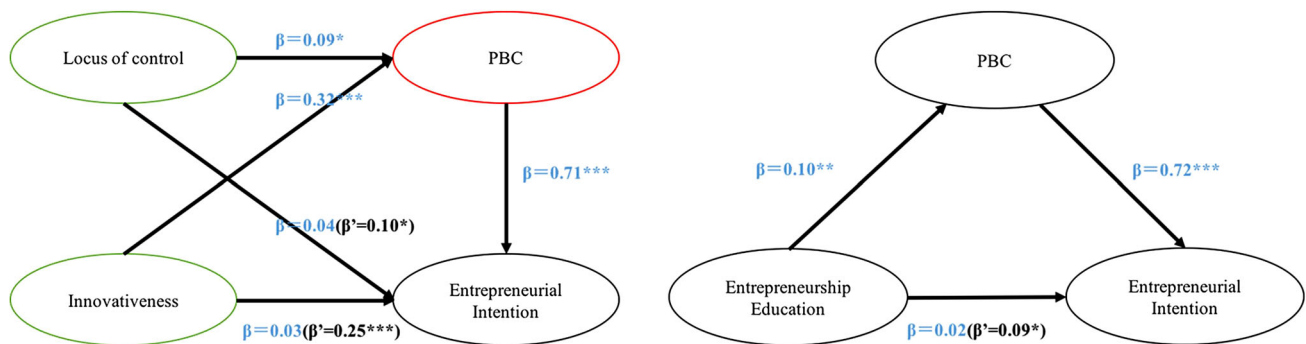


Fig. 2 Two mediating models. β' refers to the single predictive value of independent variables on the dependent variable

subjective norm, and PBC differed significantly by gender and entrepreneurial experience of close family members. Male students had higher scores than female students for these four variables; participants whose close family had entrepreneurial experience gained higher scores on all four of these variables than those whose close family did not. This result is consistent with previous studies by Ye (2009) and Harris and Gibson (2008) in which significant gender and age differences in entrepreneurial attitude scale scores for undergraduate business students were examined. In contrast, Ayodele (2013) found that gender and age had no effect on SSS entrepreneurial intention, which may result from the culture difference between the East and the West as boys are given more social expectation than girls in China.

The present study also showed that entrepreneurship education and personal traits significantly predict EI. These results are consistent with previous studies showing that entrepreneurship education (Souitaris et al. 2007) and information technology-based entrepreneurship education (Hejazinia 2015) are important factors that positively affect EI. Furthermore, we found that PBC had a completely mediating effect on relationships between locus of control, innovativeness, entrepreneurship education, and EI. This result is consistent with that of a study by Gollwitzer (1999).

The findings of this study support the predictions outlined in the TPB; the predictive effects of attitude and PBC on EI were significant, while the effect of subjective norms was not. These agree well with Ajzen’s (1991) viewpoint that personal factors (attitude and PBC) were the major factors influencing one’s behavior. In addition, as a predictive variable of EI, PBC was affected by personal traits of SSS and the entrepreneurship education they had received; entrepreneurship education and locus of control had no significant influence on attitude.

Thus, this study also provides some significant implications for the implementation of entrepreneurship education in secondary schools in China, as discussed in the following sections.

Developing entrepreneurial personal traits

In the present study, innovativeness and locus of control were important personal traits that affected SSS EI. The cultivation of positive personality traits cannot occur overnight; therefore, curriculum reform and changes to teaching concepts should be used to promote students’ positive personal traits while eliminating examination-oriented education. Furthermore, we found that a higher external locus of control score was correlated with higher EI scores, suggesting that the Chinese SSS sample group

misunderstood entrepreneurship to some degree. These SSS believed that entrepreneurship was a type of behavior determined by luck or some other external causes. Entrepreneurship concepts taught to SSS should be further refined, considering their physical and mental characteristics and abilities.

Enhancing SSS's entrepreneurial confidence

PBC had a complete mediating effect on the relationships among entrepreneurship education, personal traits, and EI. Nevertheless, its scores were relatively low. PBC refers to people's confidence in their ability to perform some kinds of behaviors and to the perceived ease or difficulty of performing an entrepreneurial behavior (Ajzen 1991). According to the TPB, PBC, together with behavioral intention, can be used directly to predict behavioral achievement (Ajzen 1991). Entrepreneurship education in secondary schools should emphasize the important effect of PBC on entrepreneurial achievement to enhance students' entrepreneurial confidence.

Constructing systematic entrepreneurship courses

Secondary schools are supposed to proactively develop and improve entrepreneurial content to guarantee that entrepreneurship education transitions smoothly from middle to high school and higher education institutes and provide the community with systematic and holistic entrepreneurship education resources. At present, entrepreneurship education in secondary schools in China is in its inception; there is a lack of deeper research regarding course transitions as students progress from middle to high school and higher education institutes compared to other areas of course research. Under the policies of the European Commission, member states should foster entrepreneurial skills from primary school onwards alongside a focus from secondary to higher education on the opportunity of business creation as a career destination (Hoppe 2016). In Norway, almost 90 % of lower secondary schools and more than 90 % of upper secondary schools provide entrepreneurship education of some kind (Johansen and Schanke 2013).

Limitations

The current study is limited in the following ways. First, the participants were from seven secondary schools from different cities in China. As such, our results may not be generalizable to students in rural secondary schools. Additionally, vocational SSS were not selected for comparison. Comparison of different types of students may increase the external validity of the study. Thus, future

studies should include participants from more diverse backgrounds and different population types. Finally, many personal traits have an influence on SSS EI; this study only selected some of them that were proven to have higher degrees of correlation with EI. Locus of control, need for achievement, innovativeness, and short-term risk-taking were chosen as predictors of EI without sufficient exploration. One direction for future research is to deepen exploration of the role of personal traits in this field.

Fundings This research was funded by the key project named *Innovation and Entrepreneurship Education During the Process of Economic Transformation* (VIA150002) from National Social Science Foundation, and National Natural Science Funds of China (71302062).

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