

Innovation Capacity and Entrepreneurial Intention: The Moderating Effects of Entrepreneurial Atmosphere¹

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There is natural relationship between innovative ability and entrepreneurial intentions (EI). Surprisingly, very little attention has been given to this important issue in previous literatures. Combining innovator's DNA model with social cognitive theory, this paper collects 1263 samples to test the complex link between innovative capacity (operationalized as IC) and EI of potential entrepreneur. In addition, the effects of perceived entrepreneurial atmosphere (EA) on EI are examined. The results show that innovation capacity significantly affects EI, and perceived entrepreneurial desirability (ED) and feasibility (EF) mediates this relationship significantly. EA has direct effect on EI and indirectly changes the effect of IC through moderating the relationship between EF and EI. For robust test, we substitute dependent variable EI with entrepreneurial behavior and repeat the process above. The core results remain unchanged. The difference here is that actual entrepreneurial practice is not affected by attractiveness of start-up, innovator's confidence to succeed in it is more important. This research confirms the necessary link between innovative capacity and EI, and substantially improves the explaining efficacy of classical EI models based on personality traits. Our findings indicate that policymakers need to pay more attention to training and improving potential entrepreneurs' innovative ability and create social atmosphere more suitable for innovators entering the process of starting a new venture. Through increasing attractiveness and the simplicity to be an entrepreneur, government can motivate innovators to be more willing to start a business and also help them succeed at ease.

Innovation is a necessary condition for creating a new firm successfully. Then, would the person with higher innovation capacity more willing to be an entrepreneur than others? This is a valuable issue worth exploring more extensively and profoundly. Innovators are the main sources of potential entrepreneurs who are in the irreplaceable position of modern economy. Since innovation is highly scarce for long term economic growth, if innovators were not more inclined to start new ventures relatively, the total size of entrepreneurial activities of whole economy would decrease dramatically, it is difficult to remain economic development in the long run.

Surprisingly, although innovation is in the core of entrepreneurial activity (Amit et al. 1990), there have been many studies considering entrepreneurship as well as innovation issues (Chen and Zhang 2009; Liñán and Fayolle 2015), very little attention has been given to such an important link between innovation and entrepreneurship in previous literatures (Zampetakis et al. 2011; Zhao et al. 2014). Except few studies that indirectly touching this issue (for instance, Hmieleski and Corbett 2006; Sun et al. 2015; Ward 2004;

Zampetakis et al. 2011 and so on), most of literatures in this field are based on the Theory of Planned Behavior (TPB) (Ajzen 1991) and Entrepreneurship Event Model (EEM) (Shapero and Sokol 1982) which did not try to use innovation as a core variable to explain entrepreneurial intention. More attention is paid to the factors such as personality traits, demographics, subjective perception and environment. The effects of their explanation for entrepreneurial intention are confirmed by many researches (Liñán and Fayolle 2015). Although some researches indeed found that there are significant differences in attitudes to innovate between entrepreneurs and non-entrepreneurs (Robinson et al. 1991) which can affect personal entrepreneurial intention (Wurthmann 2014), and innovativeness can predict the intention to start a new business to some extent (Ahmed et al. 2010), there are many unanswered questions remaining open for further study.

As for the purpose of our research, the direct and indirect effects of innovation capacity on entrepreneurial intention will be examined as a core explanatory variable. In addition, the influence of an important external environment factor – entrepreneurial atmosphere –this relationship will be considered as a moderating variable in detail. Based on these experiential findings we can reveal the complex mechanism through which potential entrepreneurs with high innovation capacity and how they generate their intention to start a business, and propose some measures to motivate this process.

Specifically, based on mainstream entrepreneurial intention theories, this paper combines the model of innovator's DNA with social cognition theory, and tries to illustrate some theoretical analysis and empirical examination for the link between innovation and entrepreneurial intention. On the one hand, we hope to confirm the path and mechanism through which innovation capacity affects entrepreneurial intention (EI). On the other hand, the complex effects of external factors on this relationship can be revealed. Our results show that, under controlling several important personal traits variables, individual innovation capacity that can distinguish innovators from non-innovators significantly affect his EI. Meanwhile, such effects are realized by the mediation roles of two variables: entrepreneurial desirability (ED) and feasibility (EF). In addition, perceived entrepreneurial atmosphere (EA) has direct effect on EI as well as indirectly changes innovator's EI through negatively moderate the mediating relationship between EF and EI. Consequently, improving potential entrepreneurs' innovation capacity can achieve dual purposes: enhancing EI, increasing surviving rate of startups.

LITERATURE REVIEWS

Innovation and Entrepreneurship

Essentially entrepreneurship is closely tied to innovation (Amit et al. 1990; Ji and Yao 2011; Schumpeter 1934). Nevertheless, early classical theorists had neither realized the importance of innovation for creating new business successfully nor noticed the two different roles played by entrepreneur in economy: owner of capital and innovator (for instance, Smith 1997, p.47). Knight (1921) firstly proposes the concept of entrepreneurship with modern sense. He thinks that the special function of entrepreneur is undertaking uncertainty. The person without ability to cope with uncertainty is not qualified by an entrepreneur. Owning capital is not a necessary condition for starting a new venture. Schumpeter (1934) formally separates the function of innovator from capitalist. According to Schumpeter, innovation is prerequisite for success of startups. If entrepreneur cannot use five new combinations to break the economic equilibrium of circular flow, it is impossible to earn extra profits. Startup is precisely the process of realizing innovation. The necessary funds for entrepreneurship can be provided through the function of bank credit creation. Entrepreneurs with high innovation capacity can always persuade owner of capital to support him.

Additionally, from the perspective of management Drucker argues that innovation is the most basic role entrepreneur ought to play. "It is not entrepreneurship to only open a deli without providing new satisfactory service nor creating new need for consumers" (Lin et al. 2001, p.89). The empirical research by Dyer et al. (2011) illuminates that comparative to non-entrepreneur, entrepreneurs are indeed more innovative. Further, Shane and Venkataraman (2000) directly defines entrepreneur as innovator. Only through new business model, new technology, new service and new products that meet market needs we

can thus create unique value, and able to make profits for the entrepreneurs. In reality, startup is a kind of innovation activity with high risk (Lin et al. 2001). Therefore, no matter how the signal function of wealth may increase the probability of capitalist-innovator starting new business (Zhang 1995; Yin et al. 2015), innovation is the requirement for success of startup.

Now looking at this issue from another side, since innovation is so significant for entrepreneurship, then is person with high innovation potential more willing to start his own business? Answering this question is crucial because entrepreneurial talent is a major scarce in resource (Ji and Yao 2011). If innovator does not want to establish a new firm, his creativities will be buried and cannot be activated any more. When most of innovators in economy lack enough motivation to start new businesses, economic vitality will be weakened dramatically and long term of endogenous growth will be stagnated as a result. Surprisingly, although some literatures study this problem indirectly (Dutta et al. 2015; Sun et al. 2015; Wurthmann 2014 etc.), previous researches do not pay sufficient attention to it on the entire issue (Zampetakis et al. 2011).

There are three reasons for such situation at least. Firstly, under the overwhelming influence of Schumpeter's innovation theory, most of literatures equate innovator with entrepreneur as a whole (e.g. Lin et al. 2001), and it is not necessary to discuss the problems about entrepreneurship for innovators. Nevertheless, there are many innovative talents who are underutilized, and that the entrepreneurship is not a matter of course (Zhao et al. 2014). Secondly, so far there are no reliable ways to measure innovation capacity. Researches in this field are limited to theoretical discussion. It is very difficult to do empirical examination in depth². At last, the theoretical foundations for the majority of EI researches are Theory of Planned Behavior (TPB) (Ajzen 1991) and Entrepreneurship Event Model (EEM) (Shapero and Sokol 1982). These models are not developed on the base of particular characteristics of innovation and entrepreneurship. Their focuses are personal traits and social psychological factors. Since "entrepreneurship event itself is innovation" (Shapero and Sokol 1982, p.78), entrepreneurial models need not to involve innovation.

Entrepreneurial Intention Models

Entrepreneurial intention (EI) refers to the willingness to start a new business. Many authors have confirmed its important role in the process of entrepreneurship (Kautonen et al. 2015; Liñán and Fayolle 2015). A meta-analysis for 185 TPB empirical studies conducted by Armitage and Conner (2001) shows that behavioral intention may explain 27% of real behavior variances. For EI, Ajzen et al. (2009) finds correlation coefficient being in the range of 0.90 and 0.96.

In present literatures, the explanations for EI are mainly based on TPB (Ajzen 1991) and EEM (Shapero and Sokol 1982). The former uses entrepreneurial attitude, subjective norm and perceived behavior control to explain individual EI. The explanatory power can arrive at 30-45% (Kautonen et al. 2015). The latter sees entrepreneurship as an event, which happens under the influences of perception on entrepreneurial desirability (ED) and entrepreneurial feasibility (EF). Certainly these two models are correlated to each other in many aspects (Wurthmann 2014), e.g. some dimensions of perceived behavior control in TPB are overlapped by perceived EF in EEM (Krueger et al. 2000). The key point here is that the determinants of both of these are connected with personality, demographics, perception, external environment and human capital (Liñán and Fayolle 2015).

To the best of our knowledges, the link between innovation capacity (IC) and EI have not been studied enough in previous literatures relating to EI. Although TPB and EEM did not exclude taking into account the effects of proxy variable of IC, there was not research focusing on the effects of innovation factor on personal EI in huge literatures based on the two classical EI models. We do not find any researches using innovation as core variable to explain EI. Despite all this, Using different meanings of innovation and at different levels, there are a few of literatures involved into this problem to some extent, e.g. Wurthmann (2014), Robinson et al. (1991), Zampetakis et al.(2011), Ward (2004), Hmieleski and Corbett (2006), Ahmed et al.(2010), Jiang et al. (2006), Sun et al. (2015) and so on³. For instances, some researches point out that there are significant differences in Attitudes to Innovate (AI) between entrepreneurs and non-entrepreneurs, furthermore AI affects EI greatly (Wurthmann 2014).

Innovativeness, innovation capacity and innovation dimension among personality traits had also been found having predictive effects on EI (Ahmed et al. 2010; Jiang et al. 2006; Sun et al. 2015).

Creativity is an important dimension of innovation capacity. Because it is easy to be measured comparatively, some studies try to use this construct to explain EI. Hills et al. (1999) has already confirmed its predictive power. In addition, Hmieleski and Corbett (2006) finds that creativity can explain a large part of variances of EI. Those students thinking themselves as more creative are more likely to choose self-employment (Zampetakis et al. 2011). Zhao et al. (2014) points out that creativity partially mediates the relationship between personal values and EI.

Based on these findings, this paper designs the measuring tools in line with the innovator's DNA model by Dyer et al. (2008 2011), and combines social cognitive theory into statistical model. 1263 samples collected from undergraduates and graduates with 3 working years are conducted to test the connection between innovation and entrepreneurship, discover the complex mechanism of this relationship, and examine how external factors affect them. Some practical suggestions can be derived from these results.

THEORETICAL HYPOTHESES

Innovation Capacity

Since Schumpeter's pioneering contribution, scholars have already reached a consensus on whether entrepreneur needs to be innovative enough. However, there are little researches studying how willingly innovators want to be entrepreneurs. Although it does not propose a systematic theoretical framework and enough empirical evidences, several papers point out that innovation is a key dimension of entrepreneurial activity and entrepreneurs are significantly different from non-entrepreneur in attitude toward innovation (AI) (Robinson et al. 1991). The further findings of Wurthmann (2014) show that potential entrepreneur's AI has significant effect on EI. In reality, the specific essence of innovation gives rise to high traction costs for exchange (Ji and Yao 2011). For potential entrepreneurs with high innovation capacity, self-employment is the best way to exploit so scarce resource. Consequently, it is very natural to choose creating new business for person who possesses special innovative talent. Additionally, most of innovators are with unique personalities (Schumpeter 1934). They are mavericks, challenging the status quo and with contempt for authority. These characteristics are not in accordance with the systematized, normalized and standardized management of mature organization (Dyer et al. 2011). Self-employment is a more appropriate choice for potential entrepreneur with high IC.

For direct test, the empirical research by Ahmed et al. (2010) finds that the degree of innovation is strongly correlated with EI. Jiang et al. (2006) studies the entrepreneurial traits of Chinese high-tech enterprises and finds that the innovational dimension among personal traits affects EI significantly. Gartner (2001) shows that entrepreneurial behavior is generally characterized by innovation, risk-taking propensity, which determines whether startup can succeed to a great extent. The person with such kinds of traits is more likely to start their own business because EF has already been found to affect EI greatly (Liñán and Fayolle 2015). Sun et al. (2015) shows that undergraduates' innovation capacity has significant effect on their entrepreneurial behavior. Zhang et al. (2008) realizes the value of innovative entrepreneurship, tries to use social capital theory to explain how innovative individual perceive entrepreneurial opportunity. Innovativeness of opportunity is correlated with entrepreneurial behavior indirectly.

Since it is difficult to operationalize these concepts such as innovation capacity, innovation, entrepreneurship, and design measuring items, some researches turn their attention to a dimension of innovation capacity: creativity. This construct is usually thought as an important determinant to EI and a trigger point to appearance of EI (Hills et al. 1999). Sternberg (2004) thinks that creative intelligence has influence on entrepreneurial decision. Hmieleski and Corbett (2006) also find that creativity can explain a large part of variances of EI. Based on 180 samples from undergraduates Zampetakis et al. (2011) shows that those students thinking themselves as more creative are more likely to choose self-employment. Zhao et al. (2014) points out that creativity partially mediates the relationship between personal values and EI.

Finally, Ward (2004) gives a cognitive explanation for the connection between creativity and entrepreneurship. Now we can hypothesize that:

H1: Innovation capacity affects potential entrepreneur's EI, the more his innovation capacity is, the stronger his EI is.

The Mediation Role of ED and EF

Entrepreneurial desirability (ED) is conceptually defined as attractiveness for establishing a new enterprise. Entrepreneurial feasibility (EF) refers to strength of belief with which potential entrepreneur think himself as someone who can succeed in future⁴. The explanatory power of these two factors for EI has been confirmed by many researches (Liñán and Fayolle 2015; Shapero and Sokol 1982). Furthermore, ED and EF play mediating roles in many models. This implies that a complex process is needed to generate EI. Potential entrepreneur firstly evaluates himself about the aspects such as personality, innovation ability, leadership, value and environment for entrepreneurship. Secondly, he perceives and evaluates the attractiveness of self-employment, and calculates the probability to succeed. If potential entrepreneur confirms that becoming a real entrepreneur is not attractive, or feasibility to succeed is low, his EI will tend to weaken. Otherwise, strong entrepreneurial desire can motivate him to implement entrepreneurial behavior to a great extent.

Experientially, Wurthmann (2014) finds that potential entrepreneur's attitude toward innovation (AI) significantly affects his EI, then ED and EF mediates this relationship. It indicates that there are some ways to increase individual EI through changing AI, because the attitude can be changed to some degree. Yang (2013) uses 1330 Chinese samples of students to test applicability of TPB in China. He finds that entrepreneurial attitude and perceived behavioral control have significant effects on EI. The research of Hu (2014) shows that undergraduate's background and personal traits affect EI through the mediation of entrepreneurial attitude. More important is Tsai et al. (2016), Based on TPB, this research develops a moderated mediation model and finds that the relationship between some determinants and EI are mediated by entrepreneurial attitude and planned entrepreneurial control. Since ED in EEM model overlaps many dimensions of entrepreneurial attitude, and planned entrepreneurial control is similar to EF (Krueger et al. 2000), we can infer that Tsai et al. (2016) has already confirmed the mediating effects of these two variables: ED and EF. In addition, Carr and Sequeira (2007) also indirectly finds the mediating effects of ED and EF on the relationship between some determinants and EI. Now we can hypothesize that:

H2: ED and EF affect potential entrepreneurial EI, and further mediate the effect of innovation capacity on EI.

Direct and Indirect Effects of EA

We define entrepreneurial atmosphere (EA) as the degree to which individual perceives his family members, friends and fellows involving entrepreneurship activities. The more frequently surrounding entrepreneurial activities happen, the more intense the EA is. This definition is close to the concept previous entrepreneurial exposure in Fayolle and Gailly (2015) and another one prior exposure to entrepreneurship in Krueger (1993). We refer to these two researches to design and develop measuring scales for EA. According to social cognition theory, a person's perception on the situation may have influence on his behavior as well as intention (Bandura 1986). In the environment of intense EA, the person would understand entrepreneurship more clearly, the interest to become an entrepreneur may be stronger relatively. Hence it is expected that the perception on EA can directly affect personal EI.

The direct effects of external factors on intention and behavior are supported by a lot of experiential studies (Gao et al. 2014; Liñán and Fayolle 2015). Specifically, Yang (2000) finds that entrepreneurial experiences of parents have effects on person's entrepreneurial attitude, perceived behavioral control and EI. Carr and Sequeira (2007) demonstrates that the ones with connection to family enterprises have higher intention to start new venture. These effects are realized through entrepreneurial role model generally

(that is someone such as parents, relatives or friends experiencing entrepreneurial activities) (Ahmed et al. 2010; Bae et al. 2014). Matthews and Moser (1995) and Scott and Twomey (1988) specifically demonstrate the role of close relatives in particular as models to emulate in opting for self-employment. However, some recent researches find no correlation (e.g. Mueller et al. 2014), even negative links between these two variables (e.g. Zhang et al. 2014). Related to this, Prior entrepreneurial experience also appears as a factor likely to influence EI (Fayolle and Gailly 2015; Hills and Welsch 1986; Krueger 1993).

For moderating effects, many researches point out the relationship between innovation and entrepreneurship may be affected by some kinds of social and personal factors (Krueger et al. 2000), among which the role played by family is worth paying more attention especially (Drennan et al. 2005). Fayolle et al. (2014) finds that personal value can moderate the effects of many determinants (e.g. entrepreneurial attitude) on EI. Because EA can change personal value on entrepreneurial behavior, it is reasonable to suppose EA may moderate the link between other variables (e.g. EF) and EI. Tsai et al. (2016) shows that subjective norm constructed from TPB significantly moderate the effect of planned entrepreneurial control on EI. Since subjective norm may be impacted by EA, we can infer that EA may moderate the relationship between EF and EI. Consequently, we can hypothesize that:

H3: EA affects potential entrepreneur's EI, the more intense person perceives EA, the stronger EI is.

H4: EA moderates the relationship between EF and EI, the more intense person perceives EA, the closer the link between EF and EI is.

Control Variables

In term of the literature reviews by Liñán and Fayolle(2015) and the purposes of this research, our model includes three personal traits as control variables: need for achievement (NA), internal locus of control(IL) and self-efficacy(SE).

DATA AND METHODS

Samples

We conducted survey for 988 undergraduates and 275 graduates who have left business school for 3 years. Student-based samples are widely used in many researches especially the ones about entrepreneurship (Zhang et al. 2015). Many studies have shown that the results from students and general ones are comparable (Bateman and Zeithaml 1989; Wilson et al. 2007). Krueger et al. (2000) even argues that students are more appropriate respondents when studying subjects such as entrepreneurial intention, because generating intention is an entrepreneurial phenomenon in a pre-emergent stage (e.g. in universities). Wurthmann (2014) also use the business students samples to test the relationship between attitudes and EI, he pays great attention to the question about how to encourage university students to start their own ventures. Of course, most of relevant conclusions can extend general ones easily (Dutta et al. 2015).

For our research purposes and theoretical framework, samples collected from students have some particular advantages. At first, self-selection problem does not exist, because respondents participate into this survey passively. Secondly, random sampling is usually not enough for representing real society. The community of university students can be seen as a little society. Their characteristics and propensities can represent the average population. Thirdly, the experiences from many countries demonstrate that graduate students are major group for entrepreneurial activities. The main subjects of many policies are for motivating startups such as entrepreneurial education and support toward undergraduates or new graduates (Dohse and Walter. 2012). Finally, students will face problems in choosing careers soon. Their responses on EI questions are closer to what they really think (Mueller et al. 2014).

Questionnaire

The primary challenge is measuring innovation capacity. Benefiting from the contribution by Dyer et al. (2008 2011), we construct relevant items on the basis of their innovator's DNA model. Different from previous literatures Dyer et al. distinguishes innovators from non-innovator in term of innovation skills and behaviors. Their scales are developed from in-depth interviews and qualitative analyses for hundreds of top innovator-entrepreneurs such as Jobs, Bezos and Benioff, and quantitative analyses for other 500 innovators and 500 managers. Dyer et al. (2008) has already tested the validity and reliability of these scales strictly.

According to Dyer et al. (2011), innovation capacity consists of 5 dimensions: Association, Questioning, Observing, Experimenting/Exploring, Idea networking. We translate original items from English into Chinese and design initial questionnaire through discussion and revision by the members of research team. Then we invite a teacher from Department of English to translate Chinese items back into English, make a comparison with original English items and give suggestions for modification. At last, 10 students fill the revised questionnaire experimentally and give their feelings about this questionnaire⁵. We perfect it furthermore and complete a formal version. The items of other variables have already been fully tested in previous literatures. We can use them directly here. The dependent variable EI and entrepreneurial behavior are respectively measured by the questions: "Do you want to start a new venture in future?" (All respondents are required to answer this question) and "Have you already started a new venture?" (Only graduate students need to answer it). Answer is "Yes" or "No"⁶.

TABLE 1
VARIABLES AND ITEMS

Variable	Abbr.	Items	Variable	Abbr.	Items
Questioning	QU	4	Internal locus of control	IL	4
Observing	OB	8	Self-efficacy	SE	5
Experimenting	EX	4	Entrepreneurial desirability	ED	3
Idea networking	IN	4	Entrepreneurial feasibility	EF	4
Need for achievement	NA	5	Entrepreneurial atmosphere	EA	3

We use collected data to conduct Exploratory Factor Analysis (EFA) for all samples⁷. Innovation capacity extracts 4 factors and 20 items from 5 original dimensions and 23 items. Other 3 items are deleted because their factor loadings are too low. The items for both "Association" and "Observing" are loaded on one factor, which is consistent with Dyer et al. (2008). We can name it "Observing" factor. Other variables and related items are shown in Table 1. Table 2 shows the correlation coefficients matrix for all variables.

TABLE 2
CORRELATION COEFFICIENTS MATRIX

Variable	Mean	Std. Dev.	QU	OB	EX	IN
QU	3.621	1.121	1			
OB	4.052	1.145	0.546**	1		
EX	3.962	1.224	0.486**	0.703**	1	
IN	3.581	1.239	0.450**	0.648**	0.576**	1
NA	4.235	1.131	0.415**	0.611**	0.557**	0.493**
IL	4.863	1.058	0.207**	0.377**	0.346**	0.236**
SE	4.488	1.062	0.317**	0.536**	0.495**	0.409**
ED	3.915	1.727	0.304**	0.509**	0.412**	0.424**
EF	3.384	1.520	0.390**	0.553**	0.457**	0.546**
EA	3.275	1.606	0.306**	0.417**	0.347**	0.499**
EI	0.442	0.497	0.183**	0.326**	0.256**	0.238**

On the basis of EFA, to make sure discriminant validity and convergent validity of the core variable innovation capacity, we continue to conduct first-order and second-order Confirmatory Factor Analysis (CFA) (the results are shown in Table 3). Such analysis can help us confirm whether there exists a higher-order factor determining preceding 4 latent variables. If it exists we can name it as “innovation capacity” (IC) reasonably. The CFA demonstrates that of both models are almost the same, but the second-order one releases two degree of freedoms and is relatively better. Furthermore, while other fit indexes are almost same for both, the TLI and RMSEA of second-order model are better. As a result, subsequent test will be conducted based on high-order model.

Test Methods and Procedures

Firstly, we use Structural Equation Model (SEM) to test the link between IC and EI, and examine the affecting paths and mechanism especially the mediation of ED and EF. According to the suggestions from relevant literatures, the best method to test mediating effects is Bootstrap. We employ Mplus7.0 to complete this process.

TABLE 2
CORRELATION COEFFICIENTS MATRIX (CONTINUED)

	NA	IL	SE	ED	EF	EA
NA	1					
IL	0.515**	1				
SE	0.639**	0.622**	1			
ED	0.497**	0.292**	0.450**	1		
EF	0.536**	0.266**	0.496**	0.785**	1	
EA	0.391**	0.160**	0.341**	0.497**	0.648**	1
EI	0.284**	0.149**	0.232**	0.537**	0.520**	0.305**

Note: “**” means significant at 0.01 level (two tails).

TABLE 3
FIT INDEXES FOR FIRST AND SECOND-ORDER CFA MODELS

Model	χ^2	df	TLI	CFI	AIC	BIC	RMSEA	SRMR
1 st -order	1378.304	164	0.892	0.907	79944.293	80283.615	0.077	0.047
2 nd -order	1378.529	166	0.893	0.907	79940.518	80269.558	0.076	0.047

Next, the moderation of EA is considered into the above model as an addition. The emphasis here is on how EA indirectly changes the effect of IC through moderating the relationship between mediation variable and EI. We use product indicator approach to test such moderated mediation model. Relating indicators are matched by their degree of loading.

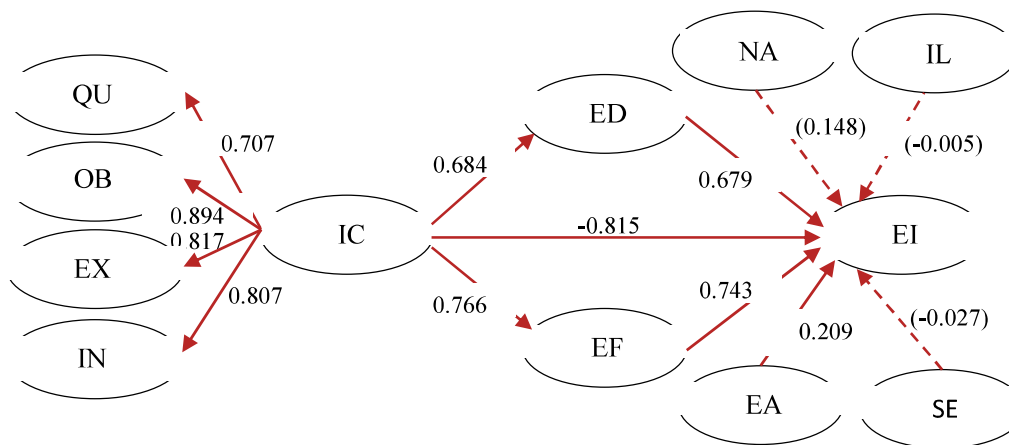
Finally, no matter what the previous studies has confirmed, or how close the relationships are between EI and entrepreneurial behavior (e.g. Ajzen et al. 2009), they are not the same concepts after all. For example, the person with high EI does not necessarily take actual action and implement entrepreneurship as a result. To ensure robustness of key conclusion of this research, we employed 275 separate graduates samples and examined the mechanism directly through which actual entrepreneurial behavior happen.

RESULTS

Structural Equation Model

Figure 1 and Table 4 display the estimate results of SEM. The fit indexes for total model are $\chi^2 = 5056.92$, $df=924$, $p<0.001$, $CFI=0.631$, $TLI=0.604$, $RMSEA=0.06$ at acceptable level. Figure 1 shows that IC has significant effect on EI. Specifically, the indirect effect coefficients are respectively 0.465 and 0.569 through the mediation of ED and EF, and the direct one is -0.815. Net effect equals $0.465+0.569-0.815=0.219$. These findings indicate that the higher potential entrepreneur's IC is, the higher his EI is. H1 is supported. Furthermore, it is a complex process and transmission mechanism that IC influences on EI. Its positive effect is realized through ED and EF, which coincides H2. Additionally, we find EA directly affects EI at the significant level of 0.001, and the direction coincide our hypothesis. H3 is supported. Besides that, the effects of control variables NA, IL and SE are all insignificant.

FIGURE 1
SEM RESULTS



Note: the path coefficients in parentheses are insignificant at the level of 0.05 (the same as below).

TABLE 4
DIRECT AND INDIRECT EFFECTS OF IC ON EI

Path	Std. coeff.	Std. error	p value
IC-ED-EI	0.465	0.036	<0.001
IC-EF-EI	0.569	0.051	<0.001
IC-EI	-0.815	0.146	<0.001

Moderated Mediation Model

This kind of model can test the moderating effects of some variables on mediation, and reveal complex connection between external factors and other variables. The main attention here is given to the moderation of EA on EF. Figure 2 shows the standardized estimate results. The fit indexes for total model are $\chi^2=5105.773$, $df=1053$, $p<0.001$, $CFI=0.667$, $TLI=0.643$, $RMSEA=0.055$. Specific results demonstrate that the key effects are same as SEM. Innovation capacity has negative direct effect on EI: -0.836, but indirect effect through ED and EF is significantly positive: $0.462+0.575=1.037$. The net effect is significantly positive: $1.037-0.836=0.201$. The direct effect of EA is significantly positive: 0.232. All control variables are not significant.

What we are interested in here is the moderation of EA. From Figure 2, the moderate effect of EA on EF-EI relation is significantly negative at level of 0.01: -0.104, which is surprisingly contrary to H4. Such result indicates that the more intense potential entrepreneur perceives EA, the weaker EF's effect on EI is (see also Figure 3)⁸, which seems not accordant to intuition. The following discussion section will give some explanation.

FIGURE 2
ESTIMATE RESULTS FOR MODERATED MEDIATION MODEL

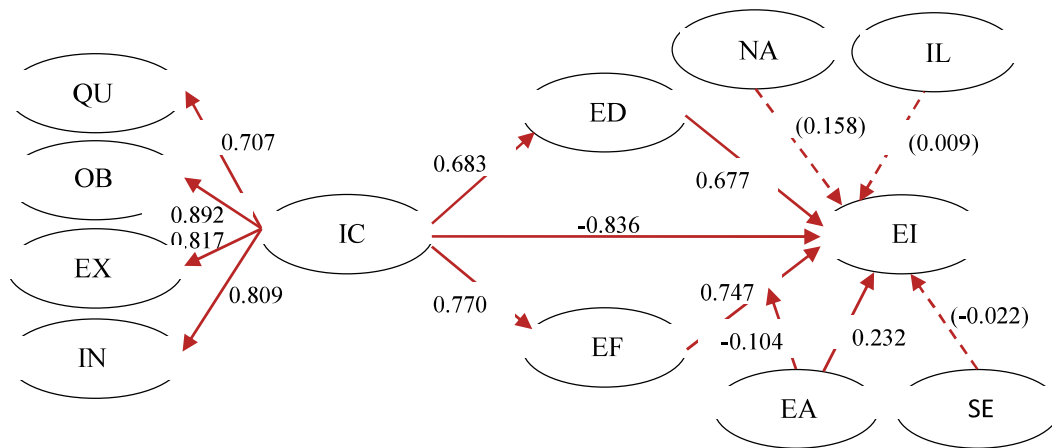
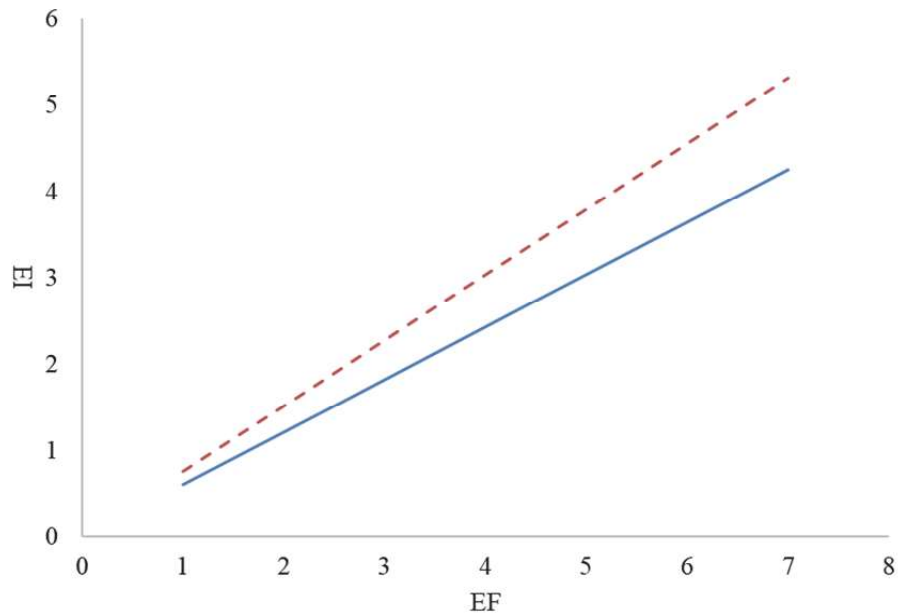


FIGURE 3
SIGNIFICANT NEGATIVE MODERATION OF EA ON EF-EI



Robust Test: Substitute EI with Entrepreneurial Behavior (EB)

We use separately 275 graduate students samples to test the robustness of our results. The variable EI is substituted by entrepreneurial behavior (EB) here because we can collect data about actual behavior for graduates. The results show that the core explanatory variable IC significantly affects personal entrepreneurial behavior as before: the higher innovation capacity of potential entrepreneur is, the more likely he starts up a new venture. This means our key conclusion is robust. Specifically, IC affects entrepreneurial behavior by complete mediation of EF. Total effect is significant (0.263) at level of 0.05. The mediation of ED is not significant, although its direct effect on entrepreneurial behavior is not negligible. Besides that, both direct and indirect effects of EA on behavior are not found being significant.

DISCUSSION

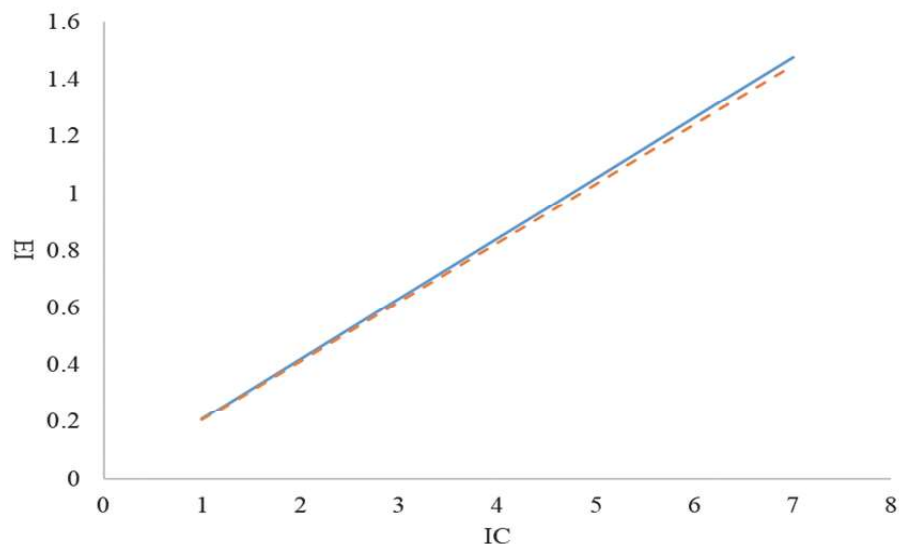
SEM analyses confirm the predictive power of innovation capacity on entrepreneurial intention. As expected, the person with higher IC is more inclined to become an entrepreneur. Furthermore, we find that there is a complex process and transmission mechanism through which IC affects EI. Specifically, the effect of IC is realized through ED and EF. It is noteworthy that the direct effect of IC is negative if indirect ones are excluded, which means that the mediation roles of ED and EI are indispensable. These findings imply that innovators do not necessarily start their own business unless they think self-employment is very attractive and believe that they can succeed at last. If these two conditions do not exist, innovator’s intention to become an entrepreneur is even lower than non-innovator⁹.

The direct effect of EA on EI is also found in our SEM analysis. Entrepreneurial role model (namely parents, relatives or friends have experienced start-ups) can give a good explanation for the effects of EA (Ahmed et al. 2010; Bae et al. 2014; Fayolle and Gailly 2015; Matthews and Moser 1995). The more intense potential entrepreneur’s perception on EA is, the higher his EI is. It is noteworthy to point out that EA does not travel through the mediation of ED and EF to affect EI. Its influence on EI is direct. Consequently, we can expect that the residents in the cities like Wenzhou of China that has frequent entrepreneurial activities will be more inclined to start new businesses¹⁰. Besides that, the effects of control variables NA, IL and SE are all insignificant.

The moderated mediation model shows that EA moderates negatively the relationship between EF and EI. This result is opposite to H4 and seem not accordant to intuition. In fact, it is not rare that moderating variable negatively change the effects of determinants. For instance, Tsai et al. (2016) finds that subjective norm negatively moderates the link between SE and EI. Besides that, Zhang et al. (2014) reveals the negative correlation between EA and EI. They explain that subjects probably have observed negative entrepreneurial experiences. Krueger (1993) points out that the perceived quality of the exposure to entrepreneurship could be positive or negative, the impact of such experience on EI lies in how subjects perceive them. Our result can be explained on the basis of these insights. For some reasons, entrepreneurship is not easy and failure rate is high now in China¹¹, which results in that the innovators perceiving negative experiences are more cautious than others: what we should pay attention to is not only startups, but also success rate.

Despite all of this, if we consider all paths from IC to EI, the person in the environment with more intense EA is almost as much inclined to start new business as less intense EA (see also Figure 4). In other words, EA does not moderate the relationship between IC and EI on the whole, even though the effect of EF on EI is indeed negatively moderated by it.

FIGURE 4
NON-SIGNIFICANT MODERATION OF EA ON IC-EI



Robust test based on the data of actual entrepreneurial behavior means that our key conclusion is robust¹². If potential entrepreneur perceives his innovation capacity higher, his confidence level to succeed in self-employment is higher, and the probability to implement start-up is also higher. The mediation of ED is not significant, although its direct effect on entrepreneurial behavior is not negligible, which means that innovator does not want to become an entrepreneur because of its glamour. Besides that, both direct and indirect effects of EA on behavior are not found significantly. On the whole, behavior is not same as the intention after all. When an innovator really goes toward the hard road to entrepreneurship, he regards the possibility of success as more important than other aspects. In general, the reason why innovator decides to start up a business is not for its glamour, but its feasibility, which is related to the low quality of self-employment in China today. Chinese entrepreneurs' satisfaction is not high and the vast majority of entrepreneurship are necessary. (Yin et al. 2015). As a result, it is a huge challenge for policy-makers to motivate innovators who desire startups.

CONCLUSION AND SUGGESTION

We collect 1263 samples to answer this question “Is innovator more inclined to start a new venture?” SEM results show that innovator is indeed more willing to become an entrepreneur, ED and EF plays mediating role in this connection. EA directly affects EI. The more intense potential entrepreneur’s perception on EA is, the stronger his intention for startup is. For moderation test, we find that EA negatively changes the relationship between EF and EI, indirectly impacts on the link between IC and EI, but the total effect is consistent with expectation. Separately using 275 graduate students samples to repeat the tests for entrepreneurial behavior, the results show that innovation capacity affects behavior through the mediation of EF, which supports the core conclusion robustly. It is noteworthy noticing here that actual self-employment is not affected by its attractiveness, but potential entrepreneur’s confidence on its success.

This research can contribute to entrepreneurship literatures to some extent in three aspects. The first is that we systematically examine the relationship between innovation capability and entrepreneurial intention for the first time. The second is that we reveal the complex paths and mechanism through which IC affects EI, especially the mediation of ED and EF. The last one is that we confirm the roles played by environment on EI of potential entrepreneur through testing the moderation of entrepreneurial atmosphere on the link of IC -EI. These ones have not been fully discussed in previous researches.

Our findings are also meaningful for policy-making. At first, for stimulating passion to self-employment in whole society and increase survival rate of startups, it is very important to train and improve innovation capacity of potential entrepreneurs. Secondly, for the countries like China that hope to motivate more entrepreneurship, it is required to create social atmosphere appropriate to entrepreneurial activities and encourage talented people with high innovation capacity to go toward the road of entrepreneurship. Finally, it is needed to respect and protect innovation outcomes of entrepreneurs, to make self-employment more attractive, and diminish difficulties for start-ups, which will motivate innovators to become an entrepreneur as well as help him succeed as a result.

ENDNOTES

1. The financial support of this research is from the National Social Science Fund of China (NSSFC) through a project “Research on the financing and risk control of start-up enterprises based on dynamic contracts” (Grant No. 15BJY162).
2. In this paper we construct indicators to measure innovation capacity based on innovator’s DAN model Dyer et al. (2008 2011) proposed, which can overcome this difficult very well (See also the 4th Chapter for details).
3. Relevant details can be found in next chapter.
4. Many studies operationalize it as entrepreneurial self-efficacy (ESE) (Dutta et al. 2015). We will continue to use EF variable in our model.
5. For avoiding survey bias, these students’ responses do not enter into subsequent analysis.
6. Our questionnaire is available on request.
7. KMO statistic is 0.942, Bartlett test is 14189.956 (df=351, Sig.<0.001), which means that our data is appropriate for factor analysis. In addition, the reliability coefficients Cronbach of all variables meet the requirement.
8. The results of Fig 3 and Fig 4 come from SEM tests for sub-samples, which are from dividing original sample by mean of EA (=3.2776). The line for High EA shows the relationship between EF (or IC in Fig 4) and EI in more intense entrepreneurial environment ($EA \geq 3.2776$). The line for Low EA is converse ($EA < 3.2776$).
9. Moderated mediation model shows that EA negatively moderates the effect of EF on EI. A possible explanation is relating to this point. When person observes negative entrepreneurial experiences, the positive effect of EF will be partly offset.
10. According to the report by MyCOS institute (2015) in China, extensive Yangtze River Delta is the area where the percentage of 2014 college graduates self-employment (2.5%) is the highest and higher 0.7

points than extensive Bohai Bay area with lowest points. The difference in EA is the one of important reasons for such district difference.

11. For example, the failure rate of Chinese college graduates self-employment arrives at 98% (Zhang et al. 2014).
12. It is cautious that there is essential difference between EI and EB. The test results for EI here cannot be completely compared with EB. In consequence, longitudinal data are needed to test the relationship between EI and EB. Different effects of IC on EI and EB and the complex mechanisms connecting them should be examined in more detail. This is a limitation of this paper. Based on a research project that will last for at least 7 years, our next goal is just to resolve this problem.

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APPENDIX: MEASURING SCALES

Innovation Capacity (higher-order factor, 4 dimensions)

Questioning (alpha = 0.687)

1. I am always asking questions.
2. Others are frustrated by the frequency of my questions.
3. I often ask questions that challenge the status quo.
4. I regularly ask questions that challenge others' fundamental assumptions.

Observing (alpha = 0.903)

1. I am constantly asking questions to understand why products and projects underperform.
2. New business ideas often come to me when directly observing how people interact with products and services.
3. I have a continuous flow of new business ideas that comes through observing the world.
4. I regularly observe customers' use of our company's products and services to get new ideas.
5. By paying attention to everyday experiences, I often get new business ideas.
6. Find new ideas by relating out-of-industry trends and patterns to the business.
7. Creativity solve challenging problems by drawing on diverse ideas or knowledge.
8. Often find solutions to problems by drawing on solutions or ideas developed in other industries, fields, or disciplines.

Experimenting/exploring (alpha = 0.858)

1. I love to experiment to understand how things work and to create new ways of doing things.
2. I frequently experiment to create new ways of doing things.
3. I am adventurous, always looking for new experiences.
4. I actively search for new ideas through experimenting.

Idea networking (alpha = 0.809)

1. I have a network of individuals whom I trust to bring a new perspective and refine new ideas.
2. I attend many diverse professional and/or academic conferences outside of my industry/profession.
3. I initiate meetings with people outside of my industry to spark ideas for a new product, service, or customer base.
4. I have a large network of contacts with whom I frequently interact to get ideas for new products, services, and customers.

Entrepreneurial Desirability (alpha = 0.913)

1. I really want to create own enterprise.
2. Creating own enterprise is the biggest dream for me.
3. Starting a new business can give me great sense of accomplishment.

Entrepreneurial Feasibility (alpha = 0.897)

1. I am sure I can succeed to start a new venture.
2. I will take much effort to try entrepreneurial activity.
3. I know the process to create a new enterprise very well.
4. I am very confident on entrepreneurship.

Entrepreneurial Atmosphere (alpha = 0.851)

1. My family or relatives have experiences to start new business.
2. There are many successful entrepreneurs among my friends.
3. There are many successful entrepreneurs around me.