Applied Mathematics and Nonlinear Sciences

<https://www.sciendo.com>

Entrepreneur's Passion and Entrepreneurial Opportunity Identification: A Moderated Mediation Effect Model

Wendi Cai¹, Zongfa Wu¹, Yingli Zhang^{1,2,†}¹ School of Economics and Management, Tongji University, Shanghai 200092, Shanghai, China² College of Economics and Management, Shanghai Ocean University, Shanghai 201306, Shanghai, China

Submission Info

Communicated by Juan Luis García Guirao

Received November 29th 2020

Accepted February 26th 2021

Available online May 25th 2021

Abstract

Based on the theory of entrepreneurial cognition, we examined the relationship between entrepreneurial passion and opportunity identification, and the moderating roles of environmental complexity and mediating role of entrepreneurial contextual knowledge in this relationship. Results from 246 entrepreneurs supported the hypothesis that both their entrepreneurial passion and their entrepreneurial contextual knowledge would be positively related to opportunity identification, and these relationships would be moderated by environmental complexity. Further, environmental complexity enhanced the relationship between entrepreneurial passion and opportunity identification, and also amplified the relationship between contextual knowledge and opportunity identification. The results suggest that the effect of entrepreneurs' passion on opportunity identification depends on the level of the individual's contextual knowledge and environmental complexity.

Keywords: entrepreneurial passion; opportunity identification; entrepreneurial contextual knowledge; environmental complexity

1 Introduction

Entrepreneurship has a proven effect on the economic development, job creation and creativity of a country (Laguia and Moriano 2019; Cardella et al., 2020). In the literature on entrepreneurship, entrepreneurial opportunities (EO), recognised as optimistic and desirable conditions leading to entrepreneurial activity, play a key role (Eckhardt and Shane, 2003). Entrepreneurship activities begin with opportunity identification (OI), and the question 'why some people can recognize opportunities and others cannot' has attracted widespread attention from scholars (Shepherd et al., 2017). In the last three decades, many influential variables have been identified

[†]Corresponding author.Email address: yl-zhang@shou.edu.cn

that play an unavoidable role in understanding entrepreneurship opportunities. The majority of previous theoretical and empirical literature proposes that human and social capital (DeTienne and Chandler, 2007; Ramos-Rodriguez et al., 2010), personality traits (Zahra et al., 2006) and prior knowledge (Shane 2000; Ardichvili et al., 2003). However, these findings are mostly based on a rational perspective, and the results are ambiguous.

During the dynamic and complex entrepreneurial process, entrepreneurs must take steps by playing various positions in management, R&D, marketing and public relations (Zhang and Arvey, 2009). To face the high degree of pre-event uncertainty, the success of entrepreneurship not only involves substantive expertise, abilities and creative skills but also is affected by irrational factors such as the entrepreneur's personal cognition and emotions (Baron et al., 2015).

Of the irrational factors, passion is seen as a key element of entrepreneurship and can become a critical component of the mechanism of entrepreneurial behaviour as well as the process of company development and its performance (Cardon et al., 2013; Santos and Cardon, 2019). According to Vallerand et al. (2003), the intense feeling of doing any job that people want to do with maximum force is synonymous with passion. Passion can motivate individuals to become entrepreneurs and find creative opportunities (Cardon et al., 2017). Entrepreneurs with passion would be stimulated to solve problems creatively, and they are more likely persistent in the face of barriers or challenges to participate in entrepreneurial practices, such as starting up a new enterprise (Murnieks et al., 2014). In addition, some scholars found that entrepreneurial passion (EP) produced optimistic feelings among people and strengthened the motivational factors when the entrepreneurial environment was unpredictable and resources were limited (De Clercq et al., 2013).

Existing literature that focused on the analysis of entrepreneurial passion can motivate individual self-efficacy, stimulate the initiative to seek resources in the organisation network, and promote entrepreneurs to discover and identify entrepreneurial opportunities (Cardon and Kirk, 2015; Hubner et al., 2020). However, the relationship between entrepreneurial passion and opportunity identification has not been explicitly specified for a concentrated investigation in the literature. In particular, the mechanism that connects and promotes the relationship between entrepreneurial passion and opportunity identification has not yet been identified. To bridge the research gap, this study explores the relationship between entrepreneurial passion and opportunity identification, and possible mechanism by which entrepreneurial passion contributes to identify more opportunities.

We intended to make three contributions to the literature by investigating this relationship. First, we empirically test the relationship between entrepreneurial passion and opportunity identification. Second, this finding sheds light on the role of contextual knowledge (CK) in mediating the impact of entrepreneurial passion on opportunity identification, providing valuable evidence on how to identify entrepreneurial opportunities. Finally, this study identified environmental complexity (EC) as a moderator to explain and advance understanding on the strength of the relationship between entrepreneurial passion and opportunity identification.

2 Literature Review and Hypothesis

2.1 Entrepreneurial Passion

Passion has been studied in many areas as an important drive factor of human behaviour (Vallerand et al., 2003). Passion has been characterised in numerous ways, but these meanings share themes related to a certain action or goal, such as 'strong motivation' (Vallerand et al., 2003) and 'powerful optimistic emotions' (Cardon et al., 2009). What distinguishes passion from motivation is the concentration on a single focus and enthusiasm for a specific task (Murnieks et al., 2014).

The entrepreneurial process is an emotional journey, and emotional factors are the important driver of entrepreneurial activities (Baron, 2008). Entrepreneurship passion is the strong positive emotion that entrepreneurs show in the process of pursuing entrepreneurial goals. Entrepreneurship passion is defined as the continuous, very positive and strong emotions caused by entrepreneurs' entrepreneurial identity when participating in entrepreneurial activities (Cardon et al., 2009). This definition clarifies the two connotations of entrepreneurial

passion: identity and strong positive emotions. Among them, strong positive emotion means that entrepreneurs should have a strong interest in the entrepreneurial activities they participate in, and identity includes self-identity and social identity, that is, the degree of perception and acceptance of entrepreneurs' identity by themselves and others. In other words, entrepreneurial passion is not a general emotion but needs to rely on activities that have the meaning of entrepreneur identity to stimulate. When individuals perceive their entrepreneurial identity from certain activities, they will experience entrepreneurial passion (Cardon et al., 2013). Entrepreneurs' passion will improve their trust in themselves, contributing to a profitable business plan.

2.2 Entrepreneurial Passion and Opportunity Identification

Entrepreneurship opportunities are the foundation of entrepreneurial activities, and how to identify and exploit opportunities is the focus of entrepreneurship research. There are two main perspectives in the research of opportunity identification, namely 'discovery view' (Shane and Venkataraman, 2000) and 'creation view' (Kaish and Gilad, 1991). The former thinks that opportunity is an objective existence, which is discovered by the entrepreneur by accident or active search; the latter thinks that opportunity is created by entrepreneur subjectively. No matter the 'discovery view' or 'creation view', both emphasise the main body and dominant position of entrepreneurs in the process of opportunity identification.

Entrepreneurship is not only a complex management activity but also an emotional journey (Baron, 2008). Entrepreneurs' emotions are particularly important at the stage of starting a business. Previous studies unveiled that passion is an important factor of enterprise motivation (Smilor, 1997). Entrepreneurial passion provides power for entrepreneurial activities, stimulates the thinking of entrepreneurs and motivates entrepreneurs to carry out entrepreneurial actions. Passionate entrepreneurs, first of all, have a strong sense of self-realisation and pay more attention to control. They have a high tolerance for risk and uncertainty (Stroe et al., 2018), can accept changing goals, dare to try new ideas and methods, and are willing to search for the way forward through experiments and trial and error method.

Entrepreneurial passion has an important impact on entrepreneurs' identification of entrepreneurial opportunities. Cardon (2013) divided entrepreneurial passion into two dimensions: positive emotion and identity. Strong positive emotions will inspire entrepreneurs' self-efficacy (Cardon and Kirk, 2015) and make them more confident in identifying valuable entrepreneurial opportunities. At the same time, even in uncertain and risky situations, strong positive emotions can still support entrepreneurs to maintain creativity (Baron, 2008), thus enhancing their awareness of opportunities to quickly and sensitively identify new opportunities. Entrepreneur's identity affects the way entrepreneurs identify new opportunities (Mathias and Williams, 2017). The higher the awareness of their own entrepreneurs' identity, the deeper the degree of entrepreneurs' immersion in entrepreneurial activities. Entrepreneurs' high concentration on entrepreneurial activities is conducive to identify more suitable entrepreneurial opportunities from the complex market environment.

Hence, the following hypothesis is then postulated in the present study:

Hypothesis 1: Entrepreneurial passion has a positive impact on opportunity identification.

2.3 Entrepreneurial Passion and Contextual Knowledge

Entrepreneurial knowledge mainly comes from the perspective of resource-based view theory, which refers to the acquisition and integration of information and resource knowledge, including market and customer-related knowledge, functional knowledge and strategy-oriented knowledge. This knowledge will be used by entrepreneurs to search, integrate and utilise valuable resources, and efficiently deploy this knowledge to discover ways and methods to use market opportunities to create profits (Barney, 1991; Alvarez and Busenitz, 2001). In this process, the knowledge generated based on different entrepreneurial activity contexts is known as entrepreneurial contextual knowledge. Specifically, it refers to the entrepreneur's ability to summarise the experiences and lessons of different entrepreneurial activities and apply these experiences and lessons to specific situations.

When the external environment of enterprise entrepreneurship changes, as a positive influence, entrepreneurial

passion will promote cognitive response, which can increase cognitive flexibility. Specifically, when the individual is in a strong positive emotional state, it will strengthen the integration of information, and it is easier to wake up and extract information related to previous similar emotional experiences (Corbett and Hmielecki, 2007). Therefore, when entrepreneurs are faced with complex and highly uncertain entrepreneurial situations, entrepreneurial passion can help individuals to recall a large number of positive cognitive materials from multiple perspectives (Sun and van Emmerik, 2015), and more flexible association of existing knowledge with the current situation helps to evaluate entrepreneurial-related elements.

Moreover, entrepreneurial passion can stimulate entrepreneurs' intrinsic motivation (Baron, 2008); it can give them positive power, encourage them to persevere in achieving entrepreneurial goals and drive entrepreneurs to actively participate in entrepreneurial activities to complete the identification of their own entrepreneurial identity. In this process, entrepreneurs' sensitivity to information has been improved, and more contextual information is received and perceived by entrepreneurs (Yitshaki and Kropp, 2016). In addition, driven by the positive emotions and identity of entrepreneurial activities, passionate entrepreneurs will deliberately practice the entrepreneurial activities they participate in, accumulate, summarise and review their experience and knowledge in different entrepreneurial situations so as to form contextual knowledge that can be applied to other specific contexts.

Hence, the following hypothesis is then postulated in the present study:

Hypothesis 2: Entrepreneurial passion has a positive impact on accumulating contextual knowledge.

2.4 Mediating Role of Entrepreneurial Contextual Knowledge

Entrepreneurship, as a complex management activity, requires entrepreneurs to master a variety of entrepreneurial knowledge. According to the theory of entrepreneurial cognition, the more knowledge entrepreneurs have in a certain field, the more attention they will pay to the opportunities related to their existing knowledge and information (Shane, 2000). Entrepreneurs, especially the first-time entrepreneurs, often rely on their existing contextual knowledge and previous experience to identify entrepreneurial opportunities and make other rational entrepreneurial decisions. Some studies have taken college students as an example and found that the more contextual knowledge, the higher the possibility of entrepreneurial behaviour (Ismail et al., 2015).

For those individuals who have been engaged in entrepreneurial activities or business management, they are more likely to show certain entrepreneurial behaviours, because they have accumulated diversified experiences and lessons from different entrepreneurial activities or business management managers and applied them to specific situations. In the end, individuals can have a more sober and rational understanding of the internal and external entrepreneurial environment so as to further enhance self-efficacy (Roxas, 2008), stimulate entrepreneurial intention, improve the efficiency of resource allocation for starting new businesses and discover entrepreneurial opportunities.

In a dynamic and constantly changing entrepreneurial environment, when faced with different entrepreneurial information, the stronger the entrepreneur's ability to grasp the entrepreneurial context, the higher the possibility of further identifying entrepreneurial opportunities and interpreting opportunities closely related to contextual knowledge. Besides, the identification of entrepreneurial opportunities is a behaviour with strong personal subjective colour. Even in the face of the same opportunity with greater benefit value, not everyone can identify it (Shane, 2000). According to the theory of information processing, a large amount of contextual information obtained by individuals from different entrepreneurial activities will be stored in various cognitive structures or concepts. Individuals with rich contextual knowledge will show stronger creativity and effective processing of information, thus generating new ideas and building new entrepreneurial opportunities (Biraglia and Kadile, 2017).

Recently, it has been reported that there is a positive relationship between entrepreneurial passion and opportunity identification (Hubner et al., 2020). It can be expected that passionate entrepreneurs are more likely to identify entrepreneurial opportunities. However, it is not well known how passionate entrepreneurs identify more entrepreneurial opportunities by constructing their own contextual knowledge. It is necessary to exam-

ine contextual knowledge as a mediator in the relationship between entrepreneurial passion and opportunity identification.

The entrepreneurial process is composed of a series of complex and changeable situations. Entrepreneurs can obtain explicit and easily overlooked hidden entrepreneurial resources through different entrepreneurial activity situations. In the theory of entrepreneurial cognition, entrepreneurial contextual knowledge is an important part of the entrepreneurial cognitive ability script (Mitchell et al., 2000). It is the ability of entrepreneurs to learn lessons from different entrepreneurial activity contexts and transform them into specific entrepreneurial contexts (Douglas and Shepherd, 2002).

Research by Mueller et al. (2017) showed that, on the one hand, entrepreneurs' passion promotes them to actively carry out their actions. Entrepreneurs with passion will vigorously express their ideas, quickly and directly pursue their goals and quickly mobilise resources to put ideas into practice. On the other hand, entrepreneurial passion promotes adaptive cognitive processes, which makes entrepreneurs to reorganise and expand their existing cognitive framework, attention span and perception domain (Kruglanski et al., 2009).

Specific entrepreneurial behaviour begins with the identification and evaluation of entrepreneurial opportunities according to the cognitive theory of entrepreneurship. Therefore, individuals often evaluate the entrepreneurial situation, entrepreneurial potential and various elements required for entrepreneurship based on their existing experience and accumulated knowledge, and then exhibit a series of entrepreneurial behaviours. The accumulation of contextual knowledge in different entrepreneurial activities can help individuals enrich their 'knowledge map'. When faced with different entrepreneurial information, it can help individuals to evaluate their entrepreneurial potential and entrepreneurial elements, and further interpret the closely related contextual knowledge opportunity (Shane, 2000).

Besides, according to information processing theory, continuous attention to different entrepreneurial activities can enable individuals to obtain a large amount of contextual information and store it in a variety of cognitive forms (Biraglia and Kadile, 2017). When entrepreneurs are faced with complex and highly uncertain entrepreneurial situations, entrepreneurial passion helps individuals recall a large number of positive cognitive materials from multiple perspectives (Sun and van Emmerik, 2015) and more flexibly associate existing knowledge with current situations, which helps to evaluate the relevant elements of entrepreneurship. Further, entrepreneurship passion can stimulate entrepreneurs' intrinsic motivation (Baron, 2008). It can give entrepreneurs positive power, encourage them to persevere in achieving their entrepreneurial goals and drive entrepreneurs to actively participate in entrepreneurial activities to complete their identification with their entrepreneurial identity. In this process, entrepreneurs' sensitivity to information has been improved, and more contextual information is received and perceived by entrepreneurs (Yitshaki and Kropp, 2016). At the same time, driven by the positive emotions and identity of entrepreneurial activities, passionate entrepreneurs will deliberately practice the entrepreneurial activities they participate in, and accumulate, summarise and review the experience and knowledge in different entrepreneurial situations so as to form contextual knowledge that can be applied to other specific contexts.

Positive entrepreneurial emotions can effectively help entrepreneurs enrich their personal contextual knowledge map and help entrepreneurs to interpret and extract opportunities that are closely related to contextual knowledge when faced with various entrepreneurial information. Given these findings, passionate entrepreneurs may be bold in exploring and identifying entrepreneurial opportunities and rely on their own contextual knowledge.

Therefore, the following hypothesis is then postulated in the present study:

Hypothesis 3: The contextual knowledge mediates the relationship between entrepreneurial passion and opportunity identification.

2.5 Moderating Role of Environmental Complexity

In the new economic era, the soil on which enterprises rely for survival has changed rapidly, which is mainly reflected in the increasingly turbulent market environment, the increase of unstable factors and the acceleration

of demand for replacement brought by the rapid change of technology. Changes in the policy environment, changes in consumer preferences and behaviour patterns, strategic adjustments of competitors, technological innovations and the emergence of new business models have an important impact on the innovation and operation of the enterprise. Environmental complexity refers to the complex state realised by the environmental factors that affect the trading and innovation activities in the process of enterprise operation. The complexity of the environment may bring great impact and challenge to the enterprises and have a negative impact on the entrepreneurs, which is not conducive to the production and operation of the start-up enterprises; however, it may also bring opportunities for the enterprises to enhance their own strength and achieve greater success in the dynamic environment. The current theoretical research on the influence of environmental complexity on entrepreneurs' passion is still weak, so it is necessary to study the moderating effect of environmental complexity.

To deal with a complex external environment, entrepreneurs need to make more investment and actions in innovation. According to social cognitive theory, individual psychological and cognitive characteristics, behaviour and environment are interactively affected, and the uncertainty of the external environment will affect entrepreneurial decision-making through individual self-regulation, self-efficacy and emotional response. Environmental complexity also means that there will be more information gaps in the entrepreneurial environment. Using the information asymmetry, entrepreneurs can treat them as entrepreneurial opportunities, identify changes in market demand, and adjust their own entrepreneurial products and technological innovation strategies so as to achieve entrepreneurial success.

Passionate entrepreneurs will regard higher environmental uncertainty as a kind of positive entrepreneurial situation which can bring more opportunities. Entrepreneurial passion can stimulate entrepreneurs' potential to identify information in an uncertain environment, give entrepreneurs the confidence to identify potential entrepreneurial opportunities from information asymmetry. Therefore, the following hypothesis is proposed:

Hypothesis 4: Environmental complexity plays a moderating role between entrepreneurial passion and opportunity identification, that is, the more complex the environment, the more significant the relationship between entrepreneurial passion and opportunity identification, and vice versa.

According to the ternary interaction theory, entrepreneurs, entrepreneurial environment, organisations and entrepreneurial process are inseparable and affect each other. In other words, entrepreneurs' behaviour cannot exist independently from the external entrepreneurial environment. The entrepreneurial environment has a certain degree of uncertainty, and it is difficult for entrepreneurs to clearly judge the environmental changes they are facing. Environmental complexity is an important context variable in entrepreneurship. On the one hand, when the environmental complexity is at a low level, the external environment of start-up enterprises is relatively stable, and it is relatively easy to predict the user demand. The innovation risks and challenges faced by entrepreneurs are relatively low, and entrepreneurs will deal with the problems encountered in the business process according to the strategies or mechanisms formulated in advance, which is not conducive to the identification and development of opportunities. On the other hand, when the environmental complexity is high, entrepreneurs will face high uncertainty (Azadegan et al., 2013). Consumer needs and competitors' behaviours are rapidly updated, technology and new business models are emerging in an endless stream and entrepreneurial situations are also enriched. When the external environment of business entrepreneurship changes, the sensitivity of passionate entrepreneurs will be enhanced. This positive impact can increase cognitive flexibility, and entrepreneurs will actively expand their entrepreneurial context knowledge to adapt to changing entrepreneurship environment, and they actively search for opportunities to obtain more information about entrepreneurship. Therefore, the following hypothesis is proposed:

Hypothesis 5: Environmental complexity plays a moderating role between entrepreneurs' contextual knowledge and opportunity identification, that is, the simpler and stable the environment, the weaker the relationship between entrepreneurial passion and contextual knowledge, and vice versa.

To sum up, it can be concluded that the higher the complexity of the environment, the more passionate entrepreneurs are to summarise the experiences and lessons generated in different situations, thereby enriching their own contextual knowledge and then identifying potential entrepreneurial opportunities. Therefore, we

hypothesise the following:

Hypothesis 6: Environmental complexity moderates the mediating relationship between entrepreneurial passion and opportunity identification.

Our hypothesised relationships are shown in Figure 1.

Fig. 1 Research model.

3 Methods

3.1 Sample and Procedure

In this study, a questionnaire survey was used to collect data. Before the formal survey, 48 MBA students were selected for the preliminary research, and combined with the feedback of the preliminary research results, the measurement items of the questionnaire were modified appropriately and finally a complete measurement scale was obtained.

The formal research objects are mainly MBA and EMBA students from business schools and schools of economics and management of three universities in Shanghai. The reason is that the group has rich work experience and life experience, and has high entrepreneurial passion and entrepreneurial possibility, which is in line with the theme of this study. The questionnaire was filled in anonymously. A total of 300 questionnaires were sent out, and 246 questionnaires were finally recovered; 52 questionnaires with serious vacancy and obvious regularity were excluded. Finally, 194 valid questionnaires were obtained and the effective recovery rate was 64.67%. Among them, 69.11% of the respondents were male, which was higher than female respondents, which was in line with the situation of the entrepreneurial market.

3.2 Measurement Variables

To ensure the reliability and validity of the measurement, we used the mature scales at home and abroad and the variables were measured by the Likert-5 scale.

3.2.1 Identification of entrepreneurial opportunities

Based on the research of Shane (2008) and Zhang et al. (2013), this study measures the identification of entrepreneurial opportunities, including 'I am particularly sensitive to new venture capital opportunities' and 'opportunities I find can bring higher returns'.

3.2.2 Entrepreneurial passion

Based on the research of Cardon et al. (2017), this study measures entrepreneurial passion, including 13 items, such as 'it's very exciting to be able to find out the opportunity to solve the unmet market demand and commercialize it', 'I'm excited to start a new company', etc.

Table 1 Descriptive statistics of sample characteristics.

Characteristic		Frequency/person	Ratio (%)
Age	≤25	58	23.58
	26–45	144	58.54
	≥46	44	17.89
Gender	Male	170	69.11
	Female	76	30.89
Industry experience	Within 3 years	27	10.98
	3–5 years	106	43.09
	6–8 years	64	26.02
	>8 years	49	19.92
Years of entrepreneurship	<3 years	117	47.56
	4 years	69	28.05
	5 years	41	16.67
	≥6 years	19	7.72
Enterprise scale	<30 persons	43	17.48
	31–100 persons	92	37.40
	101–200 persons	57	23.17
	>200 persons	54	21.95

3.2.3 Contextual knowledge

Based on the definition of contextual knowledge and the research of Mitchell and He Liangxing (2017), this study selects five items to measure contextual knowledge. Mitchell and others involved in the measurement of contextual knowledge in entrepreneurial cognitive research, and domestic scholar Zhang et al. (2013) also verified the applicability of the scale in the Chinese context. However, this study only focuses on contextual knowledge, one of the dimensions of entrepreneurial cognitive ability script.

3.2.4 Environmental complexity

Based on the research of Waldman et al. (2001), this study selected four items to measure environmental complexity.

3.2.5 Control variables

This study noted that the age, gender and entrepreneurial experience of entrepreneurs have a certain impact on the identification of entrepreneurial opportunities; so they are taken as the control variables in this study.

3.3 Analysis of Homologous Variance

In this study, we consider that the answer to the questionnaire and the survey environment may be identical, which may lead to the problem of homologous variance, which cannot truly reflect the relationship between variables. In this regard, the Harman single factor test was used. The analysis results showed that the interpretation rate of the first common factor without rotation was 28.41%, which was not more than half of the total explanatory variables, and no single factor was found to be dominant, indicating that the problem of homologous variance in this study was not serious. In addition, the variance expansion factor VIF among variables is far lower than the critical value of 10, which excludes the possibility of multicollinearity among variables.

4 Data Analysis Results

4.1 Reliability and Validity Test

In this study, Cronbach's α coefficient was used to test the reliability of the collected data (see Table 2). The results showed that Cronbach's α coefficients of all variables were greater than 0.7 and KMO values were greater than 0.7, indicating that there were strong consistency and good reliability among the items.

Table 2 Reliability and validity.

Variable	Cronbach's α coefficient	α KMO value	Minimum factor load	AVE
EP	0.927	0.932	0.664	0.517
CK	0.826	0.837	0.708	0.533
EC	0.789	0.830	0.717	0.549
OI	0.814	0.879	0.735	0.572

In this study, factor loads and AVE values were used to test the convergence validity. The results showed that the factor loads of each variable were greater than 0.5, and AVE values were greater than 0.5, which indicated that the scale had good convergence validity. Table 3 shows the descriptive statistics and correlation coefficients of each variable. The value on the diagonal is the square root of AVE. It can be seen from Table 2 that the square root of AVE of each variable is greater than the correlation coefficient between the variable and other variables, which indicates that each variable has good discriminant validity. At the same time, Amos 23.0 software was used to conduct confirmatory factor analysis (CFA) for the variables. The results showed that the overall measurement model and data had a good fit ($\chi^2/DF = 1.780$, $RMR = 0.028$, $GFI = 0.941$, $TLI = 0.887$, $RMSEA = 0.06$). At the same time, the results of correlation analysis show that there is a certain correlation between independent variables, intermediary variables, regulatory variables and dependent variables, which provides a basis for subsequent verification of mediating effects and regulatory effects.

Table 3 Means, standard deviation and correlations.

	Mean	SD	1	2	3	4	5	6	7
1 Gender	1.39	0.49							
2 Age	2.34	0.64	-0.234**						
3 Entrepreneurial experience	2.32	0.86	-0.400**	0.460**					
4 EP	3.67	0.53	-0.334**	0.352**	0.712**	0.719			
5 CK	3.73	0.60	-0.343**	0.213**	0.564**	0.610**	0.730		
6 EC	3.59	0.58	-0.262**	0.222**	0.331**	0.381**	0.398**	0.741	
7 OI	3.78	0.48	-0.190**	0.178*	0.436**	0.495**	0.554**	0.282**	0.756

Note: The diagonal value is the square root of AVE.

* $P < 0.500$, ** $P < 0.010$, *** $P < 0.001$.

4.2 Hypothesis Test

On the basis of controlling the age, gender and entrepreneurial experience of the subjects, this study uses stepwise regression analysis to test the hypothesis mentioned above. Table 4 showed the results of the impact of entrepreneurial passion on opportunity identification and the mediating role of contextual knowledge. On the basis of controlling the influence of control variables, the independent variable entrepreneurial passion was

positively related to entrepreneurial opportunity identification ($\beta = 0.335$, $P < 0.001$, Model 4), and the total variance of entrepreneurial passion in explaining opportunity identification was 26.1%, hence, Hypothesis 1 was supported. The results of model 1 show that entrepreneurial passion has a significant positive impact on contextual knowledge ($\beta = 0.466$, $P < 0.001$), and entrepreneurial passion accounts for 42.2% of the total variance of contextual knowledge, so Hypothesis 2 is supported.

Table 4 Results of multiple regression analysis

	Contextual knowledge			Opportunity identification				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Control variables								
Gender	-0.146*	-0.176*	-0.019	0.002	0.048	0.045	0.051	0.031
Age	-0.074	-0.064	-0.022	-0.030	-0.006	0.001	-0.003	-0.007
Entrepreneurial Experience	0.178**	0.373**	0.244**	0.104	0.048	0.108*	0.106**	0.108*
Independent variable								
EP	0.466**	0.432**	0.328***	0.335***	0.189***	0.252***	0.227***	0.313***
Mediator								
CK					0.313**			0.376**
Moderator								
EC		0.413***	0.425***			0.053	0.047	0.114
Interaction								
CK $\times$ EC			0.162**				0.312**	0.219**
R ²	0.422	0.392	0.191	0.261	0.350	0.331	0.334	0.368
ΔR^2	0.410	0.269	0.179	0.245	0.333	0.317	0.316	0.035
F	14.527**	15.234**	14.989**	16.648**	20.257**	23.367**	18.817**	18.166**

EP, entrepreneurial passion; CK, contextual knowledge; EC, environmental complexity.

* $P < 0.500$, ** $P < 0.010$, *** $P < 0.001$.

For the mediating test of contextual knowledge, we followed the causality stepwise regression method proposed by Baron and Kenny (1986). The effect of EP on opportunity identification decreased from 0.335 ($P < 0.001$, Model 4) to 0.189 ($P < 0.001$, Model 5) after the mediating variable contextual knowledge were put into the regression equation, while the effect of contextual knowledge on opportunity identification was still significant ($\beta = 0.313$, $P < 0.001$, Model 5). The results showed that contextual knowledge partially mediated the relationship between entrepreneurial passion and opportunity identification. Hence, Hypothesis 3 is supported.

To test the moderating effect of EC, we followed the recommendation by Aiken and West (1991). We created the interactive term, i.e. entrepreneurial passion $\times$ environmental complexity, and then put it into the regression equation with EP, EC together (Model 7). The results showed that the interaction term was positively related to entrepreneurial opportunity identification ($\beta = 0.334$, Model 7), and the ΔR^2 of 0.316 was also significant. The results mean that if the entrepreneurs were in more complex entrepreneurial environment, the relationship between EP and entrepreneurial opportunity identification was stronger. Hence, Hypothesis 4 was supported. Figure 2 showed the moderating role of environmental complexity.

As same as Hypothesis 4, we also found the positive effect of interaction term on contextual knowledge ($\beta = 0.162$, $P < 0.010$, Model 3) and ΔR^2 value 0.179 was also significant. This result means that if the entrepreneurs faced more complex entrepreneurial environment, the relationship of EP and contextual knowledge was stronger. Hence, Hypothesis 5 was supported. Figure 3 shows the moderating role of environmental complexity.

We followed the path analysis framework proposed by Edwards and Lambert (2007) to test Hypothesis 6.

Fig. 2 The moderating role of environment complexity on the relationship between CK and opportunity identification.

Fig. 3 The moderating role of environment complexity on the relationship between contextual knowledge and opportunity identification.

The results are shown in Table 5. This indicated that the moderating effect of environmental complexity on the relationship between EP and opportunity identification was mediated by contextual knowledge, as the indirect effect of EP on opportunity identification via contextual knowledge was 0.01, $P < 0.010$. Hence, Hypothesis 6 was supported.

5 Research Conclusion and Enlightenment

This study explored the impact of entrepreneurial passion on entrepreneurial opportunity identification and the mediating effect of contextual knowledge and environmental complexity. The results show that (1)

Table 5 Moderate path analysis results

EP – contextual knowledge – opportunity identification					
Stage	Effect				
X–M	M–Y	Direct effect PYX		Indirect effect	Total effect
PMX	PYM			PMX × PYM	PYX + (PMX × PYM)
High EC (1 s.d)	0.32**	0.38**	0.46**	0.12**	0.58**
Low EC (-1 s.d)	0.05	0.35**	0.06	0.02	0.08
Difference	0.22**	0.05	0.47**	0.01**	0.48**

EP, entrepreneurial passion; CK, contextual knowledge; EC, environmental complexity.

* $P < 0.500$, ** $P < 0.010$.

entrepreneurial passion has a significant role in promoting individual identification of entrepreneurial opportunities. Positive emotion and identification of entrepreneurs can help individuals to improve self-efficacy and entrepreneurial intention, and ultimately enable them to maintain creativity, enhance their awareness of entrepreneurial opportunities, and further discover and identify new opportunities. (2) Individual contextual knowledge plays a partial mediating role between entrepreneurial passion and opportunity identification. Entrepreneurship is a complex and highly uncertain activity. Individuals with entrepreneurial passion can enrich their knowledge map in various entrepreneurial situations. The accumulated diversified knowledge, experience and lessons are helpful to find and extract relevant entrepreneurial opportunities. (3) Environmental complexity has a positive moderating effect on entrepreneurial passion, contextual knowledge and opportunity identification; that is, when in a high environmental complexity situation, the mediating role of individual contextual knowledge between entrepreneurial passion and entrepreneurial opportunity identification is stronger than that of low environmental certainty. In the case of high environmental complexity, individuals with entrepreneurial passion show positive self-confidence and will actively enrich their contextual knowledge so as to broaden the scope of entrepreneurial cognition and provide new ideas for identifying entrepreneurial opportunities.

The results of this paper have the following contributions and implications for entrepreneurial management practice: first, this study expands the existing research on the influencing factors of entrepreneurial opportunity identification. Previous studies have shown that entrepreneurial passion has an important impact on the entrepreneurial success and new venture performance, but few studies have explored the impact of entrepreneurial passion on opportunity identification. This paper focuses on the impact of individual entrepreneurial passion on opportunity identification and enriches the exploration of influencing factors of entrepreneurial opportunity identification from the perspective of entrepreneurial emotion. Second, this study found that although individuals with passion are more willing to identify entrepreneurial opportunities, not all entrepreneurs with passion can successfully identify entrepreneurial opportunities. Individual contextual knowledge plays a partial mediating role between entrepreneurial passion and opportunity identification. Therefore, for entrepreneurs, especially for the first-time entrepreneurs, timely and efficient enrichment and expansion of their entrepreneurial experience and participation in diversified entrepreneurial situations will be conducive to optimising individual entrepreneurial cognitive ability and identifying entrepreneurial opportunities more effectively. Finally, this study verifies that the uncertainty of the external environment has a moderating effect on the relationship between contextual knowledge and opportunity identification. Entrepreneurs should enhance the ability to identify environmental changes, combine their own entrepreneurial context knowledge and then transform the external environment into available resources so as to make more favourable decisions in the opportunity identification.

References

- [1] Alvarez, S. A. and L. W. Busenitz (2001). "The entrepreneurship of resource-based theory." *Journal of Management* 27(6): 755-775.
- [2] Ardichvili, A., R. Cardozo and S. Ray (2003). "A theory of entrepreneurial opportunity identification and development." *Journal of Business Venturing* 18(1): 105-123.
- [3] Azadegan, A., P. C. Patel, A. Zangouinezhad and K. Linderman (2013). "The effect of environmental complexity and environmental dynamism on lean practices." *Journal of Operations Management* 31(4): 193-212.
- [4] Barney, J. (1991). "FIRM RESOURCES AND SUSTAINED COMPETITIVE ADVANTAGE." *Journal of Management* 17(1): 99-120.
- [5] Baron, R. A. (2008). "The role of affect in the entrepreneurial process." *Academy of Management Review* 33(2): 328-340.
- [6] Baron, R. A., H. Zhao and Q. Miao (2015). "Personal Motives, Moral Disengagement, and Unethical Decisions by Entrepreneurs: Cognitive Mechanisms on the "Slippery Slope"." *Journal of Business Ethics* 128(1): 107-118.
- [7] Biraglia, A. and V. Kadile (2017). "The Role of Entrepreneurial Passion and Creativity in Developing Entrepreneurial Intentions: Insights from American Homebrewers." *Journal of Small Business Management* 55(1): 170-188.
- [8] Cardella, G. M., B. R. Hernandez-Sanchez and J. C. Sanchez-Garcia (2020). "Women Entrepreneurship: A Systematic Review to Outline the Boundaries of Scientific Literature." *Frontiers in Psychology* 11.
- [9] Cardon, M. S., D. A. Gregoire, C. E. Stevens and P. C. Patel (2013). "Measuring entrepreneurial passion: Conceptual foundations and scale validation." *Journal of Business Venturing* 28(3): 373-396.
- [10] Cardon, M. S. and C. P. Kirk (2015). "Entrepreneurial Passion as Mediator of the Self-Efficacy to Persistence Relationship." *Entrepreneurship Theory and Practice* 39(5): 1027-1050.
- [11] Cardon, M. S., J. Wincent, J. Singh and M. Drnovsek (2009). "THE NATURE AND EXPERIENCE OF ENTREPRENEURIAL PASSION." *Academy of Management Review* 34(3): 511-532.
- [12] CHEN Y, WANG Y, NEVO S, et al(2014). "IT capability and organizational performance: the roles of business process agility and environmental factors." *European Journal of Information Systems*, 23(3): 326-42.
- [13] Corbett, A. C. and K. M. Hmieleski (2007). "The conflicting cognitions of corporate entrepreneurs." *Entrepreneurship Theory and Practice* 31(1): 103-121.
- [14] De Clercq, D., B. Honig and B. Martin (2013). "The roles of learning orientation and passion for work in the formation of entrepreneurial intention." *International Small Business Journal-Researching Entrepreneurship* 31(6): 652-676.
- [15] DeTienne, D. R. and G. N. Chandler (2007). "The role of gender in opportunity identification." *Entrepreneurship Theory and Practice* 31(3): 365-386.
- [16] Eckhardt, J. T. and S. A. Shane (2003). "Opportunities and entrepreneurship." *Journal of Management* 29(3): 333-349.
- [17] He L X(2017). "Contextual Knowledge and Entrepreneurial Behavior: a Moderated Mediating Model." *Science of science and science and technology management* 38 (08): 155-66.
- [18] Hubner, S., M. Baum and M. Frese (2020). "Contagion of Entrepreneurial Passion: Effects on Employee Outcomes." *Entrepreneurship Theory and Practice* 44(6): 1112-1140.
- [19] Ismail, I., N. Husin, N. A. Rahim, M. H. M. Kamal and R. C. Mat (2015). "Entrepreneurial Success among Single Mothers: The Role of Motivation and Passion." *Fifth International Conference on Marketing and Retailing (5th INCOMaR) 2015* 37: 121-128.
- [20] Kaish, S. and B. Gilad (1991). "CHARACTERISTICS OF OPPORTUNITIES SEARCH OF ENTREPRENEURS VERSUS EXECUTIVES - SOURCES, INTERESTS, GENERAL ALERTNESS." *Journal of Business Venturing* 6(1): 45-61.
- [21] Lagua, A. and J. A. Moriano (2019). "Perceived representation of entrepreneurship in the mass media and entrepreneurial intention." *International Entrepreneurship and Management Journal*.
- [22] Ma C P, Gu J B and Dou J S, et al(2017). "Research on the influence mechanism of entrepreneurial passion on the performance of new ventures." *Science of science and management of science and technology* 38 (11): 142-54.
- [23] Mathias, B. D. and D. W. Williams (2017). "The Impact of Role Identities on Entrepreneurs' Evaluation and Selection of Opportunities." *Journal of Management* 43(3): 892-918.
- [24] Mitchell, R. K., B. Smith, K. W. Seawright and E. A. Morse (2000). "Cross-cultural cognitions and the venture creation decision." *Academy of Management Journal* 43(5): 974-993.
- [25] Murnieks, C. Y., E. Mosakowski and M. S. Cardon (2014). "Pathways of Passion: Identity Centrality, Passion, and Behavior Among Entrepreneurs." *Journal of Management* 40(6): 1583-1606.
- [26] Ramos-Rodriguez, A.-R., J.-A. Medina-Garrido, J.-D. Lorenzo-Gomez and J. Ruiz-Navarro (2010). "What you know or who you know? The role of intellectual and social capital in opportunity recognition." *International Small Business Journal-Researching Entrepreneurship* 28(6): 566-582.
- [27] Santos, S. C. and M. S. Cardon (2019). "What's Love Got to Do With It? Team Entrepreneurial Passion and Performance in New Venture Teams." *Entrepreneurship Theory and Practice* 43(3): 475-504.
- [28] Shane, S. (2000). "Prior knowledge and the discovery of entrepreneurial opportunities." *Organization Science* 11(4): 113-129.

448-469.

- [29] Shane, S. and S. Venkataraman (2000). "The promise of entrepreneurship as a field of research." *Academy of Management Review* 25(1): 217-226.
- [30] Shepherd, D. A., J. S. McMullen and W. Ocasio (2017). "IS THAT AN OPPORTUNITY? AN ATTENTION MODEL OF TOP MANAGERS' OPPORTUNITY BELIEFS FOR STRATEGIC ACTION." *Strategic Management Journal* 38(3): 626-644.
- [31] Smilor, R. W. (1997). "Entrepreneurship - Reflections on a subversive activity." *Journal of Business Venturing* 12(5): 341-346.
- [32] Stroe, S., V. Parida and J. Wincent (2018). "Effectuation or causation: An fsQCA analysis of entrepreneurial passion, risk perception, and self-efficacy." *Journal of Business Research* 89: 265-272.
- [33] Sun, S. and H. I. J. van Emmerik (2015). "Are Proactive Personalities Always Beneficial? Political Skill as a Moderator." *Journal of Applied Psychology* 100(3): 966-975.
- [34] Yitshaki, R. and F. Kropp (2016). "Entrepreneurial passions and identities in different contexts: a comparison between high-tech and social entrepreneurs." *Entrepreneurship and Regional Development* 28(3-4): 206-233.
- [35] Zahra, S. A., R. I. Yavuz and D. Ucbasaran (2006). "How much do you trust me? The dark side of relational trust in new business creation in established companies." *Entrepreneurship Theory and Practice* 30(4): 541-559.
- [36] Zhang, Z. and R. Arvey (2009). "Rule breaking in adolescence and entrepreneurial status: An empirical investigation." *Journal of Business Venturing* 24(5): 436-447.
- [37] Zhang, X. E. Zhou R. X. and Wang Y. (2012). "The relationship between cultural values, entrepreneurial cognition and entrepreneurial decision-making." *Economic issues exploration* 10: 74-80.