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Multi-Agent Interaction in the Digital Entrepreneurial Ecosystem and Digital Re-Entrepreneurial Intention in Jiangxi Province, China: The Roles of Opportunity Belief and Episodic Future Thinking
การปฏิสัมพันธ์ของตัวแทนหลายฝ่ายในระบบนิเวศผู้ประกอบการดิจิทัลและความตั้งใจในการกลับมาเป็นผู้ประกอบการดิจิทัลอีกครั้งในมณฑลเจียงซี ประเทศจีน: บทบาทของความเชื่อในโอกาสและการคิดถึงอนาคตแบบเป็นตอน

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Lei LI¹ เลย์ ลี Chuensumon Bunnag^{2,*} ชื่นสมุล บุนนาค Ke ZHANG³ เค ซาง

¹ DBA. Candidate, International College, Faculty of Business Administration, Mahanakorn University of Technology, Bangkok, Thailand.

² Ph.D., Associate Professor, Faculty of Business Administration, Mahanakorn University of Technology, Bangkok, Thailand.

³ Ph.D., Assistant Professor, Chinese International College, Faculty of Education, Dhurakij Pundit University, Bangkok, Thailand.

¹ นักศึกษาปริญญาเอก วิทยาลัยนานาชาติ คณะบริหารธุรกิจ มหาวิทยาลัยเทคโนโลยีมหานคร กรุงเทพมหานคร ประเทศไทย

² ปรด.รองศาสตราจารย์ คณะบริหารธุรกิจ มหาวิทยาลัยเทคโนโลยีมหานคร กรุงเทพมหานคร ประเทศไทย

³ ปรด.ผู้ช่วยศาสตราจารย์ วิทยาลัยนานาชาติจีน คณะศึกษาศาสตร์ มหาวิทยาลัยธุรกิจบัณฑิต กรุงเทพมหานคร ประเทศไทย

บทคัดย่อ

การทำความเข้าใจถึงวิธีการกระตุ้นให้ผู้ประกอบการกลับมาเป็นผู้ประกอบการดิจิทัลอีกครั้งถือเป็นกุญแจสำคัญในการฟื้นฟูเศรษฐกิจในอนาคต ซึ่งปฏิสัมพันธ์ระหว่างตัวแทนภายนอกหลายรายมี

* E-mail address: bchuensumon@gmail.com

ความเกี่ยวข้องกับการกลับมาเป็นผู้ประกอบการดิจิทัลอีกครั้ง ดังนั้น งานวิจัยนี้จึงศึกษาความสัมพันธ์ระหว่างปฏิสัมพันธ์ระหว่างตัวแทนหลายรายภายในระบบนิเวศการประกอบการดิจิทัลกับความตั้งใจที่จะเป็นผู้ประกอบการดิจิทัลอีกครั้งในมณฑลเจียงซี ประเทศจีน และบทบาทที่ควบคุมของความเชื่อในโอกาสและการคิดเกี่ยวกับอนาคตแบบเป็นตอน ๆ โดยรวบรวมข้อมูลจากผู้ประกอบการดิจิทัลในมณฑลเจียงซี ประเทศจีน ในเดือนพฤษภาคม 2024 โดยใช้วิธีการสุ่มตัวอย่างแบบเฉพาะเจาะจงกับกลุ่มตัวอย่าง 327 คน ซึ่งได้ผลความถูกต้อง 93.42%

ผลวิจัย พบว่า ปฏิสัมพันธ์ระหว่างตัวแทนหลายรายภายในระบบนิเวศการประกอบการดิจิทัล โดยเฉพาะปฏิสัมพันธ์ระหว่างผู้ประกอบการดิจิทัล รัฐบาล บริษัทพันธมิตร ผู้ใช้ดิจิทัล ตัวกลาง มหาวิทยาลัย และสถาบันวิจัย มีความสัมพันธ์ในเชิงบวกกับความตั้งใจที่จะเป็นผู้ประกอบการดิจิทัลอีกครั้งในมณฑลเจียงซี ประเทศจีน บทบาทของความเชื่อในโอกาสไม่มีผลต่อความสัมพันธ์ดังกล่าว ในขณะที่การคิดแบบอนาคตแบบเป็นตอน ๆ มีผลในเชิงบวกอย่างมีนัยสำคัญ ซึ่งบ่งชี้ว่า ผู้ประกอบการในมณฑลเจียงซี ประเทศจีน ไม่เพียงแต่ต้องการปฏิสัมพันธ์ระหว่างตัวแทนหลายรายที่มีประสิทธิภาพภายในระบบนิเวศดิจิทัลเท่านั้น แต่ยังต้องมีความสามารถในการมองเห็นอนาคตด้วย เพื่อเพิ่มความตั้งใจที่จะประกอบการต่อไปในสภาพแวดล้อมออนไลน์อย่างเต็มที่ ข้อเสนอแนะว่าภายในระบบนิเวศการประกอบการดิจิทัล ควรเน้นที่การสร้างนโยบายเพื่อสนับสนุนผู้ประกอบการดิจิทัลที่กลับมาประกอบการอีกครั้ง รวมถึงโปรแกรมการฝึกอบรมพิเศษเพื่อให้พวกเขาสร้างการคิดแบบอนาคตแบบเป็นตอน ๆ เพื่อเพิ่มอัตราความสำเร็จของผู้ประกอบการดิจิทัลที่กลับมาประกอบการอีกครั้งในระบบนิเวศดิจิทัลได้อย่างมีประสิทธิภาพ สุดท้าย ผลการวิจัยสามารถส่งเสริมผู้ประกอบการดิจิทัลที่กลับมาประกอบการอีกครั้งได้อย่างมีประสิทธิภาพ และให้การสนับสนุนอันมีค่าต่อแนวทางปฏิบัติเศรษฐกิจดิจิทัลในห้องถิ่นในอนาคตในมณฑลเจียงซี ประเทศจีน จึงมีส่วนสนับสนุนในเชิงทฤษฎีและเชิงปฏิบัติในระดับหนึ่ง

คำสำคัญ การติดต่อระหว่างตัวแทนหลายรายภายในระบบนิเวศการประกอบการดิจิทัล ความตั้งใจที่จะประกอบการดิจิทัลอีกครั้ง ความเชื่อในโอกาส การคิดเกี่ยวกับอนาคตแบบเป็นตอน ๆ

ABSTRACT

Understanding how to prompt entrepreneurs' re-entry into digital entrepreneurship is the key to revitalizing the future economy. The interaction among multiple external agents is related to re-entrepreneurship. Therefore, this study investigated the relationship between multi-agent interaction within the digital entrepreneurial ecosystem and digital re-entrepreneurial intention in Jiangxi Province, China, and the moderating roles of opportunity belief and episodic future thinking. The data were collected from digital entrepreneurs in Jiangxi Province, China, in May 2024 using purposive sampling methods. A total of 327 valid questionnaires were obtained, yielding a validity rate of 93.42%.

The results show that multi-agent interaction within the digital entrepreneurial ecosystem, particularly interactions among digital entrepreneurs, government, partner companies, digital users, intermediaries, universities, and research institutes, is positively correlated with the digital re-entrepreneurial intention in Jiangxi Province, China. Opportunity belief does not have a moderating effect on this relationship, whereas episodic future thinking has a significantly positive moderating effect. This indicates that entrepreneurs in Jiangxi Province, China, require not only effective multi-agent interaction within the digital ecosystem but also the ability to envision the future in order to fully enhance their intention to continue entrepreneurship in the online environment. Therefore, it is suggested that within the digital entrepreneurship ecosystem, the focus should be on building policies to support digital re-entrepreneurs, as well as special training programs for them to build episodic future thinking, in order to effectively enhance the success rate of digital re-entrepreneurship in the digital ecosystem. Finally, the research findings can effectively promote digital re-entrepreneurship among entrepreneurs and provide valuable support to future local digital economy practices in Jiangxi Province, China, thereby making a certain theoretical and practical contribution.

Keywords: Multi-agent interaction within the Digital Entrepreneurial Ecosystem, Digital Re-Entrepreneurial Intention, Opportunity Belief, Episodic Future Thinking

Introduction

Digital entrepreneurship has become a strong driver for the future development of society (Zhu and Yang, 2023). However, with more than 90% of new start-ups facing bankruptcy and liquidation within three years, and 70% of SMEs going out of business within five years, start-up failure has become an inevitable part of the entrepreneurial process (Zhang and Wang, 2020a; Zhao *et al.*, 2022). As stated by Cai *et al.* (2022), although digital entrepreneurship is an important driver of socio-economic development, the failure rate of first-time entrepreneurs is extremely high. Compared to start-ups, re-entrepreneurs tend to have greater access to capital and are better able to utilize and optimize entrepreneurial resources, making it easier to take quick entrepreneurial action, seize entrepreneurial opportunities, and facilitate new venture establishment and success (Wang and Xiong, 2023). Therefore, tapping into the influencing factors of digital re-entrepreneurial intention is key to facilitating failed entrepreneurs to re-engage in digital entrepreneurial activities and is a key driver to realizing the future development of the digital economy (Du *et al.*, 2022).

A digital entrepreneurial ecosystem is a combination of supportive subjects and elements constructed by a digital entrepreneurial venture to overcome the resource constraints of a single subject, and to obtain direct or indirect resources to enhance entrepreneurial performance through multi-subject interaction (Ma *et al.*, 2022a). It was found that multi-agent interaction in digital entrepreneurial ecosystem have a significant effect on digital entrepreneurial performance (Ma *et al.*, 2022b). Conversely, digital multifactor that fails to interact effectively and synergistically will result in low levels of output (Zhu and Yang, 2023). As Zhu and Yang (2023) suggest, a digital multi-actor interaction system is an important path for leapfrogging enterprises, and the study of digital entrepreneurial ecosystems is of great significance for the development of the entrepreneurial field. On the other hand, entrepreneurship in the digital business field is not always smooth, and the path to entrepreneurial success is often accompanied by failure (Zhao *et al.*, 2022). However, entrepreneurial failures can also provide valuable lessons learned, and the resulting fundamental changes can help entrepreneurs improve their existing entrepreneurial models, thus fueling their re-entry success (Zhang and Wang, 2020b). This intention of choosing to start a business again in the digital domain is defined in this study as existing entrepreneurs having the intention of continuing to start a business in the online environment. Due to the survivor bias, previous research in the field of entrepreneurship has focused on the path to achieving entrepreneurial success, and there is a lack of attention on how entrepreneurs can come out of the shadows to make a comeback after experiencing the blow of failure (Zhang and Wang, 2020a; Zhao *et al.*, 2022). Therefore, it is necessary to explore the antecedents and process mechanisms that motivate entrepreneurs' digital re-entrepreneurial intention, so that they can achieve success. As Li *et al.* (2022) suggest, it may be difficult to accurately reveal the pathways that influence entrepreneurial success if we only focus on first-time entrepreneurial willingness and ignore research on re-entrepreneurship. However, the multi-agent interaction in digital entrepreneurial ecosystem help entrepreneurs' re-entry into digital entrepreneurship. However, the connection between the two has not been explored yet.

Furthermore, opportunity belief may be an important factor in increasing digital re-entrepreneurial intention as digital entrepreneurs gestate towards re-entry (Cai *et al.*, 2022). It has been described as the individual beliefs that entrepreneurs develop after overcoming ignorance of information about opportunities in their environment (Grégoire *et al.*, 2010). Research has found that digital entrepreneurship ecosystems are strongly related to opportunity belief (Du *et al.*, 2022). In addition, Guo and Shen's (2014) study found that the interaction of opportunity belief with the market environment of external environmental factors can promote entrepreneurial performance. This is because entrepreneurs with high opportunity

belief can accurately grasp information about existing entrepreneurial policies, culture, and organizational environments, thereby forming an assessment of the feasibility of the opportunity itself, reducing the impact of environmental uncertainty on the entrepreneurial psyche, and eliminating entrepreneurial wistfulness about the feasibility and desirability of the opportunity (Cai *et al.*, 2022). However, it is not clear the indirect facilitating influence of the interaction between multi-agent interaction in digital entrepreneurial ecosystem and opportunity belief on digital re-entrepreneurial intention.

Episodic future thinking is a possible facilitator of how to increase digital re-entrepreneurial more effectively. It is defined as the process of thinking about and imagining the future based on current situations or past experiences and is the ability to envision the future (Lu *et al.*, 2021). Research has found that digital re-entrepreneurial is associated with prospective decision-making (Rösch *et al.*, 2022). As Lu *et al.* (2021) suggest, episodic future thinking enables how people can adapt more positively to the future and promotes sustainable behavior. Furthermore, during the development of individual behavior, research has also found that episodic future thinking has a moderating effect between hedonic and future time insights and individual behavior (Rebiguli *et al.*, 2023). As Wang *et al.* (2017) suggest, episodic future thinking can bring about changes in the role of motivation and executive intention and alter the direction or degree of its influence on goal attainment. Although episodic future thinking is an important facilitator, its facilitating role between multi-agent interaction in the digital entrepreneurial ecosystem and digital re-entrepreneurial intention has never been explored.

On the other hand, Jiangxi Province is located in the central region of China, and currently has an economy that is in the backward region of China, ranking 16th (Tang, 2024). One of the main reasons for the economic backwardness of China's Jiangxi Province is a serious deficit in digital entrepreneurship; in 2023, the scale of the digital economy in Jiangxi Province, China, reached 1.42 trillion yuan, far below Zhejiang Province's 4.33 trillion yuan (Li *et al.*, 2024). As Yang and Wang (2023) suggest, policy support and investment in digital entrepreneurship by relevant authorities in Jiangxi Province, China, lags far behind other regions, which severely limits the overall development rate of the digital economy. Therefore, this study will explore the antecedents and process mechanisms that can drive the willingness of digital re-entrepreneurship based on Jiangxi Province in China as a context to promote the development of digital entrepreneurship and revitalize the region's economy.

In summary, the research objectives of this study are to investigate the perceptions of people who have had failed entrepreneurial experiences in Jiangxi Province, China, on the multi-agent interaction in digital entrepreneurial ecosystem, as well as the manifestation of their digital re-entrepreneurial intention, and the facilitating effects of opportunity beliefs and

episodic future thinking in the relationship between the aforementioned relationships. Clarifying these relationships will identify the antecedents and facilitating mechanisms of entrepreneurs' digital re-entrepreneurship, and provide experiences and assistance in promoting re-entrepreneurship practices in the digital domain in Jiangxi Province, China.

Research Questions

In recent years, digital re-entrepreneurship has become a focal issue. However, researchers have found it difficult to avoid the topic of why diverse digital external resources struggle to inspire entrepreneurs to engage in re-entrepreneurship practices in the future. To address this issue, researchers surveyed digital re-entrepreneurship intention. Despite analyses from multiple perspectives, such as multi-agent interaction in digital entrepreneurial ecosystem, there remains a lack of in-depth exploration into the underlying mechanisms of the process. Based on this, this study explores the relationship between multi-agent interaction in digital entrepreneurial ecosystem and digital re-entrepreneurial intention in Jiangxi Province, China, as well as the moderating roles of opportunity belief and episodic future thinking, using social network theory. The aim is to gain a deeper understanding of the antecedents and process mechanisms that activate entrepreneurs' digital re-entrepreneurship intentions, thereby promoting the further development of research in the field of digital entrepreneurship. The research questions are as follows:

- (1) Does the multi-agent interaction in digital entrepreneurial ecosystem related to digital re-entrepreneurial intention in Jiangxi Province, China?
- (2) Does opportunity belief and episodic future thinking moderating between multi-agent interaction in digital entrepreneurial ecosystem and digital re-entrepreneurial intention in Jiangxi Province, China.?

Research Objectives

- (1) To exploring the relationship between multi-agent interaction in digital entrepreneurial ecosystem and digital re-entrepreneurial intention in Jiangxi Province, China.
- (2) To analyze the moderating effect of opportunity belief and episodic future thinking between multi-agent interaction in digital entrepreneurial ecosystem and digital re-entrepreneurial intention in Jiangxi Province, China.

Literature Review and Hypothesis

Social Network Theory

The entrepreneurial process is based on resource assurance, and resources are one of the indispensable elements in entrepreneurial activities (Ma *et al.*, 2022a). Multiple actors within a digital ecosystem can maximize the strategic synergy of resources by building participant synergy structures (Zhu and Yang, 2023). Therefore, this study categorizes the multi-agent interaction in digital entrepreneurial ecosystem as a type of external resource. In addition, this study considers digital re-entrepreneurial intention as existing entrepreneurs have the intention to continue to start a business in a networked environment and categorizes it as social behavior. On the other hand, the social network is a product of the entrepreneurs' entrepreneurial process catalyzed by various social, economic, and ecological factors, and the connecting ties of the social network include, rational and emotional, blood, emotional, and economic interest factors (Peng and Xie, 2004). Opportunity belief, on the other hand, are defined as individual beliefs that entrepreneurs develop after overcoming ignorance of opportunity information in their environment (Grégoire *et al.*, 2010). Therefore, this study categorizes opportunity belief as perceptual factors. In addition, episodic future thinking is the process of thinking about and imagining the future based on current scenarios or past experiences, which is a vision of the future and is considered a thinking ability (Lu *et al.*, 2021). Therefore, this study categorizes episodic future thinking as a rational factor. Therefore, the multi-agent interaction in digital entrepreneurial ecosystem as a resource for individuals who choose to re-enter the entrepreneurial process can interact with opportunity belief as a perceptual factor and episodic future thinking as a rational factor as a nexus, and influence the re-entrepreneurs' social behaviors.

Research Conceptual Framework

The research framework was constructed according to the research objectives and hypotheses (Figure 1).

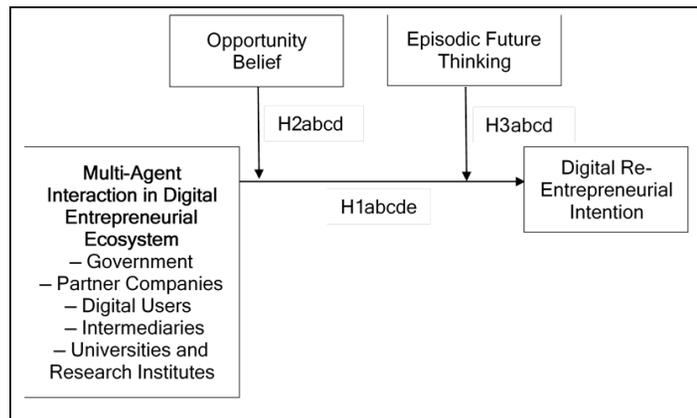


Figure 1: Research Conceptual Framework

Source: Li, Bunnag and Zhang (2024)

Digital Re-Entrepreneurial Intention

Traditionally, re-entrepreneurial Intention has been defined as the willingness of existing entrepreneurs to continue their business (Bao and Dou, 2021). Subsequently, digital re-entrepreneurial intention has been developed due to the development of network technology. Therefore, this study defines digital re-entrepreneurial intention as existing entrepreneurs having the intention to continuously start a business in the online environment.

Multi-agent Interaction in Digital Entrepreneurial Ecosystem and Digital Re-Entrepreneurial Intention

Research has shown that multi-agent interaction in digital entrepreneurial ecosystem is positively correlated with digital entrepreneurial performance (Ma *et al.*, 2022b). Conversely, demoralized digital multi-actor synergy will be detrimental to entrepreneurship (Zhu and Yang, 2023). In addition, in the coupling mechanism of digital entrepreneurial elements, digital entrepreneurial enterprises, and the government play a leading role, while universities and research institutes provide key elements of protection, and digital users gradually become the core of the coupling of digital entrepreneurial elements (Ma *et al.*, 2022b). As stated by Zhu and Yang (2023), digital multi-objects can construct diversified and rich elemental contexts through interaction, and by screening and configuring entrepreneurial elements, elemental coupling can be realized between digital multi-objects by taking digital users' needs as the core and linking heterogeneous elements of the subjects to form a virtuous cycle of entry, expansion, and coupling between digital entrepreneurial multi-objects' elements, which will ultimately stimulate entrepreneurs' digital re-entrepreneurship (Guerrero and Espinoza-Benavides, 2021). Therefore the hypothesis:

H1abcde: Multi-agent interaction in digital entrepreneurial ecosystem (digital entrepreneurs and government, partner companies, digital users, intermediaries, universities and research institutes) and digital re-entrepreneurial intention are positively correlated.

The Moderator Role Played by Opportunity Belief

One possible factor contributing to the relationship between multi-agent interaction in digital entrepreneurial ecosystem and digital re-entrepreneurial intention is opportunity belief. Meanwhile, entrepreneurial opportunities, similar to the concept of opportunity belief, have been shown to have a facilitating effect between environmental uncertainty and entrepreneurial decisions (Zhou and Song, 2020). As stated by Du and Hao (2023), opportunity belief are the cornerstone and pillar on which entrepreneurship research is constructed, serving as an important bridge between the cognitive and behavioral interactions of entrepreneurs. In other words, in the digital entrepreneurship ecosystem, the interaction of multiple subjects (digital startups and government, partner companies, digital users, intermediaries, universities and research institutes) with entrepreneurial beliefs can strengthen entrepreneurs' behaviors toward opportunity identification and exploitation activities, which in turn further enhance the structure and innovation of entrepreneurship, and this strengthens the symbiosis of opportunities between multiple subjects, which in turn can better assist the entrepreneurs in the process of re-entrepreneurship (Zhu and Yang, 2023). This suggests that such beliefs that help entrepreneurs overcome ignorance and skepticism in the entrepreneurial process can effectively contribute to an individual's entrepreneurial performance (Du *et al.*, 2022), and thus opportunity belief can serve as a potential facilitating mechanism to increase entrepreneurs' numerical re-entry performance. Therefore, the hypothesis is illustrated below:

H2abcde: Opportunity belief has a positive moderating effect between multi-agent interaction in digital entrepreneurial ecosystem (digital entrepreneurs and government, partner companies, digital users, intermediaries, universities and research institutes) significantly and digital re-entrepreneurial intention.

The Moderator Role Played by Episodic Future Thinking

Research has shown that episodic future thinking is associated with prospective decision-making (Rösch *et al.*, 2022). In turn, as a facilitative mechanism, episodic future thinking has also been shown to promote hedonic and future-time insights concerning individual behavior (Rebiguli *et al.*, 2023). As suggested by Wang *et al.* (2017), episodic future thinking can lead to changes in the role of motivation and executive intention and alter the direction or degree of its influence on goal attainment. This suggests that in the process of

entrepreneurs' re-entrepreneurship, the interactions between multi-agent interaction in digital entrepreneurial ecosystem (digital entrepreneurs and government, partner companies, digital users, intermediaries, universities and research institutes) and episodic future thinking as an adaptive function may further influence people's perception of risk in future choices, or will increase people's ability to exercise self-control, which will then influence individuals' cross-period decision-making behavior (Rösch *et al.*, 2022; Wang *et al.*, 2022), as well as easier access to multi-agent support and entrepreneurial strategy renewal, which will ultimately enhance entrepreneurs' psychological state to start up again. Therefore, the hypothesis is illustrated below:

H3abcde: Episodic future thinking has a positive moderating effect between multi-agent interaction in digital entrepreneurial ecosystem (digital entrepreneurs and government, partner companies, digital users, intermediaries, universities and research institutes) significantly and digital re-entrepreneurial intention.

Methodology

Sample and Data Collection Procedure

The survey was conducted in May 2024, with a purposive sampling method, through an electronic questionnaire to survey entrepreneurs who have had failed start-up experiences in eight e-incubation parks in Jiangxi Province, China, it was conducted through the assistance of park managers. They were also surveyed on their multi-agent interaction in digital entrepreneurial ecosystem, digital re-entrepreneurial intention, opportunity belief, and episodic future thinking, which resulted in 327 samples (93.42% validity rate).

Measures

Multi-agent interaction in digital entrepreneurial ecosystem Scale: Designed by Ma *et al.* (2022a) with 5 factors with 25 items for digital entrepreneurship firms and government (The α of the scale = 0.828), partner firms (α = 0.760), digital users (α = 0.778), intermediary organizations (α = 0.820), and universities and research institutes (α = 0.799). Digital re-entrepreneurial intention scale: Adapted the instrument from Bao and Dou (2021) (The α of the scale = 0.893) and Xu (2012) (α = 0.894) to add digital elements, 4 items in total. Sample question: If you found a digital entrepreneurial opportunity, would you want to start a new business? Opportunity belief scale: Designed by Grégoire *et al.* (2010) and Grégoire and Shepherd (2012), 2 factors of 5 items (The α of the scale = 0.908) on perceived feasibility of

the opportunity through the perception of the fit between the mode of supply and the target market. Episodic future thinking scale: Designed by Li *et al.* (2023), a single factor of 3 items (The α of the scale = 0.90) for future scenario envisioning ability. The overall model had a SRMR (Standardized Root Mean Square Residual) =0.034, the fit between the sample and the model is good.

Results

Distribution of Population Characteristics

As shown in Table 1, the sample was predominantly female (206 People, 62.997%), the greatest number of digital start-ups were 1-3 years old (161 People, 49.235%), and the greatest number of businesses had 51-100 employees (163 People, 49.847%).

Table 1: Distribution of population characteristics

Background variables	Category	N	%
Gender	Male	121	37.003
	Female	206	62.997
Duration of digital entrepreneurship	11 months and under	43	13.150
	1-3 years	161	49.235
	4-5 years	78	23.853
	6 years and above	45	13.761
Number of employees in the enterprise	11-30 people	34	10.398
	31-50 people	84	25.688
	51-100 people	163	49.847
	101 people and above	46	14.067

Note: n=327

Correlation Analysis

The correlation matrix shows that digital startups and governments, partner companies, digital users, intermediary organisations, and universities and research institutes are positively correlated with digital re-entrepreneurial intention ($r=0.526^{***}$, 0.517^{***} , 0.516^{***} , 0.540^{***} , 0.540^{***} , $p<0.001$), and H1abcde valid.

Table 2: Correlation analysis

Variable	1	2	3	4	5	6	7	8
1. Digital startups and governments	0.822							
2. Digital startups and partner companies	0.394***	0.756						
3. Digital startups and digital users	0.424***	0.360***	0.813					
4. Digital startups and intermediary organisations	0.397***	0.396***	0.376***	0.768				
5. Digital startups and universities and research institutes	0.411***	0.403***	0.366***	0.396***	0.792			
6. Digital re-entrepreneurial intention	0.526***	0.517***	0.516***	0.540***	0.540***	0.758		
7. Opportunity belief	0.303***	0.182***	0.220***	0.261***	0.169**	0.295***	0.798	
8. Episodic future thinking	0.279***	0.185***	0.323***	0.353***	0.320***	0.390***	0.242***	0.815
M	3.554	3.853	3.420	3.595	3.580	3.513	3.214	3.437
SD	0.934	0.956	1.043	0.944	1.050	0.866	0.937	1.091
Cronbach's α	0.860	0.790	0.848	0.849	0.835	0.842	0.896	0.854
CR	0.862	0.800	0.854	0.852	0.835	0.844	0.898	0.856
AVE	0.676	0.572	0.661	0.590	0.628	0.575	0.638	0.665

Note: *** $p < 0.001$; the value in the diagonal is the AVE open root value.

Moderating Analysis

As shown in Table 3, there is no moderating effect of opportunity belief between multi-agent interaction in the digital entrepreneurial ecosystem (digital entrepreneurial firms and government, partner firms, digital users, intermediaries, universities, and research institutions) and digital re-entrepreneurial intention, and H2 abcde is not valid. Episodic future thinking moderates between multi-agent interaction in the digital entrepreneurial ecosystem (digital entrepreneurial firms and government, partner firms, digital users, intermediaries, universities, and research institutions) and digital re-entrepreneurial intention, and H3abcde valid.

Table 3: Moderating Analysis

Path	β
Digital startups and governments \times opportunity belief \rightarrow digital re-entrepreneurial intention	-0.025
Digital startups and partner companies \times opportunity belief \rightarrow digital re-entrepreneurial intention	-0.014
Digital startups and digital users \times opportunity belief \rightarrow digital re-entrepreneurial intention	0.073
Digital startups and intermediary organisations \times opportunity belief \rightarrow digital re-entrepreneurial intention	-0.047
Digital startups and universities and research institutes \times opportunity belief \rightarrow digital re-entrepreneurial intention	0.065
Digital startups and governments \times episodic future thinking \rightarrow digital re-entrepreneurial intention	0.076*
Digital startups and partner companies \times episodic future thinking \rightarrow digital re-	0.099**

entrepreneurial intention	
Digital startups and digital users × episodic future thinking → digital re-entrepreneurial intention	0.123***
Digital startups and intermediary organisations × episodic future thinking → digital re-entrepreneurial intention	0.111**
Digital startups and universities and research institutes × episodic future thinking → digital re-entrepreneurial intention	0.157***

Note: *** $p < 0.001$.

Discussion

The results confirm, for the first time, that multi-agent interaction in digital entrepreneurial ecosystem (digital entrepreneurial firms and government, partner firms, digital users, intermediaries, universities and research institutions) are positively correlated with the digital re-entrepreneurial intention the business. As Cai *et al.* (2022) suggest, in the process of entrepreneurial practice, digital entrepreneurial firms often interact with multiple actors at the same time to satisfy their survival and development needs. Therefore, in digital entrepreneurship, enterprises, and the government play a leading role, while cooperative enterprises, digital users, intermediaries, universities and research institutions provide key elemental guarantees, which can help enterprises identify entrepreneurial opportunities, assist multiple subjects in accurately judging the trend of the digital market, put forward new digital solutions, and form a virtuous cycle of digital entrepreneurship development.

In addition, the study shows that opportunity belief do not contribute to the relationship between multi-agent interaction in the digital entrepreneurial ecosystem and digital re-entrepreneurial intention. This may be due to the openness, ease of use, and scalability of digital entrepreneurship, as entrepreneurs in the digital domain can complete opportunity co-creation through low-cost trial-and-error and adjustment opportunities, and more convenient social interactions. This is because technological openness and the configuration of decision-making power in digital ecosystems affect the entrepreneurial opportunities generated based on digital operations, and even lower the threshold of knowledge required for entrepreneurship and reduce the initial learning costs (Zhu and Yang, 2023).

The results also confirm, for the first time, that episodic future thinking has a significant facilitating effect between multi-agent interaction in digital entrepreneurial ecosystem (digital entrepreneurial firms and government, partner firms, digital users, intermediaries, universities and research institutions) and digital re-entrepreneurial intention. This is because when the

combined interaction of digital entrepreneurial ventures with supporting subjects and elements is moderated by episodic future thinking and thus its role on motivation and execution intentions changes, it changes the direction or degree of its influence on goal attainment and facilitates the propensity to digitally re-entrepreneur. As Lu *et al.* (2021) suggest, episodic future thinking has the potential to influence goal attainment, and as an important component of cognitive activity, it is goal orientated most of the time, and is not only influenced by the individual's life goals, but can, in turn, help the individual to plan for the future, facilitate goal attainment, and improve coping skills.

Recommendations

Based on the conclusions, the following measures are proposed to enhance the digital re-entrepreneurial intention of Chinese entrepreneurs. Firstly, from the perspective of multiple subjects in the digital ecosystem, it is necessary for the Chinese government to improve the construction of various subjects on entrepreneurship and re-entrepreneurship, and to form a complete external multi-supportive environment, to enhance the intention of digital re-entrepreneurship. Secondly, in the process of re-entrepreneurship, it is necessary to pay attention to the development and cultivation of individual capabilities. From the perspective of entrepreneurs, they should proactively enhance their episodic future thinking ability by participating in entrepreneurship training to enhance their willingness for digital re-entrepreneurship. Thirdly, from the perspective of the government, support policies for re-entrepreneurship should be further improved, and assistance should be provided to entrepreneurs in the form of financial support, risk funds, and entrepreneurial insurance, to solve their worries.

Limitations and Future Directions

Limited by the research methodology, the conclusion only focuses on the relationship between multi-agent interaction in the digital entrepreneurial ecosystem and digital re-entrepreneurial intention, as well as the facilitating role of opportunity belief and episodic future thinking. It does not propose a plan for the current dilemmas and improvement strategies for the interaction between supportive subjects and digital re-entrepreneurship. Therefore, qualitative methods such as group interviews can be used in the future to enrich related research.

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