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Do universities play the role of entrepreneurial gender equalizer? Evidence from China

Yaping Song [a], Genshu Lu [b,*]

[a] Center of Higher Education Research, Southern University of Science and Technology, Shenzhen City, Guangdong Province, China
[b] School of Humanities and Social Science, West China Higher Education Evaluation Center & Institute of Higher Education, Xi'an Jiaotong University, Xi'an City, Shaanxi Province, China

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ABSTRACT

The gender imbalance in entrepreneurship makes people expect universities to play the role of gender equalizers. Nevertheless, it is unclear whether universities play such a role as expected. Based on the survey data of 5468 college graduates in Shaanxi Province, China, this study utilizes the multigroup analysis (MGA) technique in a partial least squares structural equation model to investigate the gender difference in the direct and indirect effect of university entrepreneurship support (UES) on college students' entrepreneurial intention (EI). The results illustrate no significant gender differences in the direct effect of UES on EI, entrepreneurial self-efficacy (ESE) on EI, and ESE's mediating role in the relationship between UES and EI. More importantly, we find that UES demonstrates a greater reduction in fear of entrepreneurial failure (FEF) for male students compared to female students; UES has a more positive influence on male students' ESE than female students. Moreover, compared with female students, FEF has a stronger attenuating effect on male students' EI; UES is more likely to stimulate EI for male students by lowering FEF. These findings imply that universities seem to maintain and exacerbate gender inequality in startups, and current UES may be required to adapt or redesign.

1. Introduction

In past decades, there has been a growing consensus that women play an essential role in entrepreneurial activities. In the US, as of 2019, nearly 13 million women-owned businesses generate $1.9 trillion in revenue and employ 9.4 million people (Great Business Schools, 2021). Woetzel et al. (2015) noted that if women participate in the economy at the same level as men, global GDP could increase by 26%. Moreover, studies have shown that compared to male entrepreneurs, females tend to invest more of their income back into their families and society and spend more money on food and children's education (Siba, 2016). Jennings and Brush (2013) argued that female entrepreneurs are less concerned with economic goals than males and more focused on pursuing social goals. These statistics and opinions explain why people are interested in female entrepreneurship. However, a fact that cannot be ignored is that women are still underrepresented in entrepreneurial activities. The Global Entrepreneurship Monitor (GEM) 2022/2023 survey of 49 countries, including China, showed that despite a shrinking trend in the proportion of men and women starting businesses, there is still a gap in women's entrepreneurial activity compared with men (GEM, 2023). Indeed, this gap may arise from gender-related barriers and the consequent low entrepreneurial intention (EI).

* Corresponding author.
E-mail addresses: songyp@sustech.edu.cn (Y. Song), gslu@mail.xjtu.edu.cn (G. Lu).

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To more fully realize the entrepreneurial potential of women, increase women's participation in business, and better achieve the goal of "gender equality and empowerment of women and girls" set out in the United Nations 2030 Agenda for Sustainable Development (United Nations, 2018), governments around the world are actively supporting potential entrepreneurs, including women, to inspire their EI. With government promotion, universities have also joined the ranks of entrepreneurship support providers. For instance, evidence shows that as of 2018, more than 2000 universities in the United States have offered entrepreneurship education courses, of which more than 500 universities offer bachelor's degrees in entrepreneurship (Qie & Sun, 2018). In 2018, a report in the UK pointed out that almost all 169 public universities in the UK provided innovation and entrepreneurship education for college students, and about 50% of them also provided additional forms of entrepreneurial support, including workshops, training camps, entrepreneurship competitions, leave for entrepreneurship, entrepreneurship awards, entrepreneurship incubators (Shi, 2020).

In parallel with the world, there is an increasing interest in providing entrepreneurship support for college students in Chinese universities as well. Over the past two decades, many universities have established entrepreneurship centers or colleges, dedicating considerable human, material, and financial resources (Song, 2023). It is clear that they have done a lot of work in entrepreneurship education, climate, management measures, practical training conditions, and services. Specifically, data shows that by the end of 2018, more than 1100 undergraduate universities in China had offered 27,283 courses on innovation and entrepreneurship, with a specialized teaching staff exceeding 27,000 (Editorial Board, 2020). 33,994 innovation and entrepreneurship lectures were conducted to create an entrepreneurship climate (Editorial Board, 2019). Implement rules and regulations such as leave for entrepreneurship (e.g., Shanghai Jiao Tong University, 2021), scholarship programs for innovation and entrepreneurship (e.g., Jiangsu University, 2016), and regulations for replacing graduation projects with entrepreneurial projects (e.g., North China University of Technology, 2022). Various universities have established 45,712 entrepreneurship practice bases (Editorial Board, 2020) and 141 national science parks (Ministry of Science and Technology, 2021). Additionally, many universities have set up specialized entrepreneurship funds for college students (e.g., Xidian University, 2015), actively help college student venture projects settle in science parks, and assist them in establishing connections with investors and alumni entrepreneurs (Song, 2023).

Subjectively, universities are expected to act as "gender equalizers" through entrepreneurship support, narrowing the gap between men and women (Wilson, Kickul, & Marlino,2007; Westhead & Solesvik, 2016; van Ewijk & Belghiti-Mahut, 2019). In practice, in the context of China, do universities really help to address the apparent gender imbalance in startups? In other words, do male and female students benefit equally from university entrepreneurship support (UES)? If so, it suggests that UES has not exacerbated the gender gap. If female students have benefited more, it means that UES has narrowed the gap as expected; otherwise, it indicates that UES may play the opposite role of "literally snow plus frost". This question is crucial as it relates to the effectiveness of China's current UES in closing the entrepreneurial gender gap and whether the UES needs to be adapted or redesigned.

There have been several attempts to answer this question to some extent. However, they are at least deficient in the following aspects. First, previous scholars start from the single dimension (entrepreneurship education, EE), investigate the gender differences in the impact of EE on college students' entrepreneurial attitude (EA) (e.g., Packham et al., 2010), entrepreneurial self-efficacy (ESE) (Wilson et al., 2007) and EI (Zhang et al., 2014), and draw some ambiguous results, such as that both genders benefit equally (Li, 2020), that women benefit more (Nowiński et al., 2019) or less (Salavou et al., 2021). Yet, they rarely assess gender differences in the impact of UES (including various support, like entrepreneurship education, climate, management measures, practical training conditions, and services) on college students from a holistic perspective (Song, 2023). Second, as exceptions, Liu (2018) analyzed gender differences in the effects of UES on EA, subjective norms (SN), and perceived behavioral control (PBC), and Tian et al. (2022) explored the moderating role of gender in the relationship between UES and EI. Nevertheless, it is unknown whether UES has a significant gender difference in the influence of other aspects, which might also be crucial factors related to startup, e.g., ESE and fear of entrepreneurial failure (FEF), except for variables such as EA. In addition, researchers have not yet answered whether the possible mediating role of FEF and ESE in the UES-EI relationship differs significantly for different gender groups of college students.

This study, therefore, to better answer the question of whether universities play the role of gender equalizers, aims to adopt the concept of UES from a holistic perspective and construct an analytical framework that includes UES, FEF, ESE, and EI and systematically analyze the gender differences in these relationships (i.e., the moderating role of gender). This includes examining gender differences on direct paths (e.g., UES-EI, UES-FEF) and indirect paths (e.g., UES-FEF-EI, UES-ESE-EI). In short, the main research question addressed in this paper is.

RQ1. Are there significant differences in the effects and mechanisms of UES on EI for college students of different genders?

In what follows, we first present the theoretical background, which introduces several theories related to the influence of external environmental factors on behavioral intention and the need to examine group differences, and then develop hypotheses; second, the sample, variable measures, and data analysis strategies used in this paper are described; third, we report the findings of path analysis and multigroup analysis; next, we discuss our findings; and finally conclude with the implications, limitations, future directions, and conclusions.

2. Theory background

Two theories are closely related to this study. One is the "EI environmental impact model" proposed by Wagner and Sternberg (2004). The model posits that entrepreneurship is a regional event; individuals are part of a regional social network, and they take entrepreneurial action under the influence of the regional context; the sum of individual entrepreneurial activities in a specific area determines the overall level of entrepreneurial activities in that area; and individuals' perception of the macro and micro environments

in a given region affects their EI, which in turn determines the number of new enterprises. In particular, the macro environment includes regional or super-regional (national or international) policies, economic trends, education, industrial structure, capital, infrastructure, knowledge transfer, and cultural values. Microenvironmental factors include potential entrepreneurs' social and professional backgrounds and individual social networks. The perception of these two environments varies depending on an individual's gender, age, education, employment status, etc., as each person filters or receives the environmental signals they receive (Wagner & Sternberg, 2004). This means that external environmental factors have a significant and direct impact on the formation of EI. At the same time, individual background factors mediate the relationship between individual perception of environmental factors and EI. Overall, Wagner and Sternberg's (2004) model highlights their focus on environmental factors that influence individual EI and illustrates the differences in the perception of the environment among individuals with different characteristics; that is, individual background factors play a moderating role in the relationship between individual perception of environmental factors and EI. This offers guidance for investigating the direct effects of environmental factors (UES in this context) on undergraduate students' EI and examining the group (in this paper, gender) differences.

The second is the Cognitive-Affective Processing System theory. It suggests that in some specific contexts, certain cognitive-affective units of an individual are awakened and impact behavioral choices (Mischel & Shoda, 1995). The cognitive-affective units in question refer to all mental representations and are composed of five main components: coding, expectations and beliefs, affect, goals and values, and competencies and self-regulatory plans. These cognitive-affective units are interconnected to form a relatively stable network that represents the stable structure of the personality system. The relationship among the external situation, cognitive-affective system, and behavior is as follows: when faced with a particular situational feature, some cognitive and affective units of an individual may be activated; the activated units have a contagious function that gradually spreads to the entire cognitive-emotional processing network, and ultimately affecting the behavioral choices and outcomes. In essence, the cognitive-affective processing system theory reveals the "black box" of how external situations affect behavior choice through cognitive-affective units and provides theoretical support for us to comprehensively understand the mechanism of UES on college students' EI (entrepreneurial choices) and its group differences (Song, 2023). More specifically, on the one hand, under this theoretical perspective, UES can be regarded as an external context, and college students' perception and encoding of UES will affect their EI through cognitive (ESE) and affective (FEF) factors. On the other hand, according to the theory, different groups of college students may perceive and encode UES in different ways, and different encoding strategies will lead to different cognitive and affective responses, which in turn have a differentiated impact on their behavior or choice (Yu, 2022). This suggests that when examining the influence mechanism of UES on college students' EI, it is necessary to conduct a fine-grained subgroup discussion (gender, in this study).

3. Hypotheses development

3.1. The influence of UES on college students' EI

UES and EI. UES refers to multiple initiatives, actions, and efforts (Tian et al., 2022) that universities provide to foster innovation, instill entrepreneurial knowledge, and encourage startup as a viable career option for college students (Anjum et al., 2021). According to Krueger and Carsrud (1993), EI is an antecedent to entrepreneurial behavior, and it is the psychological predisposition of individuals to desire, be willing, and expect to engage in entrepreneurial activities in the future. In theory, drawing upon Timmons' (1999) entrepreneurial elements model as well as human and social capital theories, the key to starting a business is that entrepreneurs have a high level of entrepreneurial human capital, high-quality entrepreneurial opportunities, and abundant entrepreneurial resources. UES's function and role precisely cover the three elements of entrepreneurs, entrepreneurial opportunities, and entrepreneurial resources (Song, 2023). Moreover, according to the environmental impact model of EI (Wagner & Sternberg, 2004), UES, as a "micro-environment", directly influences EI. Following the social information processing theory (Salancik & Pfeffer, 1978), UES conveys the information that "university support and encourage businesses" and "startups is a viable career choice". The encoding and interpretation processes of this information by students can subsequently impact their career choices, specifically their EI. Previous empirical studies have substantiated our expectation that UES exhibits a positive correlation with EI, as evidenced by the works of Nguyen (2020) and Lu et al. (2021).

UES affects FEF and ESE. FEF refers to the fear and worry that individuals feel when they face the topic of entrepreneurship or engage in entrepreneurial activities, considering that the startup may fail and such a result will mean huge losses to them (Song, 2023). ESE is related to an individual's perception of their ability to perform a given task successfully (Bandura, 1977). Drawing on the cognitive-affective processing system theory (Mischel & Shoda, 1995), when making entrepreneurial decisions, students will activate the cognitive processing system based on the characteristics of the external context (in this paper, UES) and rationally think about whether or not choose entrepreneurship from the aspects of entrepreneurial outcome expectation and ESE (whether they can carry out entrepreneurial activities); at the same time, students' perception, encoding, and information processing of the UES has an emotive and emotionally evocative function, which triggers their affective responses, especially the FEF, which is closely related to the risk characteristics of business activity itself (Song, 2023). As for the exact direction of the effect of UES, Kollmann et al. (2017) pointed out that a high level of FEF occurs when individuals lack external support. Lu et al. (2021) investigated 13154 college graduates in China and found that UES positively correlates with ESE ($\beta = 0.21$). Thus, we expect UES to have negative and positive effects on FEF and ESE, respectively.

FEF and ESE affect EI. For FEF-EI, firstly, the cognitive-affective processing system theory suggests that individuals' affective responses triggered by situations and information will affect their behavioral choices (Mischel & Shoda, 1995). In addition, in

psychology and economics, people are loss averse, and the negative affective experience caused by losses will motivate individuals to avoid "stimuli" (Arnold, 1960). FEF, as a negative affective response triggered by the potential risk of failure involved in entrepreneurship and the associated economic, social, and psychological costs, essentially represents an individual's aversion to loss (Morgan & Sisak, 2016), which increases people's tendency to avoid entrepreneurial failure and its adverse consequences (McGregor & Elliot, 2005), indicating that FEF may discourage students from choosing a business. This inference has been confirmed in empirical studies of the relationship between FEF and EI from an affective perspective (e.g., Li, 2011; Xie, 2020). Regarding the effect of ESE on EI, following the EI model constructed by Liguori et al. (2018) based on the social cognitive career theory, individual self-efficacy, and outcome expectations can effectively stimulate their interest in a specific career, that indicate ESE directly affects EI (Rosique-Blasco et al., 2018).

The mediating role of FEF and ESE. First, with the cognitive-affective processing system theory (Mischel & Shoda, 1995), college students' perception and evaluation of UES will influence entrepreneurial choice (EI) through cognitive (ESE) and affective (FEF) factors, suggesting that FEF and ESE may play mediating roles in the relationship between UES and EI. Specifically, the negative correlation between FEF and EI implies that the lower the FEF level, the more likely college students are to choose entrepreneurship (Ukil & Jenkins, 2023), and UES is precisely expected to reduce FEF (Kollmann et al., 2017). Thus, it is expected that UES will be able to boost students' EI by reducing their FEF. Second, on the one hand, regarding the mediating role of ESE, from the analysis of roles and functions, UES, as a contextual factor, may influence college students' ESE by providing direct experience, alternative experiences, and so on (Lu et al., 2021). On the other hand, Liguori et al.'s (2018) EI model suggests that ESE directly affects individuals' EI; existing empirical studies have also confirmed that ESE mediates the relationship between UES and EI (e.g., Nguyen et al., 2021).

Based on the arguments above, we suggest that the influence of UES on EI may be mediated through FEF (affective factors) and ESE (cognitive factors) and therefore propose the hypothesis.

H1. The relationship between UES and EI is mediated by (a) FEF and (b) ESE.

3.2. The moderating role of gender in the relationship between UES and college students' EI

Although no country explicitly restricts women's participation in business activities, it must be acknowledged that studies conducted in various contexts generally show that women have lower EI than men (Maslakçı et al., 2024). Many factors contribute to the gender gap, such as cognition, culture, resources, social networks, etc. Three of these aspects are related to the entrepreneurial elements mentioned in Timmons' (1999) model. Specifically, considering personality traits in the socialization process, there are specific differences between different genders in personality traits due to the influence of various factors such as education and cultural background (Sitaridis & Kitsios, 2022). Second, according to resources, implicit and explicit gender bias hinders women's access to entrepreneurial funding (Guzman & Kacperczyk, 2019; Liu & Cowling, 2024), which may lead them to perceive that the environment is not supportive of their entrepreneurship. Third, in the eyes of social networks, a study by Neumeyer et al. (2019) showed that women have an advantage in joining similar groups (such as business clubs for women entrepreneurs) but lag behind men in establishing connections with heterogeneous groups (such as national entrepreneurs associations). It is difficult for women in China to build political networks (Goltz et al., 2015), which results in them facing a significant disadvantage in accessing formal resources (Wang et al., 2019).

Furthermore, there are three crucial interpretive perspectives. The first is social roles. In many societies, the familial roles expected of women in terms of childbearing and child-rearing responsibilities make them anxious about leaving the gendered expectations of motherhood (Marlow & McAdam, 2011), which limits women's career aspirations to a certain extent (Wang et al., 2019). The second is social norms. Women have low normative support for engaging in business because they are primarily given obligations related to family responsibilities (Brush et al., 2019), which may make them feel the pressure from social norms when attempting to make entrepreneurial choices, and they are more prone to comply with social norms than men (Maes et al., 2014), so women are less inclined to start businesses. Third, regarding cognitive and affective characteristics, Jakobsson (2012) found that women are apt to underestimate their performance in "male tasks", even if they have the same strengths as men. Zhang et al. (2014) indicated that women tend to hold more negative views regarding their abilities and environmental factors than men, thus their less positive attitudes towards entrepreneurship. GEM (2012) confirmed that women have a higher FEF than men. In conclusion, negative perceptions of their abilities and FEF hinder women's entrepreneurial choices.

From the above analysis, the existence of entrepreneurial personality traits, social role expectations, gender stereotypes, social norm pressure, and other factors means that women may need more support in making entrepreneurial choices. Because of this, women may generally benefit more from entrepreneurial support than men (Bae et al., 2014). The only research results also showed that UES has a greater impact on female graduate students' perceived behavioral control (like ESE) (Liu, 2018). However, this paper argues that male college students are more likely to benefit from UES because men's strengths in entrepreneurial personality traits and social expectations for men's roles lead to a smaller cognitive gap for entrepreneurial activities than women (BarNir et al., 2011). This means that the initial ESE (Kakouris et al., 2018) and EI (van Ewijk & Belghiti-Mahut, 2019) of male college students may be higher than that of females, and the FEF may be lower than that of females (GEM, 2012). At higher initial levels, male college students are more likely than female students to be aware of the various UES and proactively utilize them. Moreover, in the provision of UES, universities intentionally or unintentionally invite male entrepreneurs to participate in entrepreneurship education and model successful male entrepreneurs, which may exacerbate the stereotype of startups as a "male profession". This stereotype encourages male students to consider entrepreneurship as a career choice to achieve financial freedom and obtain social status; this, in turn, stimulates them to acquire ESE and utilize UES to reduce FEF through direct or indirect experience.

Except for direct influence, in the process of the influence of UES on EI, is there a significant gender difference between the two groups of FEF-EI and ESE-EI? For FEF-EI, research results showed that female students have a higher FEF than male students (GEM, 2012), which indicates that FEF may have a greater obstacle to female students' entrepreneurial choices than male students. Regarding the relationship between ESE and EI, Kakouris et al. (2018) found that female college students have lower confidence in their entrepreneurial ability than male students. Kourilsky and Walstad (1998) reported that although men and women exhibit low entrepreneurial knowledge and ability levels, women are more likely to feel underprepared. This suggests that male students, who are relatively advantaged in all aspects of entrepreneurship, are confident that they can succeed in business even if they are not competent, while female students may consider starting a business only when convinced that they have a high level of ESE. Previous empirical studies have also confirmed that ESE has a stronger influence on female students' EI (Shinnar et al., 2014). In conclusion, we argue that gender may moderate the relationship between ESE-EI and FEF-EI.

H2. The structural associations between UES, FEF, ESE, and EI will differ in male and female college students.

In short, we propose a theoretical analysis framework in which UES directly influences EI or indirectly through FEF and ESE; these structural associations may differ in male and female students. Fig. 1 presents our framework.

4. Methodology

4.1. Sample

The data used in this study are from the employment and entrepreneurship tracking survey of 2019 college graduates in Shaanxi Province, China. The survey, funded by local government education authorities, was launched in 2016 and has been held annually ever since. Its purpose is to assist education policymakers in determining the direction of university educational improvement by investigating college graduates' learning and research experiences during studies and their employment, entrepreneurship, and study abroad after graduation. The class of 2019 graduated in July 2019. After about six months of pre-preparation, in January 2020, the survey officially began. In the first step of the survey, the local government education authorities provided us with basic information about all the graduates of the class of 2019 (about 320000), including gender, educational background, birthplace, graduation institution, email address, etc. In the second stage, the survey team emailed an invitation to all graduates with a link to the questionnaire, explaining the study's objectives, the confidentiality of the participation, and the primary uses of the data. By the end of April 2020, a total of 15057 responded back (response rate of about 4.7%).

For the purpose of our study, 1581 responses from master's and doctoral students were excluded from the sample. We also removed 4956 samples with missing observations for any of the dependent, independent, and mediating variables. Additionally, to ensure data quality, we eliminated 2368 samples with the same answers to all questions and 684 outliers. Finally, 5468 samples were left for further analysis. Table 1 presents descriptive statistics of the participants.

4.2. Measures

Dependent variable. According to Thompson (2009), EI is not simply about yes or no but a question of the extent to which an individual's beliefs range from zero and very low to very high; thus, it is appropriate to measure using a continuous variable rather than a categorical variable approach. Specifically, in this study, data for EI was collected using the instrument developed by Peng and Lu (2013), which contained six items that describe EI, from career goals, behavioral expectations, interests, preparation, desire, and

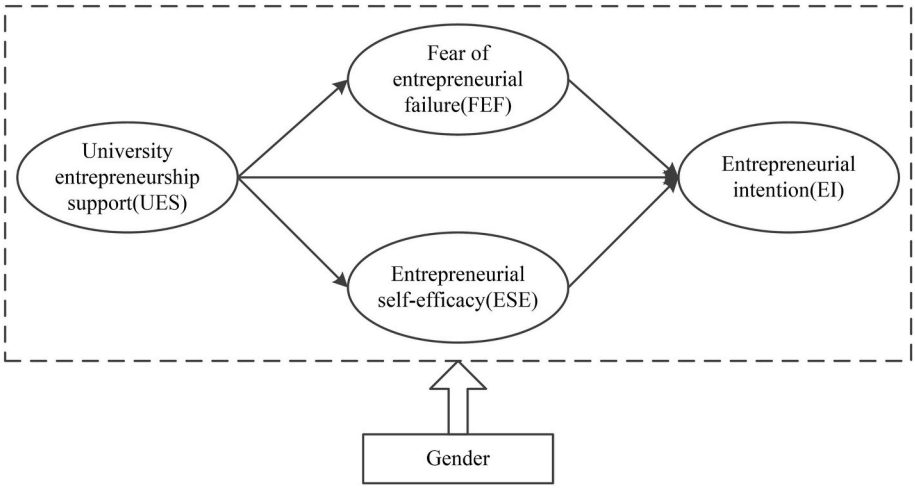


Fig. 1. The theoretical analysis framework.

Table 1
Participant profiles (N = 5468).

Respondents' Characteristics	Absolute Frequencies (N)	Absolute Frequencies (%)
Gender		
Male	2715	49.7
Female	2753	50.3
Educational background		
Bachelor's degree	3950	72.2
Associate degree	1518	27.8
Entrepreneurial experience		
Yes	1081	19.8
No	4387	80.2
Birthplace		
Urban	2687	49.2
Rural	2771	50.7
Family entrepreneurship background		
Yes	2388	43.7
No	3080	56.3
Total	5468	100

career preference when constrained. The respondents were graded on a 1–5 scale; one means strongly disagree, and five represents strongly agree.

Independent variable. The concept of UES is a formative construct in terms of its connotations. Therefore, the scale developed by Lu et al. (2021) was used in this paper to measure the various efforts made by universities to support student entrepreneurship from five dimensions, including university entrepreneurship education, entrepreneurship climate, entrepreneurship management practices, entrepreneurship training conditions, and entrepreneurship services. Respondents were asked to rate their feelings about UES from very poor to very good, with scores ranging from 1 to 5.

Mediating variables. Concerning FEF, since we understand it as a negative affective response, data were collected using three items, such as "I fear that entrepreneurial failure will result in a significant financial burden," referring to Conroy et al. (2002). For ESE, it was operationalized employing the 5-item scale developed by Liñán and Chen (2009), designed to ask students about their perceptions of their ability to succeed in startups. All prespecified mediating variables were measured on a five-point Likert scale, and students' responses ranged from 1 (strongly disagree) to 5 (strongly agree).

Control variables. To explore the "net effect" of UES and to solve the endogeneity issue (Hult et al., 2018), several control variables were added to the proposed model, namely gender (male and female), family entrepreneurial background (with and without), entrepreneurial experience (with and without), educational background (bachelor's degree and associate degree), and birthplace (urban and rural). These variables were chosen since their considerable usage in many entrepreneurial studies and have been shown to have an impact on EI (Gupta et al., 2008; Georgescu & Herman, 2020; Quan, 2012; Huang & Chen, 2018; Wang, 2016).

4.3. Assessing common method variance

Data collection from a single respondent using a single questionnaire may be affected by common method variance (CMV) (Podsakoff et al., 2003). We adopted two steps to control and examine CMV's potential impact on research results. First, pre-procedural, appropriate actions were taken during the variable measurement process. For example, the anonymity of the questionnaire, the degree of voluntary participation, and the scientific research use of the questionnaire results were declared to reduce the subjects' assumptions about the purpose of measurement and the utilization of results. Second, we employ Harman's-OneFactor-Test to assess the extent of CMV (Podsakoff et al., 2003). The results of exploratory factor analysis show that the first factor explained 40.06% of the variance, below the 50% threshold (Podsakoff & Organ, 1986; Hair et al., 2010), implying that this study does not suffer from a severe CMV.

4.4. Data analysis strategy

The partial least squares structural equation modeling (PLS-SEM) was used to perform our proposed structural. The PLS-SEM was chosen primarily because a) our proposed structural model contains a formative construct (Hair et al., 2011); b) it produces accurate estimates of complex relationships between variables (Chin et al., 1996); c) moreover, it has very powerful multi-group analysis techniques that can be used to examine the moderating effects of specific variables (Henseler, Ringle, & Sarstedt, 2016). Smartpls 3.0 software was used for data processing. Specifically, we first unitized the PLS-SEM approach to test the complex effects of UES on EI. Next, the moderating effects of gender were examined through multigroup analysis (MGA) techniques.

For MGA, we first used MICOM to evaluate the measurement invariance. The measurement invariance is a primary issue that researchers must address. The purpose of this step is to examine whether the construct measurements are invariant across the groups, i.e., to confirm whether differences between groups are due to differences in the structural model rather than differences in the measurement model (Henseler et al., 2016). Lack of measurement invariance is a potential source of measurement error, which reduces the statistical power of hypothesis tests and casts doubt on their results. Thus, measurement invariance must be tested to ensure the

validity of study findings (Millsap, 2011). Then, the path coefficients of the structural model are estimated in subsamples (Sarstedt et al., 2011). Third, the MGA test method based on the bootstrap procedure was primarily used to determine whether the differences between groups were significant. Besides, we checked the robustness of MGA results using the Welch-Satterthwait test (assuming unequal variances between groups). If differences are significant, they are considered to have moderating effects; otherwise, no moderating effects exist.

5. Results

5.1. Measurement model analysis

Formative construct. As shown in Table 2, although the weight of UES4 and UES5 are small and lack statistical significance, they were retained because not only it's loading large enough and significant at the 0.001 level, but also the content validity of UES will be affected once discarded them (Diamantopoulos and Siguaw, 2006). After calculation, there is no serious multicollinearity problem in each indicator of UES, as all indicators' variance inflation factor (VIF) values (see Table 2) are less than 10 (Brettel et al., 2011). Finally, to assess the nomological validity of UES, we examined the relationships between UES and other constructs. Findings show that the nomological validity of UES is supported, as it significantly affects FEF, ESE, and EI, as expected by theories.

Reflective constructs. First, the reliability of the items is confirmed, as our results show that the loadings for all indicators of FEF, ESE, and EI are greater than 0.5(Hair et al., 2017) (see Table 3), and there are no non-contributing items that needed to be removed. Besides, Cronbach's α, Composite Reliability (CR), and rho_A were used to test the internal consistency reliability. As displayed in Table 3, all measures exceed the common threshold criteria, for instance, by Hair et al. (2019) and Dijkstra and Henseler (2015). In this vein, the FEF, ESE, and EI measurements established enough reliability. Second, both constructs exhibit high convergent validity, as the average variance extracted (AVE) exceeds the threshold of 0.5 (Hair et al., 2019). Furthermore, all constructs demonstrate good discriminant validity because the values of heterotrait-monotrait (HTMT) below 0.85 (Henseler et al., 2015), and the square root of the all-constructs' AVE does not exceed the correlations with other constructs (Fornell & Larcker, 1981) (see Table 4).

5.2. Structural model analysis

Our model presents good goodness of fit (GoF) as the value of SRMR (0.050), d_ULS (0.742), d_G (0.188), NFI (0.931), and rmsTheta (0.128) both meet specific threshold proposed by Henseler, Hubona, and Ray (2016). Following the criteria proposed by Hair et al. (2019), the structural model has a small explanatory power for FEF ($R^2 = 0.050$) and ESE ($R^2 = 0.133$) and a large explanatory power for EI ($R^2 = 0.555$). Moreover, the Stone-Geisser Q^2 values of FEF (0.039), ESE (0.102), and EI (0.388) calculated through the blindfolding procedures are higher than 0, indicating our model with small predictive relevance for FEF and ESE, and medium predictive relevance for EI (Henseler et al., 2009).

Table 5 displays the results of the path coefficient and its significance through the bootstrapping procedure with N = 10,000 samples, from which UES significantly and positively related to EI; besides that, UES has a significant negative and positive effect on FEF and ESE, respectively, then subsequently affects EI. The results of the mediating effect show that the 95% confidence intervals for both paths, USE-FEF-EI and UES-ESE-EI, do not include zero and have two-tailed significance values of less than 0.001, indicating that the mediating effect exists. These findings show that UES positively affects EI, and this association is mediated by (a) FEF and (b) ESE, thus supporting H1.

Moreover, findings reveal that all control variables significantly affect EI: gender ($\beta = -0.022$, $P < 0.05$), family entrepreneurial background ($\beta = 0.038$, $P < 0.01$), entrepreneurial experience ($\beta = 0.070$, $P < 0.001$), educational background ($\beta = 0.133$, $P < 0.001$), and birthplace ($\beta = 0.052$, $P < 0.05$).

To check the robustness of the results, according to Klein and Rai (2009), we recalculated the data by running the OLS program in SPSS 26 software. In terms of direct effect: UES-EI ($\beta = 0.216$, $P < 0.001$), UES-FEF ($\beta = -0.225$, $P < 0.001$), UES-ESE ($\beta = 0.365$, $P < 0.001$), FEF-EI ($\beta = -0.135$, $P < 0.01$), ESE-EI ($\beta = 0.531$, $P < 0.001$). For the mediating role: UES-FEF-EI ($\beta = 0.030$) (Boot CI lower = 0.025, Boot CI upper = 0.036), and UES-ESE-EI ($\beta = 0.194$) (Boot CI lower = 0.178, Boot CI upper = 0.211). Compared with the results of PLS-SEM and OLS regression, there is no significant difference between them, supporting the fact that the results of this study are credible and robust.

Table 2
UES indicator's weight, sign, loading, and VIF.

Construct	Indicator	Weight	P-value	Loading	P-value	VIF
UES	UES1	0.328	0.000	0.930	0.000	4.006
	UES2	0.260	0.000	0.935	0.000	4.727
	UES3	0.287	0.000	0.928	0.000	4.410
	UES4	0.108	0.084	0.871	0.000	5.181
	UES5	0.105	0.107	0.879	0.000	5.465

Note: 1. UES = university entrepreneurship support. 2. UES1-UES5 are different items of UES. For the specific content, please see the measurement of independent variables.

Table 3
Reliability and convergent validity.

Variable	Item	Loading	Cronbach's α	CR	roh_A	AVE
FEF	FEF1	0.905	0.859	0.915	0.862	0.782
	FEF2	0.916				
	FEF3	0.828				
ESE	ESE1	0.837	0.928	0.946	0.928	0.776
	ESE2	0.899				
	ESE3	0.889				
	ESE4	0.893				
	ESE5	0.886				
EI	EI1	0.838	0.916	0.934	0.917	0.704
	EI2	0.841				
	EI3	0.827				
	EI4	0.851				
	EI5	0.870				
	EI6	0.806				

Note: 1. FEF=Fear of entrepreneurial failure; ESE = entrepreneurial self-efficacy; EI = entrepreneurial intention. 2.CR = composite reliability; AVE = average variance extracted.

Table 4
The HTMT and Fornell-Larker criterion test results of reflective constructs.

Variable	HTMT			Fornell-Larker		
	1	2	3	1	2	3
1.FEF				**0.884**		
2.ESE	0.193			−0.173	**0.881**	
3.EI	0.329	0.730		−0.293	0.674	**0.839**

Note: 1. FEF=Fear of entrepreneurial failure; ESE = entrepreneurial self-efficacy; EI = entrepreneurial intention. 2. HTMT = heterotrait-monotrait ratio. 3. Diagonal values represented in bold are square roots of AVE; off-diagonal values are the correlations between Latent variables.

Table 5
Results of direct and mediated effects tests.

Path	Coefficient	T-stat	95% CI	P-value	Results
UES-EI	0.216	18.830	(0.193,0.238)	0.000	Supported
UES-FEF	−0.225	17.118	(-0.251,0.200)	0.000	Supported
UES-ESE	0.365	28.303	(0.340,0.391)	0.000	Supported
FEF-EI	−0.135	13.631	(-0.154,-0.115)	0.000	Supported
ESE-EI	0.531	49.573	(0.510,0.552)	0.000	Supported
UES-FEF-EI	0.030	10.341	(0.025,0.036)	0.000	Supported
UES-ESE-EI	0.194	22.982	(0.178,0.211)	0.000	Supported

5.3. Multigroup analysis

Measurement invariance test. In PLS-SEM analysis, the MICOM procedure developed by Henseler et al. (2016) includes three steps: configural invariance, compositional invariance, and equality of composite mean values and variances. These three steps are hierarchically interrelated, with the former step being a prerequisite for the latter. The "permutation" procedure was used to test the measurement invariance of different genders through the two-tailed arrangement test and 5000 permutations at 5% significance level, and the results of MICOM are shown in Tables 6 and 7.

First, for respondents of different genders, the same measurement items and data processing and calculation methods were used in this paper, which ensured the configural invariance of the first step and laid the foundation for the second step. Second, the raw

Table 6
The measurements result of configural invariance and compositional invariance tests.

	Step 1: configural invariance				Step 2: compositional invariance		
	Measurement indicators	Data processing	Data calculation	Configural invariance?	Raw correlation coefficient	5%	Compositional invariance?
UES	Same	Same	Same	Established	0.998	0.985	Established
FEF	Same	Same	Same	Established	0.999	0.999	Established
ESE	Same	Same	Same	Established	1.000	1.000	Established
EI	Same	Same	Same	Established	1.000	1.000	Established

Table 7
The measurements result of equality of composite mean values and variances tests.

	Step 3: equality of composite mean values and variances						
	M-Diff (M-F)	95%CI	Equality of mean?	Var-Diff (M-F)	95%CI	Equality of variance?	Measurement invariance?
UES	−0.090	(-0.055,0.055)	Not equal	0.227	(-0.078,0.078)	Not equal	Partial
FEF	−0.027	(-0.053,0.054)	Equal	0.263	(-0.102,0.103)	Not equal	Partial
ESE	0.177	(-0.052,0.053)	Not equal	0.162	(-0.076,0.074)	Not equal	Partial
EI	0.158	(-0.054,0.054)	Not equal	0.281	(-0.073,0.071)	Not equal	Partial

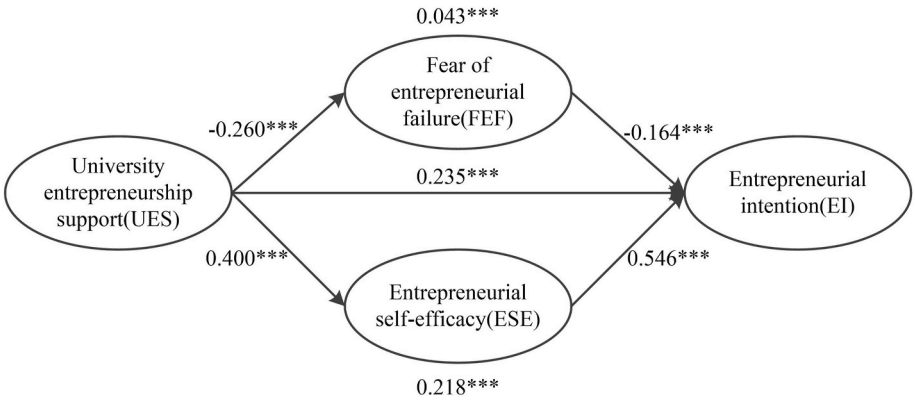
Note: 1. UES = university entrepreneurship support; FEF = fear of entrepreneurial failure; ESE = entrepreneurial self-efficacy; EI = entrepreneurial intention. 2. M-Diff = mean difference; Var-Diff = .
variance difference; M-F = male-female.

correlation coefficients of UES, FEF, ESE, and EI are equal to or greater than the 5% quantile, thus establishing compositional invariance. Finally, FEF has equality of mean but not equality of variances; the equality of mean and variance for UES, ESE, and EI are not established. According to Hair et al. (2010), the results of the first and second steps mean that we established partial measurement invariance and can proceed to the subsequent group difference analysis.

Path analysis of gender-specific samples. Before exploring the gender difference in the impact of UES on EI, this study used the MGA program in SmartPLS3.0 statistical software to calculate the influence of UES on EI with different genders. As shown in Figs. 2 and 3, the bootstrapping results of MGA show that all structural paths are significant. Specifically, first, in the direct effect, the coefficients of male college students in the four paths, namely UES-EI ($\beta = 0.235$, $P < 0.001$), UES-FEF ($\beta = -0.260$, $P < 0.001$), UES-ESE ($\beta = 0.400$, $P < 0.001$), and FEF-EI ($\beta = -0.164$, $P < 0.001$) higher than female students (in order, $\beta = 0211$, $P < 0.001$; $\beta = -0.183$, $P < 0.001$; $\beta = 0.336$, $P < 0.001$). The coefficient of female college students in the path of ESE-EI ($\beta = 0.583$, $P < 0.001$) is greater than that of male students ($\beta = 0.546$, $P < 0.001$). Secondly, in the mediating effect, the coefficient on the UES-FEF-EI path is larger for male college students ($\beta = 0.043$, $P < 0.001$) than for female students ($\beta = 0.022$, $P < 0.001$); the coefficient of female college students in the path of UES-ESE-EI ($\beta = 0.218$, $P < 0.001$) is greater than that of male students ($\beta = 0.196$, $P < 0.001$). Overall, from the absolute value of the path coefficient, the above results indicate differences in the impact of UES on college students of different genders. However, whether these differences are statistically significant should be further analyzed.

Difference analysis of gender groups. To further test whether the different effects of UES on male and female college students' EI exist, this paper adopted the MGA procedure to calculate. The MGA test results based on the bootstrap procedure (see Table 8) show that there are significant differences between male and female college students in four paths: UES-FEF ($P = 0.003$), UES-ESE ($P = 0.012$), FEF-EI ($P = 0.032$), and UES-FEF-EI ($P = 0.001$). The coefficients of female college students in these four paths are significantly lower than those of male students, indicating that gender plays a moderating role in the above four path relationships; the differences in other path coefficients do not pass the statistical significance test, demonstrating that gender does not serve as a moderator. Thus, hypothesis H2 is partially supported.

Robustness test. This paper used the Welch-Satterthwait test method in PLS-SEM (assuming unequal variances between groups) to perform additional calculations, and the results are shown in Table 8. Significant gender differences exist in four pathways among college students: UES-FEF ($p = 0.003$), UES-ESE ($p = 0.012$), FEF-EI ($p = 0.032$), and UES-FEF-EI ($p = 0.001$). The coefficients of female college students in these four paths are significantly lower than that of male students, which suggests that gender only plays a moderating role in the above four relationships. The Welch-Satterthwait test finding is consistent with the MGA, suggesting that our gender difference test results are robust.



Note: ***:P<0.001.

Fig. 2. The influence of UES on male college students' EI.

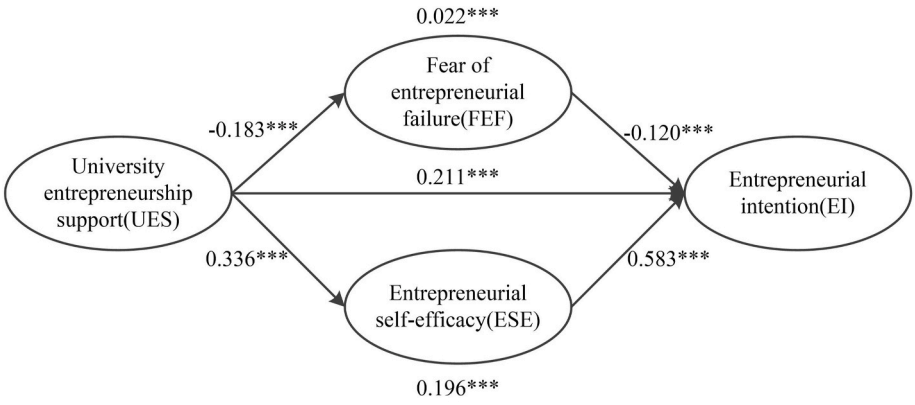


Fig. 3. The influence of UES on female college students' EI.

Table 8
Results of MGA and robustness tests for gender differences in direct and mediated effects.

Path	MGA Result			Welch-Satterthwait Result		
	Coef diff (M vs. F)	P-value raw one-tail (M vs. F)	P-value new (M vs. F)	Coef diff (M vs. F)	T-Stat (M vs. F)	P-value (M vs. F)
UES-EI	0.024	0.154	0.307	0.024	1.023	0.306
UES-FEF	−0.077	0.999	0.003	−0.077	2.942	0.003
UES-ESE	0.064	0.006	0.012	0.064	2.506	0.012
FEF-EI	−0.004	0.984	0.032	−0.044	2.141	0.032
ESE-EI	−0.037	0.963	0.073	−0.037	1.784	0.074
UES-FEF-EI	0.021	0.000	0.001	0.021	3.381	0.001
UES-ESE-EI	0.022	0.101	0.202	0.022	1.278	0.201

Note: 1. UES = university entrepreneurship support; EI = entrepreneurial intention; FEF = fear of entrepreneurial failure; ESE = entrepreneurial self-efficacy. 2. Coef diff = Coefficients difference, M vs F = male vs female.

6. Discussion

6.1. Gender consistency in UES impacts

We find no significant difference in the direct impact of UES on EI across genders (P = 0.307), which seems to support the equal impact of UES on EI of male and female college students. In other words, UES in China may be gender-neutral. Nevertheless, Tian et al.'s (2022) survey of 1515 college students at private universities in China found that gender plays a moderating role, and the UES has a greater impact on female college students' EI. It is not clear whether this contradictory finding is due to differences in the characteristics of the samples used in the two studies or other factors; thus, we suggest that other scholars strengthen the research on the moderating role of gender in the direct relationship between UES and EI, to obtain more abundant evidence.

The study found that ESE does not appear to have a gender effect on EI (P = 0.073). This finding is inconsistent with existing studies that found ESE to have a greater effect on EI in female than male college students. For example, Shinnar et al. (2014) reached similar conclusions in their study of 187 college students in the United States. Wang (2012) surveyed 1017 college students in China and found that the relationship between ESE and entrepreneurial goal intention of female students is stronger, but there is no significant gender difference in the effect of ESE on entrepreneurial execution intention. Compared with previous studies, the contradictory findings of this study imply that it is not yet possible to determine whether the relationship between ESE and entrepreneurial intention EI is indeed free of significant gender differences; thus, we encourage other researchers to provide more conclusive evidence.

Moreover, we find that the mediating role of ESE in the relationship between UES and EI does not differ significantly between male and female college students (P = 0.202). The canceling relationship between UES-ESE and ESE-EI groups may cause this result. Specifically, in terms of the path coefficients, male college students have a slightly larger coefficient on the UES-ESE path (0.400) than female college students (0.336), while female college students have a slightly higher coefficient on the ESE-EI path (0.583) than male college students (0.546). Thus, we suspect that the dominance of male students on the UES-ESE path is offset by the high values of female students on the ESE-EI path, which may result in the mediating effect of UES not being moderated by gender. As to whether this inference is tenable, further verification is needed.

6.2. Gender differences in UES impacts

We find that the coefficients on the UES-FEF path differed significantly across genders ($p = 0.003$), with UES being a significantly more powerful predictor of FEF for male than female students. There are three possible explanations: First, given that startup is considered a typically "male occupation" in many social contexts, male college students are more inclined to be aware of UES and interested in utilizing it than female students. Second, Wyrwich et al. (2016) stated that role models can reduce the fear of failure. But we guess that it is possible that universities, in providing support for entrepreneurship, are consciously or unconsciously reproducing the stereotype that entrepreneurship is a "male occupation". For instance, in the supply of entrepreneurship education, universities mainly invite male entrepreneurs to serve as teachers and entrepreneurship competition instructors, often publicizing the successful experiences of male entrepreneurs. The prevalence of male entrepreneurial role models in universities may strengthen the view that entrepreneurship is more suitable for men to some extent, which further aggravates the stereotype of female students that entrepreneurship belongs to a "male occupation" and leads them to believe that there is a conflict between startup and traditional female gender roles (García & Welter, 2013), in turn, increases their FEF, which may further discourage female students. Third, a possible explanation is that UES is not tailored to female students' specific difficulties and needs, making it challenging to have the expected impact on their ESE. Finally, the range of barriers female students face in finance, social norms, etc., make their FEF so deeply entrenched that it is unlikely to be easily shaken by UES.

As expected, there is a significant gender effect on the UES-ESE ($p = 0.012$), with UES having a stronger influence on ESE for male college students. Consistent with our results, Liu (2018) showed that gender moderates the effect of UES on graduate student's perceived behavioral control (like ESE). However, his study supported the greater impact of UES on female graduate students. Thus, while it can be approximated that both agree that gender moderates the relationship between UES and ESE, there is disagreement on whether male or female college students benefit more from UES. One possible explanation for our finding is that the prevailing aggressive mentality toward social and economic status may make male students more proactive than female students in participating in the entrepreneurial activities of teachers or classmates to accumulate direct and indirect experience during college, thus improving their ESE. A second reason may be that a critical motivation for women to start a business is balancing work and family, whereas men tend to do so for reasons such as autonomy or increasing wealth (Brush, 1992). This implies that women are predisposed to start entrepreneurial activities after starting a family rather than right out of college. Accordingly, the effect of UES on ESE in many female college students may be expected to have a "lag effect"; that is, it may play a role in a longer life stage after female students start families.

Unexpectedly, this study finds a significant gender effect for the FEF-EI path ($p = 0.032$), with FEF acting as a greater deterrent to EI for male students. This indicates that male college students are more likely than female students to hold back from entrepreneurial activities when faced with the same level of FEF. The reason may be related to the employment quality of college students of different genders. According to the theory of gender discrimination, in the labor market, other conditions being equal, employers choose to pay male employees higher wages or reject female job applicants as they perceive that male employees are more capable than females (Becker, 1993; Oaxaca, 1973). Li and Yue (2009) and Shi (2010) found that gender significantly affects college students' job search results, starting salary, and job satisfaction, with males significantly outperforming females. Compared with male graduates, females have higher employment thresholds and lower incomes (Li & Yue, 2009), and male graduates are disposed to find more satisfying jobs (Yue, 2013). More job opportunities and higher employment quality may make male students hold back in the face of FEF, which also means that the opportunity cost of choosing entrepreneurial activities in the face of FEF is higher than that of female students. On the contrary, the weak position of female college students in the labor market may make them, even in the face of FEF, only have a chance for survival and development and become a member of the survival or necessity-driven entrepreneurs (Noguera et al., 2015).

In addition, we also find that gender moderates the UES-FEF-EI mediation path ($P = 0.001$); that is, the "moderated mediation effect" is found. The mediating effect of FEF is stronger in male college students, indicating that UES is susceptible to stimulating EI in male college students by decreasing their FEF. This may be because male college students have a smaller cognitive gap for entrepreneurial activities than female college students (BarNir et al., 2011), so they are more likely to actively use UES to reduce the possibility of entrepreneurial failure, which reduces their FEF level and thus generates EI. Conversely, although the number of female entrepreneurs has gradually increased in China, pursuing a stable job still deeply affects most female college students, making them consciously and unconsciously ignore UES or believe that UES cannot effectively reduce business failure probability. In this sense, it is understandable that UES has difficulty stimulating EI in female college students by reducing FEF.

Overall, the findings of this study allow us to make an essential contribution to the literature because, to the best of our knowledge, few previous studies have examined gender consistency and differences in the direct and indirect effects of UES on EI, and our study fills gaps. In particular, the findings that male college students benefit more from UES may be disappointing to advocates of UES as a gender equalizer but provide important implications for university administrators and policymakers that universities have much work to do to encourage and support entrepreneurship among female students.

7. Implications and limitations

7.1. Theoretical implications

The theoretical contributions of this study are as follows. Firstly, going beyond the analysis scope of existing studies, we answer the question "whether universities play a gender equalizer in entrepreneurial activities" by exploring gender differences in the direct and indirect effects of UES (consisting of entrepreneurship education, entrepreneurship climate, entrepreneurship management measures,

entrepreneurship training conditions, entrepreneurship services, and other dimensions) on college students' EI. However, previous relevant research focuses on analyzing entrepreneurship education, an essential component of UES (e.g., Li, 2020; Salavou et al., 2021). Secondly, individual studies have examined the gender differences in the direct effects of UES on EA, SN, PBC, and EI (Liu, 2018) but ignored the direct effects of UES on FEF and ESE and whether the mediating effects of FEF and ESE are different due to gender. As a result, this study constructs an analytical framework guided by relevant theories, including UES, FEF, ESE, and EI, and examines gender differences in these relationships. Finally, we provide empirical evidence for the effectiveness of universities in bridging the entrepreneurial gender gap. More specifically, this study finds no significant differences between male and female students on three paths (e.g., UES-EI, UES-ESE-EI) and significantly higher coefficients for male than for female students on four paths (e.g., UES-FEF, UES-ESE, UES-FEF-EI). These results suggest that in China, universities may maintain and exacerbate gender inequality in entrepreneurship.

7.2. Practical implications

This study brings some critical implications for university administrators, educators, and policy-makers. Our finding that universities may maintain and exacerbate gender inequality in entrepreneurship requires attention because it is not what university administrators, policymakers, and educators who want gender equity expect. It suggests that the existing "one-size-fits-all" entrepreneurial support based on the assumption of homogeneity may be unscientific. The supply of entrepreneurship support needs to establish gender awareness and consider the expectations and needs of different genders. Adhering to the principle of combining "universality and specificity", we should try our best to meet the common needs of male and female college students and make corresponding deployments according to the difficulties and obstacles female college students face. Otherwise, seemingly "gender-neutral" UES may further exacerbate the entrepreneurial "gender imbalance" in society, which is not conducive to the development of female college students' entrepreneurial potential and the realization of gender equity.

To enable UES to act as a gender "equalizer" for entrepreneurial activities, as desired by administrators and policymakers, we provide some potentially valuable suggestions following the existing literature, although they have not been tested in this study. To be specific: First, the inspection and investigation of entrepreneurial support should be increased. On the one hand, professional teams should be organized to examine whether current UES intentionally or unintentionally reinforces the stereotype of the "heroic male" entrepreneur. Is there a lack of gender sensitivity in current UES? On the other hand, questionnaires and interviews could be considered used to investigate the views and evaluations of female students on the existing UES, to understand the special difficulties and obstacles they face, and to clarify their expectations and specific needs.

Next, the reform of entrepreneurship education must be strengthened. In terms of entrepreneurship curriculum setting, consideration can be given to opening an entrepreneurship course specifically for female students in the form of a pilot test, enhancing the evaluation of the effectiveness of the pilot education program, studying whether entrepreneurship courses limited to female college students are more effective than mixed-gender entrepreneurship courses, and constantly adjust and establish the best program (Shinnar et al., 2014). A certain proportion of female entrepreneurs and practitioners should be appropriately arranged for teachers. In the content arrangement and actual teaching process of the entrepreneurship courses, it is best to provide relevant content according to female students' preferred learning style, increase the discussion of gender stereotypes to guide college students to think about the origin and harm of gender stereotypes in entrepreneurship and to encourage female students to bravely break through the constraints of gender stereotypes and embark on the road of self-employment.

Then, give play to the exemplary role of female entrepreneurs. Many scholars have found that entrepreneurial role models impact individual EI and ESE (Zapkau et al., 2015). According to Bosma et al. (2012), influential role models are mainly from the same gender. The same biological sex may cause women (but not men) to psychologically identify with female entrepreneurs and believe they can be like them in the future. Hence, special attention should be paid to the exemplary role of female entrepreneurs, inviting female entrepreneurs as speakers to share their entrepreneurial journey (Santos et al., 2016), hiring them to serve as judges for entrepreneurial competitions and mentors, establishing a database of female entrepreneurs' case studies, and focusing on publicizing female alumni entrepreneurs when creating an entrepreneurial climate.

Also, to enrich the entrepreneurial practice opportunities for female college students. The results of the path analysis in this study show that ESE has a greater impact on female students' EI than male students, which means that it is crucial to improve their ESE. Thus, we suggest that universities encourage female students to actively participate in entrepreneurial activities, competitions, and internships with their teachers and classmates to accumulate knowledge and experience in hands-on practice. Organize enterprise visits to gain indirect experience in entrepreneurship, business operation, and management. Besides, universities can improve their expectations for the successful outcome of entrepreneurship by appropriately increasing the proportion of female students using entrepreneurship training conditions such as maker spaces.

Finally, optimizing entrepreneurial services for female students. To help female college students overcome the limitations of entrepreneurial resources, it is suggested that universities set up a special green channel for them to receive entrepreneurial funds, actively promote entrepreneurial projects of female college students to off-campus incubators, and use the university's social capital to help them establish connections with resource providers; equipping them with both male and female entrepreneurship mentors for greater access to resources.

7.3. Limitations

There are some limitations to the study that provide room for future research. The first limitation is that the data used for our

empirical analysis are cross-sectional and regional (collected from one province in western China), which may limit the generalizability of our findings given the differences between China and other countries or regions. Another limitation is related to the outcome variable. Future studies may be able to better answer whether universities play the role of gender equalizer in entrepreneurship if they change the outcome variable from EI to entrepreneurial behavior. Finally, we are concerned with gender differences in the influence of UES on college students' EI and do not pay attention to whether UES weakens the restrictions of subjective norms, entrepreneurial gender stereotypes, and other factors on female college students' EI or entrepreneurial behaviors, which could be considered in future studies.

8. Conclusions

The central question this study endeavors to answer is: Do universities act as gender equalizers in entrepreneurship? To this end, we use survey data from 5468 college graduates from China to examine gender differences in UES's direct and indirect effects on EI. The results demonstrate male and female college students have no significant gender differences on the three paths (UES-EI, ESE-EI, and UES-ESE-EI). More importantly, we find significantly higher coefficients for male students on the four paths (UES-FEF, UES-ESE, FEF-EI, UES-FEF-EI) than female students. Overall, universities seem to maintain and exacerbate gender inequality in entrepreneurship. In other words, universities do not play the role of gender equalizer in entrepreneurship as expected in the context of our investigation.

Despite several limitations in the data and dependent variables selected, etc. However, our findings make at least three contributions to the theory, advancing the literature on UES, EI, and female entrepreneurship. At the same time, this study combines with the literature to provide some practical suggestions for universities on how to make UES play the role of gender equalizer: strengthen the inspection and investigation of entrepreneurial support, strengthen the reform of entrepreneurship education, give play to the exemplary role of female entrepreneurs, to enrich the entrepreneurial practice opportunities for female college students, and optimizing entrepreneurial services for female students. Hopefully, this study could serve as a catalyst to attract more researchers to conduct further studies.

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Data availability data-availability

The authors do not have permission to share data.

CRediT authorship contribution statement

Yaping Song: Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Methodology, Formal analysis, Conceptualization. **Genshu Lu:** Supervision, Investigation, questionnaire design.

Declaration of competing interest

None.

Data availability

The authors do not have permission to share data.

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