



## Research article

# How entrepreneurship education affects college students' entrepreneurial intention: Samples from China

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## ABSTRACT

Colleges and universities play a pivotal role in nurturing students' entrepreneurial aspirations, as evidenced by a significant increase in entrepreneurial education. Improving its quality and igniting students' motivation are crucial. This study, grounded in established theoretical frameworks, introduces variables such as entrepreneurial intention, attitude, and self-efficacy, forming a moderated mediation model. An analysis of 347 questionnaires using Mplus 8.0 reveals the following insights: (1) Collegiate-level entrepreneurship education is positively correlated with students' entrepreneurial intentions; (2) Entrepreneurial attitude and self-efficacy mediate the relationship between entrepreneurship education and students' entrepreneurial intentions; (3) Entrepreneurial social support moderates the link between entrepreneurship education and students' entrepreneurial intentions. These findings contribute to the body of knowledge in entrepreneurship education and provide valuable guidance for enhancing its effectiveness and fostering students' entrepreneurial aspirations.

## 1. Introduction

In recent years, more college students delve into entrepreneurship, highlighting colleges' pivotal role in fostering innovation and startups. The term 'entrepreneurial intention' emerges from the fusion of entrepreneurial and psychological research. Credited with introducing this concept, Bird, an American scholar, suggests that entrepreneurial intention embodies the subjective aspirations of potential entrepreneurs [1], their attitudes and tendencies towards entrepreneurial activities [2], and their perceptions of their entrepreneurial activities [3]. Some researchers also argue that entrepreneurial intention serves as a precursor to entrepreneurial behaviour, representing entrepreneurs' subjective assessments of whether to pursue entrepreneurial activities [4], and individual's behaviours before engaging in entrepreneurship, such as planning, preparation, efforts, and the like [5,6]. Entrepreneurship education, a relatively novel concept, lacks a precise definition in terms of content and scope. Fayolle offers a comprehensive definition, characterizing entrepreneurship education as any educational program or process designed to cultivate entrepreneurial attitudes and skills [7], whereas Liñán stresses its significance in assisting individuals with career decision-making [8]. Some scholars argue that entrepreneurship education involves honing students' ability to identify entrepreneurial opportunities, providing training in essential skills for establishing successful enterprises, boosting their entrepreneurial confidence, and fostering their capacity and inclination to turn innovative ideas into entrepreneurial ventures [9–11]. Thus, this study posits that entrepreneurship education encompasses any teaching program or process aimed at fostering individuals' entrepreneurial awareness, imparting entrepreneurial knowledge and

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skills, enhancing individuals' comprehensive entrepreneurial qualities and abilities, and grooming individuals into entrepreneurs. Entrepreneurship education has undergone significant growth in recent years, emerging as a crucial tool in fostering entrepreneurial initiatives [12]. This upsurge in interest is credited to its capacity in augmenting students' entrepreneurial attitudes, capabilities, and proficiencies [13]. In current discourse, the prevailing view among studies is that entrepreneurship education significantly boosts entrepreneurial intention [13–16]. However, there are some assertions that it has a minimal effect on entrepreneurial intention [17]. Moreover, in certain cases, individuals' entrepreneurial intention may even decrease after undergoing entrepreneurship education [18]. Globally, the failure rate of entrepreneurship stands at 70 %, soaring to over 90 % among Chinese college students [19]. Entrepreneurship education in China remains exploratory [20], characterized by a lack of systematic courses, sustained lectures and competitions, and theoretical depth, with few practical platforms available [21]. So, college educators are grappling with a few key questions. First, does entrepreneurship education have a positive or negative correlation with students' entrepreneurial intentions? Second, what internal mechanisms link entrepreneurship education to students' entrepreneurial intentions? In other words, what additional variables play a role, and how? And third, how should college educators go about nurturing students' entrepreneurial intentions?

Entrepreneurial attitude, defined as one's favorable disposition toward entrepreneurship, encompasses perceptions of its advantages and disadvantages [22]. According to social psychology scholars, 'attitude' reflects individual cognition, including self-evaluation and evaluation of others, events, and activities. Strong entrepreneurial intention is deemed vital for entrepreneurial success. Entrepreneurship education nurtures entrepreneurial spirit, impacting individuals' perceptions and enthusiasm, thus enhancing positive attitudes toward entrepreneurship [23]. Some scholars argue that such education shapes attitudes and behavioral intentions toward entrepreneurship [24], while others suggest entrepreneurial attitude serves as the bridge between personal background, especially educational, and entrepreneurial spirit [25]. Therefore, this study incorporates entrepreneurial attitude into the research model to examine its role.

Entrepreneurial self-efficacy, stemming from Bandura's concept of the 1990s, signifies entrepreneurs' confidence in their abilities for entrepreneurial endeavors [26], mirroring their belief in their capacity to impact the environment and attain success through their actions. Indeed, entrepreneurship is a multifaceted and nonlinear journey, wherein entrepreneurs encounter numerous unforeseen obstacles and challenges [27]. In this process, some entrepreneurs opt for lower-risk activities, while those with high entrepreneurial self-efficacy persevere, establishing enterprises amidst challenges to achieve their goals. Thus, in complex, dynamic, and uncertain environments, entrepreneurial self-efficacy is crucial for initiating and succeeding in entrepreneurship [28].

'Entrepreneurial social support' refers to the support given to entrepreneurs from their family, friends, and other social groups during the entrepreneurial process, which is usually reflected as individuals' subjective feelings [29,30]. The Intentional Entrepreneurial Action Model, aligned with ecosystem theory, posits that individual traits and external factors shape entrepreneurship [31]. Social support, emphasized by researchers [32,33], is pivotal, as entrepreneurship relies on leveraging resources from social environments [34]. In addition, the process of undertaking entrepreneurial activities involves taking risks and putting oneself under pressure, which may reduce entrepreneurs' willingness to start a business and give up their entrepreneurial pursuits, but social support can mitigate these risks and pressures [35]. While prior research has analyzed entrepreneurs' social network structures and their impact [36], scholars increasingly explore social support's role, making it a key variable in the field of entrepreneurship [37].

Social cognitive theory proposes that human behaviour is caused by psychological factors, and it emphasises the importance of the external environment. According to this theory, individual behaviour results from the combination of individual factors and environmental factors [37]. Thus, this study explores the correlation between entrepreneurship education and entrepreneurial intention using a moderated mediated model. Findings enrich entrepreneurship education theory and offer guidance for enhancing its effectiveness and fostering students' entrepreneurial aspirations.

## 2. Theoretical review and hypothesis development

### 2.1. Entrepreneurship education and entrepreneurial intention

Scholars worldwide extensively discuss entrepreneurship education's impact on entrepreneurial intention [13,15,16]. Most agree it cultivates students' entrepreneurial attitude and intention, preparing them for entrepreneurship [38–42]. Firstly, entrepreneurship education creates an atmosphere of creativity and support for the generation of new ideas [43], and Souitaris points out that entrepreneurship education can change entrepreneurs' psychological moods and motivations as well as stimulate their entrepreneurial inspiration, thus improving their entrepreneurial attitude and intention [44]. Secondly, entrepreneurship courses enhance knowledge, skills, improve competence, and increase self-employment potential [45]. The accumulation and integration of new knowledge also improves entrepreneurs' opportunity recognition abilities to some extent as their recognising an opportunity will stimulate their cognitive processes based on their intentions, leading to the generation of entrepreneurial behaviour. Thirdly, if individuals with multidisciplinary backgrounds in entrepreneurship education cooperate, individuals will be able to obtain human resources and set up entrepreneurial teams, and they will be more likely to have close contact with technical resources that have business potential [44]. This interaction fosters the emergence of entrepreneurial intention. Therefore, the following hypothesis is proposed.

**H1.** Entrepreneurship education is positively correlated with students' entrepreneurial intention.

## 2.2. Role of entrepreneurial attitude

The entrepreneurship education content in colleges and universities, teachers' experience, and the college's overall entrepreneurial environment are closely related to students' entrepreneurial interests, which can result in college students forming positive perceptions of entrepreneurial activities and changing their entrepreneurial attitudes [46]. Entrepreneurship education in colleges shapes students' attitudes and motivations, altering perceptions and enhancing motivation through experience [47]. Additionally, it enriches knowledge, boosts enthusiasm, and helps navigate entrepreneurial challenges [48]. Consequently, educated students develop skills, altering attitudes, especially among those more aware of entrepreneurship education [49]. Research suggests that attitude plays a pivotal role in shaping behavior [50]. Behavioral intention relies on attitude, subjective norms, and perceived behavioral control. 'Behavioral attitude' signifies one's assessment of behavior, influencing intention positively or negatively. 'Subjective norms' are the pressures exerted on individuals by the important people in their life, such as their family and friends. For example, if important people have expectations for or support individuals' certain behaviours, these individuals are more likely to have social action intentions. 'Perceived behavioural control' equals 'self-efficacy': Higher levels boost behavior intention. Research suggests that entrepreneurial attitude strongly correlates with intention [51–53]. Thus, this study posits.

**H2.** Entrepreneurial attitude acts as a mediator between entrepreneurship education and students' entrepreneurial intention.

## 2.3. Role of entrepreneurial self-efficacy

Individuals confident in their abilities are more persistent in achieving their goals [54], and variations in education levels contribute to disparities in entrepreneurial self-efficacy [55]. The research accentuates the beneficial impact of entrepreneurial self-efficacy on entrepreneurial intentions and behaviors [56], emphasizing the critical role of appropriate entrepreneurship education in augmenting students' self-efficacy [57,58]. A comparative study reveals significant improvements in entrepreneurial self-efficacy among students after receiving entrepreneurship education [59]. Individuals' entrepreneurial self-efficacy hinges heavily on self-assessment, favoring efficient work choices when self-evaluation is high [60]. Confidence in entrepreneurship and positive self-assessment bolster entrepreneurial intent, fostering confidence in entrepreneurial abilities [61]. Additionally, entrepreneurial self-efficacy significantly influences college students' intent [62–65]. Hence, our third hypothesis proposes.

**H3.** Entrepreneurial self-efficacy acts as a mediator between entrepreneurship education and students' entrepreneurial intention.

## 2.4. Role of entrepreneurial social support

According to the social support theory, a social support network system is a comprehensive whole with the basic function of social support that is composed of many basic elements of social support. A strong social support network can improve individuals' ability to cope with environmental changes and challenges. For example, when college students are faced with complicated entrepreneurial environments, strong social support can allow them to gain more recognition, and their entrepreneurial intention will be stronger with the more social support they receive [66,67]. Entrepreneurs often receive emotional, informational, and financial support from social environments. Emotional support is the encouragement and motivation received from one's colleagues [35]. Given the uncertainty of entrepreneurship, reliance on learned scripts and cognitive patterns diminishes for solving challenges [68]. Therefore, emotional support plays a bigger role in an entrepreneur's decision to proceed with the business. Emotional support shapes entrepreneurs' perceptions, as positive emotions boost optimism about enterprise viability, influencing opportunity evaluation [69]. This positive evaluation of the opportunities also makes them willing to allocate more resources to the entrepreneurial enterprise and persist in ensuring the business's success [27]. Informational support aids entrepreneurs in defining, understanding, coping with, and overcoming the challenges inherent in the entire entrepreneurial process [70], thereby improving their ability to understand and analyse the situation from multiple perspectives [71]. Material support is important for entrepreneurs in the face of difficulties and challenges as the financial resources provided to entrepreneurs enhance their confidence. Based on this, this study proposes the following hypothesis.

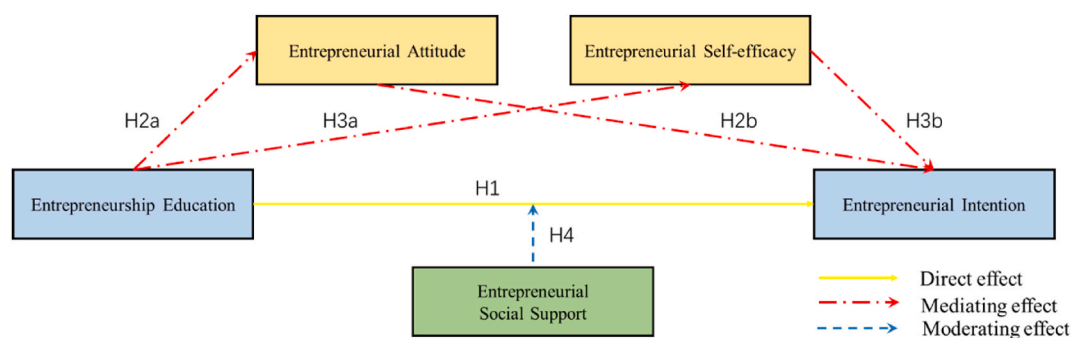


Fig. 1. Research model.

**H4.** Entrepreneurial social support moderates the relationship between college entrepreneurship education and students' entrepreneurial intention.

The research model of this study is as follows (see Fig. 1).

### 3. Method

#### 3.1. Data collection

The participants of this study are from 22 universities in China. Ten of the universities were located in eastern China, seven were in central China, and five were situated in western China. These universities were mainly located in Beijing, Shanghai, Nanjing, Wuhan, Zhengzhou, Xi'an and Lanzhou.

The data were collected using an online questionnaire hosted on the platform Wenjuanxing. It contained the instructions for completing it and a list of question items. The instructions included an explanation of the questionnaire's significance and how the data would be used. This also ensured that the participants fully understood the items contained in the questionnaire when they were completing it. 450 questionnaires were distributed, with 392 returned and 347 retained after eliminating invalid ones. Of these participants, 184 were male and 163 were female, with a mean age of 20.2 years ( $SD = 3.5$ ). Additionally, 172 were from urban areas, while 175 hailed from rural regions.

#### 3.2. Measuring the variables

Herein, entrepreneurship education was measured using Kusmintarti et al.'s 6 items [72], entrepreneurial intention was measured according to the 4 items derived from Davidsson's research [73], entrepreneurial attitude was assessed using 4 items adapted from Nguyen et al., Liñán's and Chen's, and Karimi et al. [22,29,74]. Entrepreneurial self-efficacy was gauged using 4 items, while entrepreneurial social support was evaluated with 3 items, the latter two drawn from Liñán's and Chen's work [29]. Participants rated all items on a 7-point Likert scale.

### 4. Results

#### 4.1. Reliability and validity

In Table 1, each item's factor loading exceeded 0.65, and variable composite reliability ranged from 0.77 to 0.89. AVE surpassed 0.52, indicating robust reliability and convergent validity. Table 2 demonstrated that the square root of AVE exceeded variable correlations, confirming strong discriminant validity.

**Table 1**  
CFA and reliability and validity tests.

Dim	Item	Estimate	S.E.	<i>p</i>	SMC	CR	AVE
EE	EE1	0.74	0.03	***	0.55	0.89	0.56
	EE2	0.67	0.02	***	0.45		
	EE3	0.83	0.02	***	0.69		
	EE4	0.65	0.03	***	0.42		
	EE5	0.71	0.03	***	0.50		
	EE6	0.88	0.02	***	0.77		
EI	EI1	0.72	0.04	***	0.52	0.81	0.53
	EI2	0.66	0.03	***	0.44		
	EI3	0.82	0.03	***	0.67		
	EI4	0.69	0.02	***	0.48		
EA	EA1	0.68	0.03	***	0.46	0.81	0.52
	EA2	0.79	0.02	***	0.62		
	EA3	0.66	0.03	***	0.44		
	EA4	0.74	0.02	***	0.55		
ESE	ESE1	0.78	0.03	***	0.61	0.84	0.57
	ESE2	0.77	0.04	***	0.59		
	ESE3	0.72	0.03	***	0.52		
	ESE4	0.75	0.04	***	0.56		
ESS	ESS1	0.73	0.03	***	0.53	0.77	0.53
	ESS2	0.69	0.04	***	0.48		
	ESS3	0.76	0.03	***	0.58		

Note 1: EE is for entrepreneurship education; EI is entrepreneurial intention; EA is for entrepreneurial attitude; ESE is for entrepreneurial self-efficacy; ESS is for entrepreneurial social support. The following abbreviations are identical.

Note 2: \*\*\* denotes significance at  $P < 0.001$ , \*\* at  $P < 0.01$ , and \* at  $P < 0.05$ . The asterisk following it denotes the same thing.

**Table 2**

The correlation coefficient of variables and the square root of AVE.

Dim	AVE	EE	EI	EA	ESE	ESS
EE	0.56	<b>0.75</b>				
EI	0.53	0.54	<b>0.73</b>			
EA	0.52	0.57	0.51	<b>0.72</b>		
ESE	0.57	0.53	0.48	0.52	<b>0.76</b>	
ESS	0.53	0.23	0.45	0.24	0.35	<b>0.73</b>

The square root of AVE is shown in bold diagonal font, while the lower triangle displays Pearson correlation coefficients.

#### 4.2. Model fit

In this study,  $\chi^2/df = 2.37$ , CFI = 0.92, TLI = 0.93, RMSEA = 0.06 and SRMR = 0.05, suggesting a well-fitting model.

#### 4.3. Direct and indirect effects

In Table 3, the total effect is 0.45 ( $p < .001$ ), with a direct effect of 0.27 ( $p < 0.001$ ) and an indirect effect of 0.18 ( $p < 0.001$ ), thus providing support for H1. The mediating effects of EE→EA→EI and EE→ESE→EI were 0.11 ( $p < 0.001$ ) and 0.08 ( $p < 0.001$ ) respectively. The results of bootstrapping with 5000 times supported H2 and H3.

#### 4.4. The variables' moderating effects

In Table 4, the interaction coefficient of 0.11 ( $p < 0.01$ ) indicates that entrepreneurial social support moderates the relationship, thereby confirming H4. Fig. 2 illustrates this moderation effect, emphasizing that higher levels of entrepreneurial social support exert a stronger influence on the relationship compared to lower levels of support.

### 5. Discussion

#### 5.1. Theoretical contributions

Firstly, it addresses the ongoing debate regarding the impact of entrepreneurship education on entrepreneurial intention. While many scholars have shown a positive influence [13–16], other scholars hold the opposite view [17,18]. Therefore, this study reinforces the positive association between entrepreneurship education and college students' inclination towards innovation, aligning with prior research [13–16]. Secondly, it recognizes that individual behavior results from a blend of personal and environmental factors [37]. While previous research often segregated external [75] from internal factors [16,63,76] when examining college students' entrepreneurial intent, this study integrates both. By integrating external factors like entrepreneurial social support and internal factors such as entrepreneurial attitude and self-efficacy, this model constructs a comprehensive framework elucidating the relationship between entrepreneurship education and students' entrepreneurial intentions. This approach illuminates the intricate dynamics between college entrepreneurship education and students' entrepreneurial aspirations, unveiling previously obscured insights.

#### 5.2. Practical implications

Firstly, this study offers insights for enhancing college social entrepreneurship education, a vital component in bolstering students' entrepreneurial prowess. Colleges and universities are encouraged to develop integrated theoretical and practical entrepreneurial education systems, diversify learning platforms (e.g., courses, competitions, lectures), and foster students' social entrepreneurial skills [77,78]. Moreover, colleges and universities should actively build entrepreneurship incubation bases, support promising undergraduate entrepreneurship projects, set up venture funds, and promote the smooth implementation of projects. This improvement of the entrepreneurship education support system will provide college students with an in-depth understanding of entrepreneurship, teach them how to cultivate relevant skills, and stimulate their entrepreneurial motivation and intention [79].

Secondly, the findings of this research can offer valuable insights to fortify students' entrepreneurial attitudes. Colleges and

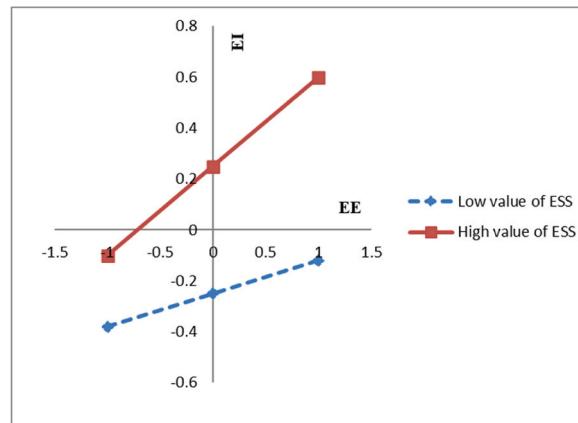
**Table 3**

Mediation effect analysis.

	Estimate	Coefficients			95 % CI		Hypothesis (Y/N)
		S.E.	Est./S.E	p	Lower 2.5 %	Upper 2.5 %	
Total	0.45	0.06	7.73	***	0.33	0.57	
Dir	0.27	0.04	6.24	***	0.19	0.35	H1(Y)
Ind	0.18	0.03	6.58	***	0.12	0.24	
Ind1: EE- > EA- > EI	0.11	0.03	4.26	***	0.05	0.17	H2(Y)
Ind2: EE- > ESE- > EI	0.08	0.02	4.13	***	0.04	0.12	H3(Y)

**Table 4**  
Moderation effect analysis.

DV	IV	Estimate	S.E.	Est./S.E.	P-Value	Hypothesis (Y/N)
EI	EE	0.24	0.04	5.63	***	H4 (Y)
	EA	0.29	0.03	8.47	***	
	ESE	0.27	0.03	9.38	***	
	ESS	0.25	0.03	7.87	***	
	EE*ESS	0.11	0.04	2.82	**	



**Fig. 2.** The moderating effect of entrepreneurial social support (ESS).

universities should focus on refining entrepreneurship education quality, emphasizing entrepreneurship courses, enhancing students' comprehension of entrepreneurship, and fostering positive attitudes toward entrepreneurship [80]. Furthermore, aligning with diverse institutional cultures, institutions can actively promote an atmosphere of innovation and entrepreneurship. This can be achieved by increasing the emphasis on entrepreneurship education through hosting lectures featuring successful entrepreneurs, organizing symposiums with alumni who have established businesses, and implementing other initiatives that encourage students to adopt positive attitudes towards entrepreneurship. In addition, various entrepreneurship support policies should be implemented, such as establishing various entrepreneurship competitions, implementing tax reductions and exemptions, providing funds to alleviate financing difficulties, increasing funding, and creating a favorable environment for entrepreneurship.

Thirdly, these findings can enhance college students' entrepreneurial self-efficacy. Colleges and universities should utilize diverse media channels to disseminate entrepreneurship policies, foster a shared entrepreneurial understanding, and highlight its societal significance through exemplification. Concurrently, universities can bolster support for entrepreneurial students by instituting awards and ensuring comprehensive testing and research provisions, thereby incentivizing student entrepreneurship [79]. In addition, colleges should change their role in students' entrepreneurial processes from that of a spectator and supporter to a guide and helper, which requires universities to provide high-quality entrepreneurship education and necessary support in terms of registered capital, business sites, platform resources, and ensuring their practices are more in line with real-world practices to create the most effective entrepreneurial environment for students [79].

Fourthly, comprehensive social support for college students is imperative. The Chinese central government should enhance entrepreneurship policies for students, while local governments should refine entrepreneurial laws, ensuring a conducive environment. Furthermore, universities must offer practical entrepreneurial opportunities and equip students with high-quality skills and knowledge [81]. Moreover, family and friends should also reformulate their traditional understanding of 'employment', provide entrepreneurs with funds, information, and other resources in a timely manner, provide positive encouragement, and promote better entrepreneurial activities to further improve entrepreneurial performance.

### 5.3. Limitations and future research directions

In the first instance, constrained by time and cost, the study employed cross-sectional data rather than longitudinal data. Subsequent research endeavors should integrate longitudinal data to better capture dynamic relationships and action mechanisms between variables. Secondly, the questionnaires were predominantly disseminated among individuals within the authors' social network, resulting in an uneven regional distribution of participants and a survey primarily focused on typical universities. As a result, future studies should broaden their research scope by improving the representativeness of samples.

## Ethical approval and consent to participate

This study was reviewed and approved by the Ethics Review Committee of Pingdingshan University's School of Economics and Management (approval number: EA-2023131). The participants provided informed consent to participate in this study.

## Data availability statement

Data included in article/supplementary material/referenced in article.

## Consent for publication

Not applicable.

## CRediT authorship contribution statement

**Jianpeng Fan:** Writing – original draft, Supervision, Software, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Junhao Hu:** Writing – review & editing, Data curation. **Jia Wang:** Writing – review & editing, Data curation.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.heliyon.2024.e30776>.

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