

The influence of entrepreneurial role model on entrepreneurial intention: a cross-level investigation

Cross-level
investigation

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Abstract

Purpose – Most of current studies have explored the impact of entrepreneurial culture on entrepreneurial intentions in specific region rather than cross-cultural regions; in addition, these studies have looked more at entrepreneurial role models as part of the environmental factors that influence individuals' entrepreneurial intentions (Lafuente *et al.*, 2007), rather than viewing environmental factors as independent variables. Furthermore, less research exists to hypothesize and validate the mechanism of this process, even if some studies have already shown the similar ideas. To fill the aforementioned research gap in this area, based on new institutional theory and social cognitive career theory, this paper aims to explore the influence of entrepreneurial role models on entrepreneurial intentions in different cultural contexts by introducing two independent national-level factors, collectivism and media publicity, and subsequently examines the mediating role of self-efficacy.

Design/methodology/approach – Two major international databases, Adult Population Survey Global Entrepreneurship Monitor (APS GEM) 2017 and Global Leadership and Organizational Behavior Effectiveness (GLOBE), were used as data sources for this paper. In total, the authors obtained data from 174,128 respondents in the APS GEM 2017 database. Because there is a national-level variable, collectivism, which was collected by the GLOBE, the authors excluded 50,046 participants because their countries did not score collectivism in this database. After screening, 124,082 valid observations from 35 countries were obtained. In this study, hierarchical linear modeling (HLM) was used as the method and HLM 6.08 was adopted for data analysis. According to the purpose of the study, the following four different models will be tested in turn using the HLM, which include the null model, random coefficients regression model, intercepts as outcomes model and slopes as outcomes model.

Findings – Some previous studies have shown that entrepreneurial role models have a positive impact on individuals' entrepreneurial intentions, however, the exploration of this effect and its mechanisms in different cultural contexts is lacking (Abbasiyanchavari and Moritz, 2021). In response, based on a cross-level and cross-national survey, this paper advances the original literature by introducing two cultural dimensions, collectivism and media publicity. The current results suggest that the positive influence of entrepreneurial role models on individuals' entrepreneurial intentions is somewhat generalized and that self-efficacy plays a mediating role.



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Moreover, collectivism and media publicity can negatively and positively moderate the effects of entrepreneurial role models on self-efficacy and entrepreneurial intentions, respectively. The findings provide some theoretical support for the role of cultural context in the formation of entrepreneurial intentions, which can help countries with diverse cultures to develop differentiated entrepreneurial role model advocacy strategies to better facilitate the emergence of potential entrepreneurs and advance their subsequent entrepreneurial activities.

Research limitations/implications – First, because this study assumes that entrepreneurial role models are templates that can inspire potential entrepreneurs and provide them with entrepreneurial approaches (Lavolette *et al.*, 2012), which has a certain positive bias, it may mean that the findings of this paper are not applicable to all scenarios, as role models are usually classified by scholars into positive and negative ones. The effect of different types of role models on entrepreneurial intention in a cross-cultural context will be considered as one of the future research directions. Second, in the measurement of country-level variables, this paper assumes that the degree of media publicity and collectivism are homogeneous within a country and does not take into account the differences in these two variables across regions within the same country. Future research is expected to use more granular designs to explore, for example, the effect of entrepreneurial role models on entrepreneurial intentions based on regional differences in media publicity and collectivism, rather than national differences. Third, due to the cross-sectional research design used in this paper, the dynamic influence of entrepreneurial role models in the entrepreneurial process was not included in the analysis. In addition, the focus of this study is only on entrepreneurial intention, which is separated from the subsequent entrepreneurial behavior of entrepreneurs. Therefore, the longitudinal study design that explores the dynamic influence of role models in entrepreneurial process should receive more attention.

Practical implications – First, enhancing the exposure of entrepreneurial role models is necessary because the authors found that entrepreneurial role models can positively promote entrepreneurial intentions, whereas self-efficacy plays a mediating role. For example, it is advised for the society to publish entrepreneurs' autobiographies, open entrepreneurial forums, create entrepreneurial interview columns, etc. In these books and activities, detailed descriptions of successful entrepreneurs' methods and skills are highly needed, as these can help potential entrepreneurs to better understand the entrepreneurial process, thus improving their self-efficacy and facilitating their entrepreneurial activities (Zhao *et al.*, 2005). It is necessary to note here that matching the characteristics of entrepreneurial role models and potential entrepreneurs cannot be ignored, as similar characteristics could facilitate the desire of potential entrepreneurs to become more like entrepreneurial role models (Hoffner and Buchanan, 2005). These similar characteristics encompass both demographic characteristics, such as gender, race and age (Garcia, 2017; Harwood, 1999; Jose, 1989), and personal characteristics, such as goal embodiment and educational background (Bosma *et al.*, 2012; Morgenroth *et al.*, 2015). Moreover, the authors believe that the media's promotion of entrepreneurial role models and entrepreneurial activities needs to be enhanced, for example, by incorporating entrepreneurship education in television programs, allowing youth to meet face-to-face with successful entrepreneurs, and developing entrepreneurship lectures or interview programs.

Social implications – At the same time, role models should be presented differently in diverse cultural contexts. For example, in countries with a strong collectivist orientation, the media should include collectivist messages when promoting entrepreneurial role models, such as his cooperation with the government, family and friends, which is in line with collectivist values, so that potential entrepreneurs in a collectivist context may perceive more similarity to role models and thus increase their entrepreneurial intentions (Morris *et al.*, 1994); On the contrary, in countries with low collectivist tendencies, the media can appropriately carry an element of individualism when promoting entrepreneurial role models, for example, by telling how entrepreneurs succeed on their own strength and superior abilities, which is in accordance with the values of individualism. Based on the same logic, potential entrepreneurs in the context of individualism may thus generate more entrepreneurial intentions (Morris *et al.*, 1994).

Originality/value – First, building on previous studies that explored the relationship between entrepreneurial role models and individuals' entrepreneurial intentions (Stupacher *et al.*, 2017), the authors further validated the moderating role of two national-level situational factors, collectivism and media advocacy, in this process, which echoes Abbasianchavari and Moritz (2021) that exploring the effects of entrepreneurial role models on entrepreneurial intentions in different cultural context is an essential topic for the future research. Second, the authors demonstrated that self-efficacy can mediate the relationship between entrepreneurial role models and entrepreneurial intentions and that this finding is generalizable. This responds to the hypothesis presented by Morgenroth *et al.* (2015) that role models, who are served as behavioral templates, can facilitate the generation of goals and behavioral intentions by increasing role aspirates' self-efficacy, as it enhances their perceived accessibility to goals. Another contribution is that the

authors found a possible explanation that the interaction of collectivism and media publicity with entrepreneurial role models may influence individuals' entrepreneurial intentions by affecting their self-efficacy, which unifies the new institutional theory and social cognition career theory.

Keywords Collectivism, Self-efficacy, Entrepreneurial intention, Entrepreneurial role models, Media publicity

Paper type Research paper

1. Introduction

In a world that is preoccupied with economic development, the promotion of innovative entrepreneurship is essential for the attainment of this growth objective. Entrepreneurial activity is frequently regarded as a source of technological innovation and competitiveness. Consequently, for more than 30 years, researchers have been investigating the factors that influence individuals' intentions to participate in entrepreneurial activities (Nowiński and Haddoud, 2019). In recent years, entrepreneurial role models have garnered a growing amount of attention as one of the antecedent factors that influence entrepreneurial intentions. This is due to the fact that many entrepreneurs assert that the development of their businesses has been significantly influenced by others, primarily entrepreneurs, former colleagues or family members, such as celebrities like Steve Jobs. A study that surveyed 92 young Dutch entrepreneurs showed that 50% of entrepreneurs had entrepreneurial role models in the pre-start-up phase and 28% of those with entrepreneurial role models fully agreed that role models were crucial for the pre-start-up or continuation phase (Bosma *et al.*, 2012), both indicating that entrepreneurial role models could play an influential role in the formation of individuals' entrepreneurial intentions.

At present, one of the three primary research questions in this field is the way in which entrepreneurial role models affect the entrepreneurial intentions of individuals in diverse contexts. This question underscores the impact of environmental factors, such as culture and institutions, on this process (Abbasianchavari and Moritz, 2021). According to existing research, culture – such as shared values, beliefs and expected behaviors – can greatly influence individuals' behaviors, and this can also be extended to individuals' entrepreneurial behaviors.

Several empirical studies have confirmed this idea, for example, in a Swedish cultural context, Andersson *et al.* revealed a local feedback effect through a modeling analysis of the national employer-employee audit registration data set, where for every 5% higher entrepreneurial intensity in a community on average, the area generates six to seven more entrepreneurs per square kilometer per year, all else being equal (Andersson and Larsson, 2016). This implies that the presence of entrepreneurial role models or businesses accelerates the development of regional entrepreneurial culture, which in turn encourages a greater number of potential entrepreneurs to participate in entrepreneurial activities.

Nevertheless, the majority of these studies have examined the influence of entrepreneurial culture on entrepreneurial intentions in specific regions, rather than cross-cultural regions. Additionally, these studies have emphasized entrepreneurial role models as part of the environmental factors that influence individuals' entrepreneurial intentions, rather than viewing environmental factors as independent variables, which may include cultural factors that are inherent at the national and regional levels. In addition, there is a scarcity of research to validate and hypothesize the mechanism of this process, despite the fact that some studies have already demonstrated similar concepts. For example, based on the theory of planned behavior, a cross-cultural study analyzing 253 students from Germany and Ethiopia showed that the entrepreneurial intentions of individuals from collectivist cultures were more likely

to be influenced by entrepreneurial role models than by their own entrepreneurial experience than individuals from individualist cultures, and that entrepreneurial role models could further influence entrepreneurial intentions by influencing their entrepreneurial attitude, perceived behavioral control and subjective norm (Muelleret *al.*, 2014). In summary, despite the fact that this is a significant research trend, there is a lack of studies that investigate the mechanisms and effects of entrepreneurial role models on the entrepreneurial intentions of individuals in various cultural contexts. On the one hand, answering this question can provide a better understanding of the influence mechanisms of entrepreneurial role models in different cultural settings, and on the other hand, it can help to understand how entrepreneurial role models influence individuals from different countries (Abbasianchavari and Moritz, 2021).

To fill the research above gap in this area, based on new institutional theory and social cognitive career theory, this paper aims to explore the influence of entrepreneurial role models on entrepreneurial intentions in different cultural contexts by introducing two independent national-level factors, collectivism and media publicity, and subsequently examines the mediating role of self-efficacy. The data for empirical tests are drawn from two large international databases: the 2017 Global Entrepreneurship Monitor (GEM) Adult Population Survey (APS) and the Global Leadership and Organizational Behavior Effectiveness Database (GLOBE).

There is some evidence that entrepreneurial intentions are significantly influenced by collectivism, a critical cultural dimension. Because there exists several traits in collectivist culture that does not appreciate independence and competition which is contrary to the traditional entrepreneurial temperament, it is expected to explore the specific characteristics of entrepreneurial orientation and entrepreneurial process in the context of collectivism (Luu and Ngo, 2019). Furthermore, it is believed that media publicity, which serves as an outlet for cultural communication, also has an impact on the entrepreneurial aspirations of individuals. On the one hand, media publicity can complement policy as a way to provide skills for new ventures; on the other hand, it may influence the way entrepreneurs intend to do so by conveying cultural values and entrepreneurial beliefs. Therefore, it is also important to consider the impact of media publicity on entrepreneurial behaviors.

We believe that the study contributes to the current literature in three main ways. First, because cross-country data are used in this paper, we can explore how individual entrepreneurial intentions are influenced by entrepreneurial role models and environmental factors in different country contexts, which echoes Abbasianchavari and Moritz's call for cross-cultural research in this field; In addition, by introducing two country-level variables, collectivism and media publicity, we complement previous studies that have typically included individual-level factors such as the type of entrepreneurial role model, the personal growth process (Abbasianchavari and Moritz, 2021), or the regional culture brought about by the entrepreneurial role model as antecedent variables that influence entrepreneurial intentions. Third, based on new institutional theory and social cognitive career theory, we introduced self-efficacy as a mediating variable to clarify the cognitive mechanism of entrepreneurial role models and culture factors on entrepreneurial behavior, integrating the effects of individual and environmental factors on entrepreneurial intention, which is relatively rare in the existing literature.

The structure of this study is organized as follows. The Section 2 presents a theoretical framework and hypotheses based on new institutional theory and social cognitive career theory. This is followed by the Section 3 including data, variable measurement and data analysis methods. Sections 4 and 5 disclose the findings and endogeneity test. Finally,

Sections 6, 7 and 8 demonstrate the discussion, implications and conclusions of this research.

2. Theoretical framework and hypotheses

2.1 Theory

2.1.1 New institutional theory. Numerous recent studies have proposed that institutions, which encompass formal regulations and social obligations, have a substantial impact on entrepreneurial activity. The implementation of individual entrepreneurship is significantly influenced by the presence of a positive entrepreneurial environment in a country or region, which can be identified in detail by institutions. In a positive entrepreneurial environment, individuals find it attractive and feasible to start a new business, which enhances individuals' entrepreneurial intentions (Matlay *et al.*, 2014), and conversely, individuals' entrepreneurial intentions are diminished. On this basis, the new institutional theory argues that institutions also involve cultural perceptions, which represents the shared values and behavioral logic of a nation. Studies based on new institutional theory have already shown that, two rule-oriented cultural dimensions, uncertainty avoidance and entrepreneurial legitimacy, can exert an impact on individuals' entrepreneurial intentions (Li *et al.*, 2021).

2.1.2 Social career cognitive theory. Social career cognitive theory (SCCT), proposed by Lent *et al.* (1994), is largely derived from Albert Bandura's General Social Cognitive Theory. It emphasizes that behavior is primarily the result of person–environment interactions, which has proven to be hugely enlightening and widely used in psychosocial areas such as educational achievement, health behavior, organizational management and emotional response. Based on general social cognitive theory, SCCT comprises three fundamental variables that may impact an individual's decision to pursue a career: self-efficacy, objectives and outcome expectations. The career literature has devoted the most attention to self-efficacy, which is believed to have an impact on the objectives one selects and the effort they exert in pursuing them, of the three. It is derived from personal performance accomplishments, vicarious learning and other sources, where role models can be used as templates (Morgenroth, Ryan, and Peters, 2015).

2.2 Hypotheses

2.2.1 Role of role model. The entrepreneurial role model, who serves as a learning template and may inspire entrepreneurial behavior, is a significant factor in the promotion of entrepreneurial intentions, according to a substantial body of research. For example, through the analysis of questionnaires from university students in Polish higher education institutions, Nowiński *et al.* demonstrated the promotion effect of role models on entrepreneurial intentions (Nowiński and Haddoud, 2019).

Bandura's social learning theory, which was introduced in 1971, posits that the observation of others is a critical method of learning. This method enables individuals to acquire knowledge about their capabilities, which in turn influences their behavior (Bandura, 1971). Extending this to the field of entrepreneurship, entrepreneurial role models can be regarded as objects from which potential entrepreneurs can learn. In contrast to potential entrepreneurs who lack role models, those who have role models within their immediate circle are more likely to acquire invisible knowledge about business strategy and entrepreneurial decisions, which is necessary for making decisions under uncertainty and controlling entrepreneurial opportunities. In addition, potential entrepreneurs who have entrepreneurial role models are more inclined to encourage entrepreneurial intentions by observing the success or failure of their role models as a means of seizing entrepreneurial opportunities and exploring entrepreneurial avenues (Dohse and Walter, 2012):

H1. Entrepreneurial role model is positively related to entrepreneurial intention.

2.2.2 Mediating role of self-efficacy. Self-efficacy is a crucial element in Bandura's social cognitive theory (1986), characterized as "a belief in one's capacity to effectively plan and execute the necessary actions to accomplish specific goals" (Bandura *et al.*, 1999). Bandura *et al.* stated that vicarious learning, discussed earlier, is a method for acquiring self-efficacy. To put it more closely, observing others successfully completing a task can increase one's confidence in succeeding at the same task (Morgenroth *et al.*, 2015).

Entrepreneurial role models offer concrete evidence that specific entrepreneurial objectives may be achieved, so assisting individuals in defining their self-concept or self-perception (Gibson, 2003) and increasing their confidence in pursuing the career (e.g. entrepreneurship). Potential entrepreneurs can, for instance, use vicarious learning to learn from successful entrepreneurs to gain helpful career advice that will support them in starting a business. This advice can include career planning, forward-thinking abilities, pertinent information, support and guidance that will boost their confidence before the business is even launched (Kong *et al.*, 2020). Therefore, entrepreneurial role models may increase the potential entrepreneurs' self-efficacy. Thus, we propose the following hypothesis:

H2. Entrepreneurial role model is positively related to self-efficacy.

Self-efficacy is seen to be the best indicator of human behavior because it is crucial for coordinating motivation, thought and emotion. Based on this, self-efficacy is widely recognized to influence entrepreneurial intentions. For example, after analyzing the data of 259 respondents using partial least squares structural equation modeling technique, Elnadi *et al.* concluded that self-efficacy has a significant effect on entrepreneurial intentions of college students and there exists a gender difference (Elnadi and Gheith, 2021).

The social cognitive career theory underscores that career development is significantly influenced by cognitive individual-related factors, such as self-efficacy. In addition, individuals' willingness to engage in a particular field suggests that they have adequate assessments of their own capacity to organize and execute the necessary activities. It has been demonstrated that self-efficacy can enhance students' entrepreneurial intentions by affecting their subjective norms, their ability to manage the process and their attitudes toward entrepreneurship. In contrast to students with low self-efficacy, those with high self-efficacy are more likely to exhibit a higher level of confidence in their ability to perform entrepreneurial tasks and a greater capacity to overcome obstacles, thereby increasing their entrepreneurial intentions. (Neneh, 2022). Therefore, we formulate the following hypothesis:

H3. Self-efficacy is positively related to entrepreneurial intention.

Based on the hypothesis above, we expect that self-efficacy can mediate the relationship between entrepreneurial role models and entrepreneurial intentions. On the one hand, entrepreneurial role models can offer potential entrepreneurs both formal and informal knowledge sharing and support. This can assist potential entrepreneurs in acquiring the necessary skills to initiate their own business, ultimately enhancing their self-efficacy and fostering entrepreneurial intentions (Taiyi Yan *et al.*, 2022); On the other hand, exposure to entrepreneurial role models can improve the risk management skills of aspiring entrepreneurs, leading to increased self-efficacy and a greater likelihood of pursuing entrepreneurial intentions (Abbasianchavari and Moritz, 2021). Therefore, the following hypothesis is established:

H4. Self-efficacy mediates the positive effects of entrepreneurial role models on entrepreneurial intentions.

2.2.3 Moderating role of media publicity. Bandura's social cognitive theory of mass communication posits that the media can, under some circumstances, instruct individuals in new behaviors and inspire them to take action by altering their value choices, self-efficacy, outcome expectations and perceptions of opportunity structures (Bandura, 2001). Research within the field of entrepreneurship indicates that media, particularly business reality shows, can significantly influence the desire and intentions of potential entrepreneurs to start their own business. In addition, exposure to such media can enhance their entrepreneurship-related skills and capacity, making it easier for them to turn their entrepreneurial intentions into actual outcomes (Levie *et al.*, 2010).

The media influences entrepreneurial intentions by presenting entrepreneurial role models, such as promoting stories of successful entrepreneurs. A research study of UK students showed a positive correlation between the skills students acquired while watching media programs (rather than actual learned skills) and entrepreneurial intentions. When these students are exposed to entrepreneurial role models through the media, they can observe a range of skills (e.g. business communication or risk assessment) resulting in tacit knowledge, which may lead to an enhancement of their entrepreneurial intentions (Swail *et al.*, 2014). Alternatively, the publicity of entrepreneurial role models can indicate the level of social acceptance of entrepreneurship, which has been shown to boost people's desire to become entrepreneurs (Krueger and Brazeal, 1994). Therefore, we propose the following hypothesis:

H5. Media publicity moderates the effect of entrepreneurial role models on entrepreneurial intentions, and the stronger the media publicity, the greater the effect of entrepreneurial role models on entrepreneurial intentions

Based on the aforementioned reasoning, we suggest that increased visibility of role models facilitates the discovery of learning opportunities for aspiring entrepreneurs, hence enhancing their self-efficacy. According to the effect of repeated exposure, an individual's attractiveness can be increased with repeated exposure (Han *et al.*, 2020), therefore, the greater the publicity of the role model, the more often they are exposed and the more attractive it is to potential entrepreneurs. When role models are sufficiently attractive, role aspirants will spontaneously be drawn to opportunities that offer the best challenges to test their skills, during which a great deal of vicarious learning is required (Reeve *et al.*, 2004). All of these can enhance role aspirants' entrepreneurial self-efficacy. Therefore, the following hypothesis is formulated:

H6. Media publicity moderates the effect of entrepreneurial role models on self-efficacy, and the stronger the media publicity, the greater the effect of entrepreneurial role models on self-efficacy

2.2.4 Moderating role of collectivism. Collectivism reflects an orientation in which individuals emphasize interdependence and the priority of collective goals over individual goals; conversely, individualism responds to a self-centered orientation that focuses on taking care of self, in which one's interests take precedence over the collective interest (Verma, 1985). Individualism and collectivism have been identified as significant determinants of entrepreneurial behavior. In an individualistic environment, individuals tend to be more independent and less willing to contribute to collective action, so their career choices are often motivated by the achievement of personal goals and the acquisition of

self-interest, which leads them to be more likely to choose entrepreneurship. Several studies also agree that entrepreneurship is a highly individualistic pursuit (Ndofirepi, 2022), which represents a person's struggle to achieve a dream and overcome multiple obstacles. When these successful entrepreneurs become role models, on the one hand, potential entrepreneurs with "individualistic" tendencies become more optimistic about the uncertainty of the external environment they encounter and more willing to involve themselves in risky situations as they observe from their role models (Zeffane, 2014), thus enhancing their entrepreneurial intentions; On the contrary, due to their shared individualistic tendencies, potential entrepreneurs are more inclined to see similarities with role models. This perception can strengthen their aspiration to become role models in different ways, ultimately boosting their entrepreneurial intentions (Hoffner and Buchanan, 2005). Because individuals' values (self-concept: individualism vs collectivism) are largely determined by national culture, we argue that national-level individualism can enhance the influence of entrepreneurial role models on entrepreneurial intentions.

On the contrary, in a collectivist setting, individuals prioritize sharing, collaboration and group harmony and are willing to contribute to the collective (Morris *et al.*, 1994; Ndofirepi, 2022), so they are less likely to choose entrepreneurship when their value is recognized by the group as compared to those in an individualist environment. When faced with an entrepreneurial role model, potential entrepreneurs with "collectivist" tendencies are more prone to avoid disappointing the important people in their lives, and therefore may view the risks of entrepreneurship negatively and try to avoid uncertainty, which would reduce their entrepreneurial intentions. In addition, because potential entrepreneurs with a "collectivist" orientation may not share the same values as the entrepreneurial role models, this could diminish the attractiveness of the role models and thus negatively affect their entrepreneurial intentions. According to this reasoning, we argue that national-level collectivism would weaken the effect of entrepreneurial role models on entrepreneurial intentions. Therefore, we propose the following hypothesis:

H7. Collectivism negatively moderates the effect of entrepreneurial role models on individuals' entrepreneurial intentions.

According to the analysis provided, we conclude that countries with a greater degree of collectivist tendencies are more likely to have potential entrepreneurs who develop "collectivist" tendencies as well. As a result, these individuals may perceive the risks and challenges faced by entrepreneurial role models in a negative light. This negative perception could diminish the appeal of entrepreneurial role models, leading to a decrease in the accumulation of entrepreneurial knowledge and ultimately reducing their belief in their own ability to succeed as entrepreneurs. As highlighted by the entrepreneurial event theory, if the entrepreneurial risk is perceived as desirable (i.e. becoming an entrepreneur is attractive) and feasible (i.e. individuals believe that the risk is achievable), individuals will increase their self-efficacy through vicarious learning and thus promote their entrepreneurial intentions. Conversely, the effect is reduced. Based on the above analysis, we developed the following hypothesis:

H8. Collectivism negatively moderates the effect of entrepreneurial role models on individuals' self-efficacy.

Furthermore, given culture and values are considered significant determinants of media publicity, we contend that collectivism can impact the efficacy of media in promoting entrepreneurial role models and thus influence individuals' entrepreneurial intentions.

Media publicity is often considered an essential disseminator of information that can shape people’s perceptions by, for example, amplifying information (Yannopoulou *et al.*, 2011). Based on the above, we can conclude that the “individualistic” tendencies of entrepreneurial role models can be amplified by media publicity, which can result in potential entrepreneurs with “collectivist” tendencies being less likely to perceive the attractiveness and feasibility of entrepreneurship due to the challenges encountered by entrepreneurial role models, and further negatively affect individuals’ entrepreneurial intentions. Therefore, the effectiveness of the media in promoting entrepreneurial role models may be weakened. We propose the following hypothesis:

H9. There is a cross-level three-way interaction between entrepreneurial role models, media publicity and collectivism, with a weaker moderating effect of media publicity on the influence of entrepreneurial role models on entrepreneurial intentions when collectivism is high.

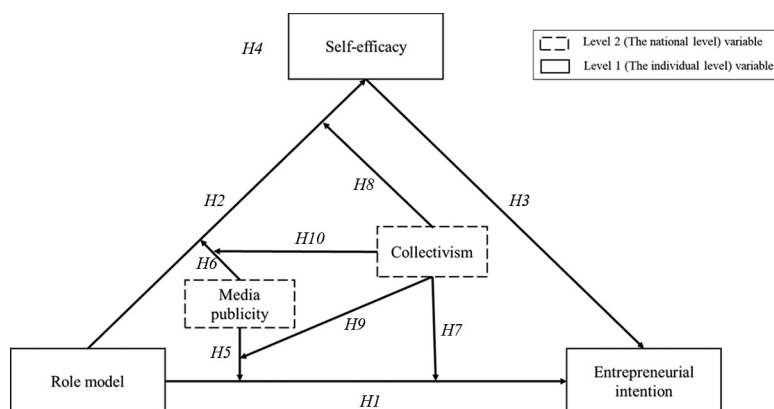
Using the same reasoning, we argue that collectivism may affect the effectiveness of the media in promoting entrepreneurial role models and thus affect individuals’ self-efficacy. Based on the previous hypothesis, when the media publicity amplifies the “individualistic” tendencies of entrepreneurial role models, potential entrepreneurs with “collectivistic” tendencies will reduce the perceived attractiveness and feasibility of entrepreneurship, which in turn weaken their ability to observe and learn from entrepreneurial role models, ultimately negatively affecting their self-efficacy. Therefore, we hypothesize that:

H10. There is a cross-level three-way interaction between entrepreneurial role models, media publicity and collectivism, with a weaker moderating effect of media publicity on the influence of entrepreneurial role models on self-efficacy when collectivism is high. **Figure 1** depicts the theoretical framework of this paper.

3. Research methodology

3.1 Data

Two major international databases, APS GEM 2017 and GLOBE, were used as data sources for this paper. The GEM consortium is the largest entrepreneurial research organization in



Source: Figure by authors

Figure 1.
Theoretical framework of this paper

the world, which annually collects survey data from at least 2,000 randomly selected adults in each participating country. These data include many items available to measure an individual's entrepreneurial intention, entrepreneurial role models, self-efficacy, media publicity and demographic variables, which could be used to analyze the hypothesis of this study. The GLOBE Project has a large survey team in 61 countries around the world, and the data they collect is designed to explore the relationship between national culture and leadership, which has been widely used in studies concerning environment and culture. We downloaded the 2017 APS from the GEM website (<http://gemconsortium.org>) and also obtained GLOBE Phase 2 Aggregated Societal Level Data for Society Culture Scales from the Globe website (<https://globeproject.com/>).

In total, we obtained data from 174,128 respondents in the APS GEM 2017 database. Because there is a national-level variable, collectivism, which was collected by the GLOBE, we excluded 50,046 participants because their countries did not score collectivism in this database. After screening, 124,082 valid observations from 35 countries were obtained. Table 1 presents the mean values of the studied variables for each country.

3.2 Measures

Role model. The GEM panel data includes a question that can be used to determine whether an individual has an entrepreneurial role model: "Do you know someone personally who started a business in the past 2 years?" (0 = "no", 1 = "yes").

Self-efficacy. Self-efficacy can be assessed using a binary variable, respondents answered if they believed they had the required skills and knowledge to start a business (0 = "no", 1 = "yes").

Collectivism. The in-group collectivism societal practices in the GLOBE database refer to the extent to which individuals express (and should express) pride, loyalty and cohesion in an organization or family, reflecting the culture of collectivism at the national level. We used this item to measure the extent of national collectivistic culture.

Media publicity. Media publicity was measured by an individualized response in which subjects were asked: "In my country, you will often see stories in the public media and/or internet about successful new businesses." (0 = "no", 1 = "yes"). To obtain country-level scores for media publicity, we aggregated individual responses to the country level and calculated ANOVA, ICC1 and ICC2 and RWG score to assess the reasonableness. The variance between countries was significant, $F(34, 124,047) = 181.674, p < 0.01$., ICC(1) values were 0.053 and ICC(2) values were 0.994, which showed acceptable interrater reliability and reliability of the average index for a country. In addition, The mean Rwg (using a uniform null distribution) for entrepreneurial legitimacy was 0.891, which is above the acceptable threshold of 0.70. Combining these results, we believe that the aggregation of this variable to the national level is reasonable.

Entrepreneurial intention. Binary variables were used to assess entrepreneurial intentions. Respondents were asked: "Are you, alone or with others, expecting to start a new business, including any type of self-employment, within the next three years?" (0 = "no", 1 = "yes").

3.3 Control variables

In addition to the above variables, we also consider the effect of demographic variables, such as age, gender, income, the individual's education level, work status, individual's risk perception and entrepreneurial opportunities recognition, as the control variables. At the national level, we introduce the Composite Index of National Capability (CINC) as a control variable, which is a statistical measure of national strength that includes total population,

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Country	N	Role model	Collectivism	Media publicity	Entrepreneurial self-efficacy	Entrepreneurial intention
USA	2,000	0.31	5.01	0.74	0.54	0.17
Egypt	2,521	0.15	5.6	0.69	0.47	0.58
South Africa	3,103	0.29	5.04	0.71	0.41	0.13
Greece	2,000	0.23	5.37	0.43	0.43	0.07
The Netherlands	2,259	0.36	4.44	0.65	0.46	0.1
France	2,000	0.29	4.9	0.48	0.32	0.15
Spain	23,400	0.33	5.62	0.51	0.43	0.06
Italy	2,005	0.22	5.33	0.55	0.33	0.13
Switzerland	2,422	0.31	4.46	0.62	0.38	0.08
UK	8,990	0.29	4.81	0.57	0.44	0.07
Sweden	5,023	0.32	4.85	0.68	0.33	0.08
Poland	8,043	0.46	5.63	0.5	0.52	0.11
Germany	4,450	0.27	4.87	0.48	0.43	0.09
Mexico	5,121	0.34	5.83	0.59	0.53	0.19
Argentina	2,031	0.26	5.83	0.47	0.41	0.13
Colombia	2,098	0.41	5.99	0.54	0.69	0.55
Malaysia	2,033	0.4	5.68	0.82	0.44	0.26
Australia	2,000	0.3	4.96	0.73	0.49	0.12
Indonesia	2,500	0.7	5.68	0.86	0.62	0.27
Thailand	2,000	0.3	5.73	0.84	0.49	0.45
Japan	2,017	0.19	4.95	0.56	0.11	0.08
South Korea	2,000	0.43	5.48	0.6	0.46	0.25
China	3,911	0.48	5.45	0.7	0.28	0.21
India	4,000	0.3	5.62	0.46	0.4	0.12
Iran	3,097	0.49	5.95	0.49	0.53	0.42
Canada	2,184	0.36	5.12	0.76	0.54	0.2
Morocco	3,099	0.44	5.78	0.46	0.5	0.31
Ireland	2,006	0.3	5.44	0.73	0.43	0.15
Slovenia	2,005	0.35	5.57	0.73	0.51	0.13
Guatemala	2,650	0.43	5.89	0.55	0.65	0.46
Ecuador	2,060	0.37	5.99	0.71	0.72	0.49
Kazakhstan	2,100	0.54	5.35	0.5	0.65	0.52
Taiwan	2,200	0.41	5.52	0.81	0.26	0.3
Israel	2,012	0.59	5.23	0.55	0.45	0.31
Qatar	2,742	0.28	5.15	0.54	0.4	0.19

Table 1. Country descriptive statistics for study variables

Note: Mean values for the study variables for each country are reported
Source: Table by authors

urban population. According to Khanh, there is a relationship between national competitiveness and entrepreneurship (Doan, 2021). Also, we controlled cultural support for the entrepreneurship index to avoid its influences on entrepreneurial behavior.

3.4 Data analysis methodology

The study used hierarchical linear modeling (HLM) as the methodology, and HLM 6.08 was used for data analysis. HLM is a statistical analysis method developed by considering the effects of different levels of univariate variables on the individual level. It differs most from traditional regression analysis in its treatment of variables at different levels. Traditional analysis methods place individual and organizational level variables in a single regression

model, which seriously violates the assumption of variable independence in regression analysis. The HLM's configuration is contingent upon the data characteristics and study requirements. According to the purpose of the study, the following four different models will be tested in turn using the HLM, which include the null model, random coefficients regression model, intercepts as outcomes model and slopes as outcomes model. The null model was used to test whether there was intragroup consistency and intergroup variation in the data. Random coefficient regression models were adopted to test the main effects of entrepreneurial role models on self-efficacy and individuals' entrepreneurial intentions, and whether the slope and intercept of individual-level regression models differed between groups. The intercept prediction model was used to detect the main effects of media publicity and collectivism, while the slope prediction model was applied to examine the moderating effects of media publicity and collectivism on the relationship between entrepreneurial role models and entrepreneurial intentions and self-efficacy, as well as cross-level three-way interactions among entrepreneurial role models, media publicity and collectivism (Hofmann, 1997). Specific data analysis models are shown in [Appendices 1 and 2](#).

4. Results

[Table 2](#) presents the means, standard deviations and correlations among the study variables. From [Table 2](#), it can be tentatively concluded that entrepreneurial role models are positively correlated with entrepreneurial intentions, and control variables such as age, gender, education level, job status and income are all associated with individuals' entrepreneurial intentions. In addition, self-efficacy was also positively related to individuals' entrepreneurial intentions.

In this study, participants (Level 1) were grouped within their country (Level 2). Excluding categorical variables such as gender, education, work status and income, we group-mean centered all Level 1 variables to avoid influencing between-group and cross-level interactions (Hofmann and Gavin, 1998). To alleviate multicollinearity in the Level 2 estimation, we grand-mean centered media publicity and collectivism, and these variables were all set with random effects.

During the analysis of cross-level studies, the presence of cross-level effects is first tested, i.e. the inter- and intragroup variance of the dependent variable must be significant. Therefore, our first step was to analyze the null model with entrepreneurial intention as the dependent variable and no predictors. According to [Table 3](#), the results showed a between-group variance of 0.027, which was significant ($\chi^2 = 10,217.747$, $df = 34$, $p < 0.001$), and a within-group variance of 0.148. The intragroup correlation coefficient (ICC1) was further calculated to be 0.175, which explains 17.5% of the country differences in the total change in entrepreneurial intentions, and the inter-group correlation coefficient ICC2 was 0.996, both of which indicate that multilevel modeling is an appropriate analytical approach for the present model (Mathieu *et al.*, 2012).

Next, the random coefficients regression model will be built. The results of the analysis show that the within-group variance decreases from 0.148 to 0.132 after adding entrepreneurial role models and control variables to Level 1, i.e. the effect sizes are 10.8%, which indicates that the variables added to Level 1 have an explanatory effect of 10.8% on the variance of the dependent variable. Entrepreneurial role models reached a significant level ($\gamma_{60} = 0.063$ ($SE = 0.008$, $t = 10.485$, $df = 34$, $p < 0.001$), which indicates that entrepreneurial role models at the individual level have a positive impact on individuals' intention to start a business. Thus, *H1* was supported. Intercepts as outcome model was subsequently built to show the explanatory contribution of level2 variables on individuals' entrepreneurial intentions. According to Model 3, when collectivism and media publicity were added to Level 2, the between-group variance decreased from 0.027 to 0.020, which means the effect sizes were

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Entrepreneurial intention	0.18	0.38	1													
2. Age	41.84	14.77	-0.184**	1												
3. Gender	1.50	0.50	-0.056**	0.031**	1											
4. Education	3.26	1.39	0.056**	-0.120**	-0.033**	1										
5. Work status	2.20	1.69	-0.033**	-0.081**	0.165**	-0.185**	1									
6. Income	23046.20	31063.70	0.029**	-0.037**	-0.069**	0.254**	-0.152**	1								
7. Risk perception	0.40	0.49	-0.040**	-0.046**	0.051**	-0.012**	0.026**	-0.012**	1							
8. Cultural support for entrepreneurship index	1.87	0.98	0.113**	-0.024**	-0.004	0.008**	-0.023**	0.000	0.035**	1						
9. CINC	0.02	0.04	-0.001	0.001	0.002	0.001	-0.031**	-0.005	-0.016**	0.025**	1					
10. Entrepreneurial opportunities	0.42	0.493	0.164**	-0.050**	-0.047**	0.121**	-0.102**	0.095**	-0.067**	0.185**	-0.012**	1				
11. Role model	0.35	0.48	0.162**	-0.098**	-0.063**	0.117**	-0.117**	0.109**	-0.019**	0.059**	0.030**	0.230**	1			
12. Collectivism	5.11	0.70	0.155*	-0.027**	0.006**	-0.226**	0.111**	-0.032**	-0.029**	-0.028**	0.161**	-0.067**	0.072**	1		
13. Media publicity	0.59	0.49	0.072**	0.019**	0.001	0.040**	-0.038**	0.008*	0.010**	0.661**	0.037**	0.128**	0.058**	-0.029**	1	
14. Entrepreneurial self-efficacy	0.45	0.50	0.225**	-0.019**	-0.109**	0.089**	-0.133**	0.090**	-0.125**	0.073**	-0.062**	0.211**	0.252**	0.059**	0.070**	1

Notes: * $p < 0.05$, ** $p < 0.01$

Source: Table by authors

Table 2.
Means, standard deviations and correlations among study variables

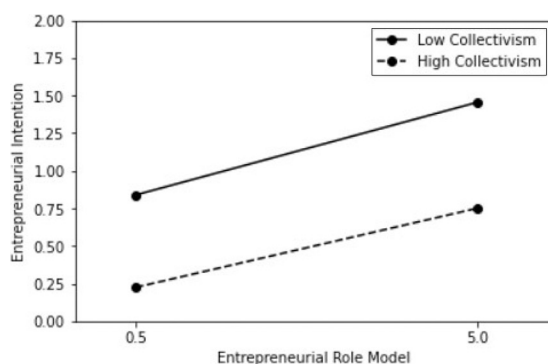
Table 3.
Results of multilevel modeling analyses – entrepreneurial intention as the dependent variable

Level and variable	Entrepreneurial intention					
	Null model (Model 1)	Random coefficients regression model (Model 2)	Intercepts as outcomes model (Model 3)	Slopes as outcomes model (Model 4)	Slopes as outcomes model (Model 5)	Slopes as outcomes model (Model 6)
<i>Level 1</i>						
Age (γ50)	—	-0.004** (0.0004)	—	-0.003** (0.0004)	-0.003** (0.0004)	-0.003** (0.0004)
Gender (γ40)	—	-0.023** (0.007)	—	-0.033** (0.008)	-0.033** (0.008)	-0.022** (0.007)
Education (γ30)	—	0.002 (0.003)	—	0.005 (0.003)	0.005 (0.003)	0.002 (0.003)
Work status (γ10)	—	0.003 (0.002)	—	-0.001 (0.003)	-0.001 (0.003)	0.002 (0.002)
Income (γ20)	—	-0.000 (0.000)	—	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Risk perception (γ80)	—	-0.019** (0.006)	—	-0.032** (0.006)	-0.032** (0.006)	-0.016** (0.006)
Cultural perception to entrepreneurship index (γ90)	—	0.020** (0.005)	—	0.024** (0.005)	0.024** (0.005)	0.017** (0.004)
Opportunity (γ70)	—	0.079** (0.010)	—	0.096** (0.011)	0.096** (0.011)	0.074** (0.010)
CINC (γ11)	—	-0.137 (0.275)	—	-0.194 (0.266)	0.000 (0.253)	-0.683* (0.274)
Intercept (γ00)	0.163** (0.027)	0.273** (0.036)	0.246** (0.023)	0.283** (0.034)	0.280** (0.037)	0.283** (0.033)
Role model (γ60)	—	0.063** (0.008)	—	0.088** (0.008)	0.087** (0.008)	0.067** (0.009)
<i>Level 2</i>						
Collectivism (γ01)	—	—	0.119** (0.023)	0.080** (0.019)	—	0.126** (0.023)
Media publicity (γ02)	—	—	0.198 (0.172)	—	-0.166 (0.158)	0.244 (0.167)
<i>Two-way interactions</i>						
Role model × media publicity (γ61)	—	—	—	—	0.143** (0.051)	0.170* (0.078)
Role model × collectivism (γ62)	—	—	—	-0.024* (0.009)	—	0.004 (0.011)
Collectivism × media publicity (γ03)	—	—	—	—	—	-0.075 (0.183)
<i>Three-way interactions</i>						
Role model × collectivism × media publicity (γ63)	—	—	—	—	—	0.075 (0.122)

Notes: * $p < 0.05$; ** $p < 0.01$
Source: Table by authors

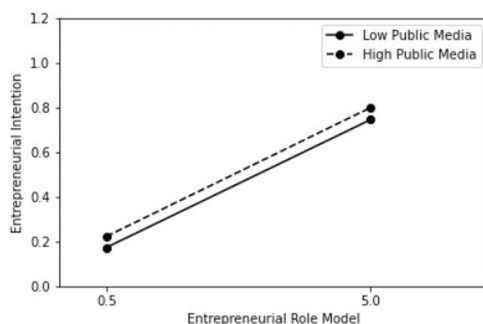
25.9%, indicating that the variables added to Level 2 had an explanatory effect of 25.9% on the variance of the dependent variable.

Eventually, the slope as outcomes model was developed. According to Model 4, the interaction between entrepreneurial role models and collectivism was significant ($\gamma_{62} = -0.024$ ($SE = 0.009$, $t = -2.716$, $df = 33$, $p < 0.05$, i.e. collectivism plays a moderating role in the relationship between entrepreneurial role models and entrepreneurial intentions; therefore, $H7$ was supported. By creating two clusters of high collectivism (above the mean of all collectivism data) and low collectivism (below the mean of all collectivism data), we plotted and tested the pattern of this interaction (see Figure 2) and calculated the simple slope of the effect of entrepreneurial role models on entrepreneurial intentions for each of the two conditions. Simple slope analysis reveals that the higher the level of collectivism in the country, the weaker the effect of entrepreneurial role models on entrepreneurial intentions ($Y_0 = 0.077 + 0.137X_0$, $Y_1 = 0.166 + 0.117X_1$). Based on Model 5, the interaction between entrepreneurial role models and media publicity is significant ($\gamma_{61} = 0.143$ ($SE = 0.051$, $t = 2.827$, $df = 33$, $p = 0.008$), which means that media publicity plays a moderating role in the relationship between entrepreneurial role models and entrepreneurial intentions. Therefore $H5$ was confirmed. We also plotted and tested the pattern of this interaction by creating two clusters of high media publicity (above the mean of all media publicity data) and low media publicity (below the mean of all media publicity data) (see Figure 3), and calculated



Source: Figure by authors

Figure 2.
Interaction of entrepreneurial role models and collectivism on entrepreneurial intentions



Source: Figure by authors

Figure 3.
Interaction of entrepreneurial role models and media publicity on entrepreneurial intentions

the simple slope of the impact of entrepreneurial role models on entrepreneurial intentions for each of the two conditions. The simple slope analysis suggests that the higher the level of media publicity in the country, the stronger the influence of entrepreneurial role models on entrepreneurial intentions ($Y_0 = 0.109 + 0.127X_0$, $Y_1 = 0.158 + 0.128X_1$). $H9$ predicts a cross-level three-way interaction between entrepreneurial role models, collectivism and media publicity on entrepreneurial intentions. According to Model 6, there was no significant three-way interaction term ($\gamma_{63} = 0.075$, $SE = 0.122$, $t = 0.613$, $df = 31$, $p > 0.01$), therefore, $H9$ was not supported.

Next, according to Baron and Kenny’s principle of mediation effect test (Baron and Kenny, 1986), the mediating role of self-efficacy between entrepreneurial role models and entrepreneurial intentions at the individual level will be verified. According to Table 4, after controlling for personal characteristics variables, the regression coefficient of entrepreneurial role models on individual self-efficacy is significant ($\beta = 0.194$, $p < 0.001$, adjusted $R^2 = 0.117$, $F = 886.124^{**}$), which supports $H2$; Furthermore, the regression coefficient of entrepreneurial role models on individuals’ entrepreneurial intentions was significant ($\beta = 0.092$, $p < 0.001$, adjusted $R^2 = 0.079$, $F = 569.747^{**}$). After adding the self-efficacy, the regression equation remained significant (adjusted $R^2 = 0.109$, $F = 721.145^{**}$), the regression coefficient of entrepreneurial role models on individuals’ entrepreneurial intentions was significant ($\beta = 0.064$, $p < 0.001$) and the regression coefficient of self-efficacy on entrepreneurial intentions was also significant ($\beta = 0.149$, $p < 0.001$), indicating that $H3$ was supported. Comparing the two models above, the addition of the self-efficacy significantly increases the proportion of variance explained by the new regression equation over the previous one by 3.0% ($\Delta R^2 = 0.030$, $\Delta F = 151.398^{**}$, and the regression coefficient of entrepreneurial role models on individuals’ entrepreneurial intentions decreases from 0.092 to 0.064. It is thus clear that self-efficacy can partially mediate the effect of entrepreneurial role models on individuals’ entrepreneurial intentions, thus $H4$ was supported.

Next, we will use the same analysis steps to validate the multilevel model with the dependent variable as self-efficacy. We first analyzed the null model with self-efficacy as the

Variable	Self-efficacy	Entrepreneurial intention	Entrepreneurial intention
Age	3.221e ^{-5**}	-0.005**	-0.005**
Gender	-0.066**	-0.023**	-0.014**
Education	0.004**	-0.001	-0.002
Work status	-0.020**	-0.002*	0.001
Income	6.409 e ^{-7**}	-2.896 e ⁻⁸	-1.238 e ^{-7*}
Risk perception	-0.105**	-0.040**	-0.024**
Cultural perception to entrepreneurship index	0.026**	0.038**	0.034**
Opportunity	0.136**	0.091**	0.073**
CINC	-0.897**	-0.168**	-0.032
Role model	0.194**	0.092**	0.064**
Self-efficacy			0.149**
Adjusted R^2	0.117	0.079	0.109
F	886.124**	569.747**	721.145**
ΔR^2			0.030
ΔF			151.398**

Table 4.
Results of mediation effect test

Notes: * $p < 0.05$; ** $p < 0.01$
Source: Table by authors

dependent variable and no predictors. According to Table 5, the results showed a significant between-group variance of 0.015 ($\chi^2 = 3221.245$, $df = 34$, $p < 0.001$) and a within-group variance of 0.238. Further calculating the intra-group correlation coefficient (ICC1) of 0.059, which explained 5.9% of the country differences in the total change in self-efficacy, and the between-group correlation coefficient ICC(2) of 0.989. This indicates that multilevel modeling is an appropriate analysis method for the present model (Mathieu *et al.*, 2012). The random coefficient regression model will be built next. The results of the analysis show that the within-group variance decreases from 0.238 to 0.208 after the addition of entrepreneurial role models and control variables to Level 1, which means the effect sizes are 12.8%. This indicates that the variables added to Level 1 have an explanatory effect of 12.8% on the variance of the dependent variable. Entrepreneurial role models reached a significant level ($\gamma_{60} = 0.184$ ($SE = 0.008$, $t = 21.852$, $df = 34$, $p < 0.001$), suggesting that entrepreneurial role models at the individual level have a positive impact on self-efficacy. Therefore, *H2* was supported. Intercepts as outcomes model were subsequently developed to show the explanatory contribution of the Level 2 variables to individuals' entrepreneurial intentions. According to Model 3, when the collectivism and media publicity were added to Level 2, the between-group variance decreased from 0.01484 to 0.01468, which means that the effect sizes were 1.08%, indicating that the explanatory effect of the variables added to Level 2 on the variance of the dependent variable was 1.08%.

Eventually, the slopes as outcomes model was developed. According to Model 4, the interaction between entrepreneurial role models and collectivism was significant ($\gamma_{62} = -0.043$, ($SE = 0.007$, $t = -6.492$, $df = 33$, $p < 0.001$), i.e. collectivism plays a moderating role in the relationship between entrepreneurial role models and self-efficacy, therefore, *H8* was supported. Following the same methodology mentioned earlier, we plotted and tested the pattern of this interaction (see Figure 4) and calculated the simple slope of the effect of entrepreneurial role models on self-efficacy for each of the two conditions. The simple slope analysis showed that the higher the level of collectivism in the country, the weaker the effect of entrepreneurial role models on self-efficacy ($Y_0 = 0.321 + 0.285X_0$, $Y_1 = 0.384 + 0.246X_1$). According to Model 5, the interaction between entrepreneurial role models and media publicity was significant ($\gamma_{61} = 0.143$ ($SE = 0.062$, $t = 2.294$, $df = 33$, $p = 0.028$), i.e. media publicity plays a moderating role in the relationship between entrepreneurial role models and self-efficacy. Following the same approach, we plotted and tested the pattern of this interaction (see Figure 5) and calculated the simple slope of the effect of entrepreneurial role models on self-efficacy in each of the two conditions. The simple slope analysis showed that the higher the level of media publicity in the country, the stronger the effect of entrepreneurial role models on self-efficacy ($Y_0 = 0.338 + 0.251X_0$, $Y_1 = 0.394 + 0.258X_1$). Therefore, *H6* was confirmed. *H10* predicted a cross-level three-way interaction between entrepreneurial role models, collectivism and media publicity on self-efficacy. According to Model 6, there was no significant three-way interaction term ($\gamma_{63} = 0.014$ ($SE = 0.056$, $t = 0.243$, $df = 31$, $p > 0.01$), therefore, *H10* was not supported.

5. Endogeneity test

To avoid biased results of model coefficients due to endogeneity issues, this study aims to use the instrumental variable of perceived standard of living to deal with omitted variables and possible reverse causality issues between entrepreneurial role models and self-efficacy and entrepreneurial intention. Perceived standard of living may influence an individual's entrepreneurial intention due to its uniqueness, which tends to have an impact on others' lifestyles. There has been no evidence that this indicator has an impact on entrepreneurial

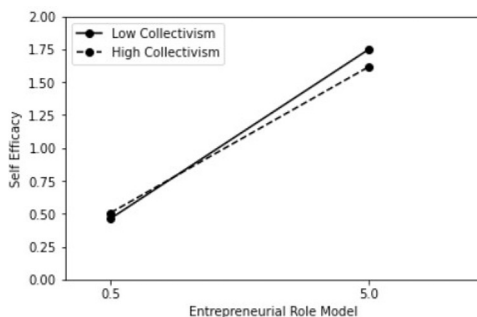
Table 5. Results of multilevel modeling analyses – self-efficacy as the dependent variable

Level and variable	Null model (Model 1)	Self-efficacy				
		Random coefficients regression model (Model 2)	Intercepts as outcomes model (Model 3)	Slopes as outcomes model (Model 4)	Slopes as outcomes model (Model 5)	Slopes as outcomes model (Model 6)
<i>Level 1</i>						
Age (γ_{50})	—	0.001** (0.0004)	—	0.0009* (0.0004)	0.0009 (0.0004)	0.0009 (0.0004)
Gender (γ_{40})	—	-0.073** (0.010)	—	-0.073** (0.010)	-0.073** (0.010)	-0.073** (0.010)
Education (γ_{30})	—	0.023** (0.003)	—	0.023** (0.003)	0.023** (0.003)	0.023** (0.003)
Work status (γ_{10})	—	-0.024** (0.002)	—	-0.024** (0.002)	-0.024** (0.002)	-0.024** (0.002)
Income (γ_{20})	—	0.000** (0.000)	—	0.000** (0.000)	0.000** (0.000)	0.000** (0.000)
Risk perception (γ_{80})	—	-0.107** (0.013)	—	-0.108** (0.013)	-0.108** (0.013)	-0.108** (0.013)
Cultural perception to entrepreneurship index (γ_{90})	—	0.022** (0.007)	—	0.022** (0.007)	0.022** (0.007)	0.022** (0.007)
Opportunity (γ_{70})	—	0.119** (0.012)	—	0.118** (0.012)	0.119** (0.012)	0.118** (0.012)
CINC (γ_{11})	—	-0.680* (0.281)	—	-0.659* (0.336)	-0.684* (0.270)	-0.870** (0.250)
Intercept (γ_{00})	0.493** (0.020)	—	0.493** (0.020)	0.493** (0.020)	0.576** (0.030)	0.580** (0.027)
Role model (γ_{60})	—	0.184** (0.008)	—	0.184** (0.008)	0.184** (0.008)	0.185** (0.008)
<i>Level 2</i>						
Collectivism (γ_{01})	—	—	0.046 (0.026)	0.063* (0.024)	—	0.070** (0.023)
Media publicity (γ_{02})	—	—	0.029 (0.158)	—	0.010 (0.157)	0.102 (0.143)
<i>Two-way interactions</i>						
Role model \times media publicity (γ_{61})	—	—	—	—	0.143* (0.062)	0.093 (0.057)
Role model \times collectivism (γ_{62})	—	—	—	-0.043** (0.007)	—	-0.042** (0.007)
Collectivism \times media publicity (γ_{03})	—	—	—	—	—	-0.749** (0.224)
<i>Three-way interactions</i>						
Role model \times collectivism \times media publicity (γ_{63})	—	—	—	—	—	0.014 (0.056)

Notes: * $p < 0.05$, ** $p < 0.01$
Source: Table by authors

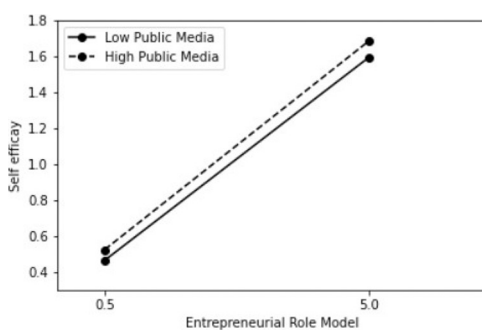
intentions, so this variable meets the relevance and homogeneity requirements for selecting instrumental variables. The results of the specific analysis are shown in Table 6.

The results of the first-stage regression show that there is a significant effect at the 1% statistical level between the perceived standard of living and entrepreneurial role modeling,



Source: Figure by authors

Figure 4. Interaction of entrepreneurial role models and collectivism on self-efficacy



Source: Figure by authors

Figure 5. Interaction of entrepreneurial role models and media publicity on self-efficacy

Explanatory variable	Perceived standard of living		Perceived standard of living	
	Stage 1	Stage 2	Stage 1	Stage 2
	Role model	Entrepreneurial intention	Role model	Self-efficacy
Perceived standard of living	-0.012*** (0.004)		-0.012*** (0.004)	
Role model		0.086*** (0.003)		0.200*** (0.004)
Control variable	Yes	Yes	Yes	Yes
Durbin	8.09024			19.9773
Wu-Hausman	8.08984			19.9803
p-value	0.000			0.000
R ²	0.0730			0.0741

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Source: Table by authors

Table 6. Results of endogeneity test

i.e. the index has strong explanatory power for endogenous variables, which indicates that the selection of this instrumental variable is reasonable. In addition, after controlling for the endogeneity problem, according to the results of the second-stage regression, there is still a significant effect of entrepreneurial role model on self-efficacy and entrepreneurial intention at the 1% statistical level, so the previous conclusion is supported.

6. Discussion

Building on new institutional theory and social cognitive career theory, this study introduces two independent country-level environmental factors, collectivism and media publicity, as moderating variables to explore the influence of entrepreneurial role models on entrepreneurial intentions in different cultural contexts and subsequently examines the mediating role of self-efficacy.

First, the findings indicate that, in line with the existing research, entrepreneurial role models have a beneficial impact on individuals' entrepreneurial inclinations. Moreover, this effect is applicable to all the countries examined in this study. This indicates that the impact of entrepreneurial role models on individuals' entrepreneurial inclinations was similar across different cultures, as it was observed in a single country.

Second, we provide evidence that entrepreneurial role models have a beneficial impact on self-efficacy. In detail, potential entrepreneurs with entrepreneurial role models have higher self-efficacy compared to those who do not have. Furthermore, we confirmed that self-efficacy is related to individuals' entrepreneurial intentions and the higher the self-efficacy, the more likely individuals are to have entrepreneurial intentions; In combination, this study suggests that self-efficacy can partially mediate the effect of entrepreneurial role models on entrepreneurial intentions, meaning that in different cultural contexts, entrepreneurial role models can stimulate potential entrepreneurs' self-efficacy by providing communication opportunities and support and offering entrepreneurial templates and methods, etc. thereby facilitating the generation of entrepreneurial intentions.

Moreover, the results also confirmed that both collectivism and media publicity had a moderating effect on the positive relationship between entrepreneurial role models and self-efficacy and entrepreneurial intentions. In a cultural context characterized by collectivist tendencies, the impact of entrepreneurial role models on an individual's self-efficacy and entrepreneurial goals is diminished. This means that collectivism has a negative moderating effect. Besides, the influence of entrepreneurial role models on individuals' self-efficacy and entrepreneurial intentions was enhanced in a cultural context with higher media publicity, i.e. media publicity acted as a positive moderator.

Finally, the cross-level three-way interaction between entrepreneurial role models, media publicity and collectivism is not supported by the research data in this paper. We attempt to clarify this outcome by noting that media publicity frequently reflects national cultural trends, as it is regarded as a starting point for analyzing a society's cultural values and orientations. Extending to the media promotion of entrepreneurial role models, it can be understood that in countries with collectivist tendencies, media publicity that highlights entrepreneurial role models may also have several collectivist elements in the presentation of their entrepreneurial process or story, such as describing that they have received a lot of help from their family in starting their business or that they founded their business with their friends (Ran, 2020). These elements of collectivist tendencies may weaken the moderating effect of collectivism, which may lead to a less significant interaction between collectivism, entrepreneurial role models and media publicity.

7. Implications

Some theoretical implications are associated with the findings. First, building on previous studies that explored the relationship between entrepreneurial role models and individuals' entrepreneurial intentions (Stupacher *et al.*, 2017), we further validated the moderating role of two national-level situational factors, collectivism and media advocacy, which echoes Abbasianchavari and Moritz (2021) that exploring the effects of entrepreneurial role models on entrepreneurial intentions in different cultural context is an essential topic for the future research.

Second, we demonstrated that self-efficacy can mediate the relationship between entrepreneurial role models and entrepreneurial intentions and that this finding is generalizable. This responds to the hypothesis presented by Morgenroth *et al.* (2015) that role models can facilitate the generation of goals and behavioral intentions by increasing role aspirates' self-efficacy, as it enhances their perceived accessibility to goals.

Another contribution is that we found a possible explanation that the interaction of collectivism and media publicity with entrepreneurial role models may influence individuals' entrepreneurial intentions by affecting their self-efficacy, which unifies the new institutional theory and social cognition career theory.

This study also provides some practical insights for triggering individuals' entrepreneurial intentions. First, it is crucial to increase the visibility of entrepreneurial role models, as our research indicates that they can have a positive impact on entrepreneurial intentions, with self-efficacy serving as a mediator. For example, it is advised for the society to publish entrepreneurs' autobiographies, open entrepreneurial forums, create entrepreneurial interview columns, etc. In these books and activities, detailed descriptions of successful entrepreneurs' methods and skills are highly needed, as these can help potential entrepreneurs to better understand the entrepreneurial process, thus improving their self-efficacy and facilitating their entrepreneurial activities. With the help of public media such as TikTok, entrepreneurial role models can also be invited to give speeches and communicate live in front of the public as a way to increase their influence. It is important to acknowledge that the alignment between the traits of entrepreneurial role models and potential entrepreneurs should not be disregarded, as shared features may enhance the aspiration of future entrepreneurs to imitate entrepreneurial role models (Hoffner and Buchanan, 2005). These shared attributes include both demographic factors, such as gender, race and age, as well as personal factors, such as goal embodiment and educational background (Bosma *et al.*, 2012; Morgenroth *et al.*, 2015).

Moreover, we believe that the media's promotion of entrepreneurial role models and entrepreneurial activities needs to be enhanced, for example, by incorporating entrepreneurship education in television programs, allowing youth to meet face-to-face with successful entrepreneurs and developing entrepreneurship lectures or interview programs. The media should be customized to the cultural and stylistic differences of various nations, with an emphasis on the distinctive values and preferences of audiences in the East and the West.

At the same time, role models should be presented differently in diverse cultural contexts. For example, in countries with strong collectivist tendencies, the media should publicize entrepreneurial role models with collectivist messages, such as cooperation with the government, family and friends, which are in line with collectivist values, so that potential entrepreneurs in a collectivist context feel that the role models are more similar to themselves, which increases entrepreneurial intentions; On the contrary, in countries with low collectivist tendencies, the media can appropriately carry an element of individualism when promoting entrepreneurial role models, for example, by telling how entrepreneurs succeed on their own strength and superior abilities, which is by the values of individualism.

Based on the same logic, potential entrepreneurs in the context of individualism may thus generate more entrepreneurial intentions.

8. Conclusion

Prior research has indicated that entrepreneurial role models have a positive effect on individuals' intentions to engage in entrepreneurship. However, there is a dearth of investigation into this effect and its underlying mechanisms in many cultural settings (Abbasianchavari and Moritz, 2021). In response, based on a cross-level and cross-national survey, this paper advances the original literature by introducing two cultural dimensions, collectivism and media publicity. The current findings indicate that the positive effect of entrepreneurial role models on individuals' intention to become entrepreneurs is rather widespread, and that self-efficacy serves as a mediator in this relationship. Moreover, collectivism and media publicity can negatively and positively moderate the effects of entrepreneurial role models on self-efficacy and entrepreneurial intentions, respectively. The findings provide some theoretical support for the role of cultural context in the formation of entrepreneurial intentions, which can help countries with diverse cultures develop differentiated entrepreneurial role model advocacy strategies to better facilitate the emergence of potential entrepreneurs and advance their subsequent entrepreneurial activities.

Furthermore, it is important to consider the limitations of this study.

First, because this study assumes that entrepreneurial role models are templates that can motivate potential entrepreneurs and provide them with an approach to entrepreneurship, this may mean that the findings of this paper do not apply to all situations, as scholars usually categorize role models into positive and negative ones. Negative role models refer to individuals who have failed or negative experiences and can motivate others to avoid similar experiences, such as entrepreneurs who fail to start a business, drunk drivers, students cheating on exams, etc. It has been shown that individuals from a collective culture are more likely to be motivated by negative role models (Lockwood *et al.*, 2005), which can be explained by regulatory focus theory. People who have been raised in collectivist cultures are inclined to have a strong interdependent self-concept and perceive themselves as a component of a network of relationships. They are inclined to be concerned about their responsibilities and obligations toward others and attempt to avoid behaviors that could lead to social disruption or disappoint the important people in their lives, thus they tend to be more prone to self-criticism and to look for mistakes that need to be corrected, i.e. to set prevention goals, which can be provided by negative role models. It therefore seems reasonable that negative role models will be especially important to members of collectivistic cultures. Extending this to the entrepreneurial domain, collectivism may positively moderate the effect of negative role models on individuals' entrepreneurial intentions, which appears to be opposite from existing findings. Therefore, the effect of different types of role models on entrepreneurial intention in a cross-cultural context will be considered as one of the future research directions.

Furthermore, this article assumes that the level of media exposure and collectivism is uniform across a country when measuring country-level variables, without considering variations in these variables between different areas within the same country. For instance, a study from Israel showed that people in religious areas scored higher on items emphasizing collectivist tendencies than in nonreligious areas (Sagy *et al.*, 1999), which gives us reason to believe that there exists intra-national differences in variables. Thus, future studies are anticipated to use more detailed methodologies to investigate, for instance, the impact of entrepreneurial role models on entrepreneurial intentions, taking into account regional variations in media publicity and collectivism, rather than just national variations.

Third, the analysis in this paper did not consider the dynamic impact of entrepreneurial role models on the entrepreneurial process due to the utilization of a cross-sectional research approach. In addition, the focus of this study is only on entrepreneurial intention, which is separated from the subsequent entrepreneurial behavior of entrepreneurs. A study based on rooting theory concluded that, first, entrepreneurs would choose various role models in different entrepreneurial stages, and the same role model may play different roles in various stages of the entrepreneurial process and have different intensities of influence on the entrepreneur. Hence, there should be a greater focus on the longitudinal study design that examines the dynamic impact of role models on the entrepreneurial process.

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Appendix 1

The null model with entrepreneurial intention as the dependent variable and the equations used in the above data analysis are presented below:

Null model (random analysis of variance model):

$$\text{Level 1: } Y_{ij} = \beta_{0j} + \varepsilon_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \mu_{0j}$$

Random coefficient regression model (excluding control variables):

$$\text{Level 1: } Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij} + \varepsilon_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10} + \mu_{1j}$$

Intercepts as outcomes model:

$$\text{Level 1: } Y_{ij} = \beta_{0j} + \varepsilon_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{01}Z_j + \gamma_{02}W_j + \mu_{0j}$$

Slopes as outcomes model (moderating model, excluding control variables):

$$\text{Level 1: } Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij} + \varepsilon_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{01}Z_j/W_j + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}Z_j/W_j + \mu_{1j}$$

Slopes as outcomes model (cross-level interaction model, not including control variables):

$$\text{Level 1: } Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij} + \varepsilon_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{01}Z_j + \gamma_{02}W_j + \gamma_{03}(Z_j \times W_j) + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}Z_j + \gamma_{12}W_j + \gamma_{13}(Z_j \times W_j) + \mu_{1j}$$

Y_{ij} = entrepreneurial intention of individual i in country j

X_{ij} = entrepreneurial role model of individual i in country j

Z_j = Collectivism in country j

W_j = Public media in country j

Source: By authors

Appendix 2

The null model with self-efficacy as the dependent variable and the equations used in the above data analysis are presented below.

Null model (random analysis of variance model):

$$\text{Level 1: } Y_{ij} = \beta_{0j} + \varepsilon_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \mu_{0j}$$

Random coefficient regression model (excluding control variables):

$$\text{Level 1: } Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij} + \varepsilon_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10} + \mu_{1j}$$

Intercepts as outcomes model

$$\text{Level 1: } Y_{ij} = \beta_{0j} + \varepsilon_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{01}Z_j + \gamma_{02}W_j + \mu_{0j}$$

Slopes as outcomes model (moderating model, excluding control variables):

$$\text{Level 1: } Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij} + \varepsilon_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{01}Z_j/W_j + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}Z_j/W_j + \mu_{1j}$$

Slopes as outcomes model (cross-level interaction model, not including control variables):

$$\text{Level 1: } Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij} + \varepsilon_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{01}Z_j + \gamma_{02}W_j + \gamma_{03}(Z_j \times W_j) + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}Z_j + \gamma_{12}W_j + \gamma_{13}(Z_j \times W_j) + \mu_{1j}$$

Y_{ij} = Self-efficacy of individual i in country j

X_{ij} = entrepreneurial role model of individual i in country j

Z_j = Collectivism in country j

W_j = Public media in country j

Source: By authors

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