



European Journal of Training and Development

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Article information:

To cite this document:

Saeid Karimi, Harm J.A. Biemans, Thomas Lans, Mohammad Chizari, Martin Mulder, (2014) "Effects of role models and gender on students' entrepreneurial intentions", European Journal of Training and Development, Vol. 38 Issue: 8, pp.694-727, <https://doi.org/10.1108/EJTD-03-2013-0036>

Permanent link to this document:

<https://doi.org/10.1108/EJTD-03-2013-0036>

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Effects of role models and gender on students' entrepreneurial intentions

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Abstract

Purpose – This paper aims to, drawing on the theory of planned behaviour (TPB), explore the effects of entrepreneurial role models on entrepreneurial intention (EI) and its antecedents and examines the question of whether the effects vary by gender.

Design/methodology/approach – Data were collected from a sample of 331 students at seven universities in Iran. Structural equation modelling and bootstrap procedure were used to analyse the data.

Findings – Consistent with the TPB, our results show entrepreneurial role models to indirectly influence EIs via the antecedents of intention. No gender differences in the relationship between perceived behaviour control and EIs were found, but gender did moderate the other relationships within the TPB. Attitude towards entrepreneurship was a weaker predictor and subjective norms a stronger predictor of EIs for female students than for their male counterparts. Furthermore, perceived behaviour control and attitudes towards entrepreneurship were more strongly influenced by role models for females as opposed to male students.

Research limitations/implications – Future studies should go beyond examining the mere fact of knowing entrepreneurial role models to examine the mechanisms underlying the relationship between role models and EIs.

Practical implications – The results of this study have clear implications for both educators and policymakers.

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A short version of this paper was published in the proceedings of the 3rd World Conference on Learning, Teaching and Educational Leadership, 2013 (Procedia-Social and Behavioral Sciences, 93, pp. 204-214).



Originality/value – The study contributes to the entrepreneurship literature by incorporating entrepreneurial role models and gender into the TPB and investigating their mediating and moderating effects within the model.

Keywords Gender, Iran, Entrepreneurship education, Theory of planned behaviour, Entrepreneurial intentions, Entrepreneurial role model

Paper type Research paper

1. Introduction

Entrepreneurship is increasingly recognized as an important driver of productivity, innovation, job creation and both economic and social development (Audretsch, 2012; Shane and Venkataraman, 2000; Parker, 2009; Wennekers *et al.*, 2005). Given these positive effects of entrepreneurship, many developing countries – including Iran – have examined entrepreneurship as a fundamental solution for such problems as lack of economic improvement, increasing unemployment rates, an excessive number of college graduates and an inability of both the public and private sectors to provide sufficient work for graduating students (Karimi *et al.*, 2010). While entrepreneurship has been viewed as crucial to economic growth and progress in developing countries, surprisingly little attention has been paid during the past decade of research to factors which influence the intention of individual to start new businesses and particularly the entrepreneurial intentions (EIs) of those still within the education system (Karimi *et al.*, 2010). It is obviously crucial that those factors which influence the EIs and behaviour of college students be adequately understood to develop and implement effective strategies to stimulate these. Stated differently, identification of a suitable theoretical framework and sufficient understanding of the determinants of EIs and behaviour can help entrepreneurial educators, consultants, advisors and policymakers to foster entrepreneurship starting at universities and within society as a whole.

Entrepreneurship researchers have adopted intentional models of social cognition to identify the key cognitive determinants of EI and behaviour (Kolvereid, 1996a; Krueger and Carsrud, 1993). One particularly well-researched model used within this context is the theory of planned behaviour (TPB) as originally presented by Ajzen (1988, 1991). The TPB postulates that intention is the most important determinant of behaviour but itself influenced by attitudes towards behaviour, subjective norms (SNs) and perceived behavioural control (PBC). In a meta-analytic review of the results of 185 empirical studies addressing the TPB in one way or another, Armitage and Conner (2001) concluded that the TPB can indeed be used to effectively predict both intention and behaviour. With regard to entrepreneurship, the efficacy and ability of the TPB to predict EIs has been demonstrated in a number of studies (Karimi *et al.*, 2013; Kolvereid, 1996a; Krueger *et al.*, 2000; Linan and Chen, 2009). These studies suggest that attitudes towards behaviour, SNs and PBC typically explain 30-50 per cent of the variance in intention, which means that about half of the variance in EI remains unexplained. Moreover, the associations between cognitive determinants and EI have also been found to vary across contexts and from situation to situation.

The unexplained variance found for behavioural intentions is unlikely to be fully attributable to methodological factors such as measurement error (Sutton, 1998). Researchers have therefore proposed that the exclusion of additional variables (through mediating effects) and moderating variables within the original TPB may account for the limited explanatory power of the TPB and inconsistencies found across studies

(Conner and Armitage, 1998; Sutton, 1998). And within the field of entrepreneurship, several authors have called for the inclusion of additional factors (Linan *et al.*, 2011). In mediating effects, exogenous or external variables (such as demographic variables) will influence an individual's beliefs, attitudes and SNs, and those factors will ultimately predict intentions (Conner and Armitage, 1998; Fishbein and Ajzen, 2010). In moderating effects, external variables may have an effect on the relative importance of beliefs, attitudes and SNs (Fishbein, 1980).

According to the institutional approach (North, 1990, 2005), socio-cultural environment can be assumed to play a crucial role in the shaping of individual attitudes and economic behaviour, including entrepreneurship (Lafuente *et al.*, 2007). Fornahl (2003) further identified the presence of entrepreneurial role models as one of the most important socio-cultural factors to play a role in entrepreneurship. According to Gibson (2004), who draws on theories of social learning and role identification, role models can generally serve three interrelated functions: "to provide learning, to provide motivation and inspiration and to help individuals define their self-concept". Nauta and Kokaly (2001) attribute another function to role models, namely, to provide support and guidance. Entrepreneurial role models are thus a promising resource for entrepreneurial learning and the inspiration of students to become entrepreneurs, but there is little agreement on the magnitude and mechanisms of their influence. Therefore, the purpose of adding entrepreneurial role models to TPB is to examine whether and how this additional variable may influence students' decision to start a new business.

Gender is a fundamental dimension of the socio-cultural environment and can therefore be a possible determinant of EI and entrepreneurship. Despite the increasing number of female entrepreneurs (de Bruin *et al.*, 2006; Thébaud, 2010), entrepreneurship is still associated with masculine traits (Ahl, 2006; Gupta *et al.*, 2009; Lewis, 2006) and female entrepreneurship is significantly lower than male entrepreneurship (Langowitz and Minniti, 2007). This gap is particularly noticeable in Iran where women constitute less than 10 per cent of entrepreneurs, which is lower than both the regional MENA (Middle East and North Africa) averages and the global average (Sarfaraz and Faghih, 2011). According to a survey by the World Bank, of 5,169 firms in the MENA, only 13 per cent are owned by females. At a global level, the World Bank estimates 25-33 per cent of all private businesses to be owned or operated by females. Therefore, it has been suggested that the identification of ways to empower women's participation and success in entrepreneurship may be critical for successful and sustainable development across countries (Allen *et al.*, 2008).

The reasons for the entrepreneurial gender gap are not yet clearly understood (Minniti and Arenius, 2003). One critical factor in the gender gap may be individual entrepreneurial perceptions, propensities and intentions (Koellinger *et al.*, 2011). Studying gender differences in EIs and behaviour might therefore help us understand the reasons for the lower entrepreneurial activity of women compared to men (Ljunggren and Kolvereid, 1996), but the majority of research on female entrepreneurship has been conducted in Western countries like the USA and UK (Ahl, 2002). Scientific knowledge of the differences in entrepreneurship according to gender is scarce in developing countries like Iran. According to McManus (2001) and Ahl (2006), the investigation of gender differences in entrepreneurship in developing countries is seen as a promising direction for new research. It is critical that gender be included as a potentially important moderator of the associations between the determinants of EI and

subsequent behaviour. Doing this can afford us a better understanding of the determinants of EI, but also the sources of the observed gender differences in entrepreneurship. And on the basis of this knowledge, we can develop a more favourable environment for women in the field of entrepreneurial education and activity.

Moreover, research has shown that role models are especially important for women who are pursuing non-traditional careers (Gilbert, 1985; McLure and Piel, 1978; Smith and Erb, 1986; Subotnik and Steiner, 1992; Tidball, 1973) such as entrepreneurship (DeMartino and Barbato, 2003). The availability of appropriate role models in non-traditional careers can, for example, reduce stereotype threat effects (Marx and Roman, 2002). Therefore, exposing women to entrepreneurial role models might help to decrease the gender gap in entrepreneurship. However, there is very little research on this issue (especially in developing countries), and it remains an open question as to how role models influence male and female entrepreneurial perceptions and intentions.

It should be noted that in most entrepreneurship studies, gender has been discussed from the perspective of its main effects as opposed to its moderating effects on EI. That is, the direct effects of gender on EI (Crant, 1996; Veciana *et al.*, 2005) and indirect effects of gender on EI via predictors of intention (Kolvereid, 1996b; Zhao *et al.*, 2005; Yordanova and Tarrazon, 2010) have been examined but not the moderating effects of gender on the relationships between EI and its determinants. Men have generally been found to have a stronger intention to start up a new business than women, but whether the specific relationships between EI and its determinants are similar for males and females is unknown.

To summarize, in the present research, we applied the TPB to predict the EI of students studying in the developing country of Iran. We added two important socio-cultural factors to the TPB – namely, entrepreneurial role models and gender – to the TPB. We then examined the mediating and moderating effects of these factors. In the following, we first present the theoretical framework used in the current study and then present our hypotheses with regard to how attitudes, entrepreneurial role models and gender can be expected to influence the EI of students in a developing country like Iran. We then describe the sample and research method before presenting the results. After discussing the possible mediating and moderating effects of role models and gender on the EI of the students in our study, we finish with the research conclusions, implications for entrepreneurship education and some directions for future studies.

2. Theoretical framework and hypotheses

2.1 Theory of planned behaviour

Among models of social-cognition, one of the most widely researched is TPB as originally presented by Ajzen (1988, 1991). This theory is one of the most influential and popular conceptual frameworks for the study of human action (Ajzen, 2002). Central to the theory is the concept of individual intention, defined as “a person’s readiness to perform a given behaviour” (Ajzen, 1991). Intention to engage in a specific behaviour is assumed to precede actual engagement in the behaviour.

Within an entrepreneurial context, Thompson (2009, p. 676) defines intention as “a self-acknowledged conviction by a person that they intend to set up a new business venture and consciously plan to do so at some point in the future”. Such an EI has been proven to be a primary predictor of future entrepreneurial behaviour (Krueger *et al.*, 2000). Consequently, the model stresses that intentions to engage in a behaviour are

affected by three motivational factors or antecedents (Ajzen, 1991; Kolvereid, 1996b; Krueger *et al.*, 2000):

- (1) attitudes towards behaviour or the degree to which the individual holds a positive or negative valuation of a behaviour and/or its consequences (e.g. becoming an entrepreneur);
- (2) SNs or perceptions of what family, friends and significant others might think about engagement in a specific behaviour (e.g. becoming an entrepreneur); and
- (3) PBC or the perceived ease/difficulty of performing a specific behaviour (e.g. becoming an entrepreneur).

These three antecedents in turn are affected by exogenous influences such as personal and situational factors. The TPB predicts that the more favourable the attitudes towards entrepreneurial behaviour and SNs regarding such behaviour but also strong PBC with regard to such, the greater the intention to engage in that behaviour.

The TPB has been used to predict the EI of students and confirmed the critical roles of attitudes towards entrepreneurship (ATE), SN and PBC in the prediction of these intentions (Karimi *et al.*, 2013; Krueger *et al.*, 2000). All three of the antecedents postulated by Ajzen (1991) have been found to be important, but their relative importance and the magnitude of their influence have been found to vary considerably across individuals, situations and countries (Fishbein and Ajzen, 2010).

2.2 Entrepreneurial role models

An individual's decision to engage in a particular type of behaviour is often influenced by the opinions and actions of others, the way in which others demonstrate their identities and the example provided by others (Ajzen, 1991; Akerlof and Kranton, 2000; Bosma *et al.*, 2012). Such "others" are often referred to as "role models". According to Gibson and Barron (2003, p. 199):

[...] a role model is a person an individual perceives to be similar to some extent, and because of that similarity, the individual desires to emulate (or specifically avoid) aspects of that person's attributes or behaviours.

The importance of role models in the career decision-making and choice of university students to become entrepreneurs has been widely documented (Krueger *et al.*, 2000; Matthews and Moser, 1996). Knowing successful business people provides the individual with good examples to imitate and can inspire them to become a business person themselves (Bygrave and Zacharakis, 2004; Caputo and Dolinsky, 1998; Gibson, 2004). Successful entrepreneurial role models not only transmit positive messages regarding entrepreneurship (Gnyawali and Fogel, 1994) but can also make it easier for the individual to discover and act on new business ideas and opportunities during the initial stages of the entrepreneurial process (Bygrave, 1995; Fornahl, 2003). In addition, the observation of and interaction with entrepreneurial role models encourages learning and provides opportunities to gain insight into entrepreneurial tasks and skills. According to social learning theories, people pay attention to role models because such observation can help them perform new tasks, learn new skills, acquire norms and make sense of the environment (Bandura, 1986). Furthermore, entrepreneurial role models provide information which can reduce the ambiguity associated with starting a business (Minniti and Nardone, 2007). Entrepreneurial role models are thus an important source

of social capital (Bosma *et al.*, 2012), but little is known about the exact mechanisms via which entrepreneurial role models influence the EI of students. And Busenitz and Barney (1997) have therefore suggested that the direct and indirect effects of role models on the decision to start a business should be explored.

In the available research literature, two hypotheses about the relationship between role models and career choices are discussed (Quimby and DeSantis, 2006). The first hypothesis draws on social cognitive career theory (Lent *et al.*, 1994) and asserts that role models provide contextual support which can directly affect the career decision-making process. Studies show that the presence of role models within the family, relatives or friends can strongly influence the EIs and activities of students (BarNir *et al.*, 2011; Carr and Sequeira, 2007; Carsrud *et al.*, 1987; Chlosta *et al.*, 2012; Davidsson and Honig, 2003; de Clercq and Arenius, 2006; Kirkwood, 2007; Matthews and Moser, 1996; Mueller, 2006; Pruett *et al.*, 2009; van Auken *et al.*, 2006). The availability of role models can increase the desire to become an entrepreneur via legitimization, advice, professional and personal feedback, insight and encouragement to turn entrepreneurial ambitions into actual reality (Arenius and de Clercq, 2005; BarNir *et al.*, 2011; Koellinger *et al.*, 2007; Mueller, 2006). And on the basis of this information, we hypothesized the following:

H1. Knowing a role model will be positively associated with an EI.

Although numerous studies have provided support for a direct, positive association between having an entrepreneurial role model and a positive entrepreneurial career choice (BarNir *et al.*, 2011; Chlosta *et al.*, 2012; van Auken *et al.*, 2006), others have failed to find such an association (Carsrud *et al.*, 1987; Franco *et al.*, 2010). Additional intervening variables may thus be at work or current conceptualizations of the relationship between entrepreneurial role models and career decisions may be deficient or somehow limited (BarNir *et al.*, 2011). And for this reason, a second hypothesis regarding the relationship between role models and an entrepreneurial career choice has been put forth in the literature. According to social cognitive theory (Bandura, 1986) and some empirical studies based on TPB (Kolvereid, 1996b; Krueger, 1993; Krueger and Carsrud, 1993), role models, as the exogenous influence, can indirectly influence career intentions via the antecedents of behavioural intention. Scherer *et al.* (1989), Krueger (1993), Krueger and Carsrud (1993) and Krueger *et al.* (2000) argue that role models can affect EI, but only if they affect the individual's ATE and perceived ability to undertake a new venture with success. Kolvereid (1996b) has also argued that role models (i.e. family background) can indirectly influence EI via their effect on the antecedents of career intentions, namely, ATE, SN and PCB. Walter and Dohse (2009) reported role models to affect all three of the antecedents to EI, as suggested by the TPB. And the results of a study by Carr and Sequeira (2007) showed significant direct effects of prior exposure to a family business on EI but also significant indirect effects via the mediating variables of ATE, SN and PCB.

Social learning theory or social cognitive theory (Bandura, 1986) suggests that role models provide vicarious learning experiences which can increase self-efficacy and thereby strengthen particular interests and choices of action with regard to various fields of education and career. By watching another person succeed, one's own self-efficacy judgements can be elevated (Scherer *et al.*, 1989). Social learning theory further asserts that role models can directly affect self-efficacy and indirectly affect career decisions by providing both financial and non-financial support and guidance but

also opportunities to perform new tasks and develop new abilities in addition to mastering other useful business-related knowledge. Modelling can offer opportunities to learn how to deal with challenges and manage risks that will increase an individual's belief in their self-efficacy (Zhao *et al.*, 2005). This is supported by Wood and Bandura's (1989) observation that role models build self-beliefs of capability by conveying to observers effective strategies for managing different situations. And according to Carsrud *et al.* (2007), entrepreneurial role models heighten PBC by strengthening the individual's perceptions of their ability to master challenges related to an entrepreneurial career.

In keeping with Bandura (1986), via the observation of role models, an individual can learn vicariously and thereby increase their self-efficacy. Observers can attempt to replicate the behaviour of role models, which can positively affect their self-efficacy. Role models can also enhance an individual's self-efficacy via persuasion, encouragement and feedback with regard to certain types of entrepreneurial behaviour (Bandura, 1986; Cox *et al.*, 2002). Entrepreneurial role models have been shown to positively influence the entrepreneurial self-efficacy or PBC of individuals (BarNir *et al.*, 2011; Scherer *et al.*, 1989). And Zellweger *et al.* (2011) have shown role models and particularly parental role models to positively contribute to an inclination to undertake an entrepreneurial career by enhancing PBC. In line with Bandura (1997), thus, role models can be expected to influence PBC, which will mediate the effect of role models on EI.

ATE can be influenced by many exogenous variables, including role models. Exposure to entrepreneurial role models can show students the potential personal, professional and societal outcomes associated with an entrepreneurial career. The attractiveness and desirability of a career as an entrepreneur and thus ATE may thus be influenced by role models. Furthermore, early socialization in a family business can contribute to the formation of positive entrepreneurial values and perceptions (Carr and Sequeira, 2007; Light and Bonacich, 1988). According to the theory of career choice (Dick and Rallis, 1991), student beliefs regarding a specific career are influenced by not only prior exposure to a particular career but also what they have perceived to be the attitudes and expectations of key socializers (e.g. parents, friends and teachers) regarding that career. Prior exposure and perceptions can thus influence the attitudes of students towards particular careers and ultimately their career choices. In particular, when individuals see important others positively evaluate entrepreneurship, they will be inclined to have more positive ATE as well (Carr and Sequeira, 2007).

In addition, the entrepreneurial spirit projected by an entrepreneurial role model can set the terms of support or pressure for the start of a new business and thus create a greater SN. In a study of a large group of Norwegian students and employees, for example, Reitan (1997) found having an entrepreneurial role model to positively influence SNs with regard to being an entrepreneur.

On the basis of the preceding information, we have thus hypothesized the following:

H2. ATE will mediate the relationship between knowing a role model and EI.

H3. SN will mediate the relationship between knowing a role model and EI.

H4. PBC will mediate the relationship between knowing a role model and EI.

2.3 Gender

As already mentioned, the proportion of entrepreneurs who are female is significantly lower than the proportion of entrepreneurs who are male (Langowitz and Minniti, 2007). According to empirical study, males are also generally more interested in an entrepreneurial career than females (Blanchflower *et al.*, 2001; Grilo and Irigoyen, 2006), males have a higher desire and intention to start their own business than females (Crant, 1996; Minniti and Nardone, 2007; Wilson *et al.*, 2004, 2009; Zhao *et al.*, 2005) and males are more likely to succeed when they start a new business than females (Boden and Nucci, 2000; Carter *et al.*, 1997; Robb, 2002). These differences in the entrepreneurial attitudes, values and behaviour of men versus women can be attributed to differences in their social orientations and behavioural motives. Based on these findings and such theories as Bem's (1981) gender schema theory, Eagly's (1987) social role theory and the social dominance theory of Sidanius and Pratto (1999) plus other empirical findings (Gefen and Straub, 1997) and the results of meta-analyses (Eagly and Wood, 1991; Franke *et al.*, 1997), male students can be expected to be more agentic (i.e. assertive, independent, autonomous, courageous, dominating, instrumental and task-oriented) than female students. They can also be expected to rely more than female students on their own intuitions in the development of their EIs, while female students can be expected to be more communal (i.e. affiliative, expressive, submissive, supportive, kind and nurturing). Female students can also be expected to rely less on their own judgements and accept the opinions of their families and other significant people when contemplating the start of a new business.

Men and women also differ in terms of self-construal, with women are more likely to demonstrate an interdependent construal of themselves than men (Cross and Madson, 1997; Garbarino *et al.*, 1995; Kashima *et al.*, 1995). Women define themselves more in relation to others than men (Markus and Kitayama, 1991). Men are similarly more often described as autonomous and acting independent of others than women (Williams and Best, 1982). And within a particular social system, women usually place more value on interpersonal goals and their achievement, harmonious relationships and smooth communication than men do (Gilligan, 1982; Gill *et al.*, 1987; Konrad *et al.*, 2000; Williams and Best, 1982). Hofstede's (1980) seminal work on culture also shows men to rate extrinsic motivators (e.g. potential for advancement, increased earning power) as more important than women. Moreover, SNs are related to self-confidence, in that less confident people have been shown to depend more on the opinions of others (Dong and Zhang, 2011) and, with regard to entrepreneurship, women have been shown to have significantly lower levels of confidence in their entrepreneurial abilities than men (Chen *et al.*, 1998; Wilson *et al.*, 2007). All of this suggests that SNs may play a more important role in the EI of females than in the EI of male students.

Based on the TPB, SNs and the perceived social pressure which these reflect can be expected to be more important for the prediction of the behavioural intentions of women as opposed to men, while individual ATE and the instrumental motives which these reflect can be expected to be more important for the prediction of the behavioural intentions of men as opposed to women.

Accordingly, we develop the following hypotheses:

H5. Gender will moderate the relationship between ATE and EI such that the relationship is stronger for male students than for female students.

H6. Gender will moderate the effect of SN on EI such that the relationship is stronger for female students than for male students.

Previous evidence suggests that women are more likely than men to limit their career aspirations and interests because they think that they lack the necessary capabilities and skills (Bandura, 1992). This has been found to particularly be the case for careers which are seen as traditionally “male” and thus for entrepreneurship (Thébaud, 2010). Female students have been shown to have less confidence in their business abilities than male students (Chen *et al.*, 1998; Chowdhury and Endres, 2005; Díaz-García and Jiménez-Moreno, 2010; Wilson *et al.*, 2007; Yordanova and Tarrazon, 2010), but moderating effects of gender on the relationship between self-efficacy and EI have not been reported. Moreover, women focus more on perceived skill deficiencies than men within the realm of entrepreneurship (Bandura, 2001). Given the agentic nature of entrepreneurship, moreover, women perceive their environment to be less supportive and less rewarding of entrepreneurial activity than men do (Zhao *et al.*, 2005), and they have a lower sense of personal control over many of the activities associated with an entrepreneurial career than men (BarNir *et al.*, 2011). The results of a large study showed women to perceive themselves and the entrepreneurial environment less favourably than men (Langowitz and Minniti, 2007).

As already mentioned, instrumentality (i.e. expected outcome) is more important for men than for women. This higher valuation of instrumentality can in turn be expected to affect PBC (Venkatesh *et al.*, 2000). Given high instrumentality (i.e. positive expected outcomes), men are more likely to invest the effort needed to overcome constraints and difficulties to achieve their goals and less likely to consider the magnitude of effort involved (Venkatesh *et al.*, 2000). In contrast, women are inclined to be more process-oriented and therefore focus on the magnitude of the effort involved to realize their goals and the nature of the processes (Hennig and Jardim, 1977; Rotter and Portugal, 1969). Given the process-orientation of women and the generally lower level of confidence in their entrepreneurial abilities (Chowdhury and Endres, 2005; Wilson *et al.*, 2007), the perceived ease or difficulty of starting up a new business is expected to influence their EI in important ways. And on the basis of this information, we hypothesized the following:

H7. Gender will moderate the relationship between PBC and EI such that the relationship is stronger for female students than for male students.

Although males may generally be more interested in starting a business than females (Blanchflower *et al.*, 2001; Grilo and Irigoyen, 2006), the presence of role models can alter the relationship between gender and EI (Matthews and Moser, 1996). The question, however, is whether this occurs similarly for males and females? Research suggests that socio-cultural factors may have a greater impact for female entrepreneurship than for male entrepreneurship (Jennings and McDougald, 2007). That is, role models may have a greater influence on the perceptions of entrepreneurship for females than for males. As already pointed out, women are more open and receptive to social influences – including the opinions of important others – than men. They also tend to focus on the interpersonal aspects of relationships more than men. As a result, we can expect entrepreneurial role models to influence the perceptual antecedents – including ATE, SN and PBC – more among women than among men.

Also as previously noted, individuals who perceive important others to positively evaluate business ownership will tend to positively perceive business ownership as well (Carr and Sequeira, 2007). Given that women are inclined to value the opinions of important others and thus role models more than men, we therefore expected entrepreneurial role models to enhance the attractiveness and desirability of entrepreneurship more for female students than for male students. We also expected entrepreneurial role models to increase the perceived support to start a new business more for female students than for male students.

H8. Gender will moderate the effect of role models on ATE such that the relationship is stronger for female students than for male students.

H9. Gender will moderate the effect of role models on SN such that the relationship is stronger for female students than for male students.

As already mentioned, role models can vicariously enhance self-efficacy or PBC. However, some studies have shown these effects to be moderated by gender such that role models exert a stronger positive effect on the entrepreneurial self-efficacy of women than of men (BarNir *et al.*, 2011). In keeping with this, we therefore expected the effects of role models to lead to greater changes in the PBC of females as opposed to males. Not only is the entrepreneurial knowledge gap greater for female entrepreneurs to start with, women have also been shown to be more responsive than men to information and feedback provided by others (Roberts, 1991). Furthermore, women are more likely than men to pick up on the interpersonal and behavioural cues which are important for learning and internalizing lessons from role models due in part to their traditional social roles, better relational abilities and superior communal skills (Kiecker *et al.*, 2000; Meyers-Levy and Sternthal, 1991). On the basis of this information, we therefore hypothesized the following:

H10. Gender will moderate the effect of role models on PBC such that the relationship is stronger for female students than for male students.

3. Research method

3.1 Sample and procedure

In our study, 400 Bachelor of Science (BSc) and Master of Science (MSc) students who had participated in entrepreneurship courses in seven Iranian universities during the academic year of 2010-2011 were targeted. This is a convenience sample, as frequently used in entrepreneurship research (de Jorge *et al.*, 2012; Karimi *et al.*, 2013; Krueger *et al.*, 2000, Linan *et al.*, 2011). These students were targeted on the basis of the assumption that they would be more likely to start a business (Hornaday and Vesper, 1982) and, because they were in their last years of college, it was assumed that they would have fairly clear vision of their plans for the future and imminent career decisions (Krueger *et al.*, 2000).

A questionnaire was distributed during a class session, and the students were given 30 minutes to complete it. The students were given a small gift for completion of the questionnaire. A total of 346 questionnaires were returned, representing a response rate of 87 per cent. When the questionnaires were subsequently screened for missing data and outliers (Hair *et al.*, 2010), 331 useful questionnaires were obtained.

Out of a total of 204 female students, 104 had entrepreneurial role models among their circle of family, relatives and friends (51 per cent); 59 of the 204 female students had entrepreneurial parents (28.9 per cent). Out of a total of 127 male students, 69 had entrepreneurial role models among their family, relatives and friends (54.3 per cent); 30 of the 127 male students had entrepreneurial parents (23.62 per cent). The other demographic characteristics of the sample are presented in [Table I](#).

3.2 Measures

Aside from the presence of role models and the demographic characteristics of the students participating in our study (see description of Control Variables), all of the variables were measured using a 7-point Likert rating scale which ranged from “1” representing “strongly disagree” to “7” representing “strongly agree”. All of the questionnaire items were adapted from existing scales. The items and sources from which the items are derived are summarized in [Table II](#).

To determine the presence of entrepreneurial role models among the circle of family, relatives and friends, the students were asked two questions: “Did your parents ever start a business?” and “Do you personally know any successful entrepreneurs among your relatives/friends/others?” Research suggests that entrepreneurial role models tend to be close (such as parents and friends) as opposed to remote “icons” ([Bosma et al., 2012](#)), and the effect of having an entrepreneurial role model was therefore expected to be relatively greater when the role model was closely tied to the respondent ([Davidsson, 2004](#)).

Following [Schmitt-Rodermund et al. \(2011\)](#), the response to the first question regarding the presence of entrepreneurial role models was coded as 0 = “no” or 2 = “yes”. The response to the second question was coded along a 3-point scale: 0 = no one, 1 = some and 2 = many. The modelling measure could thus range from 0 (= no role models) to 4 (= parental role model plus relatives and/or friends as role models). This coding procedure thus indicates the proximity of role models ([Gibson, 2004](#), [Schmitt-Rodermund et al., 2011](#)).

3.3 Control variables

To minimize the spuriousness of the results, we included four control variables in the study. Age, level of education (coded as 0 = BSc or 1 = MSc), academic major (coded as 0 = non-business and 1 = business) and university ranking (coded as 3 = high ranking, 2 = intermediate ranking and 1 = low ranking).

3.4 Statistical analyses

The data were analysed using SPSS18 and AMOS18. An exploratory factor analysis (EFA) was first conducted on the responses to the questionnaire items. Structural

Table I.
Sample characteristics

Demographic variable	Values
Age	Mean: 22.46
Gender	Male: 127 (38.4 %) Female: 204 (61.6 %)
Level of education	BSc: 255 (77 %) MSc: 76 (23 %)
Academic major	Business: 76 (23 %) Non-business: 255 (77 %)

Construct	Research reference	Number of items
Entrepreneurial intentions	Linan and Chen (2009), e.g. "I have very seriously thought of starting a firm "	6
Attitude towards entrepreneurship	Linan and Chen (2009), e.g. "Being an entrepreneur implies more advantages than disadvantages to me "	5
Subjective norm	Adopted from Kolvereid (1996b), which has been used in Kolvereid and Isakson (2006) and Krueger <i>et al.</i> (2000). This scale included two separate questions: belief (e.g. "I believe that my closest family thinks that I should start my own business") and motivation to comply (e.g. "I care about my closest family's opinion with regard to me starting my own business"). The belief items were recoded into a bipolar scale (from -3 to +3) and multiplied with the respective motivation-to-comply items. The subjective norm variable was calculated by adding the three results and dividing the total score by three	6
Perceived behavioural control	Linan and Chen (2009); e.g. "Starting a firm and keeping it viable would be easy for me"	6
Entrepreneurial role models	Krueger (1993), e.g. "Did your parents ever start a business?"	2

Table II.
List of constructs

equation modelling (SEM) was then undertaken to test for the hypothesized mediation and moderation effects. Finally, the so-called bootstrap method was used to determine the significance of the SEM mediation effects, as recommended by previous researchers (Cheung and Lau, 2008; Preacher and Hayes, 2008).

4. Results

4.1 Exploratory factor analysis

The results of the EFA called for the elimination of one item related to EI, one item related to ATE and one item related to PBC due to factor loadings which were either below 0.5 or cross-loadings which were greater than 0.4. A new EFA was then performed on the remaining 17 items. All of the factor loadings were now acceptable (> 0.5), which provides support for the validity of the questionnaire. Furthermore, a high KMO measure of sampling adequacy ($KMO = 0.871$, which is above the required minimum of 0.60) and a highly significant Bartlett test of sphericity (chi-square: 2,642.461; significance: $p < 0.00$) showed the sample and data to be suitable and adequate for the conduct of an EFA (Field, 2009).

4.2 Structural equation modelling

According to Hair *et al.* (2010) and Kline (2005), it is appropriate to adopt a two-step approach for SEM: first assess the measurement model; then assess the proposed structural model.

4.2.1 Assessment of measurement model. A confirmatory factor analysis (CFA) was conducted to determine the goodness-of-fit indices, reliability and validity of the proposed measurement model. The CFA indicated that although the chi-square statistic

was significant ($\chi^2 = 202.165; p < 0.01$), which is common with large sample sizes, the measurement model nevertheless provided a reasonable fit for the data ($\chi^2/df = 1.671$; GFI = 0.936; TLI = 0.961; CFI = 0.970; IFI = 0.970; RMSEA = 0.045). It was therefore decided that the hypothesized model with five core constructs provided a suitable model for the analyses in this study (Table III).

The convergent and discriminant validities of the core constructs can be assessed by referring to the measurement model. Convergent validity refers to the extent to which indicators of a construct converge or share a high proportion of variance in common (Hair *et al.*, 2010). According to Fornell and Larcker (1981), convergent validity can be determined for a measurement model on the basis of three criteria:

- (1) all factor loadings should be significant and higher than 0.50 (Janssens *et al.*, 2008);
- (2) the scale composite or construct reliability should exceed 0.70 according to Nunnally and Bernstein (1994); and
- (3) the average variance extracted (AVE) for each construct should be 0.5 or above (Hair *et al.*, 2010).

Table IV shows the critical ratio ($CR = t$) value to exceed 8.160 ($p < 0.01$) for all times and all of the factor loadings to be more than 0.5, which indicates good convergent validity. Furthermore, all of the items were loaded significantly on their specified constructs ($p < 0.01$). These results provide evidence for the unidimensionality of each construct. The construct reliability ranged from 0.73 to 0.87 for all of the constructs, which is higher than the recommended level of 0.70. And the results showed the AVE to be above the recommended threshold of 0.50 for all of the constructs as well (Fornell and Larcker, 1981). In sum, all of the constructs in the measurement model showed sufficient reliability and convergent validity.

Discriminant validity indicates the extent to which one construct truly differs from another construct (Hair *et al.*, 2010). According to Fornell and Larcker (1981), if the square root of the AVE estimate for each construct is greater than the correlation between that construct and all other constructs in the model, then discriminant validity is demonstrated. As can be seen from Table V, the square root of the AVE ranged from 0.69 to 0.75, which is greater than the correlations between the five constructs which ranged from 0.10 to 0.58. This means that the indicators have more in common with the target construct than with the other constructs in the measurement model (Fornell and Larcker, 1981) and that the model has been found to have sufficient discriminant validity.

We also examined the so-called nomological validity of the data or the extent to which the correlations between the constructs in the measurement model make sense (Hair *et al.*, 2010). These correlations between the constructs are examined for this purpose (Steenkamp and van Trijp, 1991). All five of the constructs in the measurement

Table III.
Summary of goodness-of-fit indices for the measurement model

Fit indices	χ^2	P	χ^2/df	GFI	CFI	TLI	IFI	RMSEA
Value	202.165	0.000	1.671	0.936	0.970	0.961	0.970	0.045
Suggest value		> 0.05	< 3	> 0.80	> 0.90	> 0.90	> 0.90	< 0.07

						Students' entrepreneurial intentions
Latent variable	Items	Standardized factor loading	<i>T</i> -value (critical ratio)	Construct reliability	AVE	
Entrepreneurial intention	<i>Y1</i> : I'm ready to do anything to be an entrepreneur	0.55		0.90	0.51	
	<i>Y2</i> : My professional goal is becoming an entrepreneur	0.68	10.272			
	<i>Y3</i> : I will make every effort to start and run my own business	0.84	9.093			
	<i>Y4</i> : I'm determined to create a firm in the future	0.80	9.008			
	<i>Y5</i> : I have very seriously thought about starting a business	0.68	8.666			
Attitudes towards entrepreneurship	<i>X1</i> : A career as an entrepreneur is totally attractive to me	0.78		0.88	0.53	
	<i>X2</i> : Amongst various options, I would rather be anything but an entrepreneur	0.85	13.550			
	<i>X3</i> : Being an entrepreneur would give me great satisfaction	0.70	11.919			
	<i>X4</i> : Being an entrepreneur implies more advantages than disadvantages to me	0.53	9.315			
Subjective norms	<i>X5</i> : Closest family (recoded belief* motivation)	0.70		0.86	0.54	
	<i>X6</i> : Closest friends (recoded belief* motivation)	0.66	10.060			
	<i>X7</i> : Important others (recoded belief* motivation)	0.84	10.510			
Perceived behavioural control	<i>X8</i> : Starting a firm and keeping it viable would be easy for me	0.69		0.92	0.56	
	<i>X9</i> : I believe I would be completely able to start a business	0.87	15.939			
	<i>X10</i> : I am able to control the creation process of a new business	0.79	12.289			
	<i>X11</i> : If I tried to start a business, I would have a high chance of being successful	0.68	10.828			
	<i>X12</i> : I know all about the practical details needed to start a business	0.70	12.167			

Table IV.
Results of confirmatory
factor analysis for the
hypothesized model

Note: * $p < 0.01$

Table V.
Correlations and square roots of AVE estimates in bold on the diagonal for all constructs

Variable	Cronbach's alpha	Full sample		Male		Female		1	2	3	4	
		M	SD	M	SD	M	SD					
1-Entrepreneurial intention	0.84	4.97	1.38	5.03	1.24	4.93	1.48	(0.73^a)				
2- Attitudes towards entrepreneurship	0.80	5.35	0.87	5.34	0.79	5.36	0.92	0.43**	(0.73)			
3- Subjective norms	0.78	3.07	5.84	2.34	5.30	3.53	6.13	0.33**	0.18**	(0.74)		
4- Perceived behavioural control	0.88	4.38	1.34	4.39	1.30	4.38	1.37	0.62**	0.26**	0.27**	(0.75)	
5- Role model		1.07	1.33	0.94	1.18	1.30	1.52	0.15*	0.11*	0.12*	0.23**	

Notes: *correlation is significant at the 0.05 level (2-tailed); **correlation is significant at the 0.01 level (2-tailed); ^athe square root of AVE estimate in bold on the diagonal

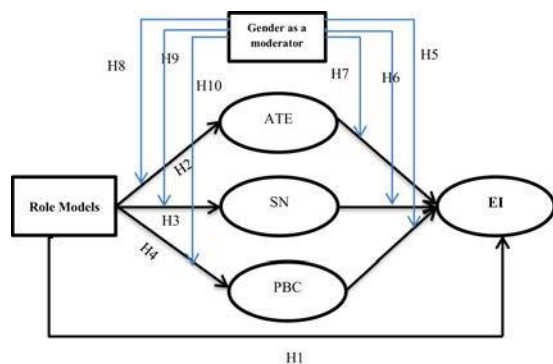
model correlated significantly with each other, which shows sufficient nomological validity for the measurement model (Table V).

Finally, the alpha coefficients were calculated to determine the reliability (i.e. internal consistency) of the five constructs in the measurement model. All of the constructs had reliability values which were greater than the required threshold of 0.70 with a range of 0.75-0.93 (Table V). The measurement scales of the constructs were thus stable and consistent (Hair *et al.*, 2010).

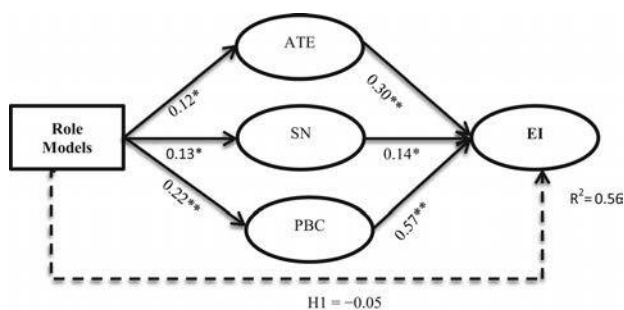
4.2.2 Assessment of structural model. Once a satisfactory measurement model was obtained, SEM could be undertaken to test the model containing the hypothesized relations derived from the research literature and depicted in Figure 1.

As shown in Figure 2, the overall goodness-of-fit statistics show the structural model to fit the data quite well ($\chi^2 = 251.898$; $\chi^2/df = 2.031$; GFI = 0.920; TLI = 0.941; CFI = 0.952; IFI = 0.952; RMSEA = 0.056). Having assessed the fit indices for the measurement model and the structural model, the estimated coefficients for the causal relationships between the constructs in the model were examined next. As can be seen from Figure 2, the first hypothesis is not supported, namely, that having a role model will have a directly positive effect on the EI of students; this was not found to be the case (*H1*: $\beta = -0.05$, CR = 1.26, $p = 0.26$). Overall, the hypothesized model explained 56 per cent of the variance in the EI of the students ($R^2 = 0.56$).

To control for any moderation effects stemming from student age, level of education, academic major and university ranking, these variables were added to the structural model as control variables. Figure 3 shows the path between university ranking and EI ($\beta = 0.04$) and the path between age and EI ($\beta = -0.03$) to not be significant. The path between level of education and EI ($\beta = 0.18$) and the path between academic major and EI ($\beta = 0.17$) were significant, which shows these control variables to influence the EI of the students to some extent; the magnitude of their effects was small, however, and did not considerably change the SEM results.



Notes: EI = Entrepreneurial intention; ATE = attitudes towards entrepreneurship; SN = subjective norms; PBC = perceived behavioral control; H = hypothesis arrows represent hypothesized paths



Notes: * $p < 0.05$, ** $p < 0.01$ the goodness of fit indices: $\chi^2 = 251.898$; $\chi^2/df = 2.031$; GFI = 0.920; TLI = 0.941; CFI = 0.952; IFI = 0.952; RMSEA = 0.056

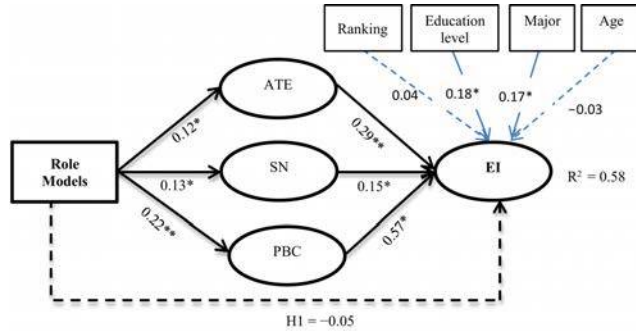
Figure 2.

Path model estimates for the hypothesized model

4.2 Mediation effects

The statistical significance test for the mediation effects is the bias-corrected confidence interval (CI; 95 per cent) through the bootstrapping procedures on 1,000 samples (Shrout and Bolger, 2002). The two-tailed significance for the CIs provides a test of the standardized estimates for the indirect, direct and total effects (MacKinnon *et al.*, 2004; Preacher and Hayes, 2008). When the range of the bias-corrected CI does not include a value of zero, one can conclude that the total indirect effect through the three mediators is significantly different from zero and that mediation is present.

The results showed role models to be positively associated with all of the mediators (ATE, $\beta = 0.12$, $p < 0.05$; SN, $\beta = 0.13$, $p < 0.05$; PBC, $\beta = 0.22$, $p < 0.01$) and the mediators to in turn exhibit significant relationships with the EI of the students (ATE, $\beta = 0.30$, $p < 0.01$; SN, $\beta = 0.15$, $p < 0.05$; PBC, $\beta = 0.57$, $p < 0.01$). In addition, the bootstrapping estimate showed a significant indirect effect of role models on EI ($\beta = 0.20$, 95 per cent CI = 0.11 to 0.30), while the direct effect of role models on EI – as also reported above – was not significant (H1). This suggests that ATE, SN and PBC *fully*



Notes: * $p < 0.05$, ** $p < 0.01$. The goodness-of-fit indices: $\chi^2 = 336.960$; $\chi^2/df = 1.925$; GFI = 0.912; TLI = 0.936; CFI = 0.947; IFI = 0.947; RMSEA = 0.053

mediate the relationship between role models and EI; support is thus found for full mediation (Table VI).

While the demonstration of a mediation effect is important for understanding the causality between the independent and dependent variables in this study and the mechanisms which determine EI, the estimates of the specific indirect effects of the multiple mediators are of even greater interest. The AMOS program does not compute bootstrap confidence for specific mediation effects, so we therefore turned to the Preacher and Hayes (2008) SPSS macro to calculate the specific indirect effects of role models on EI via ATE, SN and PBC. Age, level of education, academic major and university ranking were entered as control variables. Once again, the results showed the indirect effect of entrepreneurial role models on EI to be fully mediated by ATE ($B = 0.03$, 95 per cent CI = 0.01 to 0.07), SN ($B = 0.02$, 95 per cent CI = 0.01 to 0.05) and PBC ($B = 0.13$, 95 per cent CI = 0.07 to 0.19). $H2$, $H3$ and $H4$ are thus supported by the present data.

4.3 Moderation effects of gender

In this study, a two-group SEM analysis was used to evaluate the possible moderation effects of gender: males and females were analysed separately. The male group

Table VI. Direct, indirect and total effects on entrepreneurial intentions in the hypothesized model and associated bootstrapping bias-corrected 95 per cent confidence intervals (CI)

Outcome	Determinant	Standardized estimates		
		Direct (95 % CI)	Indirect (95 % CI)	Total
EI	ATE	0.30 (0.15–0.44)**		0.30**
	SN	0.15 (0.02–0.30)*		0.15*
	PBC	0.57 (0.55–0.77)**		0.57**
	Role models	0.05 (–0.15–0.04)	0.20 (0.11–0.30)**	0.25**
ATE	Role models	0.12 (0.01–0.22)*		0.12*
SN	Role models	0.13 (0.01–0.26)*		0.13*
PBC	Role models	0.22 (0.11–0.32)**		0.22**

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

consisted of 127 respondents; the female group of 204 respondents. A two-group AMOS model was then used to decide if significant differences occurred in the structural parameters for the male versus female groups. The same SEM model as shown in Figure 2 was evaluated for each of the groups.

In the first step, all the path coefficients in the model were constrained to be equal across the two groups. In the second step, the path coefficients were not constrained across the two groups. In the third step, the free models and the constrained models were compared using the χ^2 difference test. If the chi-square proved significant and thus indicated a difference between the models for the male versus female groups, then the differences for each of the path coefficients were analysed in a fourth step. Thus, the criterion of establishing a moderating effect is given by these conditions: If the $\Delta\chi^2 > CR$, (CR-*t* value at $\alpha = 0.05$), then the moderating variable has statistical significance in the baseline model. Hence, moderating effect is established. Otherwise, the moderating variable has no statistical significance in the baseline model if the $\Delta\chi^2 < CR$, at $\alpha = 0.05$ (Byrne, 2010). Table VII shows the fit indices for the constrained and free models. As it can be seen, both models fit the data adequately for subsequent moderating tests.

For the two groups, the fully constrained model provided a chi-square value of 445.876 (df = 269, $p < 0.00$). The free model provided a chi-square value of 405.870 (df = 250, $p < 0.00$). The chi-square difference ($\Delta\chi^2 = 40.006$, p -value = $0.003 < 0.01$) is statistically significant at a value of less than 0.01, which suggests that the groups are different at the model level. Given the significant difference in the models for the male versus female groups, the difference for each of the path coefficients was next tested. The paths from ATE to EI, SN to EI and PBC to EI but also role model to ATE, role model to SN and role model to PBC were constrained to be equal across the male and female groups in this analysis.

As can be seen from Table VIII, the male students tend to be more influenced by ATE when forming their EI ($\beta_{\text{Male}} = 0.39$) than the female students ($\beta_{\text{Female}} = 0.24$). The effect of SN on EI was stronger in the female group ($\beta_{\text{Female}} = 0.23$) than in the male group ($\beta_{\text{Male}} = 0.05$). *H5* and *H6* are thus supported. The chi-square difference for the path of PCB to EI was not significant, however, which shows *H7* to not be supported.

The constrained path from role model to ATE produced a significant increase in the chi-square ($\Delta\chi^2 = 4.421$, $p < 0.05$), which means that gender moderates the path from role model to ATE such that the path is stronger for females ($\beta_{\text{Female}} = 0.18$) than for males ($\beta_{\text{Male}} = 0.002$). *H8* is thus supported. The effect of role models on PBC is also significantly stronger for female students ($\beta_{\text{Female}} = 0.34$) than for male students ($\beta_{\text{Male}} = 0.08$), which means that *H10* is also supported. The effect of role model on SN was not moderated by gender, which means that *H9* was not supported. Out of the six moderating hypotheses, four were thus supported (*H5*, *H6*, *H8* and *H10*) and two rejected (*H7* and *H9*). Overall, the variance explained by the different determinants of the EIs of the males versus females was 0.65 and 0.50, respectively.

Moderator	Model	χ^2	χ^2/df	GFI	TLI	CFI	IFI	RMSEA
Gender	Fully constrained model	445.876 (269)	1.658	0.870	0.9928	0.936	0.937	0.045
	Free model	405.870 (250)	1.623	0.881	0.931	0.944	0.945	0.044

Table VII.
Goodness-of-fit indexes for two-group structural models

Table VIII.
Two-group path model
estimates

Moderator	Path estimated	χ^2	χ^2/df	CFI	RMSEA	Standardized coefficient estimate: female	Standardized coefficient estimate: male	$\Delta\chi^2$ ($\Delta df = 1$)	<i>p</i>
Gender	H5: ATE → EI	410.955	1.631	0.943	0.044	0.23**	0.39**	5.085	<i>p</i> < 0.05*
	H6: SN → EI	410.874	1.630	0.943	0.044	0.24**	0.05	5.004	<i>p</i> < 0.05*
	H7: PBC → EI	406.740	1.614	0.944	0.043	0.67**	0.50**	0.87	<i>p</i> > 0.05
	H8: RM → ATE	410.291	1.628	0.943	0.044	0.18**	0.002	4.421	<i>p</i> < 0.05*
	H9: RM → SN	407.093	1.615	0.944	0.043	0.14*	0.11*	1.223	<i>p</i> > 0.05
	H10: RM → PBC	412.185	1.636	0.942	0.044	0.34**	0.08	6.315	<i>p</i> < 0.01**

Notes: **p* < 0.05; ***p* < 0.01; EI = entrepreneurial intention; ATE = attitudes towards entrepreneurship; SN = subjective norms; PBC = perceived behavioural control; RM = role models

5. Discussion

This study contributes to our understanding of the development of EIs, particularly within the context of a developing country. Based on the TPB, institutional approach, social cognitive career theory and social cognitive theory but also the literature on entrepreneurial role models and gender differences in entrepreneurship, we formulated a number of hypotheses regarding the determinants of Iranian students' EIs and investigated the mediating and moderating effects of these determinants within a model of EIs.

Our findings support previous research findings which showed knowing a successful entrepreneurial role model to exert an indirect, positive effect on the EI of students via the motivational antecedents of EI, namely, ATE, SN and PBC. In other words, exposure to an entrepreneurial role model can enhance students' EIs by showing them that being an entrepreneur is both a feasible and desirable career option. This finding is in line with the existing literature (Boyd and Vozikis, 1994; Nauta and Kokaly, 2001; Scherer *et al.*, 1991; Krueger, 1993). The correspondence of the present findings with the findings of other studies implies that our conclusions can be generalized to other cultural contexts. Knowing entrepreneurial role models can positively affect a student's PBC, most likely by increasing their knowledge, mastery or general set of ability with regard to engaging in tasks required for becoming an entrepreneur (BarNir *et al.*, 2011). Knowing role models can also positively influence the ATE of students by fine-tuning their perceptions and making a positive contribution to their evaluation of a career as an entrepreneur. Furthermore, knowing entrepreneurial role models can positively influence SN as well, presumably via the provision of encouragement, support and social influence. The mediation analyses as a whole show knowing entrepreneurial role models to influence students' EI more indirectly via the antecedents of EI than directly. The results of other studies support this finding (BarNir *et al.*, 2011; Carr and Sequeira, 2007; Kolvereid, 1996b; Krueger, 1993; Scherer *et al.*, 1991).

Entrepreneurial role models exerted a considerable influence on PBC in particular ($\beta = 0.22$). This shows the availability of role models, as Bandura (1986) has stated, to be an important source for the development of self-efficacy and individuals' confidence in their ability to start a new business can increase via vicarious learning experience and observation of the behaviour of role models.

As expected, ATE was more positive for male students compared to female students. The SN of the students did not influence the EI of the male students, but it strongly influenced the EI of the female students. Thus, in the area of entrepreneurship for Iranian female students, SNs are particularly salient and can contribute considerably to their EI – presumably due to the person-orientation of these women and their affiliation and relational needs. ATE were more positive to start with for the Iranian male students relative to the Iranian female students – presumably due to the instrumental orientations of the Iranian men and their need for independence and achievement (Cross and Madson, 1997; Eagly, 1987; Hofstede, 1980). Previous studies of gender differences in EI (Díaz-García and Jiménez-Moreno, 2010) and the results of studies in other fields (such as information technology) (Grogan *et al.*, 1997; Konrad *et al.*, 2000; Venkatesh *et al.*, 2000; Venkatesh and Morris, 2000) support the gender differences found for the prediction of EI observed here. And it can thus be concluded that gender plays a crucial role in shaping the EI of students.

One possible explanation for the gender differences in ATE and SN could relate to a predisposition on the part of women to be more communal, be more aware of others' feelings and pay more attention to the opinions of others in making decisions when compared to men (Eagly, 1987; Venkatesh and Morris, 2000). The EIs of women are therefore more likely to be influenced by SN than the EI of men. In contrast, men are more predisposed to act autonomously, independent of others, agentively and base their decisions on their own motives and objectives than women (Eagly, 1987; Herring, 1993; Holmes, 1992; Kilbourne and Weeks, 1997; Weatherall, 1998; Williams and Best, 1982). The EI of men is therefore more likely to be influenced by their ATE than the EI of women.

An alternative or possibly supplemental explanation may stem from Iranian culture. In the GLOBE cross-cultural study of leadership and organizational culture, Iran's score on gender egalitarianism is relatively low. The norm in Iranian society is to maximize – or in any case not minimize – gender role differences (Dastmalchian *et al.*, 2001). Societies low on gender egalitarianism are described as societies in which relatively large gender role differences exist (House *et al.*, 2001). The present findings presumably reflect – at least in part – the relatively large gender role differences which exist in Iranian culture to start with and might therefore be more country-specific than suspected. Future research should investigate gender differences in the prediction of EI using a model which is similar to the one used here but then within other cultures.

No support was found for the expected moderating effect of gender on the relationship between PBC and EI. That is, PBC was found to be a relevant determinant of EI for both male and female students. This is contrary to what BarNir *et al.* (2011) found when they studied the effects of entrepreneurial self-efficacy on EI and found the effects to be stronger for females than for males. In the studies by Wilson *et al.* (2007) and Diaz-García and Jiménez-Moreno (2010), however, PBC was found to be the most significant predictor of EI for both genders.

One plausible explanation for this contradictory finding with regard to the moderating effects of gender on the relationship between PBC and EI might again stem from Iranian culture and values. Iranians have been found to score low on uncertainty avoidance (House *et al.*, 2004), which may mean that Iranian students are relatively unafraid of situations involving uncertainty and have a relatively strong tolerance for ambiguity. They may also feel more capable of coping with the uncertainty of a new business venture than students from countries with higher scores on uncertainty avoidance (e.g. Greece and Japan). PBC may therefore be a strong predictor of EI for both genders in Iranian culture, as found in the present study. Environmental conditions in Iran are also not conducive to entrepreneurship. According to a World Bank report (2012), Iran ranks 145th out of 185 countries with respect to the ease of doing business and 83rd with respect to the ease of getting credit. In such an environment, confidence in one's ability to start and run a business is thus critical for both men and women.

An alternative or possibly supplemental explanation for this contradictory finding might relate to gender-role orientations. According to Mueller and Conway Data-on (2008), entrepreneurial self-efficacy or PBC is more dependent on "psychological gender-role orientation" than on biological sex, with the latter being what we examined in the present study. Gender-role orientation as opposed to simply gender might therefore moderate the influence of PBC on EI and should therefore be considered in future research.

A major objective of the present research was to see if the relationships between knowing role models and the three antecedents of EI within the TPB differ for men versus women. Our results suggest that this is not the case. The influence of entrepreneurial role models on SN did not differ for men versus women. This means that entrepreneurial role models represent a source of SN for students (Carsrud *et al.*, 2007), regardless of the gender of the students. At this point, we do not have a particularly clear or convincing explanation for the lack of a moderating effect of gender on the relationship between SN and EI. More studies are thus needed to clarify and refine this relationship.

With regard to the moderating effects of gender for the influence of role models on either PBC or ATE, both PBC and ATE were more affected by knowing role models for women than for men. This finding is consistent with the results of BarNir *et al.* (2011), who found exposure to role models to have a stronger effect on women's self-efficacy than on men's. Women are generally more open and sensitive to input from role models than men are and, for this reason, entrepreneurial role models can shape the entrepreneurial attitudes and self-efficacy of females more than entrepreneurial attitudes and self-efficacy of males. It can also be argued that women are more susceptible to social influence – which can stem from role models as well – than men are due to different patterns of socialization (Eagly and Carli, 1981). In addition, role models may provide more training or instructional support for women as opposed to men because they assume or somehow sense that women have a greater lack of entrepreneurial skill than men. Alternatively, role models may give men much less support than women because they assume that the skills are already present for men and thus provide contacts, opportunities to identify and engage in entrepreneurial activities and access to resources instead (BarNir *et al.*, 2011).

Finally, it is possible that both men and women are primarily affected by those role models who are most readily available to them. To the extent that it is easier to find male entrepreneurial role models in the media and the community, men can rely on these models and may therefore need less personal role models. Women, in contrast, will have to draw more on personal role models (e.g. family, friends) who may provide direct or indirect learning opportunities, resulting in increased self-efficacy belief ((BarNir *et al.*, 2011).

6. Implications

6.1 Theoretical implications

The results of the present study have several theoretical implications. First, role models indirectly influence EI through its antecedents. These mediating effects demonstrate the TPB assumption that additional person/situational exogenous variables such as role models indirectly affect an individual's intentions via the antecedents of intention (Ajzen, 1991; Kolvereid and Isaksen, 2006). A second theoretical implication is that gender moderates the relationships between role models, ATE and EIs. These moderating results demonstrate Fishbein's (1980) notion that exogenous variables such as gender can influence the relative emphasis placed by people on the attitudinal and normative determinants of intention. In addition, the present findings extend our understanding of the role of gender in entrepreneurship. Previous studies have paid relatively little attention to the moderating effects of gender and variables such as role models within models of EI which draw on the TPB. In the present study, SN was found

to be more important for female students but to play no significant role for male students. In contrast, for male students, ATE proved relatively more important. Role models in general were also found to be more important for female students compared to male students. These findings suggest that male students focus on the instrumental outcomes of entrepreneurship, while female students are more sensitive to social factors and the opinions of others with regard to EI and the decision to become an entrepreneur. Including gender as a potential moderator of the relationships within the TPB can thus help us to gain a better understanding of EI and its antecedents.

6.2 Practical implications

The results of the present study have several practical contributions and implications for human resource development. With the growing presence of women in entrepreneurship and at universities, increased sensitivity to the diversity of career choice processes and EIs is necessary, as well as reflection on differences in the perceptions and motives for entrepreneurship.

Such increased sensitivity should also have implications for entrepreneurship education. To maximize the effectiveness of education and foster EIs, entrepreneurship education programmes should be tailored to the needs of the two genders and emphasize those factors which are salient for each group. For example, educators should be aware that modifying the ATE will produce larger increases in EI for males relative to females, while modifying SN will produce larger increases in EI for females relative to males. In other words, male students are driven by instrumental factors, while female students are more motivated by expressive, social factors. It is therefore suggested that in single-sex universities, the teaching methods and curricula should be specifically designed to enhance SN and ATE with regard to entrepreneurship for female and male students. SN can be improved with the use of teaching methods which include teamwork and give students opportunities to build a network with entrepreneurial-minded peers, friends, role models and entrepreneurs (Karimi *et al.*, 2014; Mueller, 2011; Souitaris *et al.*, 2007; Weber, 2012). Using such an approach, female students may be helped to overcome the absence of role models and other barriers such as a lack of networking.

For male students, educators should emphasize the instrumental benefits of starting a new business (e.g. fulfilment of self-interest, achievement, independence). Attention to these should positively influence the EIs of male students via the antecedents of such intention.

PBC contributed most to the prediction of EI for both males and females. The practical implication here is that increasing the frequency of media coverage for start-up business success stories, introducing and integrating an entrepreneurship curriculum into the education system and creating opportunities for extracurricular entrepreneurship activities should be encouraged to enhance perceptions of the feasibility of entrepreneurship (GEM, 2010). In particular, training programmes which specifically target the PBC of students can be expected to foster EI and subsequent entrepreneurial behaviour. Studies (Karimi *et al.*, 2014, 2013) have shown that entrepreneurship education can indeed enhance the entrepreneurial self-efficacy or PBC of students. As already mentioned, moreover, such self-efficacy can be fostered via experiences of mastery, vicarious learning (i.e. role modelling) and social persuasion (Bandura, 1986). Via an action learning approach (or problem-based learning) but also

other teaching methods and course characteristics which include practical experience, internships and business planning activities, students can obtain the insight and skill needed to be an entrepreneur and, as a result, develop their entrepreneurial self-efficacy. The present findings suggest that the presence of role models is an important factor for fostering PBC on the part of students and female students in particular. Entrepreneurship education programmes and workshops should therefore consider including contact with entrepreneurial role models as part of their curricula. Such role models can foster student confidence in their ability to start a new business, enhance their ATE and create positive SNs with respect to entrepreneurship. In particular, such role models can foster self-efficacy or PBC by providing vicarious learning experiences for students. Teachers can also enhance individual self-efficacy by providing social persuasion and the positive encouragement and feedback and increasing positive affective reactions to engage in entrepreneurship (Karimi *et al.*, 2014). Such an approach is most likely to foster both male and female PBC, but the present results suggest that it is especially relevant for female students.

Educators can invite entrepreneur guest speakers to participate in question and answer sessions, tell their success stories and share their experiences. Guest speakers can provide real-life examples of how small businesses are built and run, giving students a clear sense of the real world of entrepreneurship and foster a better understanding of both the challenges and opportunities that entrepreneurs may face. Along these lines, Hills (1988) has emphasized that providing real-world experiences is imperative for entrepreneurship education.

In a non-traditional and gender-stereotyped career like entrepreneurship, gender matching of the role model may be particularly important for women (Quimby and DeSantis, 2006). Gender-matched role models can presumably help break negative career stereotypes (Beaman *et al.*, 2012). Highly competent and successful women in male-dominated occupations can reduce traditional stereotypes (Lockwood, 2006). Educators should thus strive to make greater use of female entrepreneurial role models in their curricula and classes.

In sum, the most important contribution of the present results to university education and policymaking is the insight that interactions between suitable entrepreneurial role models and potential entrepreneurs should be stimulated, as this is very likely to foster entrepreneurship in Iran and female entrepreneurship in particular.

7. Limitations and future research

The current study has several limitations which point to directions for future research. First, the study utilized a convenience sample composed of students from public universities in Iran. The study findings may therefore not be generalizable to other universities or other contexts. Future research should employ a larger, more representative and randomly selected sample of university students from both public and private universities and other institutions in Iran. This will help validate the present findings. Second, the data collected for this study were all self-report. Future research on EIs should include other types of data and methods of collection. Third, the present study was a cross-sectional study, which prevented us from examining the influence of role models on entrepreneurial attitudes and intentions over time. Longitudinal study is

therefore recommended in the future to trace the influence of role models and any changes in the entrepreneurial attitudes and intentions of students over time. Via longitudinal study, the subsequent effects of intention on the actual occurrence of entrepreneurial behaviour can also be documented.

Future studies should go beyond merely documenting acquaintance with entrepreneurial role models to more carefully examine the mechanisms responsible for the influence of role models on EI. The similarity of individuals to career role models may be especially important for those women who are interested in more non-traditional careers such as entrepreneurship. Within the context of entrepreneurship, that is, previous research (Bosma *et al.*, 2012) has indicated that individuals and their role models tend to resemble each other in terms of gender and other characteristics. In addition and as Bandura (1986) originally posited, role modelling, as a source of self-efficacy, is more powerful when the role models resemble the individual. Thus, as suggested by Quimby and DeSantis (2006), future research should examine whether the similarity between a student and role models in terms of gender, ethnicity and other demographic characteristics indeed exerts a greater influence on career decisions than dissimilarity. Conversely and as Gibson (2004) states, negative role models can also influence the career choices of students in a negative manner and lead students away from a similar career at times. Future research should thus consider the effects of negative role models on the EIs of students as well.

Yet another limitation is that the present pattern of findings might relate to the widespread gender role differences in Iran and therefore be country-specific. Future research should thus investigate gender differences with respect to role models, EI and its predictors in other cultures.

Finally, gender in this study referred to “biological sex”. This differs from other views of gender such as that of Bem (1981), who used the term “psychological gender” to indicate an individual’s masculinity or femininity. The gender effects observed in the present study could be a result of more masculine or feminine characteristics rather than simply “biological sex”. Future studies should therefore be designed to address this question.

This research was financed by Iran’s Ministry of Science, Research, and Technology. The authors thank the participating students and teachers, who made this study possible. They also thank the EJTD editor and two anonymous reviewers for their constructive and helpful comments on earlier versions of this paper.

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Further reading

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