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Article

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The impact of narrow personality traits on entrepreneurial intention in developing countries: A comparison of Turkish and Iranian undergraduate students using ordered discrete choice models



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ABSTRACT

This study aimed to examine the potential determinants of the entrepreneurial intention (EI) levels of Turkish and Iranian undergraduate students with an emphasis on the narrow personality traits that could predict such students' EI levels. For this purpose, a well-established written questionnaire was administered to a total of 875 undergraduate students from both countries. Due to the ordered nature of the dependent variable, the data were analyzed using the ordered logit, generalized ordered logit, and partial proportional odds models. The results of the study showed significant differences between the Turkish and Iranian undergraduate students' EI levels. That is, the presence of an entrepreneur in the family increased the Turkish undergraduate students' EI levels whereas the Turkish undergraduate students whose household heads were government officials or retirees had lower EI levels than those whose parents were self-employed. The Turkish undergraduate students who saw themselves as having much enthusiasm and having the tendency to become tense and to do things efficiently had a higher intention to found a business venture in the near future compared to those who did not have such traits. In contrast, the Turkish students who saw themselves as having the tendency to persevere until their task is finished, to be moody, and to make plans and implement them had lower EI levels than those who did not have these traits. Openness (with significant narrow personality traits such as having the tendency to be original, to come up with new ideas, and to have an active imagination) was found to be the Big Five personality trait with the greatest positive impact on the Iranian undergraduate students' EI levels whereas the Iranian undergraduate students who saw themselves as ingenious, deep thinkers, and worriers had lower EI levels. It was also shown in this study that the Iranian undergraduate students with a monthly income from a job in addition to their stipend from their family were more likely to have higher EI levels than those whose monthly funds came only from their parents. In addition, the male Iranian students were found to have lower EI levels than their female counterparts. This study contributed to the existing literature by conducting a cross-cultural comparison of two developing countries using the ordered discrete choice modeling approaches, and its empirical findings may assist policymakers in coming up with effective policies for promoting entrepreneurship.

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1. Introduction

Entrepreneurship is widely believed to play a crucial role in economic growth and job creation (Franco, Haase, & Lautenschläger, 2010; McMullan & Long, 1987; Zampetakis, Gotsi, Andriopoulos, & Moustakis, 2011). Furthermore, the positive influence of venture

creation on macroeconomic variables, including economic efficiency, development, employment level sustainment, and market innovation, is highlighted (Barba-Sánchez & Atienza-Sahuquillo, 2018; Gomez-Gras, Mira-Solves, & Martinez-Mateo, 2010; Shah & Soomro, 2017; Shane & Venkataraman, 2000; Zhao, Seibert, & Hills, 2005) because entrepreneurs boost economic development by proposing a novel inspiration and converting the underlying idea into a profitable venture (Turker & Sonmez Selçuk, 2009). The negative impacts of the global economic crisis, the current economic and geopolitical uncertainties, and other macroeconomic determinants

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worldwide push policymakers to come up with policies that will generate a future supply of new entrepreneurs (Pfeifer, Šarlija, & Zekić Sušac, 2016). Especially in developing countries, many young people are inspired to perform entrepreneurial activities to overcome their unemployment and poverty (Shah & Soomro, 2017). In addition, as emerging economies are more prone to encountering crucial issues that hinder entrepreneurship, such as lack of access to resources and lack of institutional support, explaining certain attributes of the young population that may predict their EI levels may be particularly important in the context of such economies to promote entrepreneurship among them (Mustafa, Hernandez, Mahon, & Chee, 2016).

Some earlier studies suggest that people from developing countries tend to have higher EIs than people from developed countries (Iakovleva, Kolvereid, & Stephan, 2011). Based on the average income groups determined by the World Economic Forum in 2018, Iran is an upper-middle-income country (Bosma & Kelley, 2019; World Economic Forum, 2019), with a total population of almost 81.4 million people (Bosma & Kelley, 2019) and a total GDP of US\$454 billion in 2017 (The World Bank, 2019a). Iran is thus a developing country, where intensive governmental efforts have been exerted to promote entrepreneurship (Shiri, Shinnar, Mirakzadeh, & Zarafshani, 2017). Since 2008, the total entrepreneurship activity and established business ownership in Iran have generally been on the rise, and several changes in the total entrepreneurship activity have shown consistency with the shifts in GDP growth. However, both the total entrepreneurship activity and established business ownership showed a decline in 2018.

The most recent Global Entrepreneurship Monitor survey (2018) revealed that entrepreneurship activity is most prevalent among the 25 – 34 age group in Iran, and that the 55 – 64 age group has an entrepreneurship activity rate less than a third of the overall rate. In addition, Iran's GDP growth has been shown to be unsteady of late due to the political developments in the country and the international sanctions imposed on it and the subsequent reliefs from these that it received in recent years. Despite the economic turmoil in the country, Iranian individuals tend to show a highly active entrepreneurship behavior stimulated by several events and competitions organized by universities; the Ministry of Cooperatives, Labor and Social Welfare; and the Iran Chamber of Commerce, Industry, Mines and Agriculture. However, an apparent decline of total entrepreneurship activity was recognized in 2018, which can be associated with the increase in job opportunities following the sanction reliefs that the country had received (Bosma & Kelley, 2019).

The perceived-opportunities rate (i.e., the percentage of the population aged 18 – 64 who perceive good opportunities for creating a business venture in the area where they live) in Iran for the year 2018 was 22.32, below the regional average (45.16), and the perceived-capabilities rate (i.e., the percentage of the population aged 18 – 64 who believe they have the required knowledge and skills to start a business firm) for the same year was 53.11 (Global Entrepreneurship Monitor, 2019a). The Iranian economy was classified by the World Economic Forum (2017) as an efficiency-driven economy, defined as an economy whose institutions support industrialization in pursuit of higher productivity and economies of scale (Iakovleva et al., 2011).

Based on the average income groups determined by the World Economic Forum in 2018, Turkey also has an upper-middle-income economy (Bosma & Kelley, 2019; World Economic Forum, 2019). In 2018, the total population of Turkey was nearly 82 million people (Turkish Statistical Institute, 2019) while the total GDP was US\$851.5 billion (The World Bank, 2019b). The Turkish economy is regarded as a transition economy from an efficiency-driven economy to an innovation-driven one (World Economic Forum, 2017).

Despite a 3% decline in GDP in the fourth quarter of 2018, Turkey's GDP growth rate in 2018 was 2.6%. Nevertheless, the Turkish economy experienced sustained growth for nine consecutive years until late 2018 (Presidency of the Republic of Turkey, 2019a), and in January 2019, the seasonally adjusted unemployment rate was 13.3% (Presidency of the Republic of Turkey, 2019b).

According to the latest data reported by Global Entrepreneurship Monitor (2019b), Turkey's perceived-opportunities rate is currently 44.31, which is very close to the regional average (45.16), while the country's perceived-capabilities rate is 56.84. The country's current EI rate is 29.73, on the other hand, which is above the regional average (25.90) and the income level average (28.77). As Bosma and Kelley (2019) note, Turkish entrepreneurs can be distinguished from the other entrepreneurs in the Global Entrepreneurship Monitor countries due to their high expectations of economic growth and job creation, and Turkey ranks second among 42 countries in terms of the high economic-growth and job creation expectations from the early-stage entrepreneurial activity.

The Small and Medium Enterprises Development Organization (KOSGEB) is the government agency in Turkey authorized to encourage entrepreneurship and support the Turkish small and medium-sized enterprises (SMEs). Based on its three main strategic missions and 13 subgoals, its latest Strategic Plan (2016-2020) includes youth entrepreneurship as a thematic field, along with woman entrepreneurship and eco-entrepreneurship, to address particularly the country's unemployment problem. It also highlights the importance of entrepreneurship education and of a sustainable support system. KOSGEB also aims to contribute to the Turkish economy by successfully implementing an entrepreneurship support program and an applied entrepreneurship education program (The Small & Medium Enterprises Development Organization, 2015).

In many countries, university students' interest in the concept of entrepreneurship is increasing, and university students tend to seek opportunities to start their own business after graduating instead of seeking employment in a firm (Kirby & Ibrahim, 2011; Salamzadeh, Azimi, & Kirby, 2013). However, there have been few studies that focused on the impact of regional variations on EI (Liñán, Urbano, & Guerrero, 2011), although the regional dimension appears to be a function of EI under the influence of distinctive sociocultural environments (Franco et al., 2010). Further, cross-cultural research is important as it can better examine the impact of different cultures and values on EI (Liñán & Chen, 2009). Cross-cultural research reduces the risk of obtaining nation-specific results that are not generalizable, and provides a comparison of empirical findings (Paul & Shrivatava, 2016). In addition, the impact of the institutional context on entrepreneurial behavior deserves particular attention due to its considerable contribution to the performance of economies (Veciana, Aponte, & Urbano, 2005).

The main objective of this study was to determine the narrow personality traits that may have an influence on undergraduate students' EI through a cross-cultural comparison of two emerging economies: Turkey and Iran. EI gives valuable information about the vision of an emerging organization's founder and the subsequent corporate culture (Krueger, Reilly, & Carsrud, 2000) because societal norms regarding entrepreneurial activities can considerably vary (Shiri et al., 2017). EI is considered a function of the regional dimension that reflects different sociocultural environments (Franco et al., 2010). Culture provides a motivation for individuals in a certain society to engage in behaviors that may not be prominent in other societies (Liñán & Chen, 2009), and the cultural differences between countries can explain the differences in entrepreneurship between such countries to a certain extent (Paul & Shrivatava, 2016). In a case where economic and social institutions are shaped by culture, a positive aggregate impact is

expected that makes entrepreneurial activity convenient (Liñán & Chen, 2009). Shiri et al. (2017) stated that cultural values, including social valuation and closer social ties, are significant variables that stimulate EI among Iranian agriculture students. According to Liñán, Urbano et al. (2011), closer social ties raise university students' EI levels. In addition, de Pillis and Reardon (2007) pointed out significant differences between American and Irish university students in terms of their EI levels, and highlighted the importance of cultural factors in explaining distinctively high EI levels. In terms of cultural background, Turkey shows lower levels of individualism, higher masculinity, higher power distance, and higher uncertainty avoidance (Shneor, Metin Camgöz, & Bayhan Karapinar, 2013). People in individualist cultures tend to concentrate on their own and their immediate family's interests (Gurel, Altınay, & Daniele, 2010).

Although the number of empirical studies focused on cross-cultural comparison in terms of university students' EI is gradually growing (Autio, Keeley, Klofsten, Parker, & Hay, 2001; de Pillis & Reardon, 2007; Franco et al., 2010; Liñán & Chen, 2009; Moriano, Gorgievski, Laguna, Stephan, & Zarafshani, 2012; Pruett, Shinnar, Toney, Llopis, & Fox, 2009; Trivedi, 2017; Veciana et al., 2005), more studies on the said topic are needed particularly involving developing countries such as Turkey and Iran, two neighboring countries with different cultures and economic policies. The data gathered from two universities in these countries were analyzed using several ordered response models due to the nature of the selected dependent variable. The empirical results obtained from this study may contribute to the existing literature as the relevant studies in this region are relatively limited. This study differs from the earlier studies in the existing literature mainly because it focused on narrow personality traits and compared several ordered discrete choice models to determine the best model fit when few studies in the existing literature utilized ordered discrete choice modeling despite the ordered nature of EI levels. As far as is known, this study was the first study that compared ordered discrete choice models in exploring undergraduate students' EI levels in the Ardahan and Maku provinces of Turkey and Iran, respectively.

To attain its aim, this study investigated the relationship between the EI levels of undergraduate students on the one hand and sociodemographic factors (i.e., gender, age group, hometown, current residence), socioeconomic factors (i.e., monthly financial source, household head's occupation status), and other factors (i.e., presence of an entrepreneur in the family, attendance of an entrepreneurship course) on the other hand as independent variables, along with narrow personality traits and entrepreneurship scale items, by comparing such variables using several ordered discrete choice models for both countries. The estimation results revealed that the sociodemographic/socioeconomic variable *presence of an entrepreneur in the family*; the narrow personality traits *having a forgiving nature and having a tendency to become tense and to do things efficiently*; and the entrepreneurial scale items "I can generally make good decisions regarding my future job," "I can find better options if I leave my future job," "I can find suitable workplaces for my skills," and "I do not have any problem adapting to a new situation and practice" were positively associated with the Turkish undergraduate students' EI. On the other hand, the socioeconomic variable *the household head being a retiree*; the narrow personality traits *having the tendency to worry a lot, to persevere until the task is finished, to be moody, and to make plans and implement them*; and the entrepreneurship scale item "I am not afraid of making a mistake about something I am working on" were negatively associated with the Turkish undergraduate students' EI levels.

For the Iranian sample, the estimation results indicate that the sociodemographic and socioeconomic variables *being female and a job and one's family as monthly financial sources*; the narrow personality traits *having the tendency to be original, to come up with new ideas, and to have an active imagination*; and the entrepreneur-

ship scale item "I can find better options if I leave my future job" have a positive impact on the Iranian undergraduate students' EI levels. On the other hand, the Iranian undergraduate students who saw themselves as being *ingenious, deep thinkers, and worriers* were found to have lower EI levels.

The remainder of this paper is organized as follows. The second and third sections discuss EI models and the crucial role of narrow personality traits in determining undergraduate students' EI behavior. The fourth section presents and discusses some potential determinants of university students' EI as reflected in the existing literature. The fifth section gives information about the research methods that were used in this study. The sixth section presents the data and estimation results that were obtained in the study. The seventh section presents the interpretation of the analysis results. The eighth section discusses the model specifications and the limitations of this study. Finally, the last section concludes the paper and cites the recommendations for future studies and policies.

1.1. Entrepreneurial intention models

Behavioral intention, described as the decision to initiate behavior, is regarded as an essential process prior to taking an action that has a better explanation ability of such action than other possible determinants thereof (Wu & Wu, 2008). In other words, intention is considered a better predictor of planned behavior than observation of attitudes, beliefs, personality, or demographics (Bagozzi, Baumgartner, & Yi, 1989; Fishbein & Ajzen, 1975; Krueger et al., 2000; Schwarz, Wdowiak, Almer-Jarz, & Breitenecker, 2009; Shook & Bratianu, 2010; Souitaris, Zerbinati, & Al-Laham, 2007). As Ajzen (1991) notes, "As a general rule, the stronger the intention to engage in a behavior, the more likely should be its performance" (p. 181). The concept of intention facilitates the understanding of the possible factors that pave the way for individuals' future careers (Franco et al., 2010), and EI is the first step of the evolving procedure of venture creation over time (Lee & Wong, 2004; Liñán & Chen, 2009), which provides a means to better explain and predict entrepreneurship (Krueger et al., 2000).

The earlier studies on entrepreneurship can be grouped into three categories on the basis of what they focused on: what happens when entrepreneurs act, why they act, and how they act (Stevenson & Jarillo, 1990; Trivedi, 2017). In this vein, EIs give valuable information on why entrepreneurs act the way they do and provide a better understanding of the process of entrepreneurship (Trivedi, 2017). Entrepreneurship models are typically proposed based on relevant approaches using personality traits, demographics, or attitudes (Krueger et al., 2000). Intention models provide significant utility and potential for entrepreneurship scholars (Krueger et al., 2000). Ajzen's (1991) theory of planned behavior (TPB) and Shapero's model (Shapero & Sokol, 1982) of the entrepreneurial event (SEE) are the two most promising approaches to explaining the decision to establish a new business firm in the future (Franco et al., 2010). TPB proposes that "the performance of a behavior is a joint function of intentions and perceived behavioral control" (Ajzen, 1991, p. 185). TPB identifies the following three antecedents of intention: attitude toward the planned behavior, subjective norms, and perceived behavioral control (Shook & Bratianu, 2010). Behavioral intentions and perceived behavioral control can be directly used to predict behavioral achievement, and if there exist no serious behavior control problems, intentions can predict behaviors with respectable accuracy while the relative contributions of attitude, subjective norms, and perceived behavior control to the prediction of intention principally vary across behaviors and situations (Ajzen, 1991).

The SEE model proposes that perceived desirability of an entrepreneurial idea, perceived feasibility of the entrepreneurial idea, and propensity to act are the three main antecedents of

an individual's EI (Peterman & Kennedy, 2003; Shapero & Sokol, 1982). The SEE model principally considers starting a new business venture as the result of the interaction among contextual factors that would have an impact on an individual's perceptions (Liñán, Rodríguez-Cohard, & Rueda-Cantuche, 2011). TPB and SEE are considered highly analogous to each other while perceived behavioral control and perceived feasibility of an entrepreneurial idea are elements conceptually associated with perceived self-efficacy (Krueger et al., 2000). For SEE, emphasis is primarily placed on the individual, which is done by including a measure about the individual's proactiveness, whereas TPB pays more attention to the environmental context by considering the social support for the behavior (Shook & Bratianu, 2010). Autio et al. (2001) argue that entrepreneurial decisions have intentional, expectancy-driven, and situational features while the earlier studies that applied TPB complemented the more deterministic appearance of trait and demographic lines in entrepreneurship research.

A respectable number of studies on entrepreneurship focused on the application of the TPB model to their data. Some earlier studies emphasized the applicability of the SEE model (Peterman & Kennedy, 2003; Uysal & Güney, 2016), and some others (Krueger et al., 2000; Liñán, Rodríguez-Cohard et al., 2011; Veciana et al., 2005; Zhang, Duysters, & Cloodt, 2014) utilized both the TPB and SEE models to determine the main antecedents of university students' EI. Several earlier studies (Salamzadeh et al., 2013; Shiri et al., 2017) successfully applied TPB to an Iranian sample while the TPB model (Ozaralli & Rivenburgh, 2016; Shneor et al., 2013) and the SEE model (Uysal & Güney, 2016) were also used for a Turkish sample. Most recently, Trivedi (2017) proposed a new conceptual model (i.e., the EI-Constraint Model) with improved predictability and generalizability compared to the basic TPB model for further EI research by adding three contextual variables (i.e., endogenous barriers, exogenous environment, and university support) to the basic TPB model. Trivedi (2017) found that this novel model has a higher overall explanatory power (i.e., 68.20%) than the basic TPB model. Barba-Sánchez and Atienza-Sahuquillo (2017) discuss the possible use of the expectancy theory for explaining EI.

With regard to empirical analysis methods, some earlier studies utilized methods other than the traditional regression analysis method, such as structural equation modeling (Iakovleva et al., 2011; Karimi, Biemans, Lans, Chizari, & Mulder, 2014; Karimi, Biemans, Lans, Chizari, & Mulder, 2016; Liñán & Chen, 2009; Liñán, Urbano et al., 2011; Moriano et al., 2012; Roy, Akhtar, & Das, 2017; Saeed, Yousafzai, Yani-De-Soriano, & Muffatto, 2015; Trivedi, 2017; Wu & Wu, 2008; Zampetakis et al., 2011; Zhao et al., 2005), multivariate analysis based on partial least squares (Esfandiari, Sharifi-Tehrani, Pratt, & Altinay, 2019; García-Rodríguez, Gil-Soto, Ruiz-Rosa, & Sene, 2015; Liñán, 2004; Padilla-Angulo, 2019; Shiri et al., 2017), joint correspondence analysis (Fietze & Boyd, 2017), and fuzzy-set qualitative comparative analysis (Nowiński & Haddoud, 2019). The application of nonlinear models such as discrete choice modeling is quite limited, except for some successful implementations of a binary logit model (Ashourizadeh, Nasiri, & Schøtt, 2014; Bogatyreva, Edelman, Manolova, Osiyevskyy, & Shirokova, 2019; Farashah, 2013; Franco et al., 2010; Gurel et al., 2010; İlhan Ertuna & Gurel, 2011; Kaya, Erkut, & Thierbach, 2019; Pfeifer et al., 2016; Van Auken, Fry, & Stephens, 2006), a binary probit model (Zhang et al., 2014), an ordered logit (OLOGIT) model (Barba-Sánchez & Atienza-Sahuquillo, 2017), and a multinomial logit model (Zellweger, Sieger, & Halter, 2011) to examine the main antecedents of university students' EI for different datasets.

1.2. Personality traits and narrow personality traits

Several concepts referring to behavioral dispositions including social attitude and personality traits play a crucial role in pre-

dicting and explaining human behavior (Ajzen, 1991). On the one hand, personality traits take a respectable place in almost every stage of entrepreneurship processes as a critical predictor, such as intention to start a business, intention to succeed in running a business, and corporate intrapreneurship (de Pillis & Reardon, 2007; Llewellyn & Wilson, 2003; Shaver & Scott, 1992). On the other hand, more research is needed to examine the exact impact of contextual founding conditions or personality traits on university students' future self-employment decision (Lüthje & Franke, 2003). Either situational or individual variables including personality traits are considered to moderate between intentions and behavior (Krueger et al., 2000). In fact, emphasis is usually placed on entrepreneurs' personal characteristics or traits and the impact of contextual determinants in entrepreneurial research, and particularly, individual perceptions have been found to have a profound influence on the cognitive level of EIs, attitudes, and actions with respect to the encouragement by a given society, the business environment, and certain abilities (Bird, 1988; Díaz-García & Jiménez-Moreno, 2010; Liñán, Urbano et al., 2011).

Previous researchers have confirmed the existence of five fundamental personality dimensions, the so-called Big Five or the five-factor model: extraversion, neuroticism, agreeableness, conscientiousness, and openness to experience (Costa & Mcrae, 1992; John & Srivastava, 1999; Llewellyn & Wilson, 2003). Earlier researchers presumed to be able to describe an entrepreneur using only personality traits, but this conjecture was not readily demonstrated (Carsrud & Brännback, 2011). Accordingly, the classical single-view models of personality traits, which neglect other influences, have not been accepted as proper models, and interactive multidimensional models are strongly suggested (Llewellyn & Wilson, 2003). Exogenous influences, including traits, demographics, skills, and sociocultural and financial support, have an impact on attitudes and indirectly on intentions and behavior (Shapero & Sokol, 1982; Souitaris et al., 2007). Particularly, Lüthje and Franke (2003) put forward the strong impact of personality traits on engineering students' self-employment attitude. They also found that self-employment attitude is significantly associated with university students' EI. Particularly, risk-taking propensity and internal locus of control have been reported to be the most important personality traits with regard to entrepreneurial attitudes, and hence indirectly with regard to EI. Similarly, Mustafa et al. (2016) reported that the personality traits of their Malaysian university student sample were more crucial predictors of their EI levels than environmental factors were.

Each of the broad dimensions of personality can be divided into a smaller number of narrow traits that can predict individual behavior (Llewellyn & Wilson, 2003). Accordingly, the narrow personality traits of being talkative, reserved, full of energy, enthusiastic, quiet, assertive, sometimes shy and inhibited, and outgoing and sociable are classified as narrow personality traits under the Big Five personality trait of extraversion. The Big Five personality trait of agreeableness includes the tendency to find fault with others, to be helpful and unselfish, to start quarrels with others, to be forgiving, to be generally trusting, to be cold and aloof, to be considerate and kind to almost everyone, to be occasionally rude to others, and to like to cooperate with others as narrow personality traits. The Big Five personality trait of conscientiousness, on the other hand, includes narrow personality traits such as the tendency to do a thorough job, to be somewhat careless, to be a reliable worker, to be disorganized, to be lazy, to persevere until the task is finished, to do things efficiently, to make plans and implement them, and to be easily distracted. The Big Five personality trait of neuroticism includes the tendency to become sad and depressed, to be relaxed, to handle stress well, to become tense, to worry a lot, to be emotionally stable, to not be easily upset, to be moody, to remain calm in tense situations, and to get nervous easily as narrow personality

traits. Finally, the Big Five personality trait of openness includes the tendency to be original, to come up with new ideas, to be curious about many different things, to be ingenious, to be a deep thinker, to have an active imagination, to be inventive, to value being artistic and having aesthetic experiences, to prefer routine work, to like reflecting, to play with ideas, to have few artistic interests, and to have artistic, musical, or literary sophistication as narrow personality traits (Costa & Mcrae, 1992; John & Srivastava, 1999; Llewellyn & Wilson, 2003).

A number of the aforementioned narrow personality traits can be considered reverse-scored items (i.e., the tendency to find fault with others, to be reserved, to be somewhat careless, to be relaxed, to handle stress well, to start quarrels with others, to be disorganized, to be quiet, to be lazy, to be emotionally stable, to not become easily upset, to be cool and aloof, to sometimes be shy and inhibited, to remain calm in tense situations, to prefer routine work, to sometimes be rude to others, to have few artistic interests, and to be easily distracted) to better understand the exact impact of such narrow personality traits on EI levels. A previous study (Leutner, Ahmetoglu, Akhtar, & Chamorro-Premuzic, 2014) also asserts that narrow personality traits are stronger predictors of entrepreneurial success outcomes than broad personality traits are.

The main objective of this study was to determine the impact of narrow personality traits on the EI levels of Turkish and Iranian undergraduate students by comparing the results of several ordered discrete choice models. For this purpose, a number of hypotheses were developed regarding the Big Five personality traits. The first hypothesis (H1) was related to the Big Five personality trait of extraversion, stating that there is a statistically significant relationship between extraversion and the undergraduate students' EI levels. As narrow personality traits were the main interest of this study, sub-hypotheses were also formulated for each narrow personality trait under each Big Five personality trait. Hence, the first sub-hypotheses for the narrow personality traits under the Big Five personality trait of extraversion were formulated as shown below.

H1a. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of being talkative.

H1b. There is a statistically significant negative relationship between the undergraduate students' EI levels and the narrow personality trait of being reserved.

H1c. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of being full of energy.

H1d. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of being enthusiastic.

H1e. There is a statistically significant negative relationship between the undergraduate students' EI levels and the narrow personality trait of having a tendency to be quiet.

H1f. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of being assertive.

H1g. There is a statistically significant negative relationship between the undergraduate students' EI levels and the narrow personality trait of sometimes being shy and inhibited.

H1h. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of sometimes being outgoing and sociable.

One can easily notice that the direction of the relationship is determined by the nature of the narrow personality trait. In other

words, the reverse-scored items were expected to show a negative relationship with the undergraduate students' EI levels. Under similar approaches, the second hypothesis (H2) was related to the narrow personality traits under the Big Five personality trait of agreeableness, which stated that there is a statistically significant relationship between extraversion and the undergraduate students' EI levels. The second sub-hypotheses for the narrow personality traits under the Big Five personality trait of agreeableness were thus formulated as shown below.

H2a. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of being helpful and unselfish with others.

H2b. There is a statistically significant negative relationship between the undergraduate students' EI levels and the narrow personality trait of having the tendency to start quarrels with others.

H2c. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of being forgiving.

H2d. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of being generally trusting.

H2e. There is a statistically significant negative relationship between the undergraduate students' EI levels and the narrow personality trait of being cold and aloof.

H2f. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of being considerate and kind to almost everyone.

H2g. There is a statistically significant negative relationship between the undergraduate students' EI levels and the narrow personality trait of sometimes being rude to others.

H2h. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of liking cooperating with others.

The third hypothesis (H3) related to the Big Five personality trait of conscientiousness stated that there is a statistically significant relationship between conscientiousness and the undergraduate students' EI levels. The third sub-hypotheses for the narrow personality traits under the Big five personality trait of conscientiousness were thus formulated as shown in the following.

H3a. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of having the tendency to do a thorough job.

H3b. There is a statistically significant negative relationship between the undergraduate students' EI levels and the narrow personality trait of being somewhat careless.

H3c. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of being a reliable worker.

H3d. There is a statistically significant negative relationship between the undergraduate students' EI levels and the narrow personality trait of having the tendency to be disorganized.

H3e. There is a statistically significant negative relationship between the undergraduate students' EI levels and the narrow personality trait of being lazy.

H3f. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of persevering until the task is finished.

H3g. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of doing things efficiently.

H3h. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of making plans and implementing them.

H3i. There is a statistically significant negative relationship between the undergraduate students' EI levels and the narrow personality trait of being easily distracted.

The fourth hypothesis (H4) stated that there is a statistically significant relationship between the Big Five personality trait of neuroticism and the undergraduate students' EI levels. The fourth sub-hypotheses for the narrow personality traits under the Big Five personality trait of neuroticism were thus formulated as shown below.

H4a. There is a statistically significant negative relationship between the undergraduate students' EI levels and the narrow personality trait of having the tendency to become sad and depressed.

H4b. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of having the tendency to be relaxed and to handle stress well.

H4c. There is a statistically significant negative relationship between the undergraduate students' EI levels and the narrow personality trait of having the tendency to become tense.

H4d. There is a statistically significant negative relationship between the undergraduate students' EI levels and the narrow personality trait of having the tendency to worry a lot.

H4e. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of having the tendency to be emotionally stable and not to become easily upset.

H4f. There is a statistically significant negative relationship between the undergraduate students' EI levels and the narrow personality trait of being moody.

H4g. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of having the tendency to remain calm in tense situations.

H4h. There is a statistically significant negative relationship between the undergraduate students' EI levels and the narrow personality trait of having the tendency to get nervous easily.

The fifth hypothesis (H5) stated that there is a statistically significant relationship between the Big Five personality trait of openness and the undergraduate students' EI levels. The fifth sub-hypotheses for narrow personality traits under the Big Five personality trait of openness were thus formulated as shown below.

H5a. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of having the tendency to be original and to come up with new ideas.

H5b. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of being curious about many different things.

H5c. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of being ingenious and a deep thinker.

H5d. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of having an active imagination.

H5e. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of being inventive.

H5f. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of valuing being artistic and having aesthetic experiences.

H5g. There is a statistically significant negative relationship between the undergraduate students' EI levels and the narrow personality trait of preferring routine work.

H5h. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of liking reflecting and playing with ideas.

H5i. There is a statistically significant negative relationship between the undergraduate students' EI levels and the narrow personality trait of having few artistic interests.

H5j. There is a statistically significant positive relationship between the undergraduate students' EI levels and the narrow personality trait of having artistic, musical, or literary sophistication.

Along with narrow personality traits, entrepreneurship scale items were included in the survey questionnaire. Accordingly, the sixth hypothesis (H6) stated that there is a statistically significant relationship between certain entrepreneurship scale items and the undergraduate students' EI levels. The sub-hypotheses for the entrepreneurship scale items were thus formulated as shown below.

H6a. There is a statistically significant positive relationship between the undergraduate students' EI levels and the entrepreneurship scale item "I do my best even when I have a very challenging task."

H6b. There is a statistically significant positive relationship between the undergraduate students' EI levels and the entrepreneurship scale item "I can generally make good decisions regarding my future job."

H6c. There is a statistically significant positive relationship between the undergraduate students' EI levels and the entrepreneurship scale item "I can find better options if I leave my future job."

H6d. There is a statistically significant positive relationship between the undergraduate students' EI levels and the entrepreneurship scale item "I can find suitable workplaces for my skills."

H6e. There is a statistically significant positive relationship between the undergraduate students' EI levels and the entrepreneurship scale item "I do not have any problem adapting to a new situation and practice."

H6f. There is a statistically significant positive relationship between the undergraduate students' EI levels and the entrepreneurship scale item "I am not afraid of making a mistake about something I am working on."

2. Factors influencing entrepreneurial intention of undergraduate students

2.1. Entrepreneurship education

As entrepreneurship can be teachable in many respects, education is undoubtedly one of the most important ways of stimulating entrepreneurial attitudes, intentions, and competences (Karimi et al., 2016). Entrepreneurship education is regarded as one of the key ways of enhancing potential and nascent entrepreneurs' entrepreneurial attitudes (Liñán, Rodríguez-Cohard et al., 2011). Zhang et al.'s (2014) empirical study findings show that entrepreneurship education explains a significant amount of additional variance in university students' EIs even though other antecedents were included in their model. Business ventures created by well-educated entrepreneurs are usually expected to exhibit more rapid growth than other enterprises (Schwarz et al., 2009), and a recent study demonstrated that universities can play a significant role in stimulating entrepreneurship (Trivedi, 2017). In fact, successful research universities appear to foster entrepreneurial activity while many business schools in the U.S. consider the number of companies founded by their alumni and faculty an indicator of the quality of the higher education they are delivering (Lüthje & Franke, 2003).

The institutional environment in which individuals operate may also shape their subjective norms, apart from their friends and family (Autio et al., 2001; Roy et al., 2017). The university is the main institution that instructs students regarding their future work (Autio et al., 2001), and Schwarz et al. (2009) found that university students' positive perception of their university's actions to encourage entrepreneurship increases their likelihood of having high EI levels. Another research among Malaysian university students (Mustafa et al., 2016) demonstrated the considerable impact of university support on EI, but the study concluded that students' proactive personality has a higher impact on their EI than university support. Saeed et al. (2015) showed that perceived educational support, concept development support, and institutional support are the three most important antecedents of university students' self-efficacy, and that self-efficacy also has a large impact on university students' EI.

Recent studies have found that entrepreneurship education has a considerable impact on business, science and technology, and engineering students' EI (Maresch, Harms, Kailer, & Wimmer-Wurm, 2016; Zampetakis et al., 2011, and Barba-Sánchez & Atienza-Sahuquillo, 2018, respectively). As Lüthje and Franke (2003) note, undergraduate and graduate business students commonly consider establishing their own businesses as an attractive alternative to wage or salary employment. Empirically, previous studies (Franco et al., 2010; Schwarz et al., 2009) have revealed that business administration students are more likely to become self-employed after graduation than their counterparts in other disciplines. On the other hand, Zhang et al. (2014) stated that university students from technological universities and/or with a technological background have higher EI levels than other students. In contrast, Gurel et al. (2010) found no statistically significant relationship between the education and EI levels of tourism students in both the UK and Turkey.

While entrepreneurship education and EI are frequently associated with each other in the existing literature, one can argue that specific contexts are required for distinctive entrepreneurship education action (Maresch et al., 2016). Entrepreneurship courses are increasingly being implemented in higher, secondary, and even primary education (Liñán, 2004). Within the scheme of entrepreneurial awareness education, educators do not essentially aim to transform their students into entrepreneurs; instead, they aim to lend assistance to their students with regard to their future

career choice from a broader perspective (Liñán, 2004). In addition, do Paço, Ferreira, Raposo, Rodrigues, and Dinis (2011) suggest that entrepreneurial education and training concentrate on changing the students' personal attitudes toward entrepreneurship rather than just imparting entrepreneurial knowledge to them. However, many universities still do not have a research faculty and research courses on entrepreneurship (Carsrud & Brännback, 2011).

Entrepreneurship course attendance has also been found to moderate the impact of individual creativity on EI (Zampetakis et al., 2011) while entrepreneurship programs have been found to have a statistically significant positive impact on both EI and entrepreneurial attitude (Souitaris et al., 2007). Peterman and Kennedy (2003) suggest that students' positive prior entrepreneurial experience can make them desire self-employment after schooling whereas Zhang et al. (2014) found a statistically significant negative relationship between prior entrepreneurial experience and university students' EI. Liñán (2004) reported that students' attitudes and intentions are diversely affected by the different entrepreneurship education courses they attended while Barba-Sánchez and Atienza-Sahuquillo (2018) found that entrepreneurial training does not have a statistically significant impact on university students' EI. As such, the seventh hypothesis in this study was formulated as shown below.

H7. There is a statistically significant positive relationship between attendance of an entrepreneurship course and undergraduate students' EI levels.

2.2. Family background and other socio-economic characteristics relating to family

The opinions of several reference groups, including parents, spouses, friends, and relatives, are widely considered to have a considerable influence on an individual's performance or non-performance of certain actions (Ajzen, 1991; Trivedi, 2017). Zampetakis et al. (2011) highlighted the positive impact of undergraduate students' perception of their creativity on their EI, and undergraduate students' creativity was found to mediate the impact of family support on their EI whereas support for creativity in their university did not have a statistically significant effect on the undergraduate students' creativity or EI. Zellweger et al. (2011) indicated that the university students with a family business in their study were optimistic about their prospects for succeeding in their future entrepreneurial career. Similarly, Gurel et al. (2010) reported that the undergraduate students with a family business in their study showed significantly higher EI levels than those who did not have a family business.

Liñán and Chen (2009) found that Spanish students are more likely to have higher support from their respective families than Taiwanese students due to their closer family ties. The empirical results that they obtained also indicated that the students in their study who had a prior entrepreneurial experience showed a significant improvement in their perceived approval by their reference groups regardless of their culture. Many earlier studies (Shah & Soomro, 2017; Shiri et al., 2017) found that subjective norms regarding entrepreneurial behavior, which are usually influenced by one's family and other reference groups, are positively associated with university students' EI levels while the study by Shneor et al. (2013) revealed that male undergraduate students in both Norway and Turkey have higher subjective norms regarding entrepreneurial behavior than their female counterparts. Liñán, Urbano et al. (2011) found that the social valuation of entrepreneurship has a positive impact on subjective norms and behavioral control. On the contrary, the study by Maresch et al. (2016) indicated that the EI of science and technology students is negatively

associated with their subjective norms. Liñán, Urbano et al. (2011) did not find a statistically significant relationship between university students' subjective norms and EIs in both Catalonia and Andalusia.

Esfandiar et al.'s (2019) empirical findings in an Iranian sample did not reveal a statistically significant association between tourism students' subjective norms and EIs whereas do Paço et al. (2011) reported a weak significant relationship between subjective norms and EI. Like Ajzen (1991); Liñán, Rodríguez-Cohard et al. (2011) also consistently found subjective norms to have a very weak contribution to the intention of carrying out different behaviors. This positive weak relationship between university students' EIs and subjective norms was also reported by other empirical studies (Roy et al., 2017). Shook and Bratianu (2010) found that supportive reference groups have a statistically significant negative impact on university students' intention to start a business. Franco et al. (2010) found no statistically significant association between social background and university students' EIs, along with the regional dimension. Trivedi (2017) asserted that the family and friends of potential entrepreneurs should be educated about the value of entrepreneurship to help these potential entrepreneurs perceive entrepreneurship as a desirable career avenue.

Educators, policymakers, and successful business founders may also have a significant impact on entrepreneurial attitudes (Trivedi, 2017). Individuals are likely to have higher EI levels when their reference groups support their efforts to start a business venture (Shook & Bratianu, 2010). Previous studies (Shiri et al., 2017) also demonstrated that university students who have a role model have higher EI levels. In a Chinese context, university students who received entrepreneurship education from technology majors were found to have higher EI levels than other majors (Zhang et al., 2014). Nowiński and Haddoud (2019) suggested that inspiring role models would predict university students' EIs when combined with positive attitudes toward entrepreneurship. On the basis of the existing literature, this study's hypotheses about family background and other socioeconomic characteristics relating to family were formulated as shown below.

H8. There is a statistically significant positive relationship between the presence of an entrepreneur in the undergraduate students' family and such students' EI levels.

H9. There is a statistically significant positive relationship between undergraduate students' monthly financial sources and EI levels.

H10. There is a statistically significant relationship between the occupation status of the head of undergraduate students' household and such students' EI levels.

2.3. Other socio-demographic characteristics

In terms of gender, male students have been found to have a higher EI level than their female counterparts (Crant, 1996; Díaz-García & Jiménez-Moreno, 2010; Liñán & Chen, 2009; Maresch et al., 2016; Pfeifer et al., 2016; Schwarz et al., 2009; Shneor et al., 2013; Shook & Bratianu, 2010; Zhang et al., 2014). Moreover, Díaz-García and Jiménez-Moreno (2010) demonstrated that male students who perceive a higher congruence between their masculine and entrepreneurial attributes are more likely to have an EI. Shiri et al.'s (2017) empirical study findings indicate that male university students' EIs are more strongly driven by their perceived behavioral control whereas university female students' EIs are more strongly driven by their attitudes and subjective norms. Mustafa et al. (2016) found a weak relationship between gender and university students' EIs. Schwarz et al. (2009) reported a lower EI for younger students than for their older counterparts while the

EI decreased when the students' ages exceeded 35 years. Similarly, Maresch et al. (2016) found a higher EI for older university students.

H11. There is a statistically significant relationship between undergraduate students' gender and EI level.

H12. There is a statistically significant relationship between undergraduate students' age group and EI level.

Fig. 1 shows a hypothesized model of undergraduate students' EI by summarizing all the hypotheses and sub-hypotheses in this paper.

3. Methodology

3.1. Alternative ordered response models

For a particular attribute, ordered categorical variables are assumed to represent the rank order, which the underlying rank order does not necessarily exhibit the actual magnitudes. Ordinal variables enable to vary distances across adjacent values which makes them more general than continuous variables (Powers & Xie, 2008). In other words, the ordered choice models provide non-linear effects of any variable on the probabilities related to each ordered level (Greene & Hensher, 2010). Undergraduate students' EI levels can be expressed by with respect to their agreement/disagreement level for the question "I can start my own business some day in the future". Since undergraduate students' EI level is categorical and inherently ordered, it can be described as an ordered discrete choice variable with j categories (i.e. I definitely disagree/I disagree, neutral, I agree/I definitely agree) and an OLOGIT model in terms of probability can be defined as

$$Pr(y_i > j | \mathbf{X}) = g(\mathbf{X}_i \boldsymbol{\beta}') = \frac{\exp(\mathbf{X}_i \boldsymbol{\beta}'_j - \phi_j)}{1 + \exp(\mathbf{X}_i \boldsymbol{\beta}'_j - \phi_j)}, j = 1, \dots, m - 1 \quad (1)$$

where \mathbf{X}_i denotes $(k \times 1)$ vector of observed non-random explanatory variables; $\boldsymbol{\beta}$ denotes $(k \times 1)$ vector of unknown parameters to be estimated and m denotes the number of categories of the ordinal dependent variable. The parameters of the model (β) and cut off points (Φ_1 and Φ_2) are estimated using maximum likelihood method and it is assumed that the effects of explanatory variables on undergraduate students' EI levels to be fixed across observations (Long, 1997; Quddus, Wang, & Ison, 2010). Although a standard OLOGIT model is one of the most widely used discrete choice models to analyse ordinal dependent variables, the assumptions of standard OLOGIT model are frequently violated (Williams, 2016).

Parallel lines assumption is one of the crucial assumptions of the standard OLOGIT model. Parallel lines assumption presumes that the relationship between each pair of outcome groups is the same (Quddus, et al. 2010; Williams, 2006). Parallel lines assumption can be tested by Brant (1990) test and a significant test statistic provides evidence the violation of the underlying assumption (Quddus, et al. 2010). Since parallel lines assumption is violated, the use of the standard ordered logit model may lead to incorrect, incomplete, or misleading results. When the restrictive parallel lines assumption is violated, alternative ordered response models including generalized ordered logit model (GOLOGIT) and partial proportional odds model (PPO) are performed. The GOLOGIT model does not impose the constraints of parallel regressions (Fu, 1998; Quddus et al., 2010) and the unconstrained GOLOGIT can be defined as the following (Quddus et al., 2010; Williams, 2006):

$$Pr(y_i > j | \mathbf{X}) = g(\mathbf{X}_i \boldsymbol{\beta}'_j) = \frac{\exp(\mathbf{X}_i \boldsymbol{\beta}'_j - \phi_j)}{1 + \exp(\mathbf{X}_i \boldsymbol{\beta}'_j - \phi_j)}, j = 1, \dots, m - 1 \quad (2)$$

Due to several issues of the GOLOGIT model including estimating more parameters than is really necessary, a less restrictive PPO

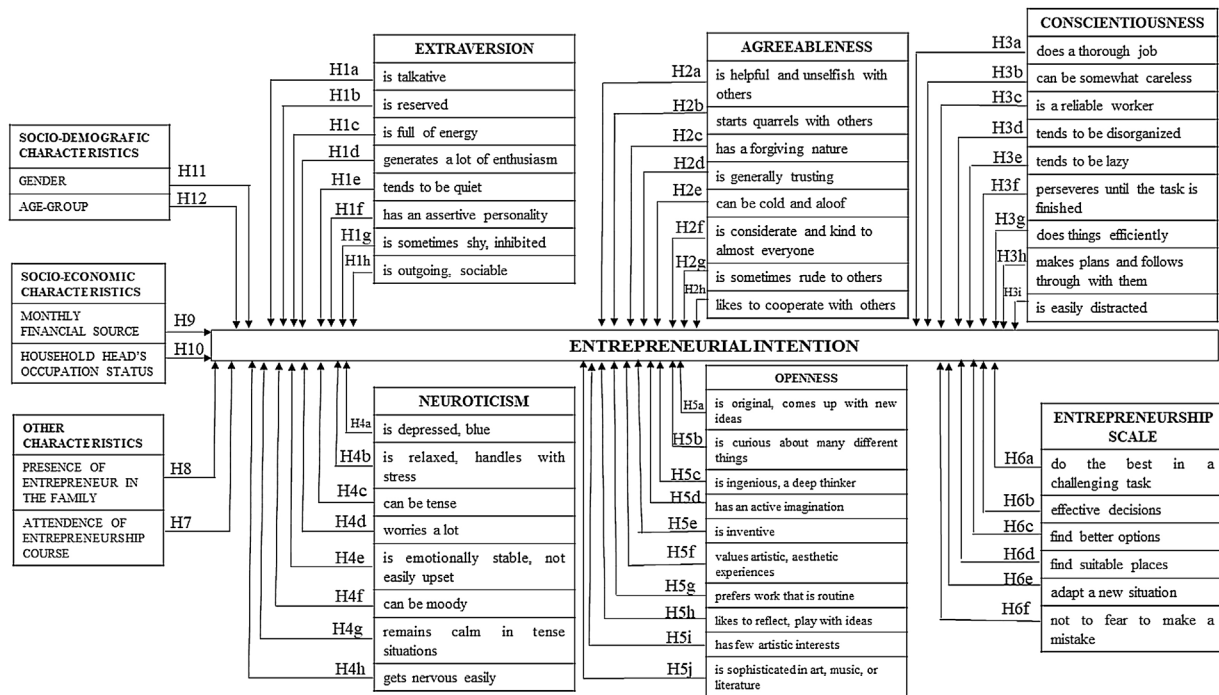


Fig. 1. Hypothesized model of undergraduate students' EI.

model was proposed in which only a subset of coefficients is constrained across values of j . The PPO model can be described as

$$Pr(y_i > j | \mathbf{X}) = \frac{\exp(\mathbf{X}_{1i}\beta'_{1j} + \mathbf{X}_{2i}\beta'_{2j} - \phi_j)}{1 + \exp(\mathbf{X}_{1i}\beta'_{1j} + \mathbf{X}_{2i}\beta'_{2j} - \phi_j)}, j = 1, \dots, m - 1 \quad (3)$$

In Equation (3), the coefficients associated with a subset of explanatory variables \mathbf{X}_2 are the same across values of j and the coefficients associated with other explanatory variables \mathbf{X}_1 differ across values of j (Quddus et al., 2010; Williams, 2006). In the present study, the motivation behind estimating alternative ordered response models including GOLOGIT and PPO models was the violation of the restrictive parallel lines assumption of the standard OLOGIT model regarding Brant (1990) test. Since the standard OLOGIT model violates the crucial parallel lines assumption, it may lead to incorrect, incomplete, or misleading results. Alternatively, Williams (2016) suggests that GOLOGIT and PPO models relax the assumptions of the standard OLOGIT model only as needed and both models provide estimation results that do not have the above-mentioned issues of the standard OLOGIT model along with easier interpretation. In that aspect, both GOLOGIT and PPO models are also considered as superior alternatives to the standard OLOGIT model.

3.2. Average direct-pseudo elasticities

The estimated coefficients obtained from alternative ordered response models including GOLOGIT, and PPO give information about the direction of the relationship between dependent variable and explanatory variables. Moreover, elasticities are generally calculated to measure the magnitude of a specific variable's impact on outcome probabilities. Elasticity can be computed from the partial derivative for each observation n

$$E_{x_{ki}}^{P(i)} = \frac{\partial P(i)}{\partial x_{ki}} \times \frac{x_{ki}}{P(i)} \quad (4)$$

where $P(i)$ denotes the probability of outcome i and x_{ki} denotes the value of variable k for outcome i . By taking the partial derivative, Equation (4) becomes the following:

$$E_{x_{ki}}^{P(i)} = [1 - P(i)] \beta_{ki} x_{ki} \quad (5)$$

However, elasticity in Equation (5) is only convenient for continuous variables and is not valid for indicator variables. For indicator variables, a pseudo-elasticity can be calculated to estimate an approximate elasticity of the variables, which gives the incremental change in frequency associated with changes in the indicator variables. The pseudo-elasticity can be defined as

$$E_{x_{ki}}^{\lambda_i} = \frac{\exp[\Delta\beta_i x_i] \sum_{\forall i} \exp(\beta_{ki} x_{ki})}{\exp[\Delta(\beta_i x_i)] \sum_{\forall I_n} \exp(\beta_{ki} x_{ki}) + \sum_{\forall I_n \neq I} \exp(\beta_{ki} x_{ki})} - 1 \quad (6)$$

where x_{ki} is the value of variable k for outcome i ; λ_i is the expected frequency for observation i ; β_i denotes a vector of estimable parameters; \mathbf{X}_i denotes a vector of explanatory parameters; I_n denotes the set of alternate outcomes with x_k in the function that determines the outcome, and I is the set of all possible outcomes (Washington, Karlaftis, & Mannering, 2011).

3.3. Study design, sample, data collection

This study aimed to determine the antecedents that may influence the EI of undergraduate students, with an emphasis on narrow personality traits, in two developing and neighboring countries: Turkey and Iran. In line with an earlier study (Trivedi, 2017), these two countries were selected due to the many differences between them, such as in terms of their land areas, populations, cultures, current economic policies, and levels of entrepreneurial activity. The two countries were also selected due to the difference between their academic traditions, which would increase the generalizability of this study's empirical findings, making them applicable to other universities as well (Souitaris et al., 2007). For the aforementioned purposes, a well-designed questionnaire was administered

to undergraduate students from two universities, Ardahan University in Turkey and Islamic Azad University in Iran, from March to May 2017.

The questionnaire that was used in this study had items for measuring the respondents' EI in three main sections. The first section had items regarding the respondent undergraduate students' demographic characteristics. The second section had items regarding the Big Five personality traits. As personality traits are considered comparatively stable and relatively unlikely to change in the short term (Lüthje & Franke, 2003), emphasis was also placed on university students' personality traits in the following 44 items constructed by Costa and Mcrae (1992). Finally, the third section had items regarding the entrepreneurship scale among undergraduate students based on Yilmaz and Sünbül (2009) entrepreneurship scale items.

During the sample period, the total number of undergraduate students in Ardahan University was 3,792 (Ardahan University, 2019) while the total number of undergraduate students in Islamic Azad University was 2,600 (Islamic Azad University, 2019). The minimum sample size of the questionnaire was calculated using the following equation:

$$n = \frac{NPQZ^2}{(N - 1)d^2 + PQZ^2} \tag{7}$$

where n = sample size; N = population size; P = probability of the occurrence of a given event; $Q = 1 - P$; Z = test statistic under the $(1 - \alpha)\%$ significance level; and d = tolerance. In this respect, the minimum representative sample size of the survey with regard to a stratified sampling method for both countries was calculated using the equations below (Yamane, 1967).

$$n = \frac{(3,792)(0.5)(0.5)(1.96)^2}{(3,792 - 1)(0.05)^2(0.5)(0.5)(1.96)^2} \cong 349 \tag{8}$$

$$n = \frac{(2,600)(0.5)(0.5)(1.96)^2}{(2,600 - 1)(0.05)^2(0.5)(0.5)(1.96)^2} \cong 335 \tag{9}$$

The minimum representative sample sizes for the survey were found to be 349 and 335 for the Turkish and Iranian samples, respectively. Consequently, the 476 and 399 respondents exceeded the minimum sample sizes for the Turkish and Iranian samples, and the surveys were found to be representative of the aforementioned universities' undergraduate student populations. Accordingly, there were 476 respondents from Ardahan University from among the undergraduate students from the Department of Economics and Administrative Sciences and the Physical Education and Sports College (also offers a four-year academic program) while there were 399 respondents from Islamic Azad University from among the undergraduate students from the Department of Economics and Administrative Sciences. Both sets of respondents exceeded the minimum sample size requirement, implying that this study's respondents were representative of the universities' undergraduate student populations and as such, reliable and unbiased estimation results could be obtained from the study. The questionnaires for both countries were anonymously completed by the respondents in the classroom. The questionnaire was originally formulated in Turkish by a native Turkish language speaker and was then translated into Persian by a native Persian language speaker using the translation-back-translation technique (Hambleton, 1994; Iakovleva et al., 2011). The respondents from both countries were assured that their responses would be kept confidential, and were told that in line with a prior study (Saeed et al., 2015), they were selected from among their university's undergraduate students enrolled or who were expected to enroll in an entrepreneurship course during their undergraduate education.

The dependent variable in this study was the EI of undergraduate students, which was determined by their agreement to the item

Table 1
Descriptive statistics of socio-demographic and socio-economic variables.

Variables	Iran Freq. (Percent)	Turkey Freq. (Percent)
EI		
I definitely disagree/I disagree	58 (15.03)	64 (13.45)
Neutral	111 (28.76)	110 (23.11)
I agree/I definitely agree*	217 (56.22)	302 (63.45)
Gender		
Male	246 (61.65)	265 (55.67)
Female*	153 (38.35)	211 (44.33)
Age-group		
17 – 20 years	60 (15.04)	134 (28.15)
21 – 23 years	178 (44.61)	269 (56.51)
>23 years*	160 (40.10)	73 (15.34)
Monthly financial source		
By only his/her family*	262 (65.66)	181 (38.03)
By both his/her family and tuition fee	23 (5.76)	230 (48.32)
By his/her job position and family	35 (8.77)	31 (6.51)
By only his/her job position	76 (19.05)	34 (7.14)
Household head's occupation status		
Government official	23 (5.76)	57 (11.97)
Worker	68 (17.04)	101 (21.22)
Retiree	81 (20.30)	109 (22.90)
Self-employed*	220 (55.14)	209 (43.91)
Presence of entrepreneur in the family		
Yes	149 (37.53)	95 (19.96)
No*	248 (62.47)	381 (80.04)
Attendance of an entrepreneurship course		
Yes	206 (51.89)	114 (23.95)
No*	191 (48.11)	360 (75.63)

Freq.: frequency; *reference category

"I can start my own business someday." As the responses to this item were naturally ordered, the ordered discrete choice modeling approach was used to analyze the data. Previous studies (Chandler & Lyon, 2001; Liñán & Chen, 2009) argued that using linear regression models to analyze EI poses the risk of obtaining biased results. As such, this study applied relevant nonlinear models to avoid this issue.

Table 1 indicates that many of the respondents from the Turkish and Iranian samples (63.45% and 56.22%, respectively) believed that they could start their own business someday. More than half of the respondents in both the Turkish and Iranian samples (55.67% and 61.65%, respectively) were men. More than half of the respondents in the Turkish sample were 21–23 years old while almost 60% of the respondents in the Iranian sample (59.65%) were 17–23 years old. Almost half of the Turkish respondents (48.32%) were receiving financial assistance for their education from both their family and the university (scholarship) during the sample period while more than 65% of the Iranian respondents (65.66%) were receiving financial assistance for their education from only their respective families. For both the Turkish and Iranian respondents, most of their household heads (43.91% and 55.14%, respectively) were self-employed. For both country samples, most of the respondents (80.04% for the Turkish respondents, 62.47% for the Iranian respondents) claimed that there was no entrepreneur in their respective families. Finally, only about 24% (23.95%) of the Turkish respondents confirmed their attendance in an entrepreneurship course while almost half of the Iranian respondents (51.89%) declared that they have attended at least one entrepreneurship course.

Table 2 presents the Turkish and Iranian respondents' agreement/disagreement levels to selected Big Five personality traits and entrepreneurship scale items. As can be seen in Table 2, the mean values for the entrepreneurial behavior scales ranged from 3.25 to 3.85 for the Iranian sample and from 3.32 to 4.03 for the Turkish sample. On the other hand, the mean values for the Iranian sample ranged from 2.43 to 3.74 while the mean values for the Turkish sample ranged from 2.21 to 4.03.

Table 2
Mean and standard error values for narrow personality traits and entrepreneurship scale items.

Big Five narrow personality traits	Turkey	Iran
I see myself as someone who...	Mean (Std. error)	Mean (Std. error)
is talkative	3.29 (1.013)	2.43 (1.068)
does a thorough job	3.91 (1.030)	3.61 (1.054)
is depressed, blue	2.36 (1.216)	2.43 (1.237)
is original, comes up with new ideas	3.25 (1.029)	3.15 (1.068)
is reserved	2.74 (1.181)	3.06 (1.247)
is helpful and unselfish with others	3.84 (1.348)	3.50 (1.245)
can be somewhat careless	2.23 (1.249)	3.45 (1.302)
is relaxed, handles stress well	2.98 (1.266)	3.13 (1.256)
is curious about many different things	3.74 (1.169)	3.52 (1.204)
is full of energy	3.72 (1.148)	3.68 (1.117)
starts quarrels with others	2.22 (1.219)	3.59 (1.282)
is a reliable worker	4.00 (1.103)	3.92 (1.171)
can be tense	3.02 (1.165)	3.27 (1.133)
is ingenious, a deep thinker	3.73 (1.146)	3.35 (1.098)
generates a lot of enthusiasm	3.57 (1.138)	3.39 (1.128)
has a forgiving nature	3.77 (1.310)	3.74 (1.201)
tends to be disorganized	2.46 (1.347)	3.36 (1.293)
worries a lot	3.04 (1.228)	3.13 (1.288)
has an active imagination	3.73 (1.193)	3.12 (1.314)
tends to be quiet	3.00 (1.300)	2.95 (1.247)
is generally trusting	2.89 (1.285)	3.16 (1.163)
tends to be lazy	2.21 (1.222)	3.41 (1.211)
is emotionally stable, not easily upset	3.03 (1.190)	2.96 (1.163)
is inventive	3.04 (1.236)	3.07 (1.200)
has an assertive personality	3.37 (1.175)	3.63 (1.177)
can be cold and aloof	2.89 (1.267)	2.45 (1.156)
perseveres until the task is finished	3.82 (1.161)	3.53 (1.158)
can be moody	2.33 (1.183)	2.77 (1.275)
values artistic, aesthetic experiences	3.51 (1.167)	3.46 (1.428)
is sometimes shy, inhibited	2.98 (1.064)	3.03 (1.109)
is considerate and kind to almost everyone	4.03 (1.085)	3.87 (1.123)
does things efficiently	3.92 (1.046)	3.81 (1.050)
remains calm in tense situations	3.39 (1.243)	2.55 (1.136)
prefers work that is routine	3.07 (1.094)	3.33 (1.263)
is outgoing, sociable	3.53 (1.170)	3.38 (1.077)
is sometimes rude to others	2.63 (1.151)	2.98 (1.225)
makes plans and follows through with them	3.35 (1.127)	3.25 (1.150)
gets nervous easily	3.11 (1.319)	3.09 (1.291)
likes to reflect, play with ideas	3.63 (1.172)	3.34 (1.160)
has few artistic interests	2.48 (1.268)	3.33 (1.259)
likes to cooperate with others	3.48 (1.134)	3.68 (1.094)
is easily distracted	3.01 (1.203)	2.96 (1.278)
is sophisticated in art, music, or literature	3.34 (1.271)	2.97 (1.301)
Entrepreneurship scale items	Turkey	Iran
	Mean (Std. Err.)	Mean (Std. Err.)
I do my best even I have a very challenging task	4.03 (0.942)	3.85 (1.018)
My own decisions are generally effective on my job	3.82 (1.043)	3.57 (1.076)
I can find better options if I enforcedly leave my job	3.53 (1.069)	3.29 (1.081)
I can find suitable places for my skills	3.44 (1.075)	3.42 (1.088)
I do not have any problems to adapt a new situation and practice	3.53 (1.132)	3.25 (1.093)
I do not fear to make a mistake about something I am working on	3.31 (1.119)	3.25 (1.264)

4. Empirical findings

4.1. Pre-estimation tests

Before fitting the estimated models, a multicollinearity test was performed to ensure the non-presence of a serious multicollinearity problem among the explanatory variables. Several explanatory variables (e.g., hometown, current residence, "I see myself as someone who tends to find fault with others," "I always endeavor to be better in my task," "I am generally sure that I will carry on with my plans") were excluded from the final models due to correlation or multicollinearity problems. Hair, Risher, Sarstedt, and Ringle (2019) recommend that the value of the variance inflation factor (VIF) not exceed 3, although Diamantopoulos and Sigauw (2006) argue that VIF values below 3.3 are admissible. As shown in Table A1, no serious multicollinearity problem was found in the final models because all the VIF values of the explanatory variables

were below 3 and 3.3, as recommended by Hair et al. (2019) and Diamantopoulos and Sigauw (2006), respectively.

Additionally, Table A2 and A3 present the results of the Pearson correlation matrix of the explanatory variables for both countries to determine the correlations among the explanatory variables before model fitting. As can be seen in Table A2 and A3, all the correlation coefficients were below the recommended threshold value of 0.50 (Landau & Everitt, 2004) for both countries, implying that there were no serious correlations among the explanatory variables. The survey's Cronbach alpha values were above 0.70 for both countries (0.8231 and 0.8396 for the Turkish and Iranian samples, respectively), satisfying the minimum value recommended by Nunnally (1978) for relatively high internal consistency.

Before fitting the alternative ordered response models, the crucial parallel-lines assumption of the OLOGIT model was tested by Brant (1990). As the estimated standard OLOGIT models violated the parallel-lines assumption recommended by Brant (1990) for all

Table 3
Average direct pseudo-elasticity values for Turkish sample.

Independent variable	OLOGIT			PPO		
	[1]	[2]	[3]	[1]	[2]	[3]
<i>Socio-demographic and socio-economic characteristics</i>						
Gender; male	-0.142	-0.096	0.046	-0.134	-0.093	0.042
Age; 17 – 20 years	0.011	0.007	-0.003	0.021	0.015	-0.007
Age; >23 years	-0.060	-0.041	0.020	-0.059	-0.040	0.018
Monthly financial source; by both his/her family and tuition fee	-0.006	-0.004	0.002	-0.028	-0.019	-0.009
Monthly financial source; by his/her job position and family	0.005	0.004	-0.002	0.016	0.011	-0.005
Monthly financial source; by only his/her job position	-0.021	-0.014	0.007	-0.025	-0.017	0.008
Household head's occupation status; government official	0.008	0.005	-0.003	0.097***	-0.035	0.007
Household head's occupation status, worker	-0.023	-0.015	0.007	-0.018	-0.012	0.006
Household head's occupation status, retiree	0.099	0.067	-0.032	0.109	0.075	-0.034***
Presence of entrepreneur in the family, yes	-0.185*	-0.125*	0.060*	-0.194*	-0.133*	0.060*
Attendance of an entrepreneurship course, yes	-0.041	-0.027	0.013	-0.041	-0.028	0.013
<i>Big Five narrow personality traits</i>						
I see myself as someone who. . .						
is talkative	-0.342	-0.231	0.111	-0.414	-0.285	0.129
does a thorough job	-0.529	-0.357	0.172	0.890	-0.831**	0.254
is depressed, blue	-0.098	-0.066	0.032	0.013	0.009	-0.004
is original, comes up with new ideas	0.350	0.236	-0.114	0.395	0.272	-0.123
is reserved	0.313	0.212	-0.102	0.213	0.146	-0.066
is helpful and unselfish with others	0.543	0.367	-0.176	0.621	0.428	-0.193
can be somewhat careless	0.096	0.065	-0.031	0.133	0.091	-0.041
is relaxed, handles stress well	-0.135	-0.091	0.044	-0.132	-0.091	0.041
is curious about many different things	0.140	0.095	-0.046	0.238	0.164	-0.074
is full of energy	0.183	0.123	-0.059	-0.988	0.354	-0.072
starts quarrels with others	0.004	0.003	-0.001	-0.001	-0.001	0.001
is a reliable worker	-0.704	-0.476	0.229	-0.794	-0.546	0.247
can be tense	-0.499	-0.337	0.162	-0.585***	-0.403	0.182***
is ingenious, a deep thinker	0.184	0.124	-0.060	0.2291	0.200	-0.090
generates a lot of enthusiasm	0.107	0.072	-0.035	0.044	0.031	-0.014
has a forgiving nature	-0.631***	-0.426***	0.205***	-1.698*	-0.028	0.110
tends to be disorganized	-0.291	-0.196	0.094	-0.308	-0.212	0.096
worries a lot	0.667**	0.451**	-0.216**	1.712*	0.198	-0.173
has an active imagination	-0.361	-0.244	0.117	-0.381	-0.262	0.119
tends to be quiet	0.264	0.178	-0.086	0.251	0.173	-0.078
is generally trusting	-0.002	-0.001	0.001	-0.009	-0.006	0.003
tends to be lazy	0.131	0.088	-0.043	0.121	0.0834	-0.038
is emotionally stable, not easily upset	-0.496	-0.335	0.161	-0.488	-0.336	0.152
is inventive	-0.213	-0.144	0.069	-0.140	-0.096	0.043
has an assertive personality	0.472	0.319	-0.153	0.451	0.311	-0.140
can be cold and aloof	-0.145	-0.098	0.047	-1.547*	0.332	-0.032
perseveres until the task is finished	0.965**	0.652**	-0.313**	1.118**	0.770**	-0.348**
can be moody	0.469***	0.317***	-0.152***	0.588**	0.405**	-0.183**
values artistic, aesthetic experiences	0.261	0.176	-0.085	0.239	0.165	-0.074
is sometimes shy, inhibited	-0.207	-0.140	0.067	-0.216	-0.149	0.067
does things efficiently	-0.983***	-0.664***	0.319***	-1.063***	-0.732**	0.331***
remains calm in tense situations	-0.294	-0.199	0.095	-0.322	-0.222	0.100
prefers work that is routine	-0.156	-0.105	0.051	-0.175	-0.121	0.055
is outgoing, sociable	-0.161	-0.109	0.052	-0.212	-0.146	0.066
is sometimes rude to others	-0.474	-0.320	0.154	-0.410	-0.282	0.128
makes plans and follows through with them	0.710***	0.480***	-0.230***	0.728***	0.501***	-0.227***
gets nervous easily	0.093	0.063	-0.030	0.005	0.003	-0.002
likes to reflect, play with ideas	-0.573	-0.387	0.186	-0.638	-0.439	0.199
has few artistic interests	-0.032	-0.022	0.010	-0.066	-0.046	0.021
likes to cooperate with others	0.081	0.055	-0.026	1.642*	-0.355	0.035
is easily distracted	-0.267	-0.181	0.087	-0.328	-0.226	0.102
is sophisticated in art, music, or literature	-0.156	-0.105	0.051	-0.088	-0.0607	0.027
<i>Entrepreneurship scale items</i>						
I do my best even I have a very challenging task	-0.417	-0.282	0.135	-0.343	-0.236	0.107
My own decisions are generally effective on my job	-1.424*	-0.962*	0.462*	-2.979*	-0.433	0.333**
I can find better options if I enforcedly leave my job	-2.383*	-1.610*	0.773*	-2.447*	-1.685*	0.762*
I can find suitable places for my skills	-1.183*	-0.799*	0.384*	-1.227*	-0.845*	0.382*
I do not have any problems to adapt a new situation and practice	-0.969**	-0.654**	0.315**	-1.004**	-0.691**	0.312**
I do not fear to make a mistake about something I am working on	0.610	0.412	-0.198	0.750***	0.516***	-0.233***

*statistically significant at 1% level; **statistically significant at 5% level; *** statistically significant at 10% level; [1] I definitely disagree/I disagree; [2] neutral; [3] I agree/I definitely agree

the fitted models, alternative ordered response models, including GOLOGIT and PPO, were performed.

4.2. Estimation results for Turkish sample

Table A4 shows the estimation results of the OLOGIT, GOLOGIT, and PPO models for the Turkish sample. All the econometric models

were fitted with Stata/MP 16.0 using two user-written Stata routines (gologit2 and oglm) (Williams, 2006, 2010). For all the ordered response models fitted for the present study, “I agree/I definitely agree” were automatically selected as the dependent variable’s base category. As shown in Table A4, all three models were statistically significant at the 1% level, the coefficients had the expected signs, and the adjusted rho-square values for all the fitted models

Table 4
Average direct pseudo-elasticity values for Iranian sample.

Independent variable	[1]	[2]	[3]
<i>Socio-demographic and socio-economic characteristics</i>			
Gender; male	2.870**	0.070	-0.038
Age; 17 – 20 years	-0.006	-0.004	0.002
Age; >23 years	-0.228	-0.148	0.080
Monthly financial source; by both his/her family and tuition fee	0.107	0.070	-0.037
Monthly financial source; by his/her job position and family	0.713**	-0.083***	0.045***
Monthly financial source; by only his/her job position	-2.960*	-0.091	0.049
Household head's occupation status; government official	-0.046	-0.030	0.016
Household head's occupation status, worker	0.063	0.041	-0.022
Household head's occupation status, retiree	-0.059	-0.039	0.021
Presence of entrepreneur in the family, yes	-0.049	-0.032	0.017
Attendance of an entrepreneurship course, yes	0.014	0.009	-0.005
<i>Big Five narrow personality traits</i>			
I see myself as someone who. . .			
is talkative	-12.527**	0.295	-0.158
does a thorough job	1.503	-0.978	0.526
is depressed, blue	4.370**	-0.146	0.078
is original, comes up with new ideas	-1.561**	-1.015**	0.546***
is reserved	17.87*	-0.157	0.084
is helpful and unselfish with others	0.833	0.541	-0.291
can be somewhat careless	-0.231	-0.150	0.081
is relaxed, handles stress well	0.062	0.041	-0.022
is curious about many different things	19.530*	-0.621	0.333
is full of energy	0.071	0.046	-0.025
starts quarrels with others	22.263*	-0.073	0.038
is a reliable worker	0.916	-0.596	0.320
can be tense	9.611**	0.217	-0.117
is ingenious, a deep thinker	1.810**	1.177***	-0.633**
generates a lot of enthusiasm	-12.245**	-0.531	0.286
has a forgiving nature	29.94*	-0.180	0.096
tends to be disorganized	-0.419	-0.273	0.147
worries a lot	-15.321*	1.034**	-0.556**
has an active imagination	-1.189	-0.773***	0.416***
tends to be quiet	-24.590*	-0.164	0.089
is generally trusting	-0.432	-0.281	0.151
tends to be lazy	1.369	0.890	-0.479
is emotionally stable, not easily upset	-0.282	-0.183	0.099
is inventive	15.172*	0.362	-0.195
has an assertive personality	-0.699	-0.454	0.244
can be cold and aloof	20.529*	0.146	-0.079
perseveres until the task is finished	-0.153	-0.099	0.053
can be moody	-0.281	-0.183	0.098
values artistic, aesthetic experiences	-14.644	0.534	-0.287
is sometimes shy, inhibited	-0.292	-0.190	0.102
does things efficiently	-0.608	0.396	0.213
remains calm in tense situations	-11.834*	0.565	-0.304
prefers work that is routine	0.798	0.519	-0.279
is outgoing, sociable	14.085	0.284	-0.153
is sometimes rude to others	0.233	0.152	-0.082
makes plans and follows through with them	-6.902**	0.269	-0.144
gets nervous easily	13.507*	0.365	-0.197
likes to reflect, play with ideas	11.268**	0.515	-0.277
has few artistic interests	16.484*	0.285	-0.154
likes to cooperate with others	0.289	0.188	-0.101
is easily distracted	-0.202	-0.132	0.071
is sophisticated in art, music, or literature	-9.036**	-0.070	0.038
<i>Entrepreneurship scale items</i>			
I do my best even I have a very challenging task	-0.247	-0.160	0.086
My own decisions are generally effective on my job	-32.743*	-0.114	0.062
I can find better options if I enforcedly leave my job	-2.583*	-1.680*	0.903*
I can find suitable places for my skills	-1.404	-0.913	0.491
I do not have any problems to adapt a new situation and practice	-0.621	-0.404	0.217
I do not fear to make a mistake about something I am working on	0.493	0.321	0.173

*statistically significant at 1% level; **statistically significant at 5% level; ***statistically significant at 10% level; [1] I definitely disagree/I disagree; [2] neutral; [3] I agree/I definitely agree

were 0.2 – 0.4, as recommended by Louviere, Hensher, and Swait (2000) as indicative for an extremely-good-fit model. In Table A4, thresholds are defined as points on the latent variable that resulted in different observed values of the dependent variable's levels used to measure the latent variable. Cut point 1 was the estimated cut-off point on the latent variable that was used to differentiate the "I definitely disagree/I disagree" category ($j = 0$) from the "neutral" ($j =$

1) and the "I agree/I definitely agree" ($j = 2$) categories when the values of the predictor variables were evaluated to be zero. Similarly, cut point 2 was the estimated cut-off point on the latent variable that was used to differentiate the "I definitely disagree/I disagree" and "neutral" categories from the "I agree/I definitely agree" category when the values of the predictor variables were evaluated to be zero.

Table A1
Multicollinearity test of independent variables.

Independent variables	Turkish sample		Iranian sample	
<i>Socio-demographic and socio-economic characteristics</i>	VIF	1/VIF	VIF	1/VIF
Gender; male	1.46	0.687	1.64	0.610
Age; 17 – 20 years	1.31	0.765	1.59	0.627
Age; >23 years	1.32	0.759	1.57	0.638
Monthly financial source; by both his/her family and tuition fee	1.42	0.702	1.66	0.601
Monthly financial source; by his/her job position and family	1.37	0.731	1.38	0.726
Monthly financial source; by only his/her job position	1.41	0.712	1.71	0.586
Household head's occupation status; government official	1.28	0.778	1.81	0.552
Household head's occupation status, worker	1.35	0.742	1.48	0.676
Household head's occupation status, retiree	1.31	0.766	1.49	0.673
Presence of entrepreneur in the family, yes	1.21	0.828	1.48	0.674
Attendance of an entrepreneurship course, yes	1.14	0.880	1.45	0.687
<i>Big Five narrow personality traits</i>				
I see myself as someone who. . .				
is talkative	1.71	0.586	1.71	0.584
does a thorough job	1.42	0.705	2.36	0.424
is depressed, blue	1.41	0.708	1.70	0.590
is original, comes up with new ideas	1.69	0.590	1.56	0.639
is reserved	1.59	0.629	1.72	0.582
is helpful and unselfish with others	1.44	0.695	1.53	0.654
can be somewhat careless	1.56	0.640	1.93	0.517
is relaxed, handles stress well	1.76	0.567	1.67	0.597
is curious about many different things	1.82	0.548	1.58	0.633
is full of energy	1.72	0.580	1.82	0.551
starts quarrels with others	1.74	0.574	2.19	0.456
is a reliable worker	1.67	0.598	2.11	0.474
can be tense	1.52	0.659	1.69	0.593
is ingenious, a deep thinker	1.62	0.616	2.11	0.473
generates a lot of enthusiasm	1.56	0.643	1.66	0.601
has a forgiving nature	1.54	0.648	1.63	0.613
tends to be disorganized	1.63	0.615	2.09	0.479
worries a lot	1.45	0.689	1.83	0.546
has an active imagination	1.49	0.671	1.95	0.512
tends to be quiet	1.50	0.667	1.93	0.518
is generally trusting	1.34	0.747	1.47	0.678
tends to be lazy	1.70	0.587	2.14	0.468
is emotionally stable, not easily upset	1.40	0.712	1.45	0.690
is inventive	1.72	0.582	2.19	0.457
has an assertive personality	1.79	0.557	2.05	0.489
can be cold and aloof	1.36	0.737	1.66	0.603
perseveres until the task is finished	1.68	0.595	2.19	0.456
can be moody	1.52	0.657	1.73	0.577
values artistic, aesthetic experiences	1.80	0.555	2.25	0.445
is sometimes shy, inhibited	1.55	0.643	2.17	0.460
does things efficiently	1.84	0.544	2.41	0.414
remains calm in tense situations	1.55	0.644	1.78	0.563
prefers work that is routine	1.32	0.757	1.93	0.517
is outgoing, sociable	1.81	0.553	1.72	0.580
is sometimes rude to others	1.58	0.633	1.73	0.577
makes plans and follows through with them	1.57	0.635	2.11	0.474
gets nervous easily	1.72	0.580	2.11	0.474
likes to reflect, play with ideas	1.69	0.592	1.85	0.541
has few artistic interests	1.43	0.702	1.54	0.650
likes to cooperate with others	1.53	0.652	1.58	0.635
is easily distracted	1.47	0.681	2.12	0.472
is sophisticated in art, music, or literature	1.42	0.705	1.40	0.715
<i>Entrepreneurship scale items</i>				
I do my best even I have a very challenging task	1.87	0.535	2.27	0.440
My own decisions are generally effective on my job	1.66	0.604	1.72	0.582
I can find better options if I enforcedly leave my job	1.66	0.602	1.63	0.614
I can find suitable places for my skills	1.64	0.611	2.18	0.459
I do not have any problems to adapt a new situation and practice	1.53	0.653	1.53	0.652
I do not fear to make a mistake about something I am working on	1.58	0.632	1.85	0.539
Mean VIF	1.55		1.81	

The decision regarding the most parsimonious model was made using the Akaike information criterion (AIC) and Bayesian information criterion (BIC) values. In this sense, a discrete choice model with the lowest AIC and BIC values among all the models had the most parsimonious (i.e., the best) model fit. In the present study, the BIC values were considered the main criteria for determining the best model fit because BIC was adopted to impose a higher penalty for additional parameters (Washington et al., 2011). Accordingly,

the OLOGIT model was the most parsimonious model among all the ordered and unordered response models with the lowest BIC values. However, the Brant (1990) test for the OLOGIT model (chi square = 75.05; p value = 0.0776) violated the parallel-lines assumption at both the 1% and 5% significance levels. On the contrary, the OLOGIT model did not violate the parallel-lines assumption at the 10% level. Consequently, the PPO model was found to be the most parsimonious model with the second lowest BIC values at the

Table A2

Pearson correlation matrix of independent variables for Turkish sample.

	GEND	AGE1	AGE3	FIN2	FIN3	FIN4	OCC1	OCC2	OCC3	ENTR	COUR	TALK	THOR	DEPR	ORIG	RESE	HELP
GEND	1.0000																
AGE1	-0.2729	1.0000															
AGE3	0.1460	-0.2657	1.0000														
FIN2	-0.0749	0.0525	-0.1092	1.0000													
FIN3	0.1161	-0.0509	0.1474	-0.2560	1.0000												
FIN4	0.2154	-0.1004	0.2213	-0.2690	-0.0734	1.0000											
OCC1	-0.0089	-0.0427	0.1121	-0.0078	-0.0189	-0.0271	1.0000										
OCC2	0.0504	0.0197	-0.0217	-0.0917	0.0085	0.1152	-0.1919	1.0000									
OCC3	0.0042	-0.0504	0.0590	-0.0178	0.0585	-0.0350	-0.2015	-0.2836	1.0000								
PRES	0.0657	-0.0539	0.0642	-0.0001	-0.0256	0.0245	0.0907	-0.0540	-0.0225	1.0000							
COUR	0.0052	-0.0816	0.0703	-0.0017	-0.0510	0.0703	0.0615	0.0639	-0.0655	0.0956	1.0000						
TALK	-0.1173	0.0843	-0.1197	0.1774	-0.1163	-0.0538	-0.0269	-0.0036	-0.0147	0.0832	0.0050	1.0000					
THOR	0.0672	-0.0739	0.0592	0.0096	0.0309	0.0080	0.0631	-0.0003	-0.0552	-0.0337	0.1106	0.1634	1.0000				
DEPR	-0.0176	0.0468	-0.0734	-0.0374	0.0199	-0.0419	0.0505	0.0578	-0.0916	0.0598	0.0010	0.0212	-0.1747	1.0000			
ORIG	0.1253	0.0180	-0.0121	0.0281	0.0025	0.0441	0.0368	0.0146	-0.0101	0.1146	0.0723	0.2658	0.1498	-0.0598	1.0000		
RESE	-0.0055	0.0119	0.0109	-0.0623	0.0878	0.0273	-0.0549	0.0374	0.0071	0.0267	0.0105	-0.2140	-0.0191	0.1643	-0.0900	1.0000	
HELP	-0.1186	0.0241	-0.0352	0.1331	-0.0722	-0.0604	0.0218	-0.0879	0.0123	-0.0502	-0.0390	0.1926	0.1885	-0.0819	0.1885	-0.0190	1.0000
CARE	-0.0084	0.0490	-0.0862	0.0141	0.0069	0.0349	-0.0407	0.0381	-0.0062	0.0405	0.0270	0.1092	-0.1269	0.0756	-0.0173	0.0274	-0.1169
RELA	0.1912	0.0040	0.0309	0.0543	-0.0288	0.0503	-0.0035	0.0705	-0.0335	0.1048	0.1149	0.2582	0.1825	-0.1315	0.3327	-0.0604	0.0897
CURI	0.0589	-0.0125	-0.0070	0.0779	0.0138	0.0046	-0.0193	0.0649	-0.0781	0.0415	0.0526	0.2678	0.1807	0.0705	0.3610	0.0323	0.1034
ENER	0.0313	0.0715	-0.0377	0.1133	-0.0019	-0.0527	-0.0165	-0.0247	0.0120	0.0862	0.0116	0.3606	0.2138	-0.0917	0.3481	-0.1200	0.2351
QUAR	0.0595	0.0628	-0.0397	0.0530	0.0636	-0.0039	-0.0730	0.1160	-0.0753	0.0207	-0.0317	0.1364	-0.0715	0.3085	-0.0241	0.0892	-0.2361
RELI	-0.0307	0.0213	0.0794	0.0802	0.0001	0.0888	0.0176	-0.0420	-0.0545	0.0191	0.0355	0.1961	0.3019	-0.1162	0.2820	0.0291	0.3131
TENS	-0.0785	0.0572	-0.0729	0.0150	-0.0048	-0.0050	0.0100	0.0525	-0.0357	0.0271	-0.0145	-0.0069	-0.0090	0.2714	-0.0395	0.1817	-0.0829
INGE	-0.0291	-0.0334	0.0544	0.0367	-0.0643	0.0012	-0.0262	-0.0439	-0.0115	0.0211	0.0824	0.1804	0.1903	0.0803	0.2640	0.0223	0.2094
ENTH	0.0051	0.0170	-0.0752	0.1029	0.0248	0.0402	-0.0144	0.0424	-0.0581	0.0315	-0.0094	0.1810	0.1437	0.0646	0.2945	-0.0512	0.0932
FORG	0.0656	0.0156	-0.0437	0.1488	0.0085	-0.0498	0.0022	-0.0794	0.0218	-0.0064	0.0725	0.0903	0.1391	-0.0750	0.2515	0.0593	0.2138
DISO	-0.0012	-0.0528	-0.0265	0.0204	0.0602	-0.0540	-0.0272	0.0298	0.0151	0.0688	0.0665	0.1328	-0.1661	0.1713	0.0469	0.0112	-0.0558
WORR	-0.1519	0.0801	-0.0227	0.0834	-0.0290	-0.1350	-0.0484	0.0468	-0.0169	0.0060	0.0104	-0.0392	-0.0340	0.1814	0.0075	0.2103	0.0009
IMAG	0.0183	-0.0360	-0.052	0.1801	-0.0689	-0.0126	-0.0089	-0.0336	-0.0068	0.0953	0.0422	0.1158	0.1040	0.0248	0.2485	0.0379	0.1841
QUIE	0.0228	-0.0217	-0.0359	0.0328	0.0195	0.0063	-0.1047	-0.0119	-0.0308	-0.0608	-0.0453	-0.2561	0.0016	0.0627	-0.0945	0.3362	0.0942
TRUS	-0.0483	0.0302	-0.0371	0.0818	0.0449	-0.1230	-0.0549	-0.0487	0.0456	-0.0197	-0.0517	-0.0462	0.0358	0.1084	0.0903	0.1063	0.0750
LAZY	0.0065	0.0373	-0.0789	0.1493	-0.0514	-0.0283	-0.0271	-0.0020	-0.0704	0.0637	-0.0027	0.0209	-0.1138	0.0562	-0.0152	0.1219	-0.1553
STAB	0.0253	0.0218	-0.0366	0.0044	0.0355	-0.0216	-0.0867	0.0502	-0.0702	0.0212	0.0251	0.1652	0.0901	-0.1206	0.2341	0.0303	0.1022
INVE	0.0926	-0.0571	0.0861	0.0020	0.0954	-0.0019	-0.0375	-0.0159	-0.0410	0.1082	0.1214	0.1075	0.1663	0.0162	0.3818	0.0444	0.0834
ASSE	0.1770	-0.1271	0.0281	0.0280	0.0246	0.0574	0.0035	0.0751	-0.0590	0.1183	0.0982	0.1884	0.1718	0.0087	0.3394	-0.1505	0.0543
COLD	0.0212	-0.0582	-0.0054	-0.1308	0.0291	-0.0345	0.0006	-0.0006	0.0107	0.1006	0.0250	-0.0748	0.0153	0.1373	-0.0733	0.0952	0.0054
PERS	0.0853	-0.1117	0.0522	0.0440	0.0197	0.0368	0.0080	0.0466	-0.0217	0.1016	0.0855	-0.0077	0.2014	-0.0309	0.1722	-0.0198	0.1665
MOOD	0.0134	0.0675	-0.0746	-0.0321	0.0126	0.0674	0.0775	0.1505	-0.1270	0.0560	0.0690	0.1589	-0.0365	0.0973	0.0674	0.0818	-0.0392
ARTI	-0.0599	0.0010	-0.0110	0.0282	-0.0058	-0.0233	0.0775	0.0465	-0.0409	0.0343	0.0248	0.1715	0.0847	0.0013	0.3015	-0.0066	0.1724
INHI	-0.1013	0.0432	-0.0300	-0.0363	0.0613	0.0132	-0.0170	0.0248	-0.0410	-0.0001	-0.0302	-0.0648	-0.0804	0.0938	-0.0202	0.4112	0.1011
EFFI	-0.0036	0.0074	-0.0344	0.0580	-0.0287	-0.0334	0.0035	0.0398	0.0130	0.0534	0.0388	0.1668	0.2730	-0.0287	0.2319	0.0136	0.2543
CALM	0.1095	-0.0467	0.0012	0.0864	-0.0564	0.0764	-0.0649	0.0259	0.0165	0.0619	0.0684	0.0970	0.1606	-0.0591	0.1939	0.0923	0.1745
ROUT	0.0938	-0.0513	0.0111	-0.0212	-0.0007	0.0352	0.0187	0.0197	-0.0199	0.0703	-0.0171	0.0131	0.0969	0.0784	0.1423	0.0382	0.0729
SOCI	0.0123	0.0808	-0.0643	0.1170	0.0327	0.0272	0.0035	-0.0123	-0.0045	0.0558	0.0302	0.3113	0.1543	-0.0771	0.2906	-0.1851	0.1648
RUDE	0.0636	0.0408	-0.1071	-0.1291	0.1143	0.0179	-0.0056	-0.0169	-0.0646	0.1327	-0.0011	0.1315	0.0276	0.1205	0.1111	-0.0264	-0.0493
PLAN	0.0182	0.0003	-0.0321	0.0358	0.0854	-0.0778	0.0248	0.0097	0.0016	0.1457	0.0867	0.1668	0.1604	0.0414	0.2837	-0.0235	0.1149
NERV	-0.1183	0.0925	-0.0606	-0.0614	0.1341	0.0098	0.0639	0.0014	-0.0740	0.1398	0.0215	0.1196	0.0317	0.1551	0.0925	0.0273	0.0339
IDEA	0.0443	0.0440	-0.0653	0.0494	0.0249	-0.0521	-0.0001	-0.0474	0.0178	0.1212	0.0909	0.1433	0.1386	0.0458	0.3134	-0.0092	0.1605
INTE	0.0173	-0.0866	0.0122	-0.0710	0.0336	0.0228	-0.0184	-0.0483	-0.0031	0.0582	0.0264	-0.0400	0.0167	0.0194	-0.0309	0.0401	-0.1098
COOP	-0.0700	0.0379	-0.0568	0.1731	-0.1044	-0.1104	-0.0249	-0.0158	0.0118	0.0019	0.0316	0.1820	0.1589	-0.0597	0.1252	0.0299	0.1455
DIST	-0.1014	0.0140	-0.0911	0.0826	-0.0307	-0.0568	0.0453	-0.0473	-0.0214	0.0131	-0.0335	0.0546	-0.0655	0.1213	0.0472	0.1043	0.0362
SOPH	-0.0953	0.0530	-0.0783	0.1693	-0.0714	-0.0300	0.0124	0.0176	-0.0410	0.0472	-0.0301	0.1664	0.1100	0.0986	0.1925	0.0209	0.1647
TASK	-0.0525	-0.0068	0.0010	0.1439	-0.1428	0.0012	0.0245	-0.0358	0.0438	0.0592	0.0160	0.1823	0.2604	-0.1403	0.1803	-0.0338	0.2246
DECI	-0.0577	-0.0626	-0.0604	0.0794	-0.0359	0.0404	-0.0042	0.0113	0.0227	0.0565	0.0141	0.1585	0.1321	-0.0333	0.1460	-0.0284	0.1688
ENFO	0.0576	-0.0672	0.0242	0.0966	-0.0350	0.0232	0.0053	0.0609	0.0629	0.0582	0.0354	0.1417	0.0981	-0.0168	0.2046	-0.0969	0.1744
SKIL	0.0405	-0.0689	0.0311	0.0561	-0.0452	0.0605	0.0349	0.0160	-0.0288	0.1860	0.0215	0.1360	0.1455	-0.0477	0.2928	0.0120	0.0502
ADAP	0.1013	-0.0580	0.0442	0.0072	-0.0174	0.0441	0.0114	0.0402	-0.0370	0.0326	0.0647	0.1212	0.2006	-0.0735	0.2313	-0.0114	0.1656
MIST	0.1124	-0.0798	0.0154	0.0316	0.0779	0.0019	-0.0058	0.0051	0.0205	0.1319	0.0499	0.1515	0.1304	0.0124	0.1736	-0.0519	0.0343

Table A2 (Continued)

	GEND	AGE1	AGE3	FIN2	FIN3	FIN4	OCC1	OCC2	OCC3	ENTR	COUR	TALK	THOR	DEPR	ORIG	RESE	HELP
	CARE	RELA	CURI	ENER	QUAR	RELI	TENS	INGE	ENTH	FORG	DISO	WORR	IMAG	QUIE	TRUS	LAZY	STAB
CARE	1.0000																
RELA	0.1845	1.0000															
CURI	0.0220	0.3777	1.0000														
ENER	0.0693	0.2606	0.4016	1.0000													
QUAR	0.3199	0.0402	0.0651	-0.0017	1.0000												
RELI	-0.0886	0.1629	0.1405	0.2759	-0.2069	1.0000											
TENS	0.1546	-0.1068	0.0303	-0.0948	0.2551	0.0049	1.0000										
INGE	-0.0400	0.1496	0.2444	0.2095	-0.0293	0.3548	0.1605	1.0000									
ENTH	0.0518	0.1789	0.3059	0.2506	0.1300	0.1393	0.1642	0.2989	1.0000								
FORG	-0.0293	0.1314	0.1824	0.2247	-0.1295	0.2085	-0.0962	0.2777	0.2785	1.0000							
DISO	0.2618	0.0286	-0.0287	0.0336	0.3359	-0.1673	0.1724	-0.0712	0.1133	0.0207	1.0000						
WORR	0.0494	-0.1092	0.0434	-0.0133	0.1479	0.0249	0.2647	0.1106	0.1323	0.0842	0.1971	1.0000					
IMAG	-0.0172	0.1326	0.2681	0.2505	-0.0427	0.1808	0.0435	0.2643	0.2996	0.2776	0.0955	0.2012	1.0000				
QUIE	-0.0298	-0.1191	-0.0236	-0.1115	-0.0319	0.0940	0.2074	0.0113	0.0199	0.1609	-0.0036	0.2046	0.0815	1.0000			
TRUS	0.0466	-0.0404	0.0211	0.1165	0.0530	0.0862	0.0705	0.1620	0.0506	0.2192	0.0790	0.0841	0.1763	0.1943	1.0000		
LAZY	0.2927	0.0359	-0.0373	-0.0038	0.2906	-0.1265	0.1419	-0.1350	0.0293	-0.0200	0.4337	0.0929	0.0176	0.0888	0.2117	1.0000	
STAB	0.0629	0.3321	0.2608	0.2229	-0.0459	0.1445	-0.0902	0.1751	0.1695	0.2080	0.0744	-0.0211	0.2469	-0.0204	0.0782	0.1428	1.0000
INVE	-0.0601	0.2819	0.3115	0.1767	0.0685	0.1606	-0.0606	0.2199	0.3127	0.0980	0.0754	0.0018	0.1612	0.0052	0.0994	0.0936	0.2857
ASSE	-0.0403	0.2551	0.2890	0.2985	0.0755	0.1657	-0.0104	0.2268	0.2812	0.2246	0.0837	0.0223	0.2224	-0.0703	0.0965	0.0208	0.2503
COLD	0.1258	0.0668	0.0313	-0.0440	0.2040	-0.0121	0.0887	0.0134	0.0382	-0.0852	0.1246	0.0365	0.0255	0.0947	-0.0589	0.1249	0.0318
PERS	-0.1910	0.2352	0.1784	0.0608	-0.1380	0.2287	-0.0205	0.2195	0.1558	0.1061	-0.1191	-0.0188	0.2124	0.0154	-0.0344	-0.2042	0.1251
MOOD	0.1305	0.0276	0.0624	0.0376	0.2133	0.0726	0.1936	0.0191	0.0398	0.0626	0.2216	0.1190	0.0989	0.0958	0.0317	0.2498	0.0609
ARTI	-0.0224	0.1748	0.3748	0.2298	-0.0696	0.1750	0.0107	0.3074	0.2283	0.2482	-0.0243	0.0747	0.2560	0.0597	0.0618	-0.0686	0.1788
INHI	-0.0756	-0.0504	-0.0196	-0.0376	-0.0012	0.1148	0.2026	0.0506	0.0169	0.0645	0.0392	0.1909	0.1001	0.2802	0.1355	0.1265	0.0355
EFFI	-0.1168	0.2357	0.2247	0.2040	-0.0174	0.2648	-0.0194	0.2070	0.1783	0.1493	-0.0662	0.0204	0.1448	0.0899	0.0203	-0.1301	0.1377
CALM	-0.0328	0.2377	0.1592	0.1755	-0.0414	0.1584	-0.0801	0.1738	0.1705	0.2270	-0.0661	0.0082	0.1599	0.0953	0.0199	-0.0066	0.1694
ROUT	-0.0558	0.0711	0.0744	0.0554	0.0709	0.0943	0.0435	0.0985	0.1232	0.1038	0.0387	0.0985	0.0349	0.0889	0.0186	-0.0328	0.0323
SOCI	-0.0504	0.2230	0.2564	0.2889	0.0008	0.2642	-0.0237	0.2327	0.2463	0.1920	0.0184	-0.0962	0.1180	-0.1122	-0.0208	-0.0262	0.1869
RUDE	0.2292	0.1026	0.1103	0.1413	0.1955	0.0514	0.2086	0.0684	0.0947	0.0318	0.1629	0.1113	0.0550	0.0169	0.0616	0.2459	0.0737
PLAN	-0.0926	0.2122	0.2363	0.2038	0.0098	0.1930	0.0169	0.2481	0.1699	0.1508	-0.0731	-0.0125	0.1146	0.0460	0.0358	-0.0074	0.1579
NERV	0.1621	-0.0213	0.0571	0.0586	0.0929	0.0724	0.2058	0.0272	0.0569	0.0376	0.0506	0.1668	0.0127	0.0652	0.0378	0.0645	-0.0520
IDEA	-0.1231	0.1546	0.2989	0.1778	0.0134	0.1628	-0.0113	0.3117	0.2603	0.1904	0.0011	-0.0254	0.2618	0.0166	0.1485	-0.0056	0.1887
INTE	0.1200	0.0280	-0.1613	-0.0248	0.0500	-0.0060	0.0402	-0.0667	-0.0047	0.0028	0.1179	0.0897	-0.0558	0.0307	-0.0133	0.1646	-0.0108
COOP	-0.1358	0.1589	0.1241	0.2091	0.0032	0.1195	-0.0236	0.1450	0.1272	0.1132	-0.0560	0.0369	0.0941	0.0214	0.0614	-0.0083	0.1098
DIST	0.0149	-0.1548	-0.0296	-0.0070	0.0386	0.0730	0.2089	0.0158	0.0741	0.1407	0.1127	0.1980	0.0710	0.1940	0.1616	0.1833	-0.0312
SOPH	-0.0262	0.0822	0.2092	0.2164	0.0335	0.1652	0.0663	0.2226	0.2709	0.1803	-0.0150	0.0497	0.1999	0.0484	0.0729	-0.0050	0.1261
TASK	-0.1032	0.2565	0.1895	0.2031	-0.1847	0.3180	-0.0465	0.2423	0.1830	0.1380	-0.1073	-0.0209	0.1709	-0.0017	0.0510	-0.1052	0.1383
DECI	0.1202	0.1292	0.1747	0.2405	0.0136	0.1647	0.0482	0.1759	0.2220	0.0798	0.0528	0.1140	0.1555	0.0777	0.0578	0.0021	0.0830
ENFO	-0.0356	0.1572	0.2229	0.1664	-0.0697	0.1879	-0.0310	0.1441	0.1888	0.1239	0.0215	-0.0636	0.0739	-0.0167	0.0260	-0.0636	0.1420
SKIL	-0.0538	0.1978	0.2455	0.1931	0.0227	0.2343	0.0010	0.1668	0.2224	0.1160	0.0143	-0.0733	0.0814	-0.0045	0.0389	-0.0251	0.1646
ADAP	0.0234	0.2422	0.2256	0.2244	0.0180	0.1939	-0.0148	0.1597	0.1658	0.1378	0.0140	-0.0538	0.1566	0.0186	0.0331	0.0150	0.2215
MIST	0.1226	0.2152	0.1052	0.0990	0.0952	0.1042	0.0240	0.0385	0.1449	0.0653	0.1287	-0.0226	0.0718	0.0377	0.0354	0.0819	0.0823

Table A2 (Continued)

	GEND	AGE1	AGE3	FIN2	FIN3	FIN4	OCC1	OCC2	OCC3	ENTR	COUR	TALK	THOR	DEPR	ORIG	RESE	HELP
	INVE	ASSE	COLD	PERS	MOOD	ARTI	INH1	EFFI	CALM	ROUT	SOCI	RUDE	PLAN	NERV	IDEA	INTE	COOP
INVE	1.0000																
ASSE	0.4152	1.0000															
COLD	0.1210	0.0540	1.0000														
PERS	0.2061	0.3069	0.1744	1.0000													
MOOD	0.0159	-0.0300	0.0504	-0.1676	1.0000												
ARTI	0.2246	0.3016	-0.0627	0.2634	0.1068	1.0000											
INH1	0.0406	-0.0526	0.0905	0.0480	0.2195	0.1409	1.0000										
EFFI	0.2615	0.2662	0.1096	0.3578	-0.0161	0.3062	0.0818	1.0000									
CALM	0.1770	0.1747	0.0966	0.2724	-0.0055	0.2221	0.1306	0.3635	1.0000								
ROUT	0.2163	0.1443	0.1679	0.2554	0.0218	0.1678	0.0700	0.3271	0.2365	1.0000							
SOCI	0.1841	0.3664	-0.0396	0.2286	-0.0648	0.3070	-0.0688	0.3344	0.2369	0.1678	1.0000						
RUDE	0.1283	0.1271	0.0885	-0.0522	0.2318	0.0395	0.1123	0.0403	-0.0695	0.0900	0.0175	1.0000					
PLAN	0.2506	0.2410	0.0820	0.2336	-0.0051	0.2905	0.0991	0.3219	0.1693	0.1417	0.3555	0.1030	1.0000				
NERV	0.0519	0.0452	0.0651	-0.0549	0.2126	0.0623	0.0556	0.1269	-0.1361	0.0842	0.0142	0.3978	0.2094	1.0000			
IDEA	0.2756	0.2333	0.0315	0.1826	0.0256	0.2758	0.0275	0.2818	0.2141	0.1229	0.3396	-0.0382	0.3959	0.1246	1.0000		
INTE	0.0353	0.0167	0.1505	-0.0356	0.1263	-0.2452	0.0497	-0.0105	0.0435	0.0403	-0.1697	0.2235	-0.0493	0.2570	-0.0812	1.0000	
COOP	0.1508	0.1116	-0.0976	0.1245	-0.0210	0.1971	0.0799	0.3220	0.1515	0.1183	0.2739	-0.1001	0.2163	-0.0733	0.3089	-0.0255	1.0000
DIST	-0.0527	-0.0445	-0.0131	-0.0590	0.2668	-0.0023	0.2305	0.0157	0.0367	0.0091	-0.0414	0.1291	-0.0136	0.2291	0.0535	0.2039	0.1414
SOPH	0.1432	0.1663	-0.0360	0.2069	0.0198	0.3606	0.0956	0.1697	0.1627	0.1167	0.2056	0.0764	0.1760	0.0526	0.2305	-0.0980	0.2232
TASK	0.1348	0.1265	-0.0260	0.2373	-0.0679	0.2564	0.1202	0.3890	0.2994	0.1026	0.3373	-0.0186	0.2832	-0.0530	0.2143	-0.0473	0.2646
DECI	0.1328	0.1362	0.0825	0.1258	0.0843	0.1866	0.0592	0.3054	0.1218	0.1326	0.2551	0.1322	0.1678	0.0706	0.2055	0.0456	0.2017
ENFO	0.1973	0.2654	0.0233	0.2365	-0.0383	0.1998	0.0228	0.3382	0.2341	0.1319	0.2856	0.0437	0.1792	-0.0471	0.2096	-0.0335	0.2098
SKIL	0.2979	0.3239	-0.0223	0.1780	-0.0123	0.2702	0.0541	0.2862	0.2198	0.2128	0.2814	0.0398	0.2336	-0.0165	0.1810	0.0144	0.1264
ADAP	0.1844	0.2111	-0.0105	0.1616	0.0242	0.2035	0.0599	0.2723	0.1883	0.0768	0.2525	0.0374	0.1579	-0.0230	0.2065	-0.0382	0.2067
MIST	0.1225	0.1489	0.0761	0.0414	-0.0025	0.0591	0.0056	0.2579	0.2126	0.1481	0.1258	0.0905	0.1308	0.0389	0.1403	0.0660	0.1995
	DIST	SOPH	TASK	DECI	ENFO	SKIL	ADAP	MIST									
DIST	1.0000																
SOPH	0.1561	1.0000															
TASK	0.0388	0.1598	1.000														
DECI	0.1442	0.1676	0.4204	1.0000													
ENFO	0.0186	0.2110	0.3743	0.3700	1.0000												
SKIL	0.0111	0.2171	0.3381	0.2930	0.4113	1.0000											
ADAP	-0.0335	0.1891	0.2876	0.2930	0.2754	0.2015	1.0000										
MIST	0.0273	0.0616	0.1224	0.2027	0.3176	0.1940	0.4181	1.0000									

Note: GEN: Gender, male; AGE1: 17 – 20 years; AGE3: >23 years; FIN2: Monthly financial source, by both his/her family and tuition fee; FIN3: Monthly financial source, by his/her job position and family; FIN4: Monthly financial source, by only his/her job position; OCC1: Household head's occupation status, government official; OCC2: Household head's occupation status, worker; OCC3: Household head's occupation status, retiree; PRES: Presence of entrepreneur in the family, yes; COUR: Attendance of an entrepreneurship course, yes; I see myself as someone who. . . TALK: is talkative; THRO: does a thorough job; DEPR: is depressed, blue; ORIG: is original, comes up with new ideas; RESE: is reserved; HELP: is helpful and unselfish with others; CARE: can be somewhat careless; REL: is relaxed, handles stress well; CURI: is curious about many different things; ENER: is full of energy; QUAR: starts quarrels with others; RELI: is a reliable worker; TENS: can be tense; INGE: is ingenious, a deep thinker; ENTH: generates a lot of enthusiasm; FORG: has a forgiving nature; DISO: tends to be disorganized; WORR: worries a lot; IMAG: has an active imagination; QUIE: tends to be quiet; TRUS: is generally trusting; LAZY: tends to be lazy; STAB: is emotionally stable, not easily upset; INVE: is inventive; ASSE: has an assertive personality; COLD: can be cold and aloof; PERS: perseveres until the task is finished; MOOD: can be moody; ARTI: values artistic, aesthetic experiences; INHI: is sometimes shy, inhibited; EFFI: does things efficiently; CALM: remains calm in tense situations; ROUT: prefers work that is routine; SOCI: is outgoing, sociable; RUDE: is sometimes rude to others; PLAN: makes plans and follows through with them; NERV: gets nervous easily; IDEA: likes to reflect, play with ideas; INTE: has few artistic interests; COOP: likes to cooperate with others; DIST: is easily distracted; SOPH: is sophisticated in art, music, or literature; TASK: I do my best even I have a very challenging task; DECI: My own decisions are generally effective on my job; ENFO: I can find better options if I enforcedly leave my job; SKIL: I can find suitable places for my skills; ADAP: I do not have any problems to adapt a new situation and practice; MIST: I do not fear to make a mistake about something I am working on.

1% and 5% levels because the OLOGIT model violated the critical assumption at such significance levels. Furthermore, the OLOGIT model was found to be the most parsimonious model with the lowest BIC value at the 10% level. Thus, the PPO model was used for the interpretation of the coefficients and the average direct pseudo-elasticities, which were statistically significant at the 1%, 5%, and 10% levels. However, the OLOGIT model was to be used only for interpretation if such variable was statistically significant at the 10% level for both the OLOGIT and PPO models.

Table A4 presents the estimation results of the estimated ordered response models and provides valuable information about the direction (positive or negative) of the relationship between the undergraduate students' EI levels and the explanatory variables. Among the sociodemographic and socioeconomic characteristics, the fact that the household head's occupation status is that of an employee and the presence of an entrepreneur in the family were found to have a positive impact on the Turkish respondents' EI levels. On the contrary, the Turkish respondents' EI levels tended to be lower when their household head's occupation category was that of a retiree. Among the narrow personality traits, the Turkish respondents who saw themselves as having the tendency to become tense, to be forgiving, to do things efficiently, and to like cooperating with others were found to have higher EI levels whereas the Turkish respondents who saw themselves as having the tendency to worry a lot, to be cold and aloof, to persevere until the task is finished, to be moody, and to make plans and implement them tended to have lower EI levels. The entrepreneurship scale items "I generally make good decisions regarding my future job," "I can find better options if I leave my job," "I can find suitable workplaces for my skills," and "I do not have any problem adapting to a new situation and practice" were positively associated with the EI levels. Finally, the Turkish respondents who saw themselves as not being afraid of making a mistake about something they are working on were found to have lower EI levels.

As the calculated coefficients in Table A4 give information only about the direction of the statistically significant relationship between EI and the independent variables, the average pseudo-elasticities were calculated to determine the exact magnitude of the underlying relationships. Table 3 presents the average direct pseudo-elasticity values for each dependent-variable category. The average pseudo-elasticity values provide information for determining the sensitivity level of the relevant positive or negative relationship between the dependent and explanatory variables in percentages. For instance, if the computed average direct pseudo-elasticity value (in percentage) was greater than 100, the underlying explanatory variable was considered elastic, implying a very strong statistical association between the dependent and explanatory variables (Washington et al., 2011).

As shown in Table 3, when the household head's occupation status was that of a government official, the probability of the Turkish respondent's EI level decreased by 9.7% ($0.097, p < 0.10$) compared to the EI level of those whose household head was self-employed. The same probability also decreased by almost 3% ($-0.034, p < 0.010$) when the household head's occupation status was that of a retiree. The estimation results revealed that the Turkish respondents' EI probability increased by 6% ($0.060, p < 0.01$) in the case of the presence of at least one entrepreneur in their family. On the basis of these results, H8 and H10 were accepted while H7, H9, H11, and H12 were rejected. In terms of the narrow personality traits, the Turkish respondents who saw themselves as having the tendency to become tense were approximately 18% ($0.182, p < 0.10$) more likely to have a higher EI level. Accordingly, H4c was rejected. The estimation results also revealed that the Turkish respondents who saw themselves as having a forgiving nature were found to be approximately 21% ($0.205, p < 0.10$) more likely to have a higher EI level. Hence, H2c was accepted.

The probability of having a higher EI level decreased by approximately 35% ($-0.348, p < 0.05$) and 18% ($-0.183, p < 0.05$), respectively, for the Turkish respondents who saw themselves as having the tendency to persevere until the task is finished and to be moody. Accordingly, H3f was rejected and H4f was accepted. Not surprisingly, the Turkish respondents who saw themselves as having the tendency to do things efficiently were 32% ($0.319, p < 0.10$) more likely to have a higher EI level. H3g was thus also accepted. The Turkish respondents who saw themselves as having the tendency to make plans and implement them were found to be 71% ($0.710, p < 0.10$) more likely to have a lower EI level. Thus, H3h was rejected.

In terms of the entrepreneurship scale items, the Turkish respondents who indicated that they believe that they can generally make good decisions regarding their future job, that they can find better options if they leave their future jobs, that they can find suitable workplaces for their skills, and that they do not have any problems adapting to a new situation and practice were found to be approximately 33% ($0.333, p < 0.05$), 76% ($0.762, p < 0.01$), 38% ($0.382, p < 0.01$), and 31% ($0.312, p < 0.05$) more likely to have a higher EI level, respectively. On the other hand, the probability of having a higher EI level decreased by approximately 23% ($-0.233, p < 0.10$) for those who indicated that they believe they have the tendency to not be afraid of making a mistake about something they are working on. Hence, H6b, H6c, H6d, and H6e were accepted, H6a and H6f were rejected, and the rest of the hypotheses related to the insignificant variables were also rejected for the Turkish sample.

4.3. Estimation results for Iranian sample

Table A5 shows the estimation results of the OLOGIT and PPO models for the Iranian sample. Louviere, Hensher, and Swait (2000) recommend that the pseudo- R^2 values from 0.20 to 0.40 be considered relatively high in terms of statistical explanatory power. Particularly, the estimated models fit well, with relatively high pseudo- R^2 values (0.2277 and 0.4596) for the discrete choice modeling approach. As shown in Table A5, the estimated models were statistically significant at the 1% significance level. However, the Brant (1990) test for the OLOGIT model (chi square = 177.47; p value = 0.0000) violated the parallel-lines assumption, and the PPO model was found to be the most parsimonious model. Thus, the PPO model was used for the interpretation of the coefficients and the average direct pseudo-elasticities. The GOLOGIT model was also estimated for this sample, but its result was not found to be statistically significant.

The estimation results revealed that there exist statistically significant negative relationships between gender and job and family monthly financial sources on the one hand and EI on the other hand for the Iranian respondents. The Iranian students with only their jobs as their monthly financial source had higher EI levels. In terms of the narrow personality traits, the estimation results also indicate that the Iranian respondents who saw themselves as having the tendency to be talkative, to be original, to come up with new ideas, to be enthusiastic, to worry a lot, to be quiet, to value being artistic and having aesthetic experiences, to remain calm in tense situations, to make plans and implement them, to like reflecting, to play with ideas, and to have artistic, musical, or literary sophistication were found to be more likely to have a higher EI level. On the other hand, the respondents who saw themselves as having the tendency to become sad and depressed, to be reserved, to be curious about many different things, to start quarrels with others, to be tense, to be forgiving, to be inventive, to be cold and aloof, to be outgoing, to be sociable, to get nervous easily, and to have few artistic interests were found to be less likely to have a higher EI level. In terms of the entrepreneurial scale items, the respondents who indicated that they believe they can generally make good decisions

Table A3

Pearson correlation matrix of independent variables for Iranian sample.

	GEND	AGE1	AGE3	FIN2	FIN3	FIN4	OCC1	OCC2	OCC3	ENTR	COUR	TALK	THOR	DEPR	ORIG	RESE	HELP
GEND	1.0000																
AGE1	-0.2453	1.0000															
AGE3	0.1945	-0.2959	1.0000														
FIN2	-0.0860	-0.0002	0.0208	1.0000													
FIN3	0.0915	-0.0665	0.0162	-0.0763	1.0000												
FIN4	0.2717	-0.0859	0.2747	-0.1236	-0.1364	1.0000											
OCC1	0.0093	-0.0995	-0.0026	0.3014	-0.0058	-0.0251	1.0000										
OCC2	-0.0662	0.0316	0.0184	-0.0257	-0.1284	-0.0568	-0.1122	1.0000									
OCC3	-0.0001	-0.0755	0.1909	0.0388	0.0110	0.1191	-0.1294	-0.2260	1.0000								
PRES	-0.0285	-0.0312	0.0283	0.0379	0.0032	0.0058	0.1317	0.0881	0.0289	1.0000							
COUR	-0.0691	-0.1633	0.1521	0.1070	-0.0175	-0.0284	0.1660	0.0433	0.0331	0.2154	1.0000						
TALK	-0.1497	0.1246	-0.0364	0.0818	0.0528	-0.1202	-0.1523	-0.0133	-0.0099	-0.0654	-0.0572	1.0000					
THOR	0.1394	0.0805	-0.0334	-0.1425	0.0836	0.1431	-0.1727	-0.0580	0.0326	-0.0915	-0.1589	-0.0168	1.0000				
DEPR	-0.0036	0.0153	-0.0362	0.0920	-0.0520	-0.1084	0.0292	-0.0094	0.0001	-0.0890	0.0662	0.0892	-0.2108	1.0000			
ORIG	-0.0161	0.0877	-0.0472	0.0288	-0.1080	-0.0241	0.0510	-0.0040	-0.1287	0.0468	0.0663	0.0145	0.0806	-0.0755	1.0000		
RESE	0.0251	0.0303	0.1096	-0.0887	0.0259	0.0637	-0.0765	-0.0113	-0.0196	-0.0255	-0.0254	0.0923	0.0487	-0.2280	0.0443	1.0000	
HELP	0.0261	0.0350	-0.1256	-0.1772	0.0019	0.1001	-0.0676	0.0104	-0.1336	-0.0914	-0.1176	-0.0909	0.2101	-0.0584	0.0182	-0.0441	1.0000
CARE	0.0684	0.0045	0.0744	-0.1554	0.0241	0.1224	-0.1989	-0.1482	0.1330	0.0229	-0.0612	-0.1291	0.0949	-0.2458	0.0087	0.1369	0.0414
RELA	-0.1678	-0.0665	0.0479	-0.0949	0.0390	0.0117	0.0944	-0.0969	0.1002	0.1525	0.0225	-0.0488	-0.1330	0.0423	-0.0900	-0.0732	-0.0607
CURI	0.0405	-0.0769	-0.0289	-0.1161	0.0356	-0.0465	0.0720	-0.0771	0.0357	-0.0050	-0.1254	0.0251	0.2541	-0.0339	0.1948	-0.0138	0.0489
ENER	0.0555	0.0078	0.0237	-0.2159	0.1034	0.0048	-0.0189	0.0114	-0.0516	-0.0147	-0.0353	0.0382	0.2647	-0.1798	0.1761	0.1677	0.0782
QUAR	0.0288	0.1043	0.0955	-0.1715	0.0232	0.1167	0.0581	-0.0224	0.0158	0.0150	-0.0302	-0.1919	0.1227	-0.2934	-0.0319	0.1452	0.1616
RELI	0.0795	0.0062	0.0071	-0.0598	0.0798	0.0956	-0.0304	-0.1147	-0.0007	-0.1145	-0.1088	-0.0449	0.2972	-0.2062	0.1585	0.1240	0.1226
TENS	-0.0701	-0.0551	-0.1307	-0.0433	0.0492	-0.0289	0.0809	-0.0684	-0.1201	-0.0130	-0.0091	0.0799	-0.0307	0.1587	-0.0825	-0.1704	0.0561
INGE	-0.0072	0.0794	-0.0651	-0.0227	0.0346	0.0941	-0.0331	-0.0023	-0.0442	0.0643	0.0121	0.0488	0.2589	-0.0757	0.2701	0.0052	0.0712
ENTH	-0.0470	-0.0430	0.0096	-0.0340	-0.0227	-0.1223	-0.0604	0.0105	0.0414	0.0250	0.0529	0.1926	0.1063	0.0096	0.2393	-0.0412	-0.0145
FORG	0.0068	0.0530	-0.0119	-0.1781	-0.0286	0.0995	-0.1088	0.0137	-0.0873	0.0056	-0.1122	0.0340	0.1616	0.0347	0.0188	0.0163	0.2599
DISO	0.0906	-0.0185	0.0809	-0.1741	0.0927	0.1937	-0.0359	-0.0511	0.1633	0.0261	-0.0688	0.2173	-0.2900	-0.1158	0.1415	0.1469	
WORR	-0.1179	-0.0721	-0.0261	-0.1351	-0.0165	-0.1016	0.0421	-0.0574	-0.0177	-0.1126	0.0759	0.1154	-0.0630	0.2989	-0.0699	-0.2868	-0.0553
IMAG	-0.2260	0.1519	-0.0647	0.0930	-0.1453	-0.2126	-0.0264	-0.0525	0.0169	-0.1040	0.0236	0.2246	-0.0468	0.2677	-0.0625	-0.2026	-0.0222
QUIE	-0.0411	0.0238	-0.0099	0.0654	0.0100	-0.0736	-0.0203	0.0902	-0.0421	0.1496	-0.0118	0.3242	-0.0733	-0.1565	-0.0093	0.1128	-0.1161
TRUS	-0.0652	-0.0016	0.0101	-0.0143	0.0058	-0.0781	-0.1027	-0.1320	-0.0402	-0.1620	-0.0679	0.1431	0.0628	0.1253	0.0274	0.0416	0.0522
LAZY	0.1362	-0.0121	0.0852	-0.1437	0.0813	0.0948	-0.0088	-0.1199	0.0728	0.0843	-0.0307	-0.0909	0.1913	-0.3223	-0.0230	0.2639	-0.0116
STAB	-0.0162	-0.1596	0.0554	0.0324	0.1060	-0.0824	0.1146	-0.0252	0.0127	0.0771	0.0352	-0.1112	-0.0172	-0.0696	-0.0585	0.0002	-0.1129
INVE	-0.0093	0.0577	-0.1071	-0.0468	0.0318	0.0546	-0.0310	0.0528	-0.0625	0.0909	0.0286	0.0652	0.1907	-0.0494	0.3347	-0.0335	0.0467
ASSE	0.1411	0.1358	-0.1029	-0.1031	0.0634	0.1689	0.0483	-0.0661	-0.0927	0.0341	-0.1224	0.0433	0.2704	-0.1866	0.2881	0.0617	0.1285
COLD	-0.1775	-0.0018	-0.0078	0.0498	0.0138	-0.1783	-0.0246	0.0965	0.0114	0.1271	0.0532	0.0892	-0.1940	0.1443	-0.1325	0.0249	-0.1678
PERS	0.1509	0.0603	-0.0585	-0.0328	0.0333	0.1746	-0.1389	0.0578	-0.0560	0.0087	-0.1107	-0.0592	0.4518	-0.0703	0.1474	0.0370	0.1448
MOOD	-0.2057	-0.0745	-0.0065	-0.1441	-0.0534	-0.1705	0.0148	0.0860	-0.0655	-0.0489	0.1076	0.1003	-0.2512	0.2601	-0.0368	-0.2422	-0.0228
ARTI	-0.0451	0.0612	-0.0093	-0.1267	0.0946	0.1116	-0.1002	-0.1389	0.0054	-0.1869	-0.1084	0.1519	0.2613	-0.1241	0.0972	0.1348	0.2500
INHI	-0.0524	0.0233	0.0213	-0.0966	0.0571	-0.0901	0.0350	0.0489	-0.0501	0.1534	-0.0794	-0.0045	-0.0484	-0.2265	0.0986	0.4217	-0.0069
EFFI	-0.0032	-0.0047	0.1085	-0.1563	0.1608	0.1857	-0.1137	-0.1747	0.0590	-0.0556	-0.0561	-0.0269	0.3643	-0.0650	0.1692	0.0525	0.0672
CALM	-0.0064	-0.0704	0.0716	-0.0191	0.0188	-0.1046	-0.0449	-0.0848	0.0196	-0.0899	0.0757	0.1061	-0.0997	0.0232	-0.1255	-0.0087	-0.1104
ROUT	0.0045	0.0778	0.0304	-0.1997	0.0276	0.0235	-0.1290	-0.1633	0.1806	0.0324	-0.1566	0.0367	0.0775	-0.1141	-0.1206	0.1886	0.1493
SOCI	0.0567	0.0394	0.1440	0.0394	0.0466	0.0683	-0.0385	-0.0769	0.0275	0.0464	-0.0216	0.1031	0.2168	-0.0518	0.1292	0.0469	0.1072
RUDE	0.0110	-0.0459	0.1061	-0.0177	-0.0673	0.0016	-0.0340	0.1053	0.0481	0.1130	0.0168	-0.1246	-0.0709	-0.1176	-0.0458	0.1366	-0.0470
PLAN	0.1494	-0.0245	0.0504	-0.0839	0.1799	0.0315	0.0117	-0.1101	0.0633	0.0345	-0.1026	0.0551	0.2709	-0.0091	0.1779	0.0588	0.1305
NERV	-0.1910	-0.0155	-0.1104	0.0171	0.0213	-0.0986	-0.0623	0.0188	-0.1025	-0.0750	0.0179	0.1517	-0.0904	0.2484	-0.0228	-0.0906	-0.0229
IDEA	-0.0030	-0.0063	0.0591	-0.0017	-0.0049	-0.0728	0.0199	-0.1032	0.0062	-0.0481	0.0009	0.0899	0.0944	-0.0016	0.2763	-0.0235	0.0107
INTE	-0.0499	0.0920	0.0069	-0.0909	0.0336	0.0545	-0.1329	0.0133	0.0592	0.0135	-0.1126	0.0520	0.0139	-0.0468	-0.0889	0.0165	0.1648
COOP	0.0802	0.0010	-0.0372	0.0398	0.1112	0.0457	-0.0154	-0.1420	0.0814	-0.1630	-0.0897	-0.0058	0.1363	-0.0165	0.0904	0.1306	0.1887
DIST	-0.1569	-0.0283	-0.0669	0.1341	-0.0147	-0.1225	-0.0225	-0.0753	0.0082	-0.0746	-0.0573	0.1753	-0.1971	0.2369	-0.0423	-0.2822	-0.0450
SOPH	-0.0417	0.0378	-0.0307	0.0118	-0.0513	0.0210	0.0113	0.0105	0.0568	0.0019	-0.0421	0.0140	-0.0249	0.1847	0.1520	-0.0917	-0.0004
TASK	0.0503	0.0635	0.0731	-0.1829	0.1062	0.1837	-0.0250	-0.0574	0.0886	-0.0055	-0.1924	0.0131	0.4095	-0.2210	0.0797	0.2189	0.1247
DECI	-0.0108	0.0817	-0.0617	-0.1092	0.0457	0.1031	-0.1910	0.0647	-0.0714	0.0484	-0.1506	0.0316	0.3580	-0.0677	0.1512	0.0785	0.2166
ENFO	0.1514	0.0957	-0.0036	0.0097	-0.0081	0.0522	-0.0716	-0.0991	0.0995	0.0936	-0.1052	-0.0616	0.0986	-0.0609	0.2040	0.0477	0.1663
SKIL	0.0030	0.0802	-0.033	-0.0516	0.1374	0.0951	0.0513	-0.0512	0.0759	0.1010	0.0355	0.0923	0.3034	-0.0892	0.2642	0.0148	0.0276
ADAP	0.1232	-0.1278	0.0252	0.0863	-0.0680	0.1208	0.0255	-0.1038	0.0200	-0.0603	-0.1195	-0.0734	0.0572	-0.0686	0.0166	0.0025	0.0543

Table A3 (Continued)

	GEND	AGE1	AGE3	FIN2	FIN3	FIN4	OCC1	OCC2	OCC3	ENTR	COUR	TALK	THOR	DEPR	ORIG	RESE	HELP
MIST	0.0602	0.0798	0.0290	-0.0613	0.0550	0.0702	-0.0591	-0.0048	-0.0382	-0.0308	-0.0871	0.0683	-0.0501	0.0971	0.0138	-0.0100	0.0103
CARE	1.0000																
RELA	0.1789	1.0000															
CURI	-0.0093	-0.0697	1.0000														
ENER	-0.0207	-0.2055	0.2980	1.0000													
QUAR	0.1819	0.1626	-0.0582	0.0126	1.0000												
RELI	0.1945	-0.0091	0.2175	0.3350	0.1827	1.0000											
TENS	-0.1056	0.0567	-0.0527	-0.0975	-0.3152	0.0628	1.0000										
INGE	0.0901	-0.1232	0.1194	0.3026	-0.0529	0.3397	0.0633	1.0000									
ENTH	-0.0772	-0.2382	0.1995	0.3061	-0.1368	0.0716	0.0028	0.2820	1.0000								
FORG	0.0369	-0.0100	0.0779	0.1914	0.0464	0.3007	0.0743	0.2209	0.1379	1.0000							
DISO	0.3545	0.1392	0.1307	0.1290	0.3242	0.2051	-0.1355	0.0149	-0.0919	0.0753	1.0000						
WORR	-0.0584	0.1890	0.0338	-0.1188	-0.2263	0.0300	0.2326	-0.0097	0.0088	0.0930	-0.1269	1.0000					
IMAG	-0.0750	0.1092	-0.0197	-0.1549	-0.1043	-0.0902	0.1434	-0.0874	-0.0236	0.0189	-0.2370	0.3565	1.0000				
QUIE	0.1061	0.0593	-0.0463	0.0110	-0.0118	-0.0339	-0.0171	0.0137	0.1198	-0.0186	0.0202	-0.2197	-0.0850	1.0000			
TRUS	0.0010	-0.0443	0.0550	0.0574	-0.2519	0.0841	0.1179	0.0380	0.0602	0.1476	0.0092	0.1232	0.1818	-0.0435	1.0000		
LAZY	0.3362	0.0708	0.1007	0.1309	0.3135	0.1459	-0.2196	-0.0410	-0.0393	-0.0319	0.4330	-0.3041	-0.2680	0.1468	-0.1674	1.0000	
STAB	0.0108	0.1010	-0.0751	-0.0890	0.1691	-0.1145	0.0774	-0.1094	-0.1129	-0.1344	-0.0119	0.0053	-0.0051	0.0104	-0.1700	0.2017	1.0000
INVE	0.0644	-0.1569	0.1257	0.2042	-0.0993	0.0514	-0.0736	0.4945	0.2965	-0.0298	-0.0576	-0.0374	-0.0278	0.0794	0.0068	0.0472	-0.0708
ASSE	0.0587	-0.1663	0.1917	0.3552	0.0116	0.2668	0.0112	0.3728	0.2010	0.1683	0.0684	-0.0787	-0.2493	0.0719	-0.0273	0.0733	-0.2108
COLD	-0.0108	0.2032	-0.1412	-0.1771	-0.0443	-0.2401	0.0734	-0.2176	-0.1807	-0.1466	-0.0522	0.1146	0.1637	0.0881	0.0295	-0.1424	0.1331
PERS	0.031	-0.1601	0.2025	0.2521	-0.0200	0.3440	-0.0177	0.2209	0.0878	0.2604	0.1117	-0.0455	-0.2051	-0.1232	0.0104	0.1923	-0.1034
MOOD	-0.2654	0.1224	-0.0731	-0.1272	-0.1896	-0.1382	0.1067	0.0235	-0.0263	-0.0932	-0.2371	0.2493	0.3020	-0.1396	0.0926	-0.2998	-0.0203
ARTI	0.2132	0.0562	0.2420	0.2383	0.1552	0.3791	-0.0588	0.2153	0.1535	0.3520	0.1567	-0.0187	-0.0424	0.0659	0.0999	0.1319	-0.0637
INHI	0.0124	-0.0087	-0.0095	0.0751	0.1609	0.0548	-0.1296	-0.0088	-0.1355	-0.1027	0.1950	-0.2856	-0.1963	0.2611	-0.0832	0.2472	0.0254
EFFI	0.2287	-0.0890	0.2715	0.2623	-0.0059	0.3411	0.0519	0.3795	0.2234	0.2633	0.1136	-0.0010	-0.0991	-0.1109	0.2395	0.1423	-0.0785
CALM	-0.0620	0.1228	-0.1380	-0.2069	-0.0134	-0.1920	-0.0087	-0.2766	-0.1308	-0.1223	-0.0352	0.1123	0.1862	0.0641	-0.0103	-0.0723	0.0959
ROUT	0.2021	0.0960	0.0920	0.1794	0.3242	0.2120	-0.1169	-0.0836	-0.0476	0.1541	0.2705	-0.1918	-0.2310	0.1898	-0.1300	0.2926	-0.0052
SOCI	0.0890	-0.1193	0.1587	0.1716	0.0287	0.2002	-0.0764	0.2225	0.2665	0.1821	0.0379	-0.0538	-0.0679	0.1645	0.0956	0.1516	-0.0485
RUDE	0.1648	-0.0624	0.0489	0.0629	0.2252	0.0065	-0.3492	-0.0489	-0.0173	-0.0112	0.2040	-0.2010	-0.2092	-0.0043	-0.1506	0.2702	-0.0220
PLAN	0.0168	-0.0611	0.2538	0.2397	0.0752	0.1714	-0.0821	0.2502	0.2322	0.1822	0.0707	-0.0296	-0.0785	0.0100	0.0921	0.1750	-0.1068
NERV	-0.1993	0.1467	-0.0773	-0.1181	-0.2996	-0.0846	0.4193	-0.0604	-0.0298	-0.0079	-0.2073	0.2777	0.2626	-0.0846	0.1553	-0.3323	0.0443
IDEA	0.1138	-0.0245	0.2399	0.1788	-0.1435	0.1267	-0.0312	0.2357	0.2133	0.0579	-0.0837	0.1105	0.0699	-0.0512	0.1169	0.0703	-0.0368
INTE	0.2124	0.1073	0.0675	0.0176	0.1189	0.0184	-0.1127	0.0344	-0.1268	0.0678	0.2775	-0.0460	0.0536	0.1032	0.0634	0.1825	-0.0615
COOP	0.1245	-0.0145	0.1227	0.1331	-0.0180	0.2900	0.0211	0.1363	0.0871	0.1102	0.1593	0.0326	-0.0941	-0.1114	0.1796	0.0854	-0.1177
DIST	-0.1732	0.0859	-0.1008	-0.1946	-0.1312	-0.0749	0.1851	0.0168	0.0297	-0.0578	-0.2460	0.3022	0.2602	-0.1027	0.0253	-0.3860	0.0858
SOPH	-0.1608	-0.0155	0.0809	0.1088	-0.0126	0.0527	-0.0230	0.1514	0.0447	-0.0085	-0.0072	0.0851	0.0283	-0.2171	0.0333	-0.0476	-0.0591
TASK	0.2404	-0.0074	0.3110	0.3821	0.1280	0.2661	-0.0937	0.2041	0.1091	0.1897	0.2891	-0.0822	-0.1598	-0.0815	0.1028	0.2433	-0.1008
DECI	0.1129	-0.0631	0.2669	0.1861	0.1204	0.1845	-0.0266	0.1961	0.1244	0.1186	0.1363	-0.1013	-0.0868	-0.0923	0.0008	0.0985	-0.0802
ENFO	0.0950	-0.1203	0.1106	0.1305	0.0117	0.2686	-0.0335	0.2643	0.1236	0.1654	0.0573	-0.1265	-0.1527	-0.0955	-0.0023	0.0987	-0.0922
SKAL	0.0587	-0.0153	0.2738	0.2572	-0.1149	0.0419	-0.0561	0.2966	0.2348	0.0819	0.0190	-0.1757	-0.2180	-0.0088	-0.0462	0.1194	-0.0716
ADAP	-0.0605	-0.0279	0.0745	0.0901	-0.0405	0.0796	-0.1055	0.0608	0.0241	0.0342	-0.1278	-0.0974	-0.1400	-0.1348	-0.0085	0.0502	-0.0184
MIST	0.0181	-0.0448	0.0019	0.0717	-0.0805	0.0107	-0.0720	0.0732	0.1125	0.0730	-0.1506	-0.1368	-0.0960	-0.0066	0.0528	0.0514	-0.2107

Table A3 (Continued)

	GEND	AGE1	AGE3	FIN2	FIN3	FIN4	OCC1	OCC2	OCC3	ENTR	COUR	TALK	THOR	DEPR	ORIG	RESE	HELP
	INVE	ASSE	COLD	PERS	MOOD	ARTI	INH1	EFFI	CALM	ROUT	SOCI	RUDE	PLAN	NERV	IDEA	INTE	COOP
INVE	1.0000																
ASSE	0.2843	1.0000															
COLD	-0.1782	-0.3706	1.0000														
PERS	0.1508	0.3353	-0.3670	1.0000													
MOOD	0.0212	-0.1655	0.1251	-0.1215	1.0000												
ARTI	0.1827	0.1871	-0.1111	0.1927	-0.0869	1.0000											
INH1	-0.0372	0.1107	0.0149	-0.0039	-0.2648	-0.2069	1.0000										
EFFI	0.2148	0.3132	-0.2206	0.3770	-0.0839	0.3610	-0.0622	1.0000									
CALM	-0.2073	-0.2800	0.1594	-0.3684	0.0071	-0.1586	-0.0006	-0.4131	1.0000								
ROUT	-0.0706	0.0233	-0.0436	0.0096	-0.2929	0.2108	0.2350	-0.0185	0.0026	1.0000							
SOCI	0.2728	0.1646	-0.1865	0.1730	-0.0726	0.3200	-0.0714	0.2709	-0.1655	0.0940	1.0000						
RUDE	0.0082	-0.0356	-0.0463	0.0653	-0.1987	-0.0123	0.1929	0.0308	-0.1134	0.2194	0.0353	1.0000					
PLAN	0.3044	0.2974	-0.2095	0.3640	-0.1007	0.3157	-0.0746	0.3643	-0.1873	-0.0071	0.3538	-0.0037	1.0000				
NERV	-0.0687	-0.0666	0.1835	-0.1077	0.2921	-0.1184	-0.1049	-0.1244	0.1627	-0.1654	-0.2536	-0.4312	-0.0735	1.0000			
IDEA	0.3989	0.1507	-0.0350	0.1015	-0.0277	0.2112	-0.0891	0.1854	-0.1753	-0.0512	0.1917	-0.0029	0.2498	-0.0067	1.0000		
INTE	0.0728	-0.0165	-0.0626	0.0671	-0.0935	0.1546	0.0572	0.0686	-0.0639	0.1634	0.0140	0.1022	0.1490	-0.1841	-0.0008	1.0000	
COOP	0.1090	0.1220	-0.1316	0.1161	-0.0678	0.2049	-0.0400	0.1733	-0.0859	0.0512	0.1892	0.0117	0.1775	-0.0828	0.2701	0.0177	1.0000
DIST	-0.0763	-0.2069	0.0957	-0.2049	0.3131	-0.1590	-0.2023	-0.1815	0.2107	-0.1439	-0.0775	-0.3366	-0.2119	0.3129	0.0744	-0.2601	-0.0067
SOPH	0.1031	0.1413	-0.0373	0.1390	0.0752	0.0036	-0.0736	0.1147	-0.1506	-0.1211	-0.0371	0.0123	0.1620	-0.0435	0.1883	-0.0094	0.1735
TASK	0.1643	0.3112	-0.2331	0.3131	-0.2509	0.3580	0.0280	0.4123	-0.2283	0.1791	0.2066	0.0757	0.3175	-0.1279	0.0947	0.1218	0.3028
DECI	0.2098	0.1952	-0.0688	0.2295	-0.0943	0.1879	-0.0403	0.2808	-0.2941	0.1382	0.1825	0.0474	0.2768	-0.0017	0.1447	0.0051	0.1435
ENFO	0.0828	0.2861	-0.1869	0.2248	-0.0670	0.0923	0.1105	0.1550	-0.2579	0.0854	0.2806	0.0772	0.2171	-0.1025	0.1172	-0.0036	0.1415
SKIL	0.3943	0.2190	-0.2123	0.2220	-0.1156	0.3065	-0.0117	0.3003	-0.2391	0.0523	0.2271	0.0128	0.3294	-0.0311	0.2626	0.0041	0.1119
ADAP	0.1030	0.1174	-0.2645	0.1771	0.0081	0.0467	-0.0103	0.0978	-0.1676	0.0270	0.1642	0.0700	0.1040	-0.0445	0.1054	0.0272	0.1572
MIST	0.1175	0.2065	-0.2030	0.1490	0.0228	0.1248	-0.0611	0.1038	-0.1346	0.0018	0.2087	0.0851	0.2672	0.0620	-0.0253	-0.0680	0.0441
	DIST	SOPH	TASK	DECI	ENFO	SKIL	ADAP	MIST									
DIST	1.0000																
SOPH	0.0404	1.0000															
TASK	-0.3036	0.0726	1.0000														
DECI	-0.1026	0.0578	0.3390	1.0000													
ENFO	-0.0782	0.0793	0.2064	0.2157	1.0000												
SKIL	-0.1397	0.0664	0.3325	0.1609	0.1881	1.0000											
ADAP	-0.0421	0.0621	0.1081	0.0807	0.1887	0.1520	1.0000										
MIST	0.0252	0.0599	0.2291	0.0643	0.1695	0.1944	0.3044	1.0000									

Note: GEN: Gender, male; AGE1: 17 – 20 years; AGE3: >23 years; FIN2: Monthly financial source, by both his/her family and tuition fee; FIN3: Monthly financial source, by his/her job position and family; FIN4: Monthly financial source, by only his/her job position; OCC1: Household head's occupation status, government official; OCC2: Household head's occupation status, worker; OCC3: Household head's occupation status, retiree; PRES: Presence of entrepreneur in the family, yes; COUR: Attendance of an entrepreneurship course, yes; I see myself as someone who. . . TALK: is talkative; THRO: does a thorough job; DEPR: is depressed, blue; ORIG: is original, comes up with new ideas; RESE: is reserved; HELP: is helpful and unselfish with others; CARE: can be somewhat careless; REL: is relaxed, handles stress well; CUR: is curious about many different things; ENER: is full of energy; QUAR: starts quarrels with others; REL: is a reliable worker; TENS: can be tense; INGE: is ingenious, a deep thinker; ENTH: generates a lot of enthusiasm; FORG: has a forgiving nature; DISO: tends to be disorganized; WORR: worries a lot; IMAG: has an active imagination; QUIE: tends to be quiet; TRUS: is generally trusting; LAZY: tends to be lazy; STAB: is emotionally stable, not easily upset; INVE: is inventive; ASSE: has an assertive personality; COLD: can be cold and aloof; PERS: perseveres until the task is finished; MOOD: can be moody; ARTI: values artistic, aesthetic experiences; INHI: is sometimes shy, inhibited; EFFI: does things efficiently; CALM: remains calm in tense situations; ROUT: prefers work that is routine; SOCI: is outgoing, sociable; RUDE: is sometimes rude to others; PLAN: makes plans and follows through with them; NERV: gets nervous easily; IDEA: likes to reflect, play with ideas; INTE: has few artistic interests; COOP: likes to cooperate with others; DIST: is easily distracted; SOPH: is sophisticated in art, music, or literature; TASK: I do my best even I have a very challenging task; DECI: My own decisions are generally effective on my job; ENFO: I can find better options if I enforcedly leave my job; SKIL: I can find suitable places for my skills; ADAP: I do not have any problems to adapt a new situation and practice; MIST: I do not fear to make a mistake about something I am working on.

Table A4
 Estimation results of OLOGIT, GOLOGIT, and PPO models for Turkish sample.

Independent variable	OLOGIT	GOLOGIT		PPO		
	Coefficient	Threshold between (j = 0) and (j = 1)	Threshold between (j = 1) and (j = 2)	Coefficient not varying by threshold	Threshold between (j = 0) and (j = 1)	Threshold between (j = 1) and (j = 2)
<i>Socio-demographic and socio-economic characteristics</i>						
Gender; male	0.272 (0.260)	0.917 (0.951)	0.380 (0.312)	0.253 (0.268)	--	--
Age; 17 – 20 years	-0.041 (0.268)	0.345 (0.885)	-0.1786 (0.317)	-0.080 (0.271)	--	--
Age; >23 years	0.419 (0.370)	1.981 (1.224)	-0.071 (0.427)	0.399 (0.377)	--	--
Monthly financial source; by both his/her family and tuition fee	0.014 (0.260)	2.373 (1.029)**	0.053 (0.309)	0.060 (0.263)	--	--
Monthly financial source; by his/her job position and family	-0.087 (0.489)	0.532 (1.685)	-0.181 (0.591)	-0.248 (0.503)	--	--
Monthly financial source; by only his/her job position	0.308 (0.531)	3.150 (4.543)	0.098 (0.584)	0.364 (0.540)	--	--
Household head's occupation status; government official	-0.069 (0.396)	-4.811 (1.521)*	0.537 (0.488)	--	0.845 (0.502)***	0.200 (0.420)
Household head's occupation status, worker	0.114 (0.309)	3.078 (1.570)**	-0.018 (0.356)	0.088 (0.315)	--	--
Household head's occupation status, retiree	-0.461 (0.293)	-0.795 (0.923)	-0.453 (0.346)	-0.494 (0.299)***	--	--
Presence of entrepreneur in the family, yes	0.984 (0.351)*	-2.819 (1.731)	1.179 (0.395)*	1.010 (0.355)*	--	--
Attendance of an entrepreneurship course, yes	0.177 (0.285)	0.664 (1.053)	0.305 (0.328)	0.174 (0.290)	--	--
<i>Big Five narrow personality traits</i>						
I see myself as someone who...						
is talkative	0.111 (0.145)	-1.454 (0.691)**	0.310 (0.167)***	0.132 (0.146)	--	--
does a thorough job	0.144 (0.124)	1.768 (0.676)*	0.264 (0.145)***	--	-0.237 (0.206)	-0.217 (0.132)
is depressed, blue	0.044 (0.110)	0.537 (0.403)	-0.165 (0.129)	-0.006 (0.111)	--	--
is original, comes up with new ideas	-0.115 (0.144)	-0.764 (0.546)	-0.089 (0.165)	-0.127 (0.147)	--	--
is reserved	-0.122 (0.120)	-1.307 (0.743)***	-0.126 (0.135)	-0.081 (0.122)	--	--
is helpful and unselfish with others	-0.150 (0.105)	-0.410 (0.491)	-0.211 (0.123)***	-0.168 (0.109)	--	--
can be somewhat careless	-0.046 (0.111)	0.716 (0.454)	-0.125 (0.130)	-0.062 (0.112)	--	--
is relaxed, handles stress well	0.048 (0.119)	-1.251 (0.504)**	0.055 (0.145)	0.046 (0.121)	--	--
is curious about many different things	-0.040 (0.129)	-0.611 (0.478)	-0.118 (0.152)	-0.066 (0.131)	--	--
is full of energy	-0.052 (0.122)	1.780 (0.559)*	-0.093 (0.143)	--	0.277 (0.176)	-0.065 (0.130)
starts quarrels with others	-0.002 (0.119)	0.819 (0.479)***	-0.033 (0.140)	0.001 (0.122)	--	--
is a reliable worker	0.188 (0.138)	0.597 (0.636)	0.147 (0.160)	0.207 (0.139)	--	--
can be tense	0.176 (0.118)	-1.360 (0.545)**	0.275 (0.141)***	0.202 (0.121)***	--	--
is ingenious, a deep thinker	-0.052 (0.122)	-1.002 (0.457)**	0.103 (0.148)	-0.081 (0.129)	--	--
generates a lot of enthusiasm	-0.032 (0.119)	1.693 (0.510)*	-0.009 (0.143)	-0.013 (0.123)	--	--
has a forgiving nature	0.179 (0.104)	2.066 (0.552)*	0.013 (0.124)	--	0.470 (0.154)*	0.097 (0.112)
tends to be disorganized	0.126 (0.112)	-0.640 (0.511)	0.211 (0.132)	-0.013 (0.123)	--	--
worries a lot	-0.234 (0.110)	-2.547 (0.658)*	-0.169 (0.125)	--	-0.587 (0.169)*	-0.190 (0.115)***
has an active imagination	0.103 (0.112)	-0.040 (0.583)	0.052 (0.128)	0.106 (0.114)	--	--
tends to be quiet	-0.094 (0.107)	-1.499 (0.533)*	0.045 (0.122)	-0.087 (0.109)	--	--
is generally trusting	0.001 (0.097)	-0.240 (0.360)	0.052 (0.116)	0.003 (0.101)	--	--
tends to be lazy	-0.063 (0.117)	1.430 (0.601)**	-0.128 (0.141)	-0.057 (0.119)	--	--
is emotionally stable, not easily upset	0.174 (0.111)	-1.204 (0.545)**	0.231 (0.134)***	0.168 (0.114)	--	--
is inventive	0.075 (0.119)	0.503 (0.510)	0.100 (0.138)	0.048 (0.121)	--	--
has an assertive personality	-0.149 (0.124)	-0.076 (0.529)	-0.302 (0.148)**	-0.139 (0.128)	--	--
can be cold and aloof	0.053 (0.105)	2.594 (0.633)*	-0.088 (0.120)	--	-0.558 (0.179)*	-0.037 (0.111)

Table A4 (Continued)

Independent variable	OLOGIT	GOLOGIT		PPO		
	Coefficient	Threshold between (j = 0) and (j = 1)	Threshold between (j = 1) and (j = 2)	Coefficient not varying by threshold	Threshold between (j = 0) and (j = 1)	Threshold between (j = 1) and (j = 2)
perseveres until the task is finished	-0.270 (0.125)**	-0.842 (0.555)	-0.276 (0.146)***	-0.305 (0.129)**	--	--
can be moody	-0.215 (0.114)***	-0.390 (0.395)	-0.379 (0.136)*	-0.263 (0.117)**	--	--
values artistic, aesthetic experiences	-0.079 (0.131)	1.421 (0.602)**	-0.070 (0.153)	-0.071 (0.133)	--	--
is sometimes shy, inhibited	0.074 (0.131)	1.477 (0.632)**	0.092 (0.157)	0.076 (0.135)	--	--
does things efficiently	0.267 (0.142)***	0.790 (0.562)	0.218 (0.168)	0.283 (0.146)***	--	--
remains calm in tense situations	0.092 (0.118)	0.405 (0.456)	0.140 (0.133)	0.099 (0.119)	--	--
prefers work that is routine	0.054 (0.118)	-2.269 (0.693)*	0.109 (0.137)	0.060 (0.120)	--	--
is outgoing, sociable	0.049 (0.128)	0.350 (0.534)	0.097 (0.150)	0.062 (0.131)	--	--
is sometimes rude to others	0.192 (0.130)	0.244 (0.468)	0.152 (0.150)	0.162 (0.132)	--	--
makes plans and follows through with them	-0.226 (0.131)***	-1.888 (0.718)*	-0.273 (0.149)	-0.227 (0.134)***	--	--
gets nervous easily	-0.032 (0.112)	1.736 (0.622)*	-0.071 (0.127)	-0.002 (0.114)	--	--
likes to reflect, play with ideas	0.168 (0.123)	1.240 (0.508)**	0.178 (0.147)	0.183 (0.127)	--	--
has few artistic interests	0.014 (0.107)	1.234 (0.493)**	-0.059 (0.121)	0.028 (0.105)	--	--
likes to cooperate with others	-0.025 (0.120)	-2.188 (0.703)*	-0.014 (0.143)	--	0.492 (0.190)*	0.028 (0.109)
is easily distracted	0.094 (0.118)	-1.144 (0.596)***	0.178 (0.138)	0.114 (0.120)	--	--
is sophisticated in art, music, or literature	0.050 (0.102)	0.747 (0.453)***	0.006 (0.121)	0.028 (0.105)	--	--
<i>Entrepreneurship scale items</i>						
I do my best even I have a very challenging task	0.110 (0.157)	2.569 (0.785)*	-0.123 (0.197)	0.089 (0.163)	--	--
My own decisions are generally effective on my job	0.398 (0.136)*	1.847 (0.550)*	0.262 (0.161)	--	0.813 (0.210)*	0.292 (0.147)**
I can find better options if I enforcedly leave my job	0.720 (0.137)*	1.023 (0.642)	0.755 (0.163)*	0.723 (0.140)*	--	--
I can find suitable places for my skills	0.366 (0.133)*	1.024 (0.556)***	0.431 (0.163)*	0.372 (0.136)*	--	--
I do not have any problems to adapt a new situation and practice	0.293 (0.119)**	1.492 (0.592)**	0.293 (0.143)**	0.297 (0.121)**	--	--
I do not fear to make a mistake about something I am working on	-0.196 (0.126)	0.059 (0.467)	-0.230 (0.145)	-0.236 (0.129)***	--	--
Constant	--	-13.620 (4.203)*	-5.648 (1.458)*	--	-6.039 (1.375)*	-6.888 (1.276)*
<i>Summary statistics</i>						
Cut point 1	5.634 (1.117)	--	--	--	--	--
Cut point 2	7.523 (1.148)	--	--	--	--	--
Number of observations	475	475		475		
Log-likelihood at zero	-425.500	-425.500		-425.500		
Log-likelihood at convergence	-320.183	-248.727		-302.555		
Likelihood ratio chi-square	210.63	353.55		245.89		
Degrees of freedom	61	120		69		
p-value	0.0000	0.0000		0.0000		
McFadden pseudo-Rho-square	0.2475	0.4154		0.2889		
AIC	762.367	737.454		743.109		
BIC	1,016.329	1,237.051		1,030.378		

Note: Standard errors in parentheses; (j = 0) denotes I definitely disagree/I disagree; (j = 1) denotes neutral; (j = 2) denotes I agree/I definitely agree; *statistically significant at 1% level; **statistically significant at 5% level; ***statistically significant at 10% level; long hyphens (--) in the table indicate the value is not calculated for the corresponding model.

regarding their future job were found to have a positive association with relatively high EI levels.

As the coefficients in [Table A5](#) give information only about the direction of the statistically significant relationships between EI and the independent variables, the average pseudo-elasticities were calculated to determine the exact magnitude of the underlying relationships. [Table 4](#) presents the average direct pseudo-elasticity values for each dependent-variable category. As can be seen in [Table 4](#), the male Iranian respondents were 287% (2.870, $p < 0.05$) more likely to have a lower EI level than their female counterparts. Thus, H11 was accepted. The Iranian respondents who were working students and who were also receiving financial assistance from their family were almost 5% (0.045, $p < 0.10$) more likely to have a higher EI level than the Iranian respondents who did not have a job and were receiving financial assistance only from their family. H9 was thus accepted for the Iranian sample.

In terms of the narrow personality traits under the Big Five personality traits, the Iranian respondents who saw themselves as having the tendency to be original and to come up with new ideas were almost 55% more likely (0.546, $p < 0.10$) to have a higher EI level. The Iranian respondents who saw themselves as having the tendency to have an active imagination were also 42% (0.416, $p < 0.10$) more likely to have a higher EI level. The probability of having a higher EI decreased by almost 63% (-0.633, $p < 0.05$) for the Iranian respondents who saw themselves as being ingenious and a deep thinker. The same probability also decreased by almost 56% (-0.556, $p < 0.05$) for the Iranian respondents who saw themselves as having the tendency to worry a lot. In terms of the entrepreneurial scale items, the estimation results revealed that the Iranian undergraduate students who indicated that they believe they can find better options if they leave their future job were almost 90% more likely (0.903, $p < 0.01$) to have a higher EI level. Hence, H4d, H5a, H5c, H5d, and H6c were accepted whereas H5c and the rest of the hypotheses related to the insignificant variables were rejected for the Iranian sample.

5. Discussion

The preliminary descriptive statistics in this study showed that the undergraduate students in both samples had a relatively high rate of agreement to the entrepreneurship scale item "I will found a new business venture in the near future." This result is in line with the results of some earlier studies. Some empirical studies ([Naktiyok, Karabey, & Gulluce, 2010](#); [Shneor et al., 2013](#)) found higher EI levels in their Turkish sample while others ([Gürol & Atsan, 2006](#)) found lower EI levels in the same sample. A cross-cultural comparison study between Indian and Japanese graduate students in terms of EI reported that the students in developing countries do not always have higher EI levels than their counterparts in developed countries ([Paul & Shrivastava, 2015](#)). Similarly, [Liñán, Urbano et al. \(2011\)](#) reported that the valuation of entrepreneurship is higher in Catalonia, a more developed region of Spain, than in the less developed regions of the country. [Paul and Shrivastava \(2016\)](#) included in their study the unfavorable business environment in India, a developing country, such as the weak institutional framework and the numerous bureaucratic obstacles that discourage the founding of a new business venture.

The empirical evidence gathered from this study shows that the narrow personality traits of both the Turkish and Iranian undergraduate students in this study were significantly correlated with their EI levels. It also indicates that at least one narrow personality trait under each of the Big Five personality traits was found to have a statistically significant impact on the Turkish and Iranian undergraduate students' EI levels. Specifically, enthusiasm, tension, and efficiency were found to be the key narrow person-

ality traits that have a statistically significant impact on higher EI levels for the Turkish undergraduate students in this study. On the other hand, originality, the tendency to come up with new ideas, and active imagination were found to be the key narrow personality traits that have a statistically significant impact on higher EI levels for the Iranian undergraduate students in this study. The Turkish undergraduate students in this study who indicated that they saw themselves as having the tendency to persevere until the task is finished, to make plans and implement them, and to be moody had lower EI levels.

The Iranian students who saw themselves as ingenious, a deep thinker, and having the tendency to worry a lot were found to have lower EI levels. Establishing a new business venture is a challenging task involving high uncertainty and relatively limited opportunities especially in emerging economies. In such an environment, undergraduate students from both Turkey and Iran may show risk-averse attitudes despite their prominent skills, including originality, an active imagination, enthusiasm, and efficiency. Such attitudes may be caused by high rates of earlier failures in emerging countries. Current opportunities can be missed, however, because one does not have an active role in the process. The estimation results of this study regarding the entrepreneurship scale items show that the undergraduate students from both countries appeared to be confident with their adaptation and other skills, and their decisions, regarding founding a new business. Such undergraduate students should thus receive professional assistance from entrepreneurship experts such as their mentors and educators to stimulate their entrepreneurial attitudes, intentions, and competences. Recently, [Li and Wu \(2019\)](#) found that the perceived presence of high team cooperation in the entrepreneurial education setting could raise the students' EI levels. Thus, further efforts to increase the team cooperation in the entrepreneurial education setting can also be beneficial for both the Turkish and Iranian undergraduate students.

On the other hand, [San-Martín, Fernández-Laviada, Pérez, and Palazuelos \(2019\)](#) discussed the role of teachers in raising their students' EI levels. The students in their study expressed that they believe that an entrepreneurship teacher should have previously started a business. Thus, the future entrepreneurship teachers in both Turkey and Iran can be selected from among experts who have previously put up a business venture. Along with team cooperation, previous entrepreneurs as teachers in such countries may significantly stimulate the specific narrow personality traits that were found in this study to increase the chances that undergraduate students would decide to start a business in the near future. As such educators are experienced people in the field of entrepreneurship, they can also provide their students with useful guidance especially in terms of risk aversion behavior considering the higher uncertainties in emerging economies such as Turkey and Iran. Hence, future entrepreneurs, including deep thinkers and successful planners, will not be likely to fail at the start of their entrepreneurship attempts despite the riskier environment. Additionally, teachers serving as role models can also help determine the relatively risky industries and their potential threats on the basis of such teachers' own early experiences. Specifically, the female Iranian undergraduate students should be carefully monitored by such experienced teachers as such students brave the risky environment so that their high ambition of becoming successful entrepreneurs in the near future could become a reality. [Boldureanu, Ionescu, Bercu, Bedrule-Grigoruta, and Boldureanu \(2020\)](#) recommend that future entrepreneurship programs be designed differently for business and non-business students as the impact of successful entrepreneurial stories on these two groups significantly differ. In both Turkey and Iran, special attention should be given to the different responses of such student groups to their entrepreneurial education considering the prominent narrow personality traits that exist in both groups. The Turkish and Iranian

Table A5
 Estimation results of OLOGIT and PPO models for Iranian sample.

Independent variable	OLOGIT	PPO		
	Coefficient	Coefficient not varying by threshold	Threshold between (j = 0) and (j = 1)	Threshold Between (j = 1) and (j = 2)
<i>Socio-demographic and socio-economic characteristics</i>				
Gender; male	-0.355 (0.392)	--	-4.593 (2.000)**	-0.173 (0.481)
Age; 17 – 20 years	-0.048 (0.544)	0.044 (0.664)	--	--
Age; >23 years	0.278 (0.481)	0.630 (0.506)	--	--
Monthly financial source; by both his/her family and tuition fee	-0.716 (0.742)	-1.655 (1.069)	--	--
Monthly financial source; by his/her job position and family	1.034 (0.718)	--	-9.190 (3.627)**	1.652 (0.893)
Monthly financial source; by only his/her job position	0.991 (0.539)***	--	16.352 (5.389)*	0.771 (0.663)
Household head's occupation status; government official	0.396 (0.841)	0.755 (1.147)	--	--
Household head's occupation status, worker	-0.159 (0.469)	-0.385 (0.607)	--	--
Household head's occupation status, retiree	0.577 (0.477)	0.286 (0.574)	--	--
Presence of entrepreneur in the family, yes	0.361 (0.390)	0.150 (0.478)	--	--
Attendance of an entrepreneurship course, yes	-0.288 (0.347)	-0.027 (0.430)	--	--
<i>Big Five narrow personality traits</i>				
I see myself as someone who...				
is talkative	0.001 (0.181)	--	5.055 (2.182)**	0.182 (0.234)
does a thorough job	0.352 (0.229)	0.417 (0.280)	--	--
is depressed, blue	0.046 (0.148)	--	-1.748 (0.758)**	0.090 (0.187)
is original, comes up with new ideas	0.486 (0.183)*	0.484 (0.243)**	--	--
is reserved	-0.033 (0.163)	--	-5.950 (1.988)*	0.080 (0.211)
is helpful and unselfish with others	-0.290 (0.155)	-0.231 (0.206)	--	--
can be somewhat careless	0.017 (0.167)	0.069 (0.208)	--	--
is relaxed, handles stress well	0.047 (0.157)	-0.020 (0.197)	--	--
is curious about many different things	-0.005 (0.164)	--	-5.546 (2.020)*	0.271 (0.203)
is full of energy	0.108 (0.173)	--0.019 (0.217)	--	--
starts quarrels with others	-0.107 (0.178)	--	-6.246 (2.030)*	0.031 (0.219)
is a reliable worker	0.225 (0.199)	0.234 (0.254)	--	--
can be tense	0.114 (0.181)	--	-2.848 (1.244)**	-0.100 (0.236)
is ingenious, a deep thinker	-0.321 (0.207)	-0.528 (0.268)**	--	--
generates a lot of enthusiasm	0.042 (0.173)	--	3.525 (1.555)**	0.235 (0.221)
has a forgiving nature	-0.214 (0.163)	--	-7.919 (2.682)*	0.073 (0.206)
tends to be disorganized	-0.028 (0.170)	0.129 (0.211)	--	--
worries a lot	-0.390 (0.165)**	--	4.652 (1.812)*	-0.482 (0.215)**
has an active imagination	0.261 (0.166)	0.371 (0.207)***	--	--
tends to be quiet	0.224 (0.160)	--	8.316 (2.722)*	0.086 (0.199)
is generally trusting	0.252 (0.160)	0.135 (0.199)	--	--
tends to be lazy	-0.077 (0.186)	-0.412 (0.255)	--	--
is emotionally stable, not easily upset	0.062 (0.170)	0.096 (0.202)	--	--
is inventive	-0.133 (0.187)	--	-4.822 (1.790)*	-0.178 (0.239)
has an assertive personality	0.072 (0.195)	0.192 (0.247)	--	--
can be cold and aloof	-0.380 (0.176)**	--	-8.582 (3.070)*	-0.095 (0.202)
perseveres until the task is finished	0.058 (0.192)	0.043 (0.270)	--	--
can be moody	-0.053 (0.160)	0.101 (0.200)	--	--
values artistic, aesthetic experiences	-0.052 (0.162)	--	4.279 (1.581)*	-0.240 (0.211)
is sometimes shy, inhibited	-0.142 (0.204)	0.095 (0.243)	--	--

Table A5 (Continued)

Independent variable	OLOGIT	PPO		
	Coefficient	Coefficient not varying by threshold	Threshold between (j = 0) and (j = 1)	Threshold Between (j = 1) and (j = 2)
does things efficiently	0.215 (0.225)	0.162 (0.265)	--	--
remains calm in tense situations	0.035 (0.186)	--	4.653 (1.715)*	-0.341 (0.252)
prefers work that is routine	-0.210 (0.171)	-0.244 (0.217)	--	--
is outgoing, sociable	-0.192 (0.189)	--	-4.090 (1.515)*	-0.127 (0.249)
is sometimes rude to others	-0.128 (0.164)	-0.079 (0.214)	--	--
makes plans and follows through with them	-0.100 (0.187)	--	2.135 (1.072)**	-0.128 (0.248)
gets nervous easily	-0.266 (0.167)	--	-4.246 (1.501)*	-0.177 (0.221)
likes to reflect, play with ideas	-0.017 (0.187)	--	3.373 (1.334)**	-0.237 (0.236)
has few artistic interests	-0.204 (0.148)	--	-4.909 (1.728)*	-0.131 (0.183)
likes to cooperate with others	-0.135 (0.180)	-0.078 (0.219)	--	--
is easily distracted	0.001 (0.172)	0.070 (0.208)	--	--
is sophisticated in art, music, or literature	-0.049 (0.173)	--	3.069 (1.282)**	0.037 (0.177)
<i>Entrepreneurship scale items</i>				
I do my best even I have a very challenging task	0.075 (0.226)	0.065 (0.279)	--	--
My own decisions are generally effective on my job	0.248 (0.192)	--	9.197 (3.161)*	0.050 (0.253)
I can find better options if I enforcedly leave my job	0.539 (0.187)*	0.768 (0.227)*	--	--
I can find suitable places for my skills	0.287 (0.192)	0.411 (0.249)	--	--
I do not have any problems to adapt a new situation and practice	0.088 (0.177)	0.191 (0.228)	--	--
I do not fear to make a mistake about something I am working on	-0.020 (0.172)	-0.151 (0.206)	--	--
Constant	--	--	35.751 (12.915)*	-3.076 (3.483)
<i>Summary statistics</i>				
Cut point 1	0.049 (2.886)	--	--	--
Cut point 2	2.327 (2.892)	--	--	--
Number of observations	399	399	--	--
Log-likelihood at zero	-222.565	-222.565	--	--
Log-likelihood at convergence	-171.885	-120.272	--	--
Likelihood ratio chi-square	101.36	204.59	--	--
Degrees of freedom	61	83	--	--
p-value	0.2277	0.4596	--	--
McFadden	0.0005	0.0000	--	--
pseudo-Rho-square	--	--	--	--
AIC	465.770	410.544	--	--
BIC	676.021	703.517	--	--

Note: Standard errors in parentheses; OLOGIT estimation results are presented for comparison only since Brant test for the corresponding model indicates a violation of parallel lines assumption; (j = 0) denotes I definitely disagree/I disagree; (j = 1) denotes neutral; (j = 2) denotes I agree/I definitely agree; *statistically significant at 1% level; **statistically significant at 5% level; ***statistically significant at 10% level; long hyphens (--) in the table indicate the value is not calculated for the corresponding model.

undergraduate students' high confidence in their adaptation skills in the business field as determined in this study can be successfully managed by considering each group separately.

The future entrepreneurship policies in both Turkey and Iran should pay particular attention especially to the undergraduate students' narrow personality traits. The specific narrow personality traits that were found to have a significant correlation with EI level in this study may be considered for future entrepreneurship policies. Personality traits may be valuable for understanding entrepreneurial behavior (Carsrud & Brännback, 2011), and traits can be considered the causes of mental and behavioral processes (Brandstätter, 2011; John, Naumann, & Soto, 2008). Krueger et al. (2000) propose that situational and personal variables have an indirect impact on entrepreneurial behavior, and that intention models can predict behavior better than either situational or individual variables can. Brandstätter (2011) puts forward the view that

although the measures of personality traits are generally based on evidence of how people behave in different situations, they can be conceived as valuable determinants of the real internal causes of a person's experiences and actions. On the other hand, Trivedi (2017) argues that although the existing literature bears out many earlier applications of intention-based models, emphasis should also be placed on the better understanding of the combined effect of contextual and situational factors and on the importance of university support for the formation of students' EI.

Earlier studies in emerging economies (Mustafa et al., 2016) found evidence indicating that personality traits are more important factors than selected environmental variables for understanding university students' EI. A similar result was found in a developed-country sample (Espíritu-Olmos & Sastre-Castillo, 2015); personality traits were found to have a higher impact on university students' EIs than work values. The study by Roy et al.

(2017) also revealed that the relationship between university students' entrepreneurial personality traits and EI is fully mediated by perceived self-efficacy. Further research may also utilize mediator variables such as self-efficacy to explain the actual impact of personality traits on university students' EIs. Mitchell et al. (2007) recommend that future entrepreneurship research focus on social cognitive categories such as person, context, cognition, and motivation (Liñán, Urbano et al., 2011). Along similar lines, Carsrud and Brännback (2011) argue that motivation is the missing link between intention and real action.

The estimation results from this study indicate that the Iranian undergraduate students in the study encountered some finance-related barriers to establishing a new business venture. Ajzen (1991) argues that the resources and opportunities that are available to a person are highly associated with the likelihood of a behavioral achievement, and thus, most individual behaviors also depend to some degree on non-motivational determinants such as availability of requisite opportunities and resources, including time, money, skills, and cooperation by others. Entrepreneurs both encounter an uncertain environment and are willing to manipulate the unknown environment (Espíritu-Olmos & Sastre-Castillo, 2015). Growth-oriented entrepreneurs are considered more risk-prone than managers as they have to cope with unstructured and uncertain situations (Brandstätter, 2011).

The latest adult population survey in Iran reported that only 22% of the adult respondents claimed that there were new business opportunities present around them while only 13% of the adult respondents expressed that they find starting a business in Iran easier than doing so in other countries (Bosma & Kelley, 2019). This evidence is in line with the previous empirical findings. Earlier studies (Autio et al., 2001; Carsrud & Brännback, 2011; Franco et al., 2010; Robertson, Collins, Medeira, & Slater, 2003; Trivedi, 2017) put forward their views regarding endogenous barriers to starting a business venture, such as fear of incurring debt and of failure, presence of an opportunity, lack of social support, insufficient skills, the current situation of the labor market, and difficulties in obtaining financial support (Trivedi, 2017), as individuals rarely have complete control over the said process (Autio et al., 2001). According to *Global Entrepreneurship Monitor (2019a)*, the rate of fear of failure among Iranian individuals is 30.40, better than the regional average in 2018 (38.17), while the EI rate was 34.97 for the same year. The results of the present study show that the Iranian undergraduate students with a job and their family as monthly financial sources had higher EI levels than those who had only their family as their monthly financial source. Similarly, Salamzadeh et al. (2013) found that lack of financial means and lack of experience are the most crucial determinants of non-self-employment among the university students in Iran. They also concluded that lack of confidence and the market uncertainty are two other highly influential factors influencing Iranian undergraduate students' decision to start their own business. The study by Barba-Sánchez and Atienza-Sahuquillo (2018) found that financial motivation and the need for independence are statistically significantly associated with university students' EI levels.

Fortunately, the latest strategic plan (2016-2020) reported by the authorized government agency in Turkey (KOSGEB) also addresses the financial-difficulty issues of SMEs in Turkey and includes ease of obtaining financial support as one of the future goals. To address the Turkish SMEs' financial difficulties, KOSGEB suggests that they take advantage of alternative financial sources, including enterprise capital, individual participation capital, and credit guarantee capital (*The Small & Medium Enterprises Development Organization, 2015*). This promising future entrepreneurship policy in Turkey may also be representative of the future strategic plans of the Iranian entrepreneurship program. On the other hand, Shiri et al. (2017) also found low

EI levels among the agriculture students in Iran and put forward the view that the governmental efforts to promote awareness of entrepreneurship have a limited impact on further EIs. The entrepreneurs in Iran are generally highly educated, with 71% of them having earned at least a bachelor's degree (Bosma & Kelley, 2019). As such, the authorized institutions in Iran should simultaneously concentrate on providing efficient entrepreneurship education and promoting awareness of the benefits of entrepreneurship by decreasing the bureaucratic barriers to establishing a new business venture.

The empirical results that were obtained in this study for the Turkish sample revealed that the undergraduate students have a higher tendency to establish a new business venture in the near future if there is an entrepreneur in the family, which coincides with the result of earlier studies (Gurel et al., 2010; Zellweger et al., 2011). The results also show that the Turkish undergraduate students whose household heads are government officials or retirees have lower EI levels. Thus, an effective future entrepreneurship policy may begin with increasing the awareness of the benefits of entrepreneurship especially among young people. The corresponding awareness campaign may also target undergraduate students' parents, who were found to be highly influential in their children's future career choices.

5.1. Model specification and limitations of the study

The dataset of this study was obtained using a well-established written questionnaire. Data triangulation, defined as obtaining a dataset from different sources at different times or under different conditions (Denzin, 1978; Turner & Turner, 2009), was not done in this study for the following reasons. One reason is that the implementation of triangulation requires certain ground rules, such as always starting with the same theoretical model and selecting methods and empirical materials that complement such perspective (Denzin, 2010; Silverman, 2005). Turner and Turner (2009) also argue that triangulation is generally preferred in the case of a difficult, demanding, or contentious field of study, which cannot be said of this study. Triangulation is also generally used in qualitative research, and in-depth interviews and focus groups are used for small samples. The dataset of this paper consisted of a total of 875 completed survey questionnaires by Turkish and Iranian undergraduate students, which makes other data collection tools, including in-depth interviews and focus groups, not applicable to this study as its sample size is too big for such other data collection tools. In addition, considering the various important advantages of the survey method over in-depth interviews and focus groups, such as the fact that it is not time-consuming, has reduced operational costs, protects the participants' privacy and confidentiality, has high reliability, and has high representativeness due to its large sample size, the survey method appears to be a convenient data collection method for this study. The reliability and goodness-of-fit statistics of the estimated models are also good, confirming the appropriateness of the survey method for this study. This study also aimed to compare different ordered discrete choice models to seek the most parsimonious model among the estimated models so as to increase the validity of the analysis results.

Structural equation modeling can also be considered another approach to explaining the impact of narrow personality traits on undergraduate students' EI levels because the dependent variable in this study (EI) is a multidimensional concept. Thus, before fitting the estimated ordered discrete choice models, structural equation modeling was also performed. However, the factor loadings of the exploratory factor analyses were not found to be adequate for both the target countries in this study. This may have been caused by the recommendation of conducting a study with larger samples for each country when using the structural equation modeling

approach because goodness-of-fit indices tend to be fixed after 500 observations (Jackson, 2007; Marsh, Hau, & Grayson, 2005; Schermelleh-Engel, Moosbrugger, & Müller, 2003). For such reason, comparison of ordered discrete choice models was selected as the main method of this study. On the basis of these model specification explanations, it can be concluded that the estimated models were reasonably stable across the data and were properly specified.

This study had some limitations that need to be highlighted. The study was carried out in two universities in two countries within a limited time period. Therefore, the generalizability of the study's empirical findings may be questioned. On the other hand, the sample size for both countries is representative of the undergraduate students in both Islamic Azad University and Ardahan University. Further, the statistically insignificant explanatory variables in the present study require further investigation to capture their actual impact on undergraduate students' EI levels. Despite these study limitations, however, the results of this study give valuable information for better understanding the EI levels of undergraduate students in developing countries, with an emphasis on how narrow personality traits impact such EI levels. Longitudinal surveys are also recommended to be conducted to periodically monitor undergraduate students' EI levels.

6. Conclusion

As a result of the international competition, major cost-cutting and restructuring processes are frequently experienced in organizations, especially in developing countries (Lüthje & Franke, 2003). Iakovleva et al. (2011) suggest that one way to better understand entrepreneurial behavior in developing countries is to examine the empirical findings regarding multi-country samples. Behavioral intention is widely considered a complex phenomenon that can be predicted by configurations of multiple potential determinants instead of a single effect (Nowiński & Haddoud, 2019). Thus, for the prediction of EI in particular, the work values or traits associated with self-employment, including independence, openness to challenges, and desire for self-realization, which have emerged as more desirable concepts in the work environment (Lüthje & Franke, 2003), can be used. A deeper understanding of EI can provide valuable future information for explaining where ideas for a business venture come from and how a business venture idea becomes a reality, although the intentional nature of entrepreneurship activity has crucial ramifications (Krueger et al., 2000).

Higher education institutions can promote or encourage entrepreneurship in many ways, but it is important to measure the students' perceptions of such encouragement (Saeed et al., 2015). University students are commonly considered the most promising sources of entrepreneurs in the knowledge society (Veciana, 1998; Veciana et al., 2005) as university students in different countries worldwide actually represent different political, economic, and cultural environments (Pruett et al., 2009). In that context, a better understanding of university students' perceptions of new-business-venture creation under the framework of a variety of phenomena (e.g., desirability and feasibility) would be a preliminary attempt to encourage such students' interest in pursuing an entrepreneurial career (Veciana et al., 2005). On the one hand, explaining university students' EIs provides a valuable way of predicting their future establishment of a business venture (Wu & Wu, 2008) because despite the fact that there have been a respectable number of studies in the last decade that focused on the potential determinants and decision processes of individuals' entrepreneurship behavior (Díaz-García & Jiménez-Moreno, 2010; Markman, Balkin, & Baron, 2002; Zhao et al., 2005), there are still those who claim that there is limited empirical evidence of such determinants and processes.

The importance of successful entrepreneurship policies for sustainable economic growth is overwhelmingly growing especially for developing countries. In that sense, a better understanding of EI is particularly valuable for developing countries. This study aimed to determine the factors influencing the EI of Turkish and Iranian undergraduate students by comparing discrete choice models with an emphasis on narrow personality traits. Although many previous studies have focused on the well-known TPB and SEE models, little research has been carried out on EI analysis by comparing alternative discrete choice models. In this study, the data gathered from the accomplished survey questionnaires were analyzed using the OLOGIT, GOLOGIT, and PPO models. As far as is known, this study was probably the first study that analyzed undergraduate students' EIs using a partial proportional odds model, which is an alternative ordered response model.

As university students' perceptions may significantly change in the future, longitudinal studies are frequently suggested when the sample consists of university students (Brandstätter, 2011; Crant, 1996; do Paço et al., 2011; Franco et al., 2010; Shook & Bratianu, 2010; Souitaris et al., 2007), with an emphasis on the impact of environmental variables (Fayolle, Liñán, & Moriano, 2014). Future studies may also concentrate on cross-country comparison in developing countries, particularly in the more populous cities therein, by also considering their economic contribution. The results of future surveys related to the prominent TPB and SEE models may be analyzed using discrete choice modeling instead of the commonly used structural equation modeling. More studies focused on narrow personality traits may also better determine such traits' EI prediction capability. The role of culture in forming EI may be specifically investigated especially for developing countries, which may help in understanding undergraduate students' EI in future studies. The considerable impact of the ongoing COVID-19 pandemic on further entrepreneurship policies and students' EIs should also be considered in future studies. Future empirical studies may also attempt to analyze university students' EIs using other discrete choice models, including the multinomial logit or random-parameters logit model, depending on the available dataset. The random-parameters logit model, in particular, may provide valuable evidence of the unobserved heterogeneity of EI.

Declaration of Competing Interest

The authors report no declarations of interest.

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