

An examination of how personal characteristics moderate the relationship between startup intent and entrepreneurship education

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Relationship
between
startup intent
and EE

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Abstract

Purpose – While research has identified a consistent link between startup intent and entrepreneurship education (EE) intentions, studies also indicate that many entrepreneurs lack the EE they need. However, research examining factors that explain why certain individuals with high startup intent pursue EE while others do not is rare. Given this, the purpose of this paper is to examine how individual characteristics moderate the startup intent EE intentions relationship.

Design/methodology/approach – Survey data were gathered on 199 US adults. Moderators examined include attitudes toward education, perceived entrepreneurial efficacy, propensity for risk taking and the Big Five personality traits. Linear regression models were used to test each of the moderation relationships predicted.

Findings – Notable findings suggest that extroversion, openness to experience, agreeableness, perceived entrepreneurial efficacy and risk propensity reduce the chances that individuals with high startup intent will pursue EE, while viewing education as instrumental enhances the relationship.

Research limitations/implications – Study findings imply that EE programs might not be reaching critical target markets, suggest that EE programs might need to be modified to attract individuals with high startup intent and indicate that individual characteristics are key factors that determine why certain individuals with high startup intent pursue EE while others with the same desires do not pursue EE.

Originality/value – This study builds on previous work that looks at the relationship between startup intent and EE intentions by investigating how individual characteristics either amplify or diminish the relationship, increasing scholarly knowledge about why certain individuals with high startup intent pursue EE while others do not.

Keywords Entrepreneurship education, Startup intent, Individual characteristics, Big Five personality traits, Human capital theory

Paper type Research paper

Introduction

Entrepreneurship education (EE) has grown exponentially over the past three decades, helping to fuel the entrepreneurship movement and providing potential entrepreneurs with a diverse skillset not possessed by earlier generations (Shepherd, 2019). As a result, entrepreneurs who possess EE are more likely to start successful firms, create new jobs and invent novel market offerings than entrepreneurs who lack EE (Rauch and Hulsink, 2015). Further, EE also helps potential entrepreneurs comprehend the multistage venture creation process, understand the risks associated with entrepreneurship, learn to expect and

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deal with failure, and develop an innovative mindset which can be utilized in other contexts besides new venture creation (Bandera *et al.*, 2020). Notably, research finds a consistent link between startup intent (how likely an individual is to pursue new venture creation) and EE intentions (how likely an individual is to pursue EE) (Burch *et al.*, 2019). However, despite the benefits of EE, many individuals who lack EE continue to launch new firms (Lyons and Zhang, 2018); perceived entrepreneurial efficacy hinders EE intentions (Williams *et al.*, 2018), and new firm failure rates remain stubbornly high (Bogatyreva *et al.*, 2019). Further, scholarly research examining why certain categories of individuals with high startup intent pursue EE and others with the same desire forgo EE is rare (Nabi *et al.*, 2017). The dearth of research in this area is problematic because lacking knowledge about which factors influence the startup intent EE intentions relationship hinders scholars' and educators' ability to take needed steps to convince individuals interested in entrepreneurship to obtain the EE they so badly need (Kuratko and Morris, 2018). As such, we employ a human capital theory lens (Becker, 1975) on the startup intent EE intentions relationship to provide insight into which types of individuals are likely to pursue both new venture creation and EE.

While a human capital perspective suggests that EE can help potential entrepreneurs become more successful, it is critical that EE participants also have high startup intent or the skillset EE programs teach will be less likely to be utilized (Ahmed *et al.*, 2020). Notably, research consistently finds that many individuals with high startup intent never follow through and launch new firms because they lack the knowledge needed to do so (Emami and Klein, 2020). Therefore, it would seem important to make EE programs as attractive as possible to individuals with high startup intent, so such individuals will pursue EE because EE attainment has been shown to enhance new venture creation and entrepreneurial success (Nabi *et al.*, 2017). Hence, identifying individual characteristics which enhance the startup intent EE intentions relationship will help EE programs recruit and educate would-be entrepreneurs that will likely leverage the skillset EE provides, which should in turn increase the number of successful new firms created (Sonfield and Lussier, 2014). Given the above, the present paper examines the influence that individuals' attitudes, beliefs and personality type have on the startup intent EE intentions relationship on a sample of 199 American adults. Study findings imply that EE programs might not be reaching critical target markets, suggest that EE programs might need to be modified to attract individuals most likely to actually start new ventures and indicate that individual characteristics are key factors that determine why certain individuals with high startup intent pursue EE while others with the same desires do not pursue it.

Human capital theory and entrepreneurship education

Human capital theory (Becker, 1975) holds that knowledge, informed perspectives and relevant skills in a particular context can increase cognitive function and facilitate higher performance. Education is recognized in the literature as a key source for knowledge, perspective and skill acquisition (Martin *et al.*, 2013; Passaro *et al.*, 2018), and multiple studies suggest that labor markets reward the increased human capital achieved in education via higher rewards (Combs and Skill, 2003; Donald *et al.*, 2019; Rospigliosi *et al.*, 2014).

In the entrepreneurship context, building entrepreneurship-specific human capital assists in one's ability to properly assess potential opportunities for a new venture (Corbett, 2007; Volery *et al.*, 2013) and helps increase the chances of survival and high growth in new startups (Brüderl *et al.*, 1992; Huggins *et al.*, 2017). Accordingly, EE has been noted as a key source of human capital for would-be entrepreneurs (Martin *et al.*, 2013; Volery *et al.*, 2013). Further, potential entrepreneurs may seek EE as a form of compensation for a perceived deficiency in human capital or neglect EE due to the possessing of a trait or attitude that precludes the potential entrepreneur from

perceiving the need to develop additional human capital. As such, the current study strives to better comprehend when individuals with high startup intent will seek EE as a source of human capital by examining whether certain personality traits and entrepreneurship-relevant attitudes influence the desire for greater human capital for those seeking to start a business.

Importantly, entrepreneurship research finds a consistent link between startup intent and EE intentions (Lyons and Zhang, 2018). For example, college students with a strong desire to start and operate a business are more likely to take business courses in small business management and entrepreneurship (Nabi *et al.*, 2017). Similarly, individuals with high startup intent are also likely to participate in business planning competitions/pitch offs, join business networking organizations and seek out other opportunities to enhance their entrepreneurial ideas (Pollack *et al.*, 2012). Further, startup intent has been found to have an indirect effect on the relationship between business-related individual characteristics and attitudes and seeking EE, suggesting that intent to start up a business is crucial to seeking EE for those who are predisposed to do so due to personality or probusiness attitudes (Burch *et al.*, 2019). Finally, startup intent facilitates EE via sending potential entrepreneurs on the multistage, iterative, path dependent process of venture creation (Alvarez *et al.*, 2013) which will in turn lead them to seek out entrepreneurial knowledge possessed by EE programs (Ahmed *et al.*, 2020). Supporting this notion, startup intent encourages individuals to research and pursue programs and resources that will help them launch and operate their businesses more successfully (Klein *et al.*, 2019), thereby leading them to both university EE programs and other EE initiatives such as incubators, accelerators, Small Business Development Center (SBDC) programs and entrepreneurship outreach agencies (Kuratko and Morris, 2018). Given the consistent positive association between startup intent and EE intentions, we advance the following:

H1. Greater startup intent will result in greater EE intentions.

Individual characteristics

While EE programs enhance entrepreneurs' chances to launch and operate successful businesses (Williams *et al.*, 2018), many practicing entrepreneurs have no formal business education or training and often start firms without performing market analysis or writing a business plan (Holland and Garrett, 2015). Similarly, individuals who are confident in their ability to launch and operate new businesses tend to be less likely to pursue EE, and individuals with knowledge in a particular field such as restaurants, retail or construction often start their own businesses in these fields without possessing EE or business management experience (Chen, 2015). Unfortunately, however, little is known about why certain individuals with high startup interest pursue EE prior to launching new firms while others do not (Ahmed *et al.*, 2020). While countless factors could explain the above quandary, individual characteristics would seem to be one of those relevant factors because previous research indicates that they predict both startup intent and EE intentions (Nabi *et al.*, 2017). Specifically, variables such as attitude toward education and business predict EE intentions (e.g. Burch *et al.*, 2019; Rideout and Gray, 2013), while variables such as confidence in one's entrepreneurial abilities and risk tolerance predict startup intent (Valliere, 2015) and personality type predicts both (Huber *et al.*, 2012). Given this, we next propose and examine the notion that the individual characteristics of attitude toward education, beliefs about entrepreneurial efficacy and risk propensity, as well as personality type moderate the startup intent EE intentions relationship.

Instrumentality of education

Research strongly suggests that attitudes predict behavior in myriad contexts such as startup intent and the pursuit of business education (Rauch and Hulsink, 2015). For example,

studies find that those who have positive attitudes about the field of business, its impact on society and education programs on business topics are more likely to pursue both business education and business careers (Baumol, 2016). Further, research also finds a strong link between the extent to which education is perceived as instrumental for success and the pursuit of higher education (Hicks, 2010). Specifically, individuals with favorable views of the importance of education (i.e. they see education as instrumental toward success in life) are more likely to pursue higher education, become involved with higher education institutions and encourage others to pursue higher education (Neubaum *et al.*, 2009; Mainardes *et al.*, 2014). Finally, research indicates that individuals who have participated in EE strongly feel that the EE they obtained significantly helped them launch and operate successful firms (Nabi *et al.*, 2017), and this perspective could enable other would-be entrepreneurs to see EE as instrumental to success and seek to follow the same path of obtaining EE as well (Oliveira and Rua, 2018). Given the above, we posit that those with strong startup intent, who perceive higher education as instrumental to success generally, will be significantly more likely to pursue EE programs. Thus, the following is advanced:

- H2. Instrumentality of education will moderate the startup intent EE intentions relationship such that the relationship will be stronger for those who see education as more instrumental to success.

Perceived entrepreneurial efficacy

Research finds broad support for the notion that individuals with a strong belief or confidence in their ability to perform certain tasks are less likely to seek training, mentorship or educational programs on that particular subject (Cardon and Stevens, 2004; Hayton, 2003). Similarly, research finds that the more experience one has in a particular area, the less likely they are to pursue additional training or education in that specific function (Dearden *et al.*, 2000). With regard to business/entrepreneurship, a similar picture emerges as studies find that many entrepreneurs possess no formal business training (Holland and Garrett, 2015); experienced entrepreneurs are not likely to return to school (e.g. Chen, 2015), and many high-level managers lack training in business and are instead trained in that company's specific function such as engineering, production or technological development (Emami and Klein, 2020). Unfortunately, in general those who operate and manage businesses are no more likely to possess business education and training than individuals who work in other careers (Williams *et al.*, 2018), and experienced business persons often feel that business education will not significantly improve their chances to succeed (Valliere, 2015). As such, we posit the somewhat counterintuitive statement that individuals' confidence and beliefs that they can successfully launch and operate businesses will reduce the likelihood that potential entrepreneurs will pursue EE. Thus, the following is advanced:

- H3. Perceived entrepreneurial efficacy will moderate the startup intent EE intentions relationship such that the relationship will be weaker for those with high entrepreneurial efficacy.

Risk propensity

Research indicates that risk propensity (i.e. the willingness to engage in risk-laden activities) diminishes the strong positive association between startup intent and EE intentions. First, entrepreneurship research consistently finds that many practicing entrepreneurs, including highly experienced entrepreneurs, do not possess EE and are unlikely to pursue it (Holland and Garrett, 2015). Such findings suggest that many new venture founders have enough risk propensity to maintain careers in the inherently risky field of entrepreneurship without EE (Baron, 2000; Zhang *et al.*, 2015). Next, the finding that confident individuals are more likely to

pursue entrepreneurship without EE (Chen, 2015) also suggests that risk tolerance weakens the startup intent EE intentions relationship because confident individuals are more risk tolerant (Valliere, 2015). Further, research studies find that EE students are fairly low in risk tolerance (Nabi *et al.*, 2017), and business students tend to be fairly risk averse (Neubaum *et al.*, 2009). All this suggests that individuals with high risk propensity are less likely to seek out EE, while risk-averse entrepreneurs tend to pursue it as a hedge (Oliveira and Rua, 2018). Finally, entrepreneurs have higher propensity for risk taking than large firm managers, other professionals and members of the general public (Busenitz and Barney, 1997; Pollack *et al.*, 2012), suggesting that many potential entrepreneurs may have enough risk propensity to forgo EE. As such, we posit that risk propensity will weaken the startup intent EE intentions relationship and thus propose the following:

- H4. Risk propensity will moderate the startup intent EE intentions relationship such that the relationship will be weaker for those with high risk propensity.

Extroversion

Extroversion has been defined as “an energetic approach toward the social and material world and includes traits such as sociability, activity, assertiveness, and positive emotionality” (Brandstatter, 2011, p. 227). The qualities that are associated with extroversion are likely to lead to starting a business, but not necessarily to EE intentions.

Sociability enhances networking (Lan *et al.*, 2015), giving extroverts better access to resources needed to start a business. Persons lacking access to resources may compensate by studying means to acquire or gain access to important resources – or by bootstrapping (Jayawarna *et al.*, 2011). Also, more sociable persons with startup intentions may come into contact with more entrepreneurs, some of which may not see EE as a contributor to their success as an entrepreneur. Attribution theory suggests that successful entrepreneurs will attribute their success to internal causes (their own hard work, risk taking etc.) as opposed to an external cause (Kelley and Michela, 1980; Rogoff *et al.*, 2004). It is possible that even entrepreneurs with EE will not fully communicate the importance of EE to their success.

Activity will likely be a major motivation for getting the business started now as opposed to waiting out the education process. The education process, especially the process associated with traditional universities, usually takes years to complete. There is evidence that extroverted entrepreneurs have a higher inclination to proactivity (Major *et al.*, 2006). Proactivity is also associated with initiating actions and shaping one's environment according to your own goals (Rauch and Frese, 2007). A person confident in their ability to shape their own environment may feel less need to understand the environment of the entrepreneur, a goal of most EE programs. This activity component may also be associated with a tendency to conduct less analysis. In support of this, there is evidence that extroverts are more risk taking than introverts (Nicholson *et al.*, 2005; Vestewig, 1977). EE focuses heavily not only on opportunity recognition, but also on opportunity analysis, a quality of EE that may not be as appealing to extroverts. Additionally, there is evidence that positive emotionality is associated with optimism (Sharpe *et al.*, 2011), a quality which may lead an individual to believe that EE is unnecessary.

Introverts, on the other hand, may believe that they lack the beneficial qualities of extroverts associated with startup success, and may seek to compensate for those perceived deficiencies (Stephens-Craig *et al.*, 2015) by seeking EE. Accordingly, we advance the following:

- H5. Extroversion will moderate the startup intent EE intentions relationship such that the relationship will be weaker for those with high extroversion.

Agreeableness

There is evidence that entrepreneurs are lower than average on agreeableness (Brandstatter, 2011; Zhao and Seibert, 2006). If this extends to startup intent, it may be that persons high in startup intent, who tend to be less agreeable, are less interested in EE. The qualities associated with agreeableness such as a prosocial and communal orientation, trust, altruism, tendermindedness and modesty (Brandstatter, 2011) fit well in an academic environment. If students with high startup intent are, however, on average, less agreeable, they may have less interest in EE.

A negative relationship has been noted between agreeableness and need for autonomy (Koestner and Losier, 1996). A need for autonomy has been associated with higher startup intent (Gelderen and Jansen, 2006). Students that highly value autonomy may care little about feedback that could be received in an EE setting. Accordingly, those who want to start a business and who are low in agreeableness may be less interested in EE.

- H6. Agreeableness will moderate the startup intent EE intentions relationship such that the relationship will be stronger for those with high agreeableness.

Openness to experience

Of the Big Five personality traits of extroversion, agreeableness, openness to experience, conscientiousness and emotional stability, openness is the most consistently linked to startup intent, as well as to actual startup behavior, survival and performance (Brandstatter, 2011; Butz *et al.*, 2018; Zhao *et al.*, 2010). Students high in openness may have diminished interest in EE however. Individuals high in openness likely prefer the experiential to the academic (Brandstatter, 2011). The quality of openness allows an entrepreneur to be comfortable in a dynamic, unpredictable environment and to adapt as needed to uncertainty (Pines *et al.*, 2012). This quality, like extroversion, may be more associated with a desire to “get on with it” via action (Wiklund *et al.*, 2018) as opposed to studying the phenomenon of entrepreneurship and learning in an academic setting on how to identify, develop and exploit business opportunities. There is also some evidence that openness is positively associated with innovativeness (Rauch and Frese, 2007), perhaps leading very open would-be entrepreneurs to not value the opportunity recognition component of EE, feeling that they are already capable of developing innovative business ideas. Accordingly, we advance the following:

- H7. Openness to experience will moderate the startup intent EE intentions relationship such that the relationship will be weaker for those with high openness to experience.

Conscientiousness

Conscientiousness has been defined as “socially prescribed impulse control that facilitates task and goal-directed behavior, such as thinking before acting, delaying gratification, following norms and rules, and planning, organizing, and prioritizing tasks” (Brandstatter, 2011, p. 227). Entrepreneurs have been characterized as breaking rules such as industry norms and as being action oriented as opposed to being oriented toward planning and organizing (Wiklund *et al.*, 2018). The need to develop a unique value proposition tends to lend itself to avoid closely following standard industry recipes (Rutherford *et al.*, 2009). Individuals with high startup intent that are highly conscientious may not be comfortable with breaking industry norms and therefore may be more interested in EE as a means of helping them compensate for this deficiency. Additionally, greater impulse control and an orientation of thinking before acting (Brandstatter, 2011) may result in conscientious individuals with high startup intentions being more willing to take the time to pursue EE. Prior research has shown a positive relationship between conscientiousness and academic motivation (Komarraju and Karau, 2005). The same orientation toward thinking before acting

may increase the likelihood of conscientious individuals with high startup intentions learning of the positive relationships between EE and significant outcomes such as entrepreneurial success, increasing the attractiveness of EE. Accordingly, we advance the following:

- H8. Conscientiousness will moderate the startup intent EE intentions relationship such that the relationship will be stronger for those with high conscientiousness.

Emotional stability

Of the Big Five, there is probably less research in the entrepreneurship literature on emotional stability than any of the other variables. There is some evidence that entrepreneurs are more emotionally stable, on average, than managers (Zhao and Seibert, 2006) and that emotional stability is positively related to both startup intentions and performance (Zhao *et al.*, 2010). As emotional stability has been defined as eventemperedness and as the opposite of negative emotionality, feeling sad, nervous, anxious and tense (Brandstatter, 2011), it is not surprising that emotionally stable persons are better suited to more effectively manage the uncertainty and stress associated with starting up and running a business enterprise. Butz *et al.* (2018) found emotional stability to be positively related to entrepreneurial intent for a sample of students taking a core management course. While this study informs us as to the relationship between emotional stability and startup intent amongst business students, it does not address the impact of emotional stability on the startup intent EE relationship.

Neurotic persons with high startup intent may be more inclined toward EE. The startup process deals with a great deal of uncertainty, and persons with high startup intent that lack emotional stability may believe that EE can help them more effectively deal with the uncertainty and stress of startup. Singh and De Noble (2003), for example, found a negative relationship between neuroticism and intent and perceived ability of self-employment. A person with a perceived lack of ability to operate a business and high startup intent may be more attracted to EE. We therefore advance the following:

- H9. Emotional stability will moderate the startup intent EE intentions relationship such that the relationship will be weaker for those with high emotional stability.

Methods and measures

To test our hypotheses, we conducted a survey of US working-age adults. Amazon's Mechanical Turk (MTurk) was used to advertise the survey. The survey advertisement was programmed to only allow for participation of those who were 18 years old or older living within the USA. Participants on average spent approximately 11 min filling out the survey. There were 207 survey participants and of those, 199 survey responses were deemed viable for analysis. The sample was approximately 38% female and 34 years of age on average.

MTurk was chosen as it provides access to reliable data from a diverse population with regards to entrepreneurship background, educational background and perceptions of the instrumentality of education (Mason and Suri, 2012). This variance in background was essential considering the present study models the moderators of the startup intent EE intentions relationship.

Startup intent

Startup intent was assessed using a three-item measure derived from Valliere's (2015) entrepreneurial intent scale. The measure queries participants on the extent to which each of them plans on engaging in behaviors required for starting a new venture at any point in the next five years. Sample items are "In the next five years or so, I am likely to invest my own resources into a business of my own" and "... Purchase major equipment for a business of my

own” with responses ranging from 1 (Strongly disagree) to 7 (Strongly agree). Cronbach’s alpha for the measure was 0.93. Note that the [Appendix](#) contains a full listing of all scale items for this and other measures used in the study.

Instrumentality of education

Participants’ perceptions of the instrumentality of education were measured using a six-item measure. The items are consistent with commonly accepted measures in a university education setting ([Husman and Lens, 1999](#); [Miller and Brickman, 2004](#)). The measure assesses the degree to which an individual considers getting postsecondary education as inherently valuable/necessary for achieving positive life goals. Sample items are “How important is college education to progressing in life” and “. . . Making life worthwhile” with responses ranging from 1 (Not at all important) to 5 (Extremely important). Cronbach’s alpha was 0.92.

Perceived entrepreneurial efficacy

Perceived entrepreneurial efficacy was measured using [Forbes’ \(2005\)](#) ten-item measure. Forbes’ measure assesses the confidence one feels in his or her ability to perform entrepreneurial behaviors/tasks. Sample items include “How confident are you in your ability to develop new ideas” and “. . . Conduct market analysis?” Potential responses range from 1 (Not confident at all) to 5 (Very confident). Cronbach’s alpha was 0.91.

Propensity for risk taking

Propensity for risk taking was derived from the risk-taking subcomponent of [Bolton’s \(2012\)](#) measure of individual entrepreneurial orientation. This subcomponent provides three statements regarding risk taking and asks respondents to indicate the extent to which each statement describes him or her. A high score indicates a general willingness to take risks in a business environment. Sample items include “I tend to act ‘boldly’ in situations where risk is involved” and “I am willing to invest a lot of time and/or money on something that might yield a high return.” Potential responses range from 1 (Does not describe me) to 5 (Describes me extremely well). Cronbach’s alpha for the three items was 0.86.

Big Five personality traits

Extroversion, agreeableness, openness to experience, conscientiousness and emotional stability were all measured using the Big Five Ten-Item Personality Inventory (TIPI) ([Gosling et al., 2003](#)). It uses two items, including one that is reverse-coded, for each of the five traits. For instance, openness to experience was measured by participants rating the extent to which they agree with the following statements: “I see myself as open to new experiences, complex” and “I see myself as conventional, uncreative.” Cronbach’s alpha for each of the traits is as follows: extroversion: 0.65; agreeableness: 0.37; openness to experience: 0.53; conscientiousness: 0.44; and emotional stability: 0.70. Cronbach’s alpha coefficients are partly a function of the number of items in the scale ([Cohen et al., 2003](#)), and therefore it is not surprising that for the TIPI the coefficients are often low being that each trait is measured by just two items, one of which is reverse coded. However, as per [Gosling et al. \(2003\)](#), the scale demonstrates test–retest reliability as well as convergence with other Big Five personality measures. Potential responses to the items range from 1 (Strongly disagree) to 7 (Strongly Agree).

Entrepreneurship education intentions

We assessed EE intentions by asking respondents to indicate the likelihood that they would enroll in entrepreneurship coursework. Sample items are “How likely are you to take

coursework on starting a business?” and “... take a college class on developing and implementing a business plan?” Potential responses from the four-item measure ranged from 1 (Extremely unlikely) to 7 (Extremely likely). Cronbach’s alpha was 0.93.

Controls

We controlled for each respondent’s education, gender and age. Previous research has found that entrepreneurial intentions of women differ from those of men (Entrialgo and Iglesias, 2017). Potential responses for education level ranged from 1 (Less than high school) to 7 (Doctorate degree).

Results

Correlation coefficients and descriptive statistics can be found in Table 1. Linear regression models were used to test each of the moderation relationships predicted in Hypotheses 1–9. To facilitate interpretation of the moderation, we modeled each moderation relationship separately and mean centered all continuous predictors (Cohen *et al.*, 2003). These linear regression analyses can be found in Table 2. The overall effect of each model on EE intentions as measured by the *F* statistic was significant ($p < 0.01$).

Hypothesis 1, which posited that startup intent would be positively associated with EE intentions, was supported ($p < 0.01$). Hypothesis 2, which predicted that the relationship between startup intent and EE intentions would be stronger for those who have a more positive attitude toward education, was supported ($p < 0.05$). To aid in interpretation, please see Figure 1 for a plot of the interaction between instrumentality of education and intentions to start a business. Please note that all moderation plots vary both intentions to start a business and each moderator by plus two standard deviations for the high condition and minus two standard deviations for the low condition.

Hypothesis 3 predicted that the relationship between startup intent and EE intentions would be weaker for those who are high in entrepreneurial efficacy. This hypothesis was supported ($p < 0.05$). See Figure 2 for a plot of the interaction between intentions to start a business and entrepreneurial efficacy. Similarly, Hypothesis 4, which predicted that the relationship between startup intent and EE intentions would be weaker for those who had higher risk propensity, was supported ($p < 0.05$). To aid interpretation, Figure 3 provides a plot of this interaction.

Hypotheses 5–9 considered the moderating effects of each of the Big Five personality traits on EE intentions. Hypothesis 5 posited that the relationship between startup intent and EE intentions would be weaker for those who are more extroverted. We found statistical support for Hypothesis 5 ($p < 0.01$). See Figure 4 for a plot of this interaction. In Hypothesis 6, we predicted that the relationship between startup intent and EE intentions would be stronger for those who are high in agreeableness. This relationship was statistically significant ($p < 0.05$), but in the opposite direction as hypothesized. This study found that high agreeableness weakened the startup intent EE relationship. Figure 5 contains a plot of the interaction. Hypothesis 7 posited that the relationship between startup intent and EE intentions would be weaker for those who were high in openness to experience. We found statistical support for this hypothesis as well ($p < 0.01$). See Figure 6 for a graphical representation of this interaction.

We failed to find statistical support for the proposed moderation effects of conscientiousness and emotional stability (Hypotheses 8–9).

In summary, our results suggest that individuals who intend to launch new businesses who have positive attitudes about education are more likely to enroll in EE programs. However, extroversion, openness to experience, agreeableness, entrepreneurial efficacy and

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Entrepreneurship education intentions	4.38	1.86												
2. Intentions to start a business	4.24	1.82	0.58											
3. Instrumentality of education	3.60	1.04	0.38	0.22										
4. Perceived entrepreneurial efficacy	3.49	0.83	0.56	0.71	0.28									
5. Propensity for risk taking	3.02	1.12	0.56	0.67	0.26	0.71								
6. Extroversion	7.73	3.42	0.37	0.36	0.21	0.45	0.46							
7. Agreeableness	10.48	2.57	-0.01	-0.05	0.02	0.08	-0.07	0.11						
8. Openness to experience	10.28	2.77	0.21	0.20	0.00	0.34	0.26	0.32	0.35					
9. Conscientiousness	11.12	2.54	-0.09	-0.05	-0.01	0.08	-0.10	0.07	0.47	0.38				
10. Emotional stability	10.14	3.06	0.02	0.11	0.07	0.27	0.15	0.30	0.43	0.34	0.46			
11. Age	34.32	9.93	-0.13	-0.11	-0.15	-0.07	-0.17	0.07	0.07	-0.05	0.06	0.07		
12. Gender	1.38	0.49	-0.03	-0.09	-0.08	-0.10	-0.22	-0.08	-0.03	0.07	-0.04	-0.25	0.10	
13. Education	4.29	1.24	0.06	0.12	0.11	0.03	0.17	-0.03	-0.20	-0.11	-0.27	-0.14	-0.07	-0.06

Note(s): Correlations with absolute values equal to or exceeding 0.14 are significant at $p < 0.05$. Correlations with absolute values equal to or exceeding 0.19 are significant at $p < 0.01$.

Correlations were performed using listwise deletion; $N = 199$

Gender was measured: 1 = Male; 2 = Female

Constant	4.34**	4.22**	4.19**	4.17**	4.35**	4.31**	4.42**	4.37**
Age	−0.01	−0.02	−0.01	−0.02	−0.01	−0.01	−0.01	−0.01
Gender	0.12	0.14	0.34	0.12	0.04	0.07	0.08	0.07
Education	−0.04	0.03	−0.02	0.03	−0.01	0.01	−0.04	−0.02
Intentions to start a business (ISB)	0.55**	0.37**	0.34**	0.46**	0.58**	0.56**	0.59**	0.58**
Instrumentality of education	0.46**							
ISB × Instrumentality of education	0.12*							
Perceived entrepreneurial efficacy		0.58**						
ISB × Perceived entrepreneurial efficacy		−0.15*						
Propensity for risk taking			0.53**					
ISB × Risk taking			−0.13*					
Extroversion				0.10**				
ISB × Extroversion				−0.05**				
Agreeableness					0.01			
ISB × Agreeableness					−0.05*			
Openness to experience						0.05		
ISB × Openness to experience						−0.06**		
Conscientiousness							−0.04	
ISB × Conscientiousness							−0.03	
Emotional stability								−0.03
ISB × Emotional stability								−0.02
<i>F</i>	23.77**	21.99**	22.66**	21.21**	17.88**	20.02**	17.56**	17.05**
<i>R</i> ²	0.43	0.41	0.41	0.40	0.36	0.38	0.35	0.33

Note(s): All coefficients are unstandardized; all continuous predictors are centered

† Significant at 0.10

* Significant at 0.05

** Significant at 0.01

Table 2.
Regression of
moderators on the link
between intentions to
start a business and
entrepreneurship
education intentions

risk propensity reduce the chances that individuals with high startup intent will pursue EE. Study findings imply that individual characteristics may be a key factor which helps explain why many folks with high startup intent do not pursue EE, which in turn likely hinders their chances to successfully launch and operate new ventures.

Discussion

The main objective of this study was to examine the influence that individual characteristics had on the startup intent EE intentions relationship. While research has identified a consistent link between startup intent and EE intentions (Burch *et al.*, 2019; Lyons and Zhang, 2018), studies also indicate that many entrepreneurs start businesses without the EE they so

Figure 1.
Plot of interaction
between intentions to
start a business and
instrumentality of
education

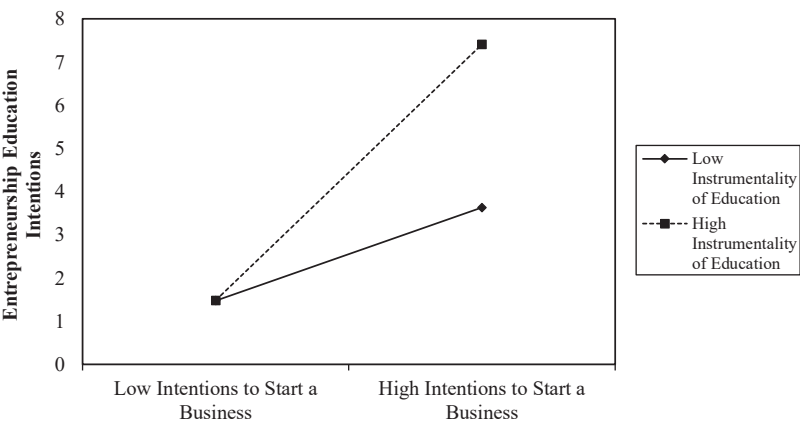


Figure 2.
Plot of interaction
between intentions to
start a business and
efficacy

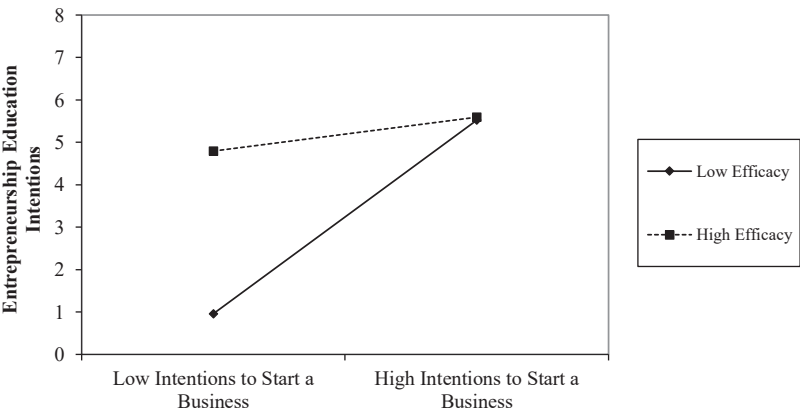
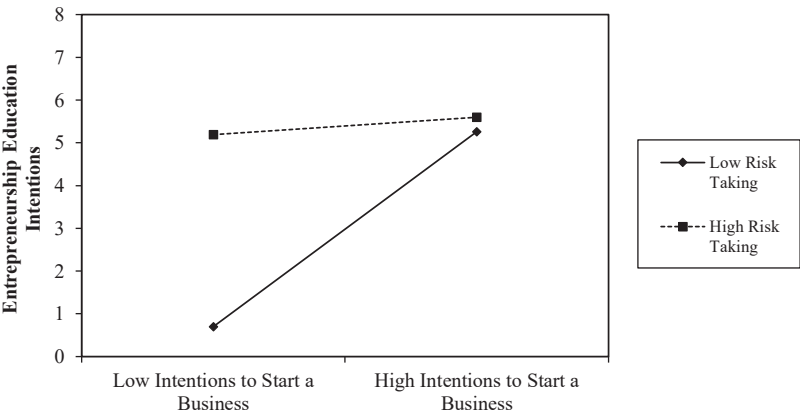


Figure 3.
Plot of interaction
between intentions to
start a business and
propensity for risk
taking



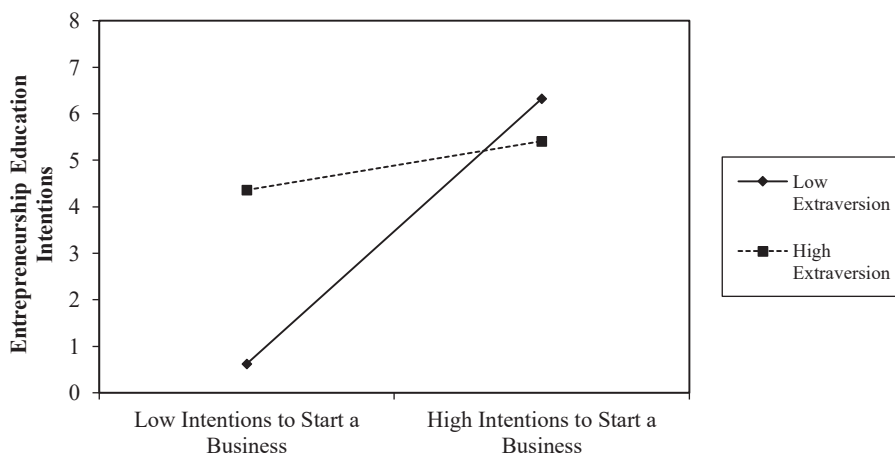


Figure 4.
Plot of interaction
between intentions to
start a business and
extroversion

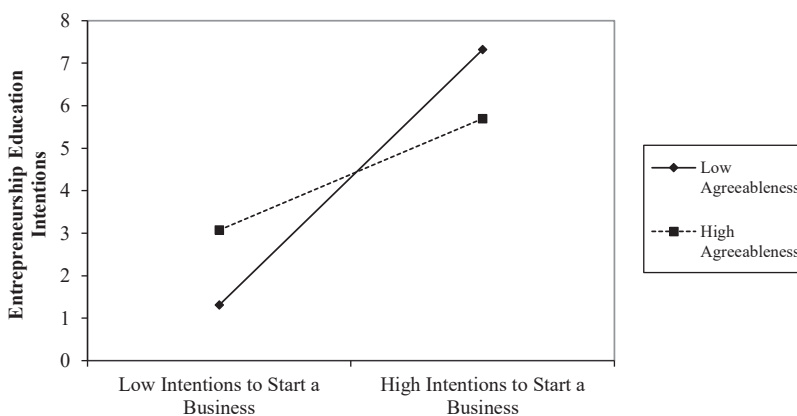


Figure 5.
Plot of interaction
between intentions to
start a business and
agreeableness

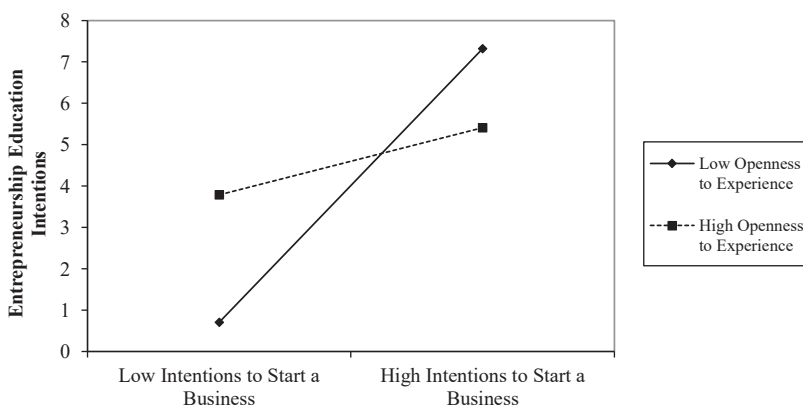


Figure 6.
Plot of interaction
between intentions to
start a business and
openness to experience

badly need (Emami and Klein, 2020). However, research examining factors that explain why certain individuals with high startup intent pursue EE and others with the same desire to start new ventures do not pursue EE is rare (Nabi *et al.*, 2017). Given this gap, we examined whether individuals' attitudes, beliefs and personality type influence the startup intent EE intentions relationship on a sample of 199 American adults. Notable findings suggest that extroversion, agreeableness, openness to experience, entrepreneurial efficacy and risk propensity reduce the chances that individuals with high startup intent will pursue EE while perceptions of the instrumentality of education increases the chances that individuals with high startup intent will pursue EE. Such findings have several interesting implications.

First, our findings suggest that individual characteristics which are highly predictive of startup intent may be less predictive of EE intentions. Specifically, a solid body of previous research suggests that risk tolerance is highly predictive of entrepreneurial orientation, startup intent and launching new ventures (Zhao *et al.*, 2010). Similarly, individuals who are open to new experience and confident in their business acumen commonly pursue entrepreneurial careers (Chen, 2015; Valliere, 2015). While our findings are in line with this research, they also suggest that such individuals are less likely to pursue EE, which may hinder their chances to operate successful new firms (Ahmed *et al.*, 2020). This finding may also help explain why new firm failure rates remain consistently in the 50–60% range (Rauch and Hulsink, 2015). If certain types of individuals consistently start firms without pursuing EE, such individuals will likely have higher failure rates than those who pursue EE, which may help keep business failure rates high despite the positive benefits of EE (Lyons and Zhang, 2018).

Similarly, study findings also imply that many individuals with high startup intent may have similar sentiments to the classic Pink Floyd song and simply feel that, "We don't need no education!" Individual characteristics such as risk propensity, entrepreneurial efficacy, extroversion and openness to experience may lead individuals with high startup intent to believe that EE will not enhance their chances of becoming successful entrepreneurs (Nagy *et al.*, 2017). For example, it is certainly reasonable that an individual who is highly confident in his or her ability to operate a business may be less inclined to pursue EE (Valliere, 2015). Further, characteristics such as risk tolerance, extroversion and openness to new experiences may lead individuals to feel that they can just figure things out as they go or learn what they would find in EE programs through entrepreneurial experience (Pollack *et al.*, 2012). Future research is needed to substantiate the above claims, but our study results suggest that certain categories of individuals with high startup intent may simply feel that they do not need EE.

Conversely, many individuals with high startup intent may seek out EE to compensate for lacking certain perceived deficiencies. For example, individuals with low risk propensity and who are not that confident in their ability to operate businesses may be drawn to EE programs to compensate for such factors (Neubaum *et al.*, 2009). Once these individuals have completed EE programs, they may see new venture creation as less risky and be far more confident in their abilities to successfully launch and operate new firms (Nabi *et al.*, 2017). Low openness and low agreeableness may also lead individuals toward EE for similar reasons, and the competencies gained in completing EE programs may help such individuals to feel more familiar with entrepreneurship, reducing worries about pursuing a new experience (Holland and Garrett, 2015). Competencies gained in EE programs may also transform individuals who did not previously agree that they could successfully pursue new venture creation to be more open to that pursuit (Sonfield and Lussier, 2014). While the above musings are reasonable, future research examining if individuals commonly pursue EE to compensate for other limitations is certainly warranted.

Next, the unexpected finding regarding agreeableness may be due to the relationship between agreeableness and the need for autonomy. Autonomy has been found to significantly influence the agreeableness performance relationship as well as the

agreeableness startup intentions relationship (Barrick *et al.*, 2003; Barrick and Mount, 1993). Van Gelderem (2010) studied the relationship between EE and autonomy and found that EE increases the capacity for autonomous action and, as a result, perceived autonomy. To the extent that persons with a high need for autonomy are also less agreeable, it may be that less agreeable persons are more likely to pursue EE in an attempt to expand their ability to act autonomously.

Further, our findings suggest that EE may not be reaching those whom it could benefit most. While research finds that EE increases entrepreneurs' chances to launch and operate successful firms (Nabi *et al.*, 2017), its influence will obviously be less significant if those who possess it do not end up pursuing entrepreneurial careers and/or those with high startup intent do not obtain EE (Oliveira and Rua, 2018). Our findings that myriad categories of individuals with high startup intent are less likely to pursue EE suggest that EE is not reaching critical target markets. As such, EE program directors should strongly consider developing plans to recruit and retain students who have high risk propensity, who are confident in their abilities to operate firms and who have open, extroverted and agreeable personalities. That said, recruiting such students to EE programs will likely be quite complicated because such students may feel that they will not benefit from EE (Nagy *et al.*, 2017). As such, directors may have to modify programs to benefit such individuals and/or stress benefits that are most attractive to such individuals. To this end, extroverted and open individuals may be attracted to aspects of EE programs such as pitching competitions, networking opportunities, experiential exercises with active entrepreneurs and opportunities for students to present their ideas to potential stakeholders. Similarly, individuals with high entrepreneurial efficacy and risk tolerance could be attracted to seed money competitions, competitive simulations and opportunities to gain alumni investors in their potential firms. Simply put, EE program directors likely need to craft different messages for different categories of individuals (Baumol, 2016).

Finally, the present study also suggests that EE programs may have to be modified to reach many individuals with high startup intent. Open, extroverted, confident, and risk tolerant individuals need EE, yet such individuals may simply not be the type of persons willing to dedicate years of their life to obtaining college degrees in entrepreneurship (Valliere, 2015). Perhaps EE programs need to create modified curriculum which is designed for working professionals, serial entrepreneurs, hyperactive individuals, etc. Four-year university programs that provide education in semester or quarter time increments may simply not be a fit for many individuals with high startup intent (Nabi *et al.*, 2017). Perhaps these folks could be convinced to attend one day courses, involve EE professionals in their business operations and enroll in certificate programs which focus only on entrepreneurial competencies. Either way, our research suggests a large opportunity for EE programs to pursue an entirely new customer niche.

Future research

The current study highlights several topics ripe for future research. First, study findings suggest that scholars should continue examining the influence of individual characteristics on the startup intent EE intentions relationship. As noted, while research finds a consistent link between startup intent and EE intentions (Lyons and Zhang, 2018), many entrepreneurs with no EE and little business experience continue to start firms (Nagy *et al.*, 2017). Our study posited and found that individual characteristics likely influence the startup intent EE intentions relationship. However, future work is needed to validate our findings. Replication studies using samples of practicing entrepreneurs, time series studies of EE students before and after program completion and studies of additional individual factors such as narcissism which may influence the startup intent EE intentions relationship are needed to substantiate our findings.

Next, as suggested above, future research is needed to examine if individual characteristics commonly convince people with high startup intent that “We don’t need no education!” and, other studies are warranted to examine if people with high startup intent pursue EE to compensate for limitations in other areas such as low openness and low agreeableness. Such studies would be highly beneficial for EE programs because it would help more clearly explain just why some persons with high startup intentions seek out EE while others with high startup intentions do not ([Oliveira and Rua, 2018](#)).

Further, cross-cultural factors may significantly impact the relationships found in this study and merit future research consideration. Individuals from collectivist cultures, for example, may have very different dispositions toward risk. Would risk propensity moderate the startup intent EE intent relationship the same way in a collectivist culture? This and other related questions suggest that replication studies in other countries with varied cultures may yield different outcomes.

Finally, future research should consider studying how EE programs can both more effectively recruit and retain students and/or be modified to be more attractive to those with high startup intentions. While EE programs have had tremendous benefits to society over the past few decades ([Baumol, 2016](#)), it is critical to take whatever actions are needed to increase the chances that EE program participants pursue entrepreneurial careers ([Sonfield and Lussier, 2014](#)). Therefore, future studies should determine best practices for attracting and retaining students with high startup intent that are resistant to EE and also examine how EE programs can be modified to be more attractive to such individuals. Such studies have the potential to decrease new venture failure rates and maximize the influence of EE programs ([Nabi et al., 2017](#)).

Limitations

Like all studies, this one has limitations. First, we measure startup intent and EE intentions instead of startup behavior and EE enrollment behavior. Measuring actual startup and enrollment behavior would have potentially strengthened the implications of the study; however, much research has found that behavioral intentions are reliable predictors of future behavior (see [Webb and Sheeran, 2006](#) for a review). Therefore, we feel that using intentions is likely immaterial as far as the conclusions that can be made from the study. Future studies would be needed to verify that assumption.

Second, we used a sample of US adults gathered through MTurk. Gathering data through MTurk is sometimes criticized due to the lack of control the investigator has over who takes the survey. However, MTurk provides some distinct advantages for the purposes of our study. It does grant access to people with varying degrees of interest in education and in starting a business, both of which are necessary for the current study. This variance would not be present in samples of college students or entrepreneurs. In addition, research has found that data collected from MTurk exhibits similar levels of statistical reliability when compared to other more conventional methods of data collection ([Mason and Suri, 2012](#)). Undoubtedly, more assurance could be had if future studies used a different data source outside of MTurk and found similar conclusions.

Third, the data are cross-sectional in nature, which may contribute to the presence of common method variance (CMV). To provide some assurance against this, we conducted a marker test ([Lindell and Whitney, 2001](#)). The marker test involves identifying one variable that should be theoretically unrelated to key variables in the study. The correlation of this marker variable to the key variables is then partialled out. If, after doing this, the key variable measures are still correlated with each other, it suggests that CMV is not having a significant influence on the relationship between these key variables. We identified gender as our marker variable and partialled out its influence on the key variables in the study. Significant

correlations observed between key variables remained significant even after the effect of gender was partialled out, suggesting that CMV is likely not influencing our analysis.

Finally, this study gathered data on participants located throughout the USA and lacks the granularity needed to discern whether participants' responses were influenced by geographic location in the US subjects in Silicon Valley, for example, living in a startup community that has a very different culture than most rural locations in the USA. As such, the inclusion of location data may have enriched the current paper and should, thus, likely be considered in future examinations of the startup intent EE intentions relationship.

Conclusion

Approximately 62% of Americans want to own a business while about 37% are seriously considering becoming an owner (New York Post, 2018). Clearly, nowhere close to that many persons pursue EE, even though EE has been shown to boost entrepreneurial intentions and performance. The present study's findings that myriad individual characteristics moderate the startup intent EE intentions relationship provide one of the first empirical examinations of why certain individuals with high startup intent pursue EE and others do not. Examining a sample of 199 American adults, we find that extroversion, agreeableness, openness to experience, risk tolerance and entrepreneurial efficacy reduce the likelihood that those with high startup intent will pursue EE while positive attitude toward the instrumentality of education increases the likelihood that those with high startup intent will pursue EE. Study findings imply that individual characteristics likely explain why many folks with high startup intent do not pursue EE and thus suggest that EE program directors should revamp recruiting messages and modify program components to better attract students who are resistant to EE. While we realize that our paper is but one study, we posit that its notable findings and interesting implications suggest that scholarly research on the topic should continue.

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Further reading

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(The Appendix follows overleaf)

Appendix
Measures

Variable	Items
Intentions to start a business	In the next five years or so, I am likely to . . . Invest my own resources into a business of my own Open a bank account for a business of my own Purchase major equipment for a business of my own
Instrumentality of education	How important is college education to . . . Achieving a better quality of life? Becoming a successful person? Being a life-long learner? Progressing in life? Gaining skills that I value? Making life worthwhile?
Entrepreneurial efficacy	How confident are you in your ability to perform the following task . . . Develop new ideas Perform financial analysis Set and meet sales goals Conduct market analysis Develop new markets Develop new products and services Reduce risk and uncertainty Establish and achieve goals and objectives Define organizational roles, responsibilities, and policies Take calculated risks
Propensity to take risk	Please respond to the following questions . . . I like to take bold action by venturing into the unknown I am willing to invest a lot of time and/or money on something that may yield a high return I tend to act "boldly" in situations where risk is involved
Big Five personality traits (TIPI)	I see myself as . . . (Extroversion) extroverted, enthusiastic (Extroversion) reserved, quiet (Agreeableness) sympathetic, warm (Agreeableness) critical, quarrelsome (Conscientiousness) dependable, self-disciplined (Conscientiousness) disorganized, careless (Emotional Stability) calm, emotionally stable (Emotional Stability) anxious, easily upset (Openness to Experience) open to new experiences, complex (Openness to Experience) conventional, uncreative
Entrepreneurship education intentions	How likely are you to . . . Take a college class on identifying a good business opportunity? Take coursework on starting a business? Seek out education on how to run your own business? Take a college class on developing and implementing a business plan?

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