

The development of entrepreneurial alertness in undergraduate students

Abstract

Purpose – The main goal of this work is to argue the theoretical validity of two TPB competitive models that integrate entrepreneurial alertness in the Theory of Planned Behavior (TPB), as well as to propose an explanation for the conceptual approach with a higher explicative ability.

Design/Methodology/Approach – 281 undergraduate students participated in the survey and the data were analyzed using structural equation modeling and competitive models.

Findings – The research shows it is possible to defend and test two competing TPB models with entrepreneurial alertness, which alerts other field researchers to consider this psychological variable as an opportunity in further research. The model showing the impact entrepreneurial alertness (EA) has on attitude towards the behavior (ATB) and perceived behavioral control (PBC), as well as the model showing the impact of ATB and PBC on EA are both valid. It is argued that the shared characteristic of the sample may explain a higher predictive power in the first model.

Research limitations/implications – The sample was limited to undergraduate students of one university.

Practical implications – For educators and policymakers, these results highlight the need to include content related to entrepreneurial alertness in entrepreneurship education programs since it could trigger the entrepreneurial process. Also, universities may go one step further to become entrepreneurial micro-ecosystems.

Social implications – There is a youth unemployment crisis, therefore universities are addressing this challenge by promoting entrepreneurship. This research provides insights on how entrepreneurial intention and entrepreneurial alertness are developed, as well as guidance on how to design high-impact entrepreneurship programs.

Originality/value – The paper is the first of its kind to demonstrate competing arguments for the role of entrepreneurial alertness in TPB.

Keywords Alertness, entrepreneurship education, entrepreneurial intention, rival models

Paper type Research paper

1. Introduction

Since entrepreneurship presents attractive prospects in regions with insufficient employment opportunities for the youth, universities worldwide now offer entrepreneurship curricula to foster the creation of new enterprises among students (Katz, 2003; Kuratko, 2005; Solomon, 2007). Despite the growing amount of entrepreneurship education research which has emerged in the last 20 years, the questions of “what”, “who”, “when”, “where”, and “how” remain a challenge (Matlay, 2018). In this context, researchers seeking to determine how and when students become entrepreneurs are attracted to the concept of entrepreneurial intention presented in the Theory of Planned Behavior (TPB) from Ajzen (1991). It states that intention is the best predictor of behavior, and that intention is preceded by attitude towards the behavior, social norms and perceived behavioral control. Particularly, intention-based models aim to explain behaviors that are hard to observe or entail variable time lags (Krueger et al., 2000), but there is the possibility

that they forfeit a true entrepreneurial character by disregarding the opportunity-individual link in the formation of entrepreneurial attitudes and intentions.

Entrepreneurial alertness could be the missing opportunity-related construct that together with TPB would provide a more robust prediction model of entrepreneurship. It is the conscious perception of being able to see opportunities better than others (Kaish and Gilad, 1991; Tang et al., 2012). Research on alertness addressed a variety of issues and growing number of papers have recently addressed the role of entrepreneurial alertness in TPB models (Samo and Hashim, 2016; Lu and Wang, 2018) or in entrepreneurial intention formation (Hu and Ye, 2017; Obschonka et al., 2017; Hu et al., 2018; Neneh, 2019). Despite the attention that has been given to the subject, the relationship between entrepreneurial alertness, entrepreneurial intention and its antecedents is usually contradictory. At least two different approaches can be drawn from the literature. For example, some studies argue to propose that entrepreneurial alertness may be the antecedent in the formation of entrepreneurial intention (Hu and Ye, 2017; Neneh, 2018), attitude towards the behavior and perceived behavioral control (Van Gelderen et al., 2008; Samo and Hashim, 2018). At the same time, other researchers argue that entrepreneurial alertness is actually preceded by all the variables in TPB models and, very specially, by attitude towards the behavior and perceived control (Lu and Wang, 2018), and entrepreneurial intention (Shook et al., 2003).

Under these circumstances, the main contribution of this study is the generation of new knowledge about the role of alertness in the formation of entrepreneurial intentions. Particularly, two competitive TPB models are empirically tested in this study to subsequently establish the conceptual approach with a higher explicative ability.

2. Theoretical background and hypotheses

2.1. Theory of planned behavior

Predicting who may become entrepreneurs, and successful ones at that, is one objective of entrepreneurship research. Extensive recent studies involving intention models compare the effects of educational programs (Bae et al., 2014; Rauch and Hulsink, 2015) and seek to understand how personal characteristics affect forming entrepreneurial intentions (Hatak et al., 2015; Obschonka et al., 2015; Gorgievski et al., 2018; Kruse et al., 2019; Munir et al., 2019), which are the best predictor of planned behaviors. According to Ajzen (1991), intentions capture the motivational factors that serve as indicators of the individual's predisposition or at which effort level they are willing to perform a specified behavior. In this context, entrepreneurial intention has been defined as the state of mind that guides action toward self-employment, contrary to a corporative job (Souitaris et al., 2007), or a cognitive state that precedes in time and cause the decision to start a business (Krueger, 2009). Intentions constitute "a more or less concrete plan to prepare for, and then ultimately start, an entrepreneurial career of one's own in the future" (Obschonka et al., 2017, p. 491).

The Theory of Planned Behavior (TPB, Ajzen, 1991) has been frequently applied to entrepreneurship (Guerrero et al. 2008; Krueger 2009), including in the field of education research (Aamir et al., 2019) and a recent meta-analysis confirms that it can predict entrepreneurial career intentions and behavior (Schlaegel and Koenig, 2014). This theory states that three variables influence intentions (Ajzen, 1991): attitudes toward a behavior (ATB), perceived behavioral

control (PBC), and subjective norms (SN). The attitude toward a behavior is the degree to which someone sees it favorably or unfavorably (Ajzen, 1991); specific to the entrepreneurial context, it is the personal perception of whether being an entrepreneur is desirable (Souitaris et al., 2007). Nevertheless, the desire to perform a behavior is insufficient motivation if people do not consider themselves as capable of undertaking the behavior. In particular, one's belief that he or she can undertake a behavior, and that the behavior is beneficial, is known as perceived behavioral control (Ajzen, 2002). Finally, subjective norms refer to the perceptions of social pressures to undertake a certain behavior (Ajzen, 1991).

The TPB has proven to be robust and relevant in predicting start-up intentions and subsequent behavior (Schlaegel and Koenig, 2014; Kautonen et al., 2015), although the inclusion of other constructs may significantly increase the explanatory power of this theoretical model (Fishbein and Ajzen, 2010). In their study, Kautonen et al. (2015) urge researchers to amplify the specificity of the TPB constructs on the entrepreneurship field. In this sense, since entrepreneurial alertness improves the identification and evaluation of opportunities, previous research has proposed that entrepreneurial alertness could increase the explanatory power of TPB in the formation of entrepreneurial intention and behavior (Samo and Hashim, 2016; Lu and Wang, 2018).

2.2. Entrepreneurial alertness

Befitting the attitudinal approach of the TPB, Hansen et al. (2009) conceptualize alertness as “a process of scanning or being alert” (p. 5). In the present study, following the previous works of Kaish and Gilad (1991) and Tang et al. (2012), alertness is defined as the conscious perception of being able to see opportunity better than others. People in whom this quality is developed seek opportunity more diligently. They look for change, challenge information, and disregard conventional wisdom (Gaglio and Katz, 2001). Research on alertness addressed a variety of topics: (1) how alertness differentiates one professional group from the other (Kaish and Gilad, 1991; Craig and Johnson, 2006; Karabey, 2012); (2) the role of alertness in the career development outcomes (Uy et al., 2015); and (3) the dimensions and process phases of alertness (Kaish and Gilad, 1991; Busenitz, 1996; Tang et al., 2012). Although it appears frequently in papers, it is an underemployed research variable (Gaglio and Katz, 2001; Valliere, 2013; Hansen et al., 2016). Fortunately, a growing number of papers have recently addressed the relationship of entrepreneurial alertness and entrepreneurial intention (Hu and Ye, 2017; Obschonka et al., 2017; Hu et al., 2018; Neneh, 2019), as well as the role of entrepreneurial alertness in TPB (Samo and Hashim, 2016; Lu and Wang, 2018). Despite the attention that has been given to the subject, the relationship between entrepreneurial alertness, entrepreneurial intention and its antecedents is usually contradictory.

At least two different models can be drawn from the literature. On some occasions, entrepreneurs may have business ideas come to them without first having the desire to start a business (Marvel, 2013), represented in Model 1. This can also be explained based on expectancy theory (Vroom, 1964) since the perceived ability to see opportunities may motivate and create expectations of gains that may be obtained from entrepreneurship behavior. Part of this proposition has already found empirical support in similar research that confirms the influence of entrepreneurial alertness on the antecedents of entrepreneurial intention: perceived behavioral

control (Samo and Hashim, 2016; Van Gelderen et al., 2008), subjective norms (Samo and Hashim, 2016) and attitudes towards the behavior (Samo and Hashim, 2016). Although there is some empirical evidence of a direct relationship between entrepreneurial alertness and entrepreneurial intention (Hu and Ye, 2017; Neneh, 2019), there is stronger evidence that individual differences such as the entrepreneurial alertness, which affect a behavior, do so by influencing attitudes, subjective norms, and perceived behavioral control (Fishbein and Ajzen, 2010; Samo and Hashim, 2016). According to Ajzen (2011), behavioral, normative and control beliefs –e.g. entrepreneurial alertness– “are expected to influence intentions and behavior indirectly by their effects on the theory’s more proximal determinants” (p. 1123).

For its part, entrepreneurial alertness as an antecedent of entrepreneurial attitudes and intentions may be especially true depending at which moment in life the individual falls. For example, undergraduate students may not have enough professional experience and information about the market, technology and tendencies. They may lack the skills to search and scan the environment for critical and connectable pieces of information, which are fundamental for entrepreneurial alertness (Tang et al., 2012). In this sense, it is reasonable to propose that when an undergraduate student spot a business opportunity, this occurrence may act as an internal motivation leading her to consider an entrepreneurial career as feasible and desirable. In the case as proposed by DeGeorge and Fayolle (2011), the beginning of the entrepreneurial process “may happen without the individual being aware of any intention” (p. 256). The perception of the individual (i.e. entrepreneurial alertness) triggers the entrepreneurial process.

As stated before, there are also arguments to propose a second relationship between entrepreneurial alertness and TPB. The entrepreneurial process may vary among individuals depending on events of displacement in their life. A displacement is a disruption of an individual's life that may be negative (for example, a divorce or the fact of being dismissed from a job) or positive, like graduating from college (Shapiro and Sokol, 1982). These events may trigger the individual to consider an entrepreneurial career as feasible and desirable. When it happens, entrepreneurial alertness and the ability to identify opportunities may be influenced by a pre-existing entrepreneurial disposition (Lu and Wang, 2018). In a competing model (Model 2), the identification of oneself as entrepreneur may precede the search for an opportunity (Jarvis, 2016). In other words, for some entrepreneurs, enterprising beliefs, values and attitudes are all potentially antecedents to the search, discovery, an exploitation of opportunities (Shook et al., 2003). This means that entrepreneurial intention and its antecedents could influence entrepreneurial alertness. Finally, Model 2 is built on the proposition of Shook et al. (2003) and the empirical work of Lu and Wang (2018), which indicates the individuals’ attitudes and intentions could precede their entrepreneurial alertness.

These competitive models resemble the duality in Kirzner’s early and late works addressed by McMullen and Shepherd (2006). Kirzner’s early publications, which have a central role in the study of entrepreneurial alertness, initially address it as a concept “in which an objective market opportunity is only an opportunity for those possessing the necessary attributes” (McMullen and Shepherd, 2006, p. 144). In this case, knowledge, attitude and intention to be an entrepreneur could be understood as the attributes necessary for a market situation to be perceived as an opportunity (Model 2). In later publications, Kirzner refers to alertness as a receptive attitude which allows an individual to scan the environment to discover opportunities. This is similar to an individual

characteristic that could proceed any attitude, knowledge or intention to be an entrepreneur (Fishbein and Ajzen, 2010), as proposed in Model 1.

Based on the previous arguments, there is evidence in the literature for both models, but as previously stated, depending on the context in which entrepreneurship emerges, one model may have stronger predictive power than the other one. Thus, for undergraduate students who probably have yet to experience significant displacement events in their lives (e.g. graduation), this research proposes that the individuals' ability to recognize entrepreneurial opportunities –i.e., entrepreneurial alertness) – will impact the main antecedents of entrepreneurial intentions: attitudes towards the behavior and perceived behavioral control.

RQ: Will Model 1 –i.e. the model where entrepreneurial alertness positively affects perceived control and entrepreneurial attitude– have a higher predictive power than Model 2 –i.e. the model where control, attitude and entrepreneurial intention positively affect entrepreneurial alertness–?

INSERT FIGURE 1

3. Methods

3.1 Sample and procedures

To give an answer to this research question, a questionnaire was distributed in the first four months of 2018 to undergraduates enrolled in an entrepreneurship course at one of the Mexico's most prestigious universities. In total, 346 students were invited to take the survey in the first round and 298 answered it. In the second round, the same students were invited and 319 responded to the survey. After matching the responses of the first and second rounds, 281 complete and valid questionnaires were obtained. The campus where the study took place is located in an urban area. Male students accounted for 55.2% of the sample (n= 155) and female students represent the other 44.8% (n= 126). Of these students, 35.9% are studying business, 40.2% engineering, 15.7% architecture, design and arts, and the others are in humanities or political science majors. The study took place in a private university, but more than half of the students sampled had some type of scholarship (54.8%). The age range was from 20 to 29 years old, while the average age of the group under investigation is 22 years old.

The course is compulsory for all undergraduates, thereby excluding the possibility of sample bias by surveying only potential entrepreneurs. Sampling students is a common practice in entrepreneurship studies (Decker et al., 2012; Fayolle et al., 2006; Kolvereid, 1996; Krueger et al., 2000). In addition, it is necessary to emphasize that this research focuses on the attitudes preceding venture creation and displacement events, like graduation, rendering the sampling appropriate. Undergraduates facing career decisions may consider entrepreneurship (Souitaris et al., 2007). In addition, sampling older respondents could introduce other variables affecting results –e.g., the foreknowledge of an industry could affect alertness and the ability to perceive opportunities– (Baron, 2006).

Questionnaires were administrated during the class and via email, and an introductory explanation to the questionnaire was added in order to ensure that the students were aware of why the research is important, the weight of their contribution and the relevance of their personal

opinion. Participation was voluntary, and students were informed that their answers would not influence their course grade. For its part, in order to avoid the conditions that cause the common method bias (MacKenzie and Podsakoff, 2012), empirical data was collected in two rounds. In the first round, the questionnaire contained the measures of alertness, attitude towards the behavior and subjective norms. In the second round, the questions related to perceived behavioral control and entrepreneurial intention were included.

3.2 Measures

The scale developed by Tang et al. (2012) was used to measure entrepreneurial alertness. For its part, the variables from the TPB model –i.e., subjective norms, perceived control, attitude and entrepreneurial intention– were measured through the scales used in the Entrepreneurial Intention Questionnaire from Liñán and Chen (2009). All measurement scales used 7-point Likert-type response anchors, where 1 means “totally disagree” and 7 means “totally agree” (the Appendix A includes all items measuring the variables of our theoretical models).

4. Results

First, Table 1 shows all means, standard deviations, and correlations between the variables included in the theoretical models.

INSERT TABLE 1

4.1 Measurement model

Second, the reliability and validity of measurement scales were analyzed. The Cronbach’s alphas spanned from 0.87 to 0.97; all exceeded the acceptable lower limit (0.7) for the reliability of multi-item scales (Robinson et al., 1991). Subsequently, a factor analysis showed that all items loaded higher than 0.70, indicating a well-defined structure (Hair et al., 2010). Table 2 shows that the model is adjusted adequately (Table 2). For its part, following Anderson and Gerbing (1988), a confirmatory factor analysis confirmed the reliability and validity of all the constructs (Table 2). Particularly, structural equation modeling (SEM) with EQS 6.2 (robust method) was used to examine how well the measurements and structural models fit the data. The measurement model tested for relations between indicators and their respective latent variables. The fit indicators were the normed chi-square (Wheaton et al., 1977), the Bentler Bonnett Normed Fit Index (BBNFI), the Bentler-Bonnett Non-normed Fit Index (BBNNFI), the comparative fit index (CFI) (Bagozzi and Yi, 1988), and Root Mean Square Error of Approximation (RMSEA) (Browne and Cudeck, 1993). Indexes BBNFI, BBNNFI, and CFI are close to the recommended value of 0.9 (Bagozzi and Yi, 1988); an RMSEA is below the limit of 0.08. For its part, normed chi-square is significant and below 5.0 (Wheaton et al., 1977). All standardized loads for latent concepts exceed 0.50, confirming the convergent validity of measurement scales (Fornell and Larcker, 1981; Hildebrandt, 1987). Following the procedure set by Fornell and Larcker (1981), it was obtained that the variances extracted (AVE coefficient) for each pair of latent variables exceed the squared correlation estimated between those pairs of variables, so the discriminant validity is confirmed.

INSERT TABLE 2

4.2 Estimation of rival models

The proposed causal relations were estimated using structural equation modeling (SEM) in the software EQS 6.2, with the robust method to avoid problems from potential non-normality of data (Figure 1 and Figure 2). Model 1 was initially tested, and the results confirmed the positive and significant influence of attitude toward behavior and perceived behavioral control on entrepreneurial intention (Figure 1). Nonetheless, subjective norms exert no significant influence on entrepreneurial intention. Since the estimation of rival models allows the comparison of different models to select the one that offers a greater predictive value (Martinez-Lopez et al., 2013), the alternative model discussed (Model 2) was also estimated (Figure 2). The results confirm that perceived control and attitude toward the behavior positively influence entrepreneurial intention, but subjective norms don't (as in Model 1). In addition, entrepreneurial alertness is positively influenced by attitude and perceived control, but not by entrepreneurial intention.

INSERT FIGURE 2

INSERT FIGURE 3

In both models, it is possible to partially confirm the Theory of Planned Behavior proposed by Ajzen (1991), meaning that both attitude towards the behavior and perceived behavioral control have an impact on entrepreneurial intention. Subjective norms exert no significant influence on entrepreneurial intention, a result encountered by Krueger et al. (2000), Boissin et al. (2007), and Liñán and Chen (2009). As shown in Figure 2, entrepreneurial alertness has a positive influence on perceived behavioral control and attitude towards the behavior, results also confirmed by Samo and Hashim (2018). It is also true that entrepreneurial alertness is positively influenced by the same constructs, as tested in Model 2 (Figure 3), a result previously presented by Lu and Wang, 2018. Therefore, the analysis would be incomplete if only one of the models was tested, or if no comparison between the models was made.

Proceeding to compare both models as revealed by Figure 2 and Figure 3, the R^2 values for the dependent variables –i.e, attitude towards the behavior and perceived behavioral control– are higher in the Model 1, although the R^2 values for entrepreneurial intention are very similar in both models. In addition, the Akaike Information Criterion (AIC) is lower in the Model 1. It is necessary to indicate that the AIC is a versatile procedure for choosing between competing models (Akaike, 1974), and a lesser value indicates the more parsimonious model (Hooper et al., 2008). The target value of the AIC is one, which is designed for the sample size available, and offers a more significant result than alternative methods when predictors in the candidate model are linear (Burnham and Anderson, 2004). Finally, it is safe to say that Model 1 offers a more appropriate solution than Model 2, although the differences among most of the comparison indicators are not especially high.

5. Discussion

This study primarily examines the role of entrepreneurial alertness in the framework of entrepreneurial attitudes and intentions, by arguing the theoretical validity of two competitive models. According to the TPB Model, the intention to perform a behavior has three antecedents: attitude towards the behavior, subjective norms, and perceived behavioral control. Our findings confirm these relationships with the exception of a direct impact of subjective norms on entrepreneurial intention. This result coincides with the results of Krueger et al. (2000), Boissin et al. (2007), and Liñán and Chen (2009). Siu and Lo (2011) empirically confirmed that the predictive power of subjective norms on the formation of entrepreneurial intentions is closely tied to the degree of the individuals' interdependent self-inference. Thus, in individualistic societies such as Mexico, the predictive power of subjective norms may be very limited. Finally, subjective norms are a contextual construct it may be, for example, that family-based subjective norms are positively associated with entrepreneurial intention, while university-based subjective norms are not (Vracheva et al., 2019).

Addressing the calls for a more highly-specified model of entrepreneurial intentions (Liñán et al., 2011; Schlaegel and Konig, 2014), one that could include an opportunity-related construct like entrepreneurial alertness, other researches have addressed the relationship of entrepreneurial alertness in TPB (Samo and Hashim, 2016; Lu and Wang, 2018) or entrepreneurial intention (Hu and Ye, 2017; Obschonka et al., 2017; Hu et al., 2018; Neneh, 2019). The issue in question in this particular work is that both theoretically and empirically we could confirm models that appear to be competitive in nature. In our Model 1, entrepreneurial alertness has a significant influence on attitude towards the behavior and perceived behavioral control, as proposed and tested by Samo and Hashim (2016). It is reversed in our Model 2, where attitude towards the behavior and perceived behavioral control have a significant influence on entrepreneurial alertness, as confirmed by Lu and Wang (2018). In this second model, entrepreneurial intention does not influence entrepreneurial alertness, contrary to the results of Neneh (2019). These results contribute to the literature by demonstrating the importance of confronting models and hypothesis when exploring the relationship between these psychological variables in the formation of entrepreneurial intentions. In our opinion, the profile of the sample could explain the higher explicative ability of one or another conceptual approach.

Generally speaking, undergraduate students are unlikely to have had relevant displacement events (like, graduation) that would trigger the entrepreneurial process (Shapiro and Sokol, 1982). In this case, entrepreneurial alertness, the skill that one student has to identify opportunity could trigger the process, as confirmed in Model 1. This is the model with the best fit in this undergraduate sample research, as well as in the case of Samo and Hashim (2018), which sampled final year business students. Following this logic, older potential entrepreneurs, that have a greater probability to face a relevant displacement event in the past, would have a model where the desire and competence to be an entrepreneur triggers the ability to see an opportunity. It was the case of the work of Lu and Wang (2018), that sampled 451 entrepreneurs and potential entrepreneurs. Of these, 298 were undergraduate students and confirmed the assertion of DeGeorge and Fayolle (2011) that there is no unique path to trigger the entrepreneurial process.

5.1 Practical implications

These results provide practical implications for universities that wish to promote, train, and encourage entrepreneurs. Among the most significant, it's important to recognize that it is not enough to only teach about entrepreneurship. If the student lacks the skill to recognize opportunities, if she did not create or discover a new business idea, it would weaken the possibility of new venture creation. That being said, it is important that entrepreneurship education programs include syllabus content and goals related to the development of entrepreneurial alertness as a skill that helps individuals: 1) to scan and search the environment (e.g. interactions to acquire new information, consumption of different medias); 2) to associate and connect ideas (e.g. connect pieces of information in a novel way to generate new ideas); and 3) to evaluate and judge the result of this process (e.g. distinguish profitable opportunities). These are the three dimensions of entrepreneurial alertness developed by Tang et al. (2012).

Also, these results make the case for a better fit between content and participant. If entrepreneurial alertness is likely to trigger the entrepreneurial process for younger, undergraduate participants, it may be a good idea to offer courses that do not focus on those students that already intend to be entrepreneurs. Universities could open the doors for students who are just looking to acquire a new skill (e.g. entrepreneurial alertness), expecting that this could motivate the rest of the process. In the case of older participants, maybe people who already have some years of professional experience, they may be considering a change in career (e.g. to be an entrepreneur), and events that present them with business opportunities could guide their next steps. Anyway, no entrepreneurship education program can dismiss the individuals' skills to spot opportunities. Universities then could be much more than providers of distinct courses, they could turn into entrepreneurial micro-ecosystems, where different actors co-exist. While some are sources of opportunities and innovation, others take this input and transform it into enterprises that generate development and wealth in regions and countries.

5.2 Limitations and future research

These results require caution due to several limitations of empirical research. First, the sample was limited to one university and, in order to avoid the so-called common method bias, the data was collected in two rounds. Thus, it is possible that asking students about their entrepreneurial alertness in the first round led them to think about entrepreneurship and, consequently, they could have reported higher entrepreneurial intentions in the next round. Second, the social desirability bias could color these results given the characteristics of the survey sample (Podsakoff and Organ, 1986), even though students were guaranteed anonymity and teachers insisted that they would not receive extra credit for participating. Third, entrepreneurial behavior is not observed per se; little information confirms as to how entrepreneurial intention transforms into action, although Kautonen et al. (2015) offer empirical evidence for relevant relations. Measuring intention or behavior may change the relevance of the theoretical antecedents. For example, Joensuu-Salo et al., (2015) found that attitude towards the behavior is the best antecedent for intention, but not significant in explaining actual behavior. In this last case, perceived behavioral control is the most important variable of the three. Finally, although gender, age, and entrepreneurial experience were controlled in this study, undergraduate students are not a

homogenous group, and additional measures to ensure the validity of the results should be taken in future research. Due to these limitations, these findings should be only considered a first step in research on alternative models of entrepreneurial attitudes and intentions.

Future research should address these limitations through longitudinal studies addressing the relations between intentions and entrepreneurial behavior. Also, by using other types of survey samples –for example, nascent or potential entrepreneurs, one could overcome the limitations of the sample of students. In addition, researchers need to continue building entrepreneurship-specific models of intention by aggregating the opportunity-related constructs important for the emergence of entrepreneurship, as well as by addressing the different types of intention referenced in the extant literature. Particularly, there are two studies of special interest for further research: Obschonka, Silveisen, and Schmitt-Rodermund (2010) use condition and non-condition intentions, while as Gollwitzer and Brandstätter (1997) distinguish between goal and implementation intention. The influence of the different measures of intention in predicting the adoption of entrepreneurial behavior remains unknown.

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Appendix A. Measurement scales

Entrepreneurial alertness (Tang et al., 2012)

- Alertness 1. I have frequent interactions with others to acquire new information.
- Alertness 2. I always keep an eye out for new business ideas when looking for information.
- Alertness 3. I read news, magazines, or trade publications regularly to acquire new information.
- Alertness 4. I browse the Internet every day.
- Alertness 5. I am an avid information seeker.
- Alertness 6. I am always actively looking for new information.
- Alertness 7. I see links between seemingly unrelated pieces of information.
- Alertness 8. I am good at “connecting dots”.
- Alertness 9. I often see connections between previously unconnected domains of information.
- Alertness 10. I have a gut feeling for potential opportunities.
- Alertness 11. I can distinguish between profitable opportunities and not-so-profitable opportunities.
- Alertness 12. I have a knack for telling high-value opportunities apart from low-value opportunities.
- Alertness 13. When facing multiple opportunities, I am able to select the good ones.

Theory of planned behavior (Liñan and Chen, 2009)

Entrepreneurial intention

- Intention 1. I am ready to do anything to be an entrepreneur.
- Intention 2. My professional goal is to become an entrepreneur.
- Intention 3. I will make every effort to start and run my own firm.
- Intention 4. I am determined to create a firm in the future.
- Intention 5. I have very seriously thought of starting a firm.
- Intention 6. I have the firm intention to start a firm someday.

Attitude towards the behavior

- Attitude 1. Being an entrepreneur implies more advantages than disadvantages.
- Attitude 2. A career as entrepreneur is attractive for me.
- Attitude 3. If I had the opportunity and resources, I'd like to start a firm.
- Attitude 4. Being an entrepreneur would entail great satisfactions for me.
- Attitude 5. Among various options, I would rather be an entrepreneur.

Subjective Norm. If you decide to create a firm, would people in your close environment approve your decision?

- Norms1. Your close family
- Norms2. Your friends
- Norms3. Your colleagues

Perceived behavioral control

- Control1. To start a firm and keep it working would be easy for me.
- Control2. I am prepared to start a viable firm.
- Control3. I can control the creation process of a new firm.
- Control4. I know the necessary practical details to start a firm.
- Control5. I know how to develop an entrepreneurial project.
- Control6. If I tried to start a firm, I would have a high probability of succeeding.