New Technologies and Entrepreneurial Intention

Natalia Martin-Cruz and Ana Isabel Rodriguez-Escudero

Abstract New technologies are powerful tools to create, disseminate, articulate, and exploit knowledge. Entrepreneurs use these technologies to promote the creation of new ventures. However, recent studies demonstrate that new technologies are not sufficient to enhance the process of venture creation. We use the fundamentals of the theory of planned behavior to understand the impact of new technologies on entrepreneurial intention. Empirical literature related to university students shows that entrepreneurial intention is dependent on attitudes toward entrepreneurship, social norms, and self-efficacy. We therefore evaluate an empirical model in a sample of students enrolled in the 2012–2013 academic year in the University of Valladolid (Spain).

Keywords Entrepreneurship · Entrepreneurial intentions · New technologies · Theory of planned behavior

1 Introduction

New technologies are powerful tools to create, disseminate, articulate, and exploit knowledge. Recently, entrepreneurs are using these technologies to promote the creation of new ventures [8]. However, our understanding of the effect of new technologies on entrepreneurial intention is still lacking. We use the fundamentals of the theory of planned behavior to examine the impact of new technologies on entrepreneurial intention. In particular, we focus on two specific objectives: (i) verify the potential of the planned behavior theory based on the three dimensions—attitude toward entrepreneurship, social norms, and self-efficacy—and some control variables, and (ii) verify the impact of a positive attitude toward new technologies on entrepreneurial intention.

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To reach those objectives, we use two models. The first model includes only the entrepreneur's attitude toward new technologies. In the second model, we add as the upper echelon characteristics the entrepreneur's personal features including education, personality, and family business background [4, 6, 13, 16, 23]. Once we control all those variables, we find that attitude toward new technologies maintains its significance and thus this variable is important for identifying individuals with a higher entrepreneurial intention. In its practical application, this observation allows specific programs to be targeted to those individuals from public and private institutions.

2 Theoretical Background

The theory of planned behavior [1] has been applied to nearly all voluntary behaviors, and it provides quite good results in very diverse fields [2, 15]. Accordingly, a narrow relation exists between the intention to be an entrepreneur and the effective outcome. In other words, intention is the fundamental element in explaining behavior.

Following this theory, three main elements constitute the explanatory variables of intention toward entrepreneurship: self-efficacy, social norms, and attitude toward entrepreneurship. Self-efficacy, which can also be described as entrepreneurial capabilities, is defined as the perception of the ease or difficulty in the fulfilment of the behavior of interest, namely, the individual's sense of capacity regarding the fulfilment of firm creations behaviors. Social norms measure the social value attributed to entrepreneurial behavior. Finally, attitude toward entrepreneurship refers to the degree to which the individual holds a positive or negative personal valuation about being an entrepreneur.

In addition to these three variables, the literature has identified additional features that may also explain entrepreneurial intention. Prior studies widely consider demographic characteristics (gender, social class), education (training, languages, academic performance), the existence of an entrepreneurial tradition in the family, and personal traits [11, 17, 18, 20]. Although planned behavior theory plays a prominent role in recent entrepreneurship research, other theoretical models have also been used to characterize and explain why some individuals become entrepreneurs. The great person theory focuses on individual intuition and the entrepreneur's unique values and attitudes, such as the need for self-fulfilment. The psychological literature argues that entrepreneurs have a higher propensity for risk-taking, and the management literature emphasizes entrepreneurs' capabilities for innovation, organizing resources, and leadership [5].

Given this discussion, we include in our empirical analysis variables that allow us to verify which variables have a stronger influence on the intention to start-up a business. Fig. 1 shows the proposed model.

We include new technologies in the model by considering the attitude of the individual toward those new technologies. In fact, institutional theory acknowledges

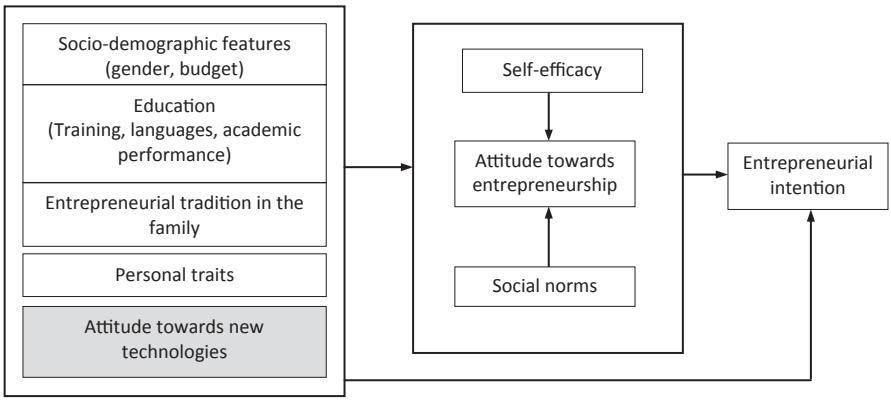

Fig. 1 Model of the planned behavior theory considering the impact of new technologies on entrepreneurial intention

that certain new technologies come to be adopted widely, whereas other, equally plausible, alternative technologies languish [21, 22]. Munir and Phillips [19] attempt to disentangle the role of entrepreneurial institutions regarding the choice of technology. Using observations from discourse analysis, they find that technologies can become a type of institution through processes of social construction. They provide a very useful foundation for the development of an institutional theory of technology that strengthens both technology and innovation research and institutional theory [19]. In addition, the accumulated tacit knowledge and culture of the entrepreneur are essential resources for the creation of wealth from research commercialization leading to technological innovation [9]. We posit that the development of a positive attitude toward new technologies is the starting point to initiate the entrepreneurial career as means to develop new technologies.

3 Method

We evaluate the model presented in Fig. 1 in a sample of students enrolled in the 2012–2013 academic year in the University of Valladolid (Spain). We collected information by means of a questionnaire during the period of February–March 2013. A total of 183 complete questionnaires were obtained. We focus on college students because this group contains the largest proportion of entrepreneurs in the European Union [3]. In fact, the European Union is particularly interested in promoting entrepreneurship and policies as evidenced by the discussion of the Programme for the Competitiveness of Enterprises and SMEs (COSME) 2014–2020.

We use the Entrepreneurial Intention Questionnaire (EIQ) designed by [14] to measure the variables. Whenever possible, items are built as 7-point Likert-type scales. The exceptions to this norm are gender, social class, and entrepreneurial traditional in the family, which are dummy variables. The questionnaire is available from the authors on request.

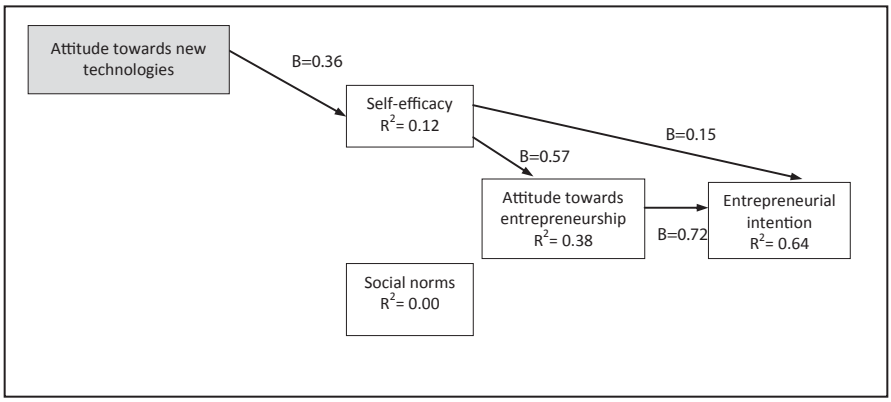

Fig. 2 Model of the planned behavior theory considering the impact of new technologies on entrepreneurial intention

We use a structural equation modeling analysis to test the research hypothesis. Between the two alternative structural equation modeling approaches, we select partial least squares mainly because our variables are not normally distributed and because of the formative nature of some of the measures used in this research. Our model includes both latent (measured with reflective indicators) and emergent (formative) constructs.

4 Results

Figures 2 and 3 summarize the results of the partial least squares analysis performed to test two structural models.

In particular, Fig. 2 shows the results of a model that includes favorable attitude toward new technologies. Figure 3 presents the same model but includes the additional antecedents emphasized by the literature. Specifically, the figures show the standardized path coefficients (B) with the values of the R^2s of the dependent variables. Because traditional parametric tests are inappropriate when no assumption is made about the distribution of the observed variables, we determine the level of statistical significance of the coefficients of both the measurement and the structural models through a bootstrap resampling procedure (500 subsamples were randomly generated).

The estimation of the first model (Fig. 2) shows that a positive attitude toward new technologies favors the feeling of self-efficacy (B = 0.36). Those last variables has an effect on the attitude toward entrepreneurship (B = 0.57) and on the entrepreneurial intention (B = 0.15).

The first model (Fig. 2) does not include the variables that the literature considers to have an effect on entrepreneurial intention. However, when we include those variables in the model (Fig. 3), the positive attitude toward new technologies re-

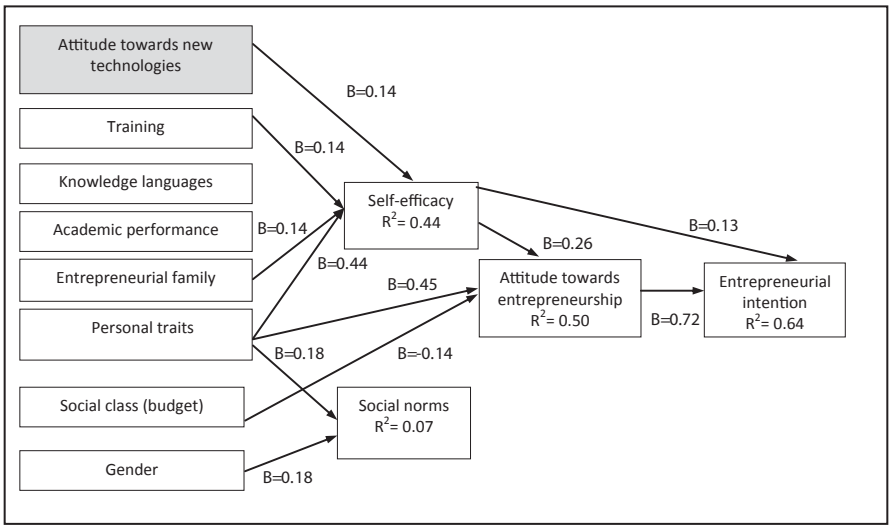

Fig. 3 Model of the planned behavior theory considering the impact of new technologies and other antecedents on entrepreneurial intention

main significant and positive (B = 0.14) along with the effects on the attitude toward entrepreneurship (B = 0.26) and on the entrepreneurial intention (B = 0.13). This attitude of the students is important in the entrepreneurial intention, even though some of its effect is captured by the students' personal traits as we observe in the reduction of the size of the coefficient from the first model (B = 0.36) to the second model (B = 0.14). Consequently, we claim that the attitude toward new technologies may help to identify those students with a higher entrepreneurial intention. Our objective is therefore accomplished.

Other interesting results from the analysis are related to the variables of the planned behavioral theory. In fact, attitude toward entrepreneurship is positively related to entrepreneurial intention (B = 0.72). In addition, self-efficacy has a positive effect on entrepreneurial intention (B = 0.15) that is smaller than the effect of attitude. This result means that students with higher capabilities to create and sustain a firm over time have a higher entrepreneurial intention. This relation may be independent of the attitude toward entrepreneurship. One possible explanation for these results may be that some students consider being entrepreneur as an alternative to find a job in the marketplace. Finally, social norms do have not a significant effect on entrepreneurial intention. The personal traits of students contribute to creating social norms (B = 0.18), such as risk aversion or searching for opportunities. However, this effect is not persistent on the relation between social norms and entrepreneurial intention. Therefore, the intention to be entrepreneur is not related to the way that the students' environment considers the entrepreneurial activity. This result is consistent with previous literature; that is, variables of the planned behavioral theory have an effect on entrepreneurial intention, even though our data do not show a strong effect of the social norms.

The variable personal traits has the broadest and largest effects on the planned behavior theory variables. In fact, outgoing, risk-taking, leader, optimistic students have higher attitude toward entrepreneurship (B = 0.45), live in an entrepreneurial environment (B = 0.18), and are self-confident about being entrepreneur (B = 0.44). Both the variables training (B = 0.14) and family business tradition (B = 0.14) have an impact on self-efficacy. In fact, the planned behavior theory variable self-efficacy is more influenced than the other two variables (social norms and attitude towards entrepreneurship) by students' individual features. Gender is significant on social norms, meaning that being women is positively related to the perception that those students have about the entrepreneurial environment (B = 0.18). That is, women feel that the environment in which they live is more entrepreneurial oriented. Finally, social class has a small effect on attitude toward entrepreneurship (B = 0.14).

5 Conclusion

Attitude and perception about new technologies have been considered in different streams of research (e.g., agricultural technology implementation, e-banking; technology adoption). The results of the empirical literature show that when new using or adopting a new technology individuals are driven by their attitudes toward this technology.

We find a similar pattern in university students; their intentions to be entrepreneur are driven by their attitude toward new technologies. For instance, they consider themselves to be on the cutting edge of innovation or experts in new technologies. This relationship between attitudes and technology is important for our understanding of the drivers of entrepreneurial intention and for designing specific training programs to promote this intention in students at the university level [7].

Our empirical model, which is based on the theory of planned behavior, provides a valid explanation for entrepreneurial intentions. Our results are robust to previous literature [1, 10, 12,]. That is, previous teaching practices that have been applied in universities based on this theoretical approach can be still used to promote entrepreneurial intentions.

Our study may be extended by adding other factors, such as the social networks in which students participate and to which they contribute. In fact, social networks are considered a powerful tool to create, disseminate, articulate, and exploit knowledge. Recently, some networks are being used to promote the creation of new ventures [8]. The inclusion of social network variables may be of interest to promote entrepreneurial intentions in students at the university level.

References

1. Azjen I (1991) Theory of planned behavior. Organ Behav Hum Decis Processes 50(2): 179–211
2. Azjen I (2011) The theory of planned behaviour: reactions and reflections. Psychol Health 26(9):1113–1127
3. Centre for Enterprise and Economic Development Research (2000) Young entrepreneurs, women entrepreneurs, co-entrepreneurs and ethnic minority entrepreneurs in the European Union and Central and Eastern Europe. Final Report to the European Commission, DG Enterprise, Middlesex University Business School, UK
4. Choy CS, Kuppusamy J, Jusoh M (2005) Entrepreneurial careers among business graduates: match-making using theory of planned behavior. Int J Entrep 9:67–90
5. Cunningham JB, Lischeron J (1991) Defining entrepreneurship. J Small Bus Manage 29(1):45–61
6. Engle LE, Dimitriadi N, Gavidia JV, Schlaegel C, Delanoe S, Alvarado I et al (2010) Entrepreneurial intent. Int J Entrep Behav Res 16(1):35–57
7. Fayolle A, Gailly B, Lassas-Clerc N (2006) Assessing the impact of entrepreneurship education programmes: a new methodology. J Eur Ind Train 30(9):701–720
8. Field JA, Elbert DJ, Moser SB (2012) The use of social media in building interest in wellness on a college campus. Am J Bus Educ 5(5):515–524
9. Hindle K, Yencken J (2004) Public research commercialisation, entrepreneurship and new technology based firms: an integrated model. Technovation 24(10):793–2003
10. Kautonena T, Van Gelderenb M Tornikoskic ET (2013) Predicting entrepreneurial behaviour: a test of the theory of planned behaviour. Appl Econ 45(6):697–707
11. Kor YY, Mahoney JT, Michael SC (2007) Resources, capabilities and entrepreneurial perceptions. J Manage Stud 44(7):1187–1212
12. Krueger NF Jr, Carsrud AL (1993) Entrepreneurial intentions: applying the theory of planned behaviour. Entrepreneurship theory and practice. Entrep Reg Dev 5(4):315–330
13. Li W (2007) Ethnic entrepreneurship: studying Chinese and Indian students in the United States. J Dev Entrep 12(4):449–466
14. Liñan F, Chen YW (2009) Development and cross-functional application of a specific instrument to measure entrepreneurial intentions. Entrep Theory Pract 33(3):593–617
15. Liñán F, Rodríguez-Cohard JC, Rueda JM (2011) Factors affecting entrepreneurial intention levels: a role for education. Int Entrep Manage J 7(2):195–218
16. Martin N, Rodríguez AI, Hernangomez J, Saboia F (2009) The effect of entrepreneurship education programmes on satisfaction with innovation behaviour and performance. J Eur Ind Train 33(3):198–214
17. Matthews CH, Moser SB (1996) A longitudinal investigation of the impact of family background and gender on interest in small firm ownership. J Small Bus Manage 34(2):29–43
18. Minniti M, Nardone C (2007) Being in someone else's shoes: the role of gender in nascent entrepreneurship. Small Bus Econ 28(2–3):223–238
19. Munir KA, Phillips N (2005/1684) The birth of the 'Kodak moment': institutional entrepreneurship and the adoption of new technologies. Organ Stud 26(11):1665–1687
20. Rauch A, Frese M (2007) Let's put the person back into entrepreneurship research: a meta-analysis of the relationship between business owners' personality characteristics and business creation and success. Eur J Work Organ Psychol 16(4):353–385
21. Tushman ML, Anderson P (1986) Technological discontinuities and organizational environments. Adm Sci Q 31(3):439–465
22. Utterback JM (1994) Mastering the dynamics of innovation: how companies can seize opportunities in the face of technological change. Harvard Business School, Boston
23. Veciana JM, Aponte M, Urbano D (2005) University students' attitudes towards entrepreneurship: a two countries comparison. Int Entrep Manage J 1(2):165–182