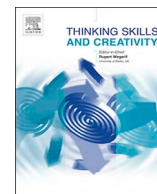


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A psychosocial study of self-perceived creativity and entrepreneurial intentions in a sample of university students

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ABSTRACT

Creativity is a commonly assumed characteristic of entrepreneurs. It is proposed to be a necessary, although not sufficient, prerequisite for entrepreneurship. This study aimed to deepen our understanding of the relationship between self-perceived creativity and entrepreneurial intentions. To do so, we conducted a cross-sectional survey study among 559 university students. We tested an expanded model based on the theory of planned behaviour (TPB), which included self-perceived creativity as a distal antecedent of entrepreneurial intentions. In addition, we examined both the role of perceived family and university support for creativity, as well as taking a creativity course, in boosting self-perceived creativity. While some empirical evidence has indicated a direct link between (perceived) creativity and entrepreneurial intentions, the TPB posits that three antecedents (attitudes, subjective norms and perceived behavioural control/self-efficacy) would be the only direct determinants of intentions. All other factors are theorized to indirectly influence intentions through one or more of these components. The results of partial least squares structural modelling refuted this assumption. Entrepreneurial self-efficacy and positive attitudes did indeed mediate the self-perceived creativity – entrepreneurial intentions link, but self-perceived creativity explained additional variance in entrepreneurial intentions, beyond these TPB components. In addition, our results showed that family and university support for creativity, as well as taking a creativity course, were significant predictors of self-perceived creativity. Postgraduate students, and particularly male students, perceived greater university and family support and reported greater self-perceived creativity than did undergraduate students. We conclude that teaching creativity contents and practice are a useful way to enrich entrepreneurship programmes.

1. Introduction

Entrepreneurship has a recognized impact on economic growth, innovation and employment (Acs, Audretsch, Braunerhjelm, & Carlsson, 2012; Carree & Thurik, 2010). Therefore, different institutions are involved in boosting entrepreneurial intentions and career choice (for instance, European Commission, 2013). In fact, the European Union has even proposed entrepreneurship as one of the key competences for lifelong learning (European Commission/EACEA/ Eurydice, 2016). Despite these considerations, early-stage entrepreneurial activity in Europe is at the lowest average regional rate compared to North America (8.1 vs. 16.2, respectively, in 2017/2018) and has decreased in countries such as France and the United Kingdom (Singer, Herrington, & Menipaz, 2018).

Abbreviations: PLS, partial least squares technique; TPB, theory of planned behaviour

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Moreover, while the number of entrepreneurship programmes has increased, questions remain as to which aspects of these programmes are most effective. Contrary to the expectations, some studies conclude that students' intentions to become entrepreneurs do not improve and may even decrease after attending entrepreneurship educational programmes (Fayolle, Gailly, & Lassas-Clerc, 2006; Nabi, Walmsley, Liñán, Akhtar, & Neame, 2016; von Graevenitz, Harhoff, & Weber, 2010). In a meta-analytic review of 73 studies, Bae, Qian, Miao, and Fiet, (2014) observed a significant, although small, correlation between entrepreneurship education and post-education entrepreneurial intentions. However, this relationship disappeared after controlling for pre-education entrepreneurial intentions. Different factors have been proposed to explain this phenomenon. For instance, it was suggested that students may gain more realistic perspectives on starting one's own firm, which may actually be beneficial. Nevertheless, studies unravelling possible key elements of educational programmes, which have the potential to boost entrepreneurial intentions, remain relevant.

The current study focuses on the role of self-perceived creativity as an antecedent of entrepreneurial intentions. Depending on the educational paradigm, educational approaches to teaching entrepreneurial competences vary in the extent to which they pay attention to the role of creativity and innovation (Edwards-Schachter, García-Granero, Sánchez-Barrioluengo, Quesada-Pineda, & Amara, 2015). The basic assumption behind including creativity related content is that entrepreneurs are considered creative individuals who generate a great deal of potentially valuable ideas (Baron, 1998). They must be capable of creatively interpreting their environment in order to identify opportunities related to their area of expertise (DeTienne & Chandler, 2004). Moreover, on many occasions, opportunities emerge because they are created by an entrepreneur (Read, Song, & Smit, 2009). According to the European Commission (2006), "Entrepreneurship refers to an individual's ability to turn ideas into action. It includes creativity, innovation and risk taking, as well as the ability to plan and manage projects in order to achieve objectives" (p. 4). We assert that if students function in an educational environment that emphasizes creativity as an important prerequisite for entrepreneurship and if they believe in their own creative potential, entrepreneurship would become more attractive as a career option for them. For example, students might become more confident they will make a good entrepreneur or because they perceive they fit the entrepreneur stereotype.

Notwithstanding previous theoretical acknowledgement, empirical studies that analyse the link between education aimed at fostering creativity, self-perceived creativity and choosing an entrepreneurial career are still scarce, although there are some exceptions (Hamidi, Wennberg, & Berglund, 2008; Smith, Sardeshmukh, & Combs, 2016; Zampetakis & Moustakis, 2006; Zampetakis, 2008; Zampetakis, Gotsi, Andriopoulos, & Moustakis, 2011). Some mechanisms explaining positive links have been proposed, such as the role of creativity in opportunity recognition and implementation (i.e., creative individuals may be more likely to recognise, create and implement new ideas to start a business). Our study aims to expand this line of research. Building on the theory of planned behaviour (TPB; Ajzen, 1991), we posit that other mechanisms may also play a role. The TPB, widely applied for predicting different types of behavioural intentions in diverse areas (Armitage & Conner, 2001), constitutes the most frequently used model in the study of entrepreneurial intentions (Liñán & Fayolle, 2015; Lortie & Castogiovanni, 2015; Schlaegel & Koenig, 2014). While other authors have investigated direct links between students' creativity and entrepreneurial intentions, the TPB posits a sufficiency hypothesis, according to which three antecedents (attitudes, subjective norms and perceived behavioural control) would be the most relevant determinants of entrepreneurial intentions. Other factors are theorised to only indirectly influence entrepreneurial intentions through one or more of these elements (Ajzen, 2011). The inclusion of self-perceived creativity as a distal antecedent in the TPB model may benefit from drawing on this framework, because it helps identify possible explanatory mechanisms. On the other hand, in challenging the sufficiency hypothesis of the TPB, this study may lead to an extended model including self-perceived creativity, which could better predict entrepreneurial intentions.

The purpose of the present study is twofold. First, relationships between possible antecedents of students' creativity (university and family support for creativity, and following creativity courses) and self-perceived creativity were explored. Second, drawing on the TPB, relationships were examined between self-perceived creativity and entrepreneurial intentions, both directly and as mediated by attitudes towards entrepreneurship, subjective norms and entrepreneurial self-efficacy. The model was tested in a group of university students. Samples of university students are commonly used to study entrepreneurial intentions (Autio, Keeley, Klofsten, Parker, & Hay, 2001; Krueger, Reilly, & Carsrud, 2000), since it is a phenomenon that must be studied before it occurs. Additionally, the number of years of education has been proven to be positively related to business performance (van der Sluis, van Praag, & Vijverberg, 2008); thus, more highly educated professionals who start businesses constitute a particularly interesting population to consider. Showing that self-perceived creativity is an important antecedent of entrepreneurial intentions has implications for designing adequate entrepreneurship education programmes.

2. Theoretical background

2.1. Self-perceived creativity and entrepreneurial intentions

In the present study, self-perceived creativity is defined as the self-perceived "creative capacity, skills and abilities that the individual possesses (Hinton, 1968, 1970)" (cited in DiLiello & Houghton, 2008, p. 39), which refers to the extent to which students perceive that they can produce new and useful ideas (Zhou, Shin, Cannella, & Albert, 2008). Entrepreneurs are usually described as creative people, and creativity is deemed a main characteristic of entrepreneurship (Athayde, 2009; Dimov, 2007; Gielnik, Krämer, Kappel, & Frese, 2014; Radu & Redien-Collot, 2008; Rauch & Frese, 2007; Ward, 2004; Zhao, Seibert, & Lumpkin, 2010). Creativity also forms part of the entrepreneurial stereotype (Gupta & Fernández, 2009; Gupta, Goktan, & Gunay, 2014; Hancock, Pérez-Quintana, & Hormiga, 2014; Orser, Elliott, & Leck, 2011). Indeed, students consider creativity to be strongly related to

entrepreneurship (Edwards-Schachter et al., 2015; Nabi et al., 2016), and drawing on the “careers anchors” typology, Feldman and Bolino (2000) have linked creativity to self-employment motivation, arguing that individuals with high perceived creativity are likely to be drawn to an entrepreneurial career option. Combining these different lines of research, we argue that students’ self-perceived creativity will be relevant for considering entrepreneurship as a career option. High self-perceptions of creativity will fit with students’ ideas of good entrepreneurs and render entrepreneurship to be an attractive and feasible option. If students evaluate themselves as not very creative, they may exclude entrepreneurship as a viable career option, because they perceive a lack of fit between their own characteristics and the entrepreneurial profile.

The few empirical studies on this topic thus far have supported the premise that if students believe they are more creative, their intentions to become entrepreneurs are higher. Zampetakis and Moustakis (2006) found that university students with higher self-perceived creativity reported higher entrepreneurial intentions. These results have been further supported by Zampetakis (2008) and Zampetakis et al. (2011), using different scales of self-perceived creativity. In two studies (Smith et al., 2016), creative output, measured as the number of ideas in a scenario task (Study 1) and using the Runco Ideational Behavior Scale –RIBS– (Study 2), showed a positive effect on entrepreneurial intentions. Based on this literature, we formulate the following hypothesis:

Hypothesis 1. Self-perceived creativity positively relates to entrepreneurial intentions.

In research on creativity, the environment is a key element (Hennessey & Amabile, 2010). In work contexts, there is evidence for a positive link between creativity and emotional, informational and organizational support for creativity (Madjar, 2008; Zhou & George, 2001). There is also a relationship between family and friends’ support and creativity in work contexts (Madjar, 2008). In the university context, Zampetakis et al. (2011) analysed the influence of family and university support for creativity on a higher self-perceived creativity. Moreover, they found that self-perceived creativity in turn predicted entrepreneurial intentions. Contrary to their hypotheses, though, no significant relationships were found for university support. To attest the generalizability of these earlier findings, we start by testing similar relationships but in a completely different cultural context (Spain rather than England) and with a sample of more diverse university students (we included undergraduate, master and pre-doctoral students, whereas Zampetakis and colleagues only included undergraduate students). These aspects guide the following hypotheses:

Hypothesis 2a. Family support for creativity relates positively to entrepreneurial intentions through increased self-perceived creativity.

Hypothesis 2b. University support for creativity relates positively to entrepreneurial intentions through increased self-perceived creativity.

2.2. The role of the theory of planned behaviour

Entrepreneurial intentions are the most commonly studied antecedent of new venture creation. Intentions are the best predictor of any type of planned behaviour, “particularly when that behaviour is rare, hard to observe, or involves unpredictable time lags” (Krueger et al., 2000, p. 411). The TPB (Ajzen, 1991; 2011) has been widely used to study entrepreneurial intentions. This theory posits that behavioural intentions depend on the influence of three components: (a) attitudes towards the behaviour, (b) subjective norms, and (c) perceived behavioural control. Each of these components can have different weights, their importance varying across behaviours and situations (Ajzen, 1991). With respect to entrepreneurial intentions, the influence of each element varies across studies (Autio et al., 2001; Engle et al., 2010; Krueger et al., 2000; Moriano, Gorgievski, Laguna, Stephan, & Zarafshani, 2012).

The attitudes of a person comprise the strength of each belief they hold, combined multiplicatively with their subjective value. Each belief associates the behaviour in question with certain outcomes or other attributes, for instance the cost of performing that behaviour (Ajzen, 1991). In this vein, favourable attitudes are developed towards behaviours with desirable consequences, and unfavourable attitudes arise towards behaviours with undesirable consequences. Thus, two people can believe with the same strength that becoming an entrepreneur would mean being their own boss. Still, one person may highly value this independence, while it may be undesirable for the other.

Subjective norms include such elements as family expectations about the desirability of becoming a lawyer, doctor or entrepreneur (Krueger et al., 2000). More generally, normative beliefs refer to the likelihood of important referent individuals or groups approving or disapproving of a behaviour (Ajzen, 1991). In the case of entrepreneurship, normative beliefs would relate to the perceived social pressure to create or not create a new venture. Subjective norms are proportional to the sum of the weights of each normative belief, multiplied by the individual motivation to meet each referent’s expectations. The more positive the subjective norms, the higher the intention to become an entrepreneur.

Control beliefs refer to the presence or absence of resources and opportunities that determine either the behavioural intention or the behaviour itself (Ajzen, 1991). Control beliefs address the capacity to succeed in certain behaviours and may be based on people’s own experience and/or vicarious information (from acquaintances and friends), as well other factors that increase or reduce the perceived difficulty of performing the behaviour. As a result, perceived control over the behaviour will increase with the higher perceived availability of resources and opportunities and fewer obstacles or impediments. Perceived behavioural control combines aspects related to beliefs of controllability and self-efficacy (Ajzen, 2002). Several scholars have suggested self-efficacy would be a better construct to include in the model. Based on their meta-analytic review, Armitage and Conner (2001) concluded the construct of self-efficacy is more clearly defined and operationalised and they found self-efficacy explained higher variance in intention than the concept of perceived behavioural control. In addition, entrepreneurial self-efficacy has been found to relate to both entrepreneurial

and intrapreneurial intentions (Douglas & Fitzsimmons, 2013). Thus, following previous research on entrepreneurial intentions (Engle et al., 2010; Krueger et al., 2000; Moriano et al., 2012) entrepreneurial self-efficacy is the variable measured in the present study.

According to the TPB, attitudes towards a behaviour, subjective norms and self-efficacy contain the most substantive information about the determinants of a behaviour, whereas other background factors, such as personality and broad life values, demographic variables (education, age, gender, income, etc.), and exposure to media and other sources of information may indirectly influence entrepreneurial intentions through one or more of these components (Ajzen, 2011). Therefore, self-perceived creativity is expected to relate indirectly to entrepreneurial intentions, through attitudes towards entrepreneurship, subjective norms and entrepreneurial self-efficacy.

First, self-perceived creativity is expected to link to positive attitudes towards entrepreneurship, because these attitudes include the expectations that an entrepreneurial career would offer opportunities to express creative potential. Examples are opportunities for being able “to create something” and “to take advantage of your creative needs” (Kolvereid, 1996), facing new challenges and being creative and innovative (Moriano, 2005) and being able to use one’s creativity (Kautonen, van Gelderen, & Tornikoski, 2013). Creative students can be expected to value such opportunities more than students who perceive themselves as being less creative. A specific objective of an entrepreneurial learning experience developed by Toledano and Urbano (2008) was to stimulate positive attitudes associated with entrepreneurship, which included imagination and creativity alongside effective problem-solving, autonomy and responsibility. Training creativity has also been shown to positively affect attitudes towards risk-taking (Perry & Karpova, 2017). Negative attitudes towards the risks related to starting one’s own business may relate to lower entrepreneurial intentions. Therefore, we hypothesise that:

Hypothesis 3a. The positive relationship between self-perceived creativity and entrepreneurial intentions will be mediated by more positive attitudes towards entrepreneurship.

Second, cultural norms and practices of the environment surrounding a person influence the development and expression of creativity (Mockros & Csikszentmihalyi, 2014). In addition, creativity training in the context of an entrepreneurship course can be expected to communicate subjective norms towards becoming an entrepreneur. Students will likely perceive that important referent others (parents, teachers and friends) have higher expectations for the more creative students and peers as future entrepreneurs. Students’ perceptions of their own creativity can interact with these perceptions to form normative beliefs. In a congruent scenario, students who perceive themselves as being creative may be more motivated to meet the expectations of important others, which would mean they perceive a higher social norm to become an entrepreneur. In cases where students perceive themselves to be less creative, the scenario is incongruent, which would lead them to avoid referents’ high expectations. They may either feel that important other people do not expect them to become entrepreneurs, or they might find their positive opinion less relevant. Hence, we hypothesise that:

Hypothesis 3b. The positive relationship between self-perceived creativity and entrepreneurial intentions will be mediated by subjective norms.

Third, self-rated creativity can also be considered an antecedent of entrepreneurial self-efficacy (Phipps & Prieto, 2015; van Gelderen et al., 2008). Entrepreneurial self-efficacy means being confident that one can successfully perform entrepreneurial tasks. These tasks include identifying new business opportunities, creating new products, commercialising ideas or new developments, solving problems, managing money, gaining agreement from people, being a leader and making decisions (Moriano, 2005; Wilson, Kickul, & Marlino, 2007). Many of these tasks relate to creativity, and possessing this skill could influence motivational factors by enhancing the perceived level of ease in pursuing this career option. Students may view entrepreneurial behaviour as easier if they are more creative, and consequently, they may report greater entrepreneurial self-efficacy. If students do not recognise their own creativity, they may be less confident that they could successfully perform such tasks and perceive an entrepreneurial career as less feasible.

Hypothesis 3c. The positive relationship between self-perceived creativity and entrepreneurial intentions will be mediated by entrepreneurial self-efficacy.

2.3. Exploring the role of education level and gender

One of the strengths of our study is the inclusion of a more diverse sample of university students as compared to previous research on the creativity related variables and entrepreneurial intentions (e.g., Zampetakis et al., 2011). This enables for further exploring possible differences in the perceptions of creativity variables across education level and other demographic characteristics, such as gender.

To the best of our knowledge, previous research has not made such comparisons between undergraduate and postgraduate students. In analogy with research on the acquisition of managerial ability (see van der Sluis et al., 2008), one might arguably expect that postgraduate students may have acquired more creative skills, which in turn would increase the likelihood of entrepreneurship. However, a review of the literature reveals that entrepreneurship education may be insufficiently aimed at enhancing creative skills (Edwards-Schachter et al., 2015). As regards university and family support for creativity, no previous research has examined the role of undergraduate vs. postgraduate education. We therefore apply an exploratory approach and formulate the following research questions:

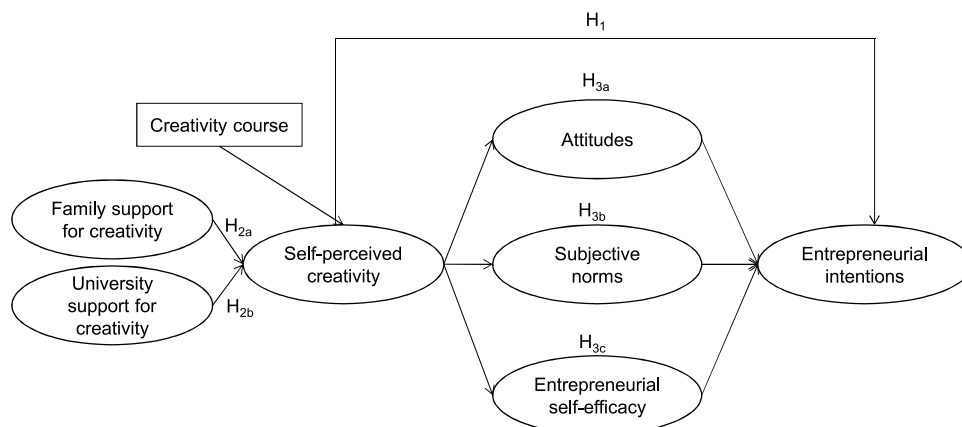


Fig. 1. Theoretical model and hypotheses.

Research question 1: Do undergraduate and postgraduate students differ in their self-perceived creativity (RQ1a), perceived university support for creativity (RQ1b) and perceived family support for creativity (RQ1c)?

Research question 2: Do undergraduate and postgraduate students differ in their self-reported entrepreneurial intentions?

Another relevant variable to consider in entrepreneurship research is gender. The number of female entrepreneurs keeps lagging behind the number of male entrepreneurs in most countries for both early stage entrepreneurial participation and established business ownership (Singer et al., 2018). Several studies have also found that females tend to report lower intentions to become an entrepreneur than males (Gupta, Turban, & Bhawe, 2008; Haus, Steinmetz, Isidor, & Kabst, 2013; Maes, Leroy, & Sels, 2014; Moriano, 2005; Sieger, Fueglistaller, & Zellweger, 2016), while others do not find significant differences (e.g., Gupta, Turban, Wasti, & Sikdar, 2009). In addition, men generally report significantly higher creativity perceptions than women (Phipps & Prieto, 2015). Indeed, creativity is more strongly associated with stereotypically masculine characteristics than with stereotypically feminine characteristics (Proudfoot, Kay, & Koval, 2015). With respect to university and family support for creativity, previous literature has not focused on the role of gender. We therefore propose the following research questions:

Research question 3: Do female and male students differ in their self-perceived creativity (RQ3a), perceived university support for creativity (RQ3b) and perceived family support for creativity (RQ3c)?

Research question 4: Do female and male students differ in their self-reported entrepreneurial intentions?

Fig. 1 illustrates the theoretical model guiding this study and research hypotheses. Drawing on previous studies on entrepreneurial intentions, we consider some control variables (Liñán & Chen, 2009). In addition, attending a creativity course is expected to have an influence on self-perceived creativity.

3. Methods

3.1. Participants and procedures

A total of 559 university students from Spain took part in this study (58.5% female; 41.5% male). The average age was 24.4 years ($SD = 4.2$). This sample consisted of 88.7% undergraduate students, 10.2% master's students, and 1.1% pre-doctoral students. The most representative areas of study (undergraduate and postgraduate students) were: Engineering and Architecture (27.3%), Psychology (24.4%), Law (11.9%) and Economics and Business Administration (11.6%).

Almost half of the participants (49.4%) indicated they had at least one relative who was an entrepreneur, specifically: 15.2% father, 4.3% mother, 2.9% both parents, 24.3% other relatives (usually uncles/aunts) and 2.7% a combination of two or more of the previous options. Up to 30.1% of participants claimed having attended a course about how to create a firm or what it means to be an entrepreneur, with a course duration of between 1 and 200 h ($M = 14.5$, $SD = 30.1$). Only 16.6% of participants claimed having attended a course about creativity and techniques to foster it, with a course duration of between 1 and 120 h ($M = 12.1$, $SD = 19.6$). These courses were usually taught at their university, 73.4% of these courses pertained to entrepreneurship and 68.8% involved creativity. Of the participants, 20.8% reported having experience in developing a business plan, 5.2% had experience in creating a firm and 46.5% had work experience ($M = 4.3$ years, $SD = 4.3$). For 12.7% of participants, that work experience lasted less than one year.

For the purposes of this study, a non-probabilistic convenience sampling procedure was used to recruit participants in person at different universities from March–May 2014. To obtain the data for this study, the participants completed a self-report questionnaire.

3.2. Measurements

All variables were measured with pre-existing scales, which were contextualised to the students' situation if necessary (see below). All scales had good composite and Cronbach's alpha reliabilities, ranging between 0.72 and 0.92 (see Table 1).

Table 1
Descriptive statistics and correlations of study and control variables.

	M	SD	ρ_c	α	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Criterion variable																			
1. Entrepreneurial intentions	3.64	1.56	.92	.88	.85														
TPB mediator variables																			
2. Attitudes	4.01	1.21	.83	.76	.41***														
3. Subjective norms	4.08	1.48	.89	.81	.27***	.40***													
4. Entrepreneur. self-efficacy	4.69	0.99	.89	.87	.42***	.53***	.33***												
Predictor variables																			
5. Self-perceived creativity	3.44	0.77	.88	.84	.35***	.26***	.13***	.41***	.78										
6. Family support for creativity	3.42	0.91	.84	.72	.19***	.15***	.24***	.26***	.26***	.80									
7. University support for creativity	3.05	0.85	.87	.83	.20***	.04	.08	.22***	.37***	.30***	.73								
8. Creativity course (0 = No)	0.17	0.37	-	-	.17***	.13***	.08*	.11*	.19***	.00	.11*	-							
Control variables																			
9. Gender (0 = Male)	0.58	0.49	-	-	-.10*	-.01	.04	-.16***	-.16***	-.03	-.06	-.04	-						
10. Age	24.4	4.22	-	-	.13**	.00	-.07	.08	.08	.02	.01	.05	-.06	-					
11. Business plan (0 = No)	0.21	0.41	-	-	.17***	.08	.08	.20***	.09*	.06	-.04	.16***	-.06	.14**	-				
12. Work experience	2.05	3.67	-	-	.10*	-.01	-.06	.08	.07	-.06	-.06	.08	-.02	.75***	.50***	-			
13. Former entrepreneur (0 = No)	0.05	0.22	-	-	.16***	-.08	-.11**	.05	.14***	.04	.03	.07	-.05	.25***	.18***	-.25***	-		
14. Family entrepreneur (0 = None)	0.49	0.50	-	-	.16***	.07	.11**	.13**	.13**	.12**	.01	.08	-.03	.09	.11**	.08	.12**	-	
15. Entrepreneurship course (0 = No)	0.30	0.46	-	-	.24***	.15***	.11**	.19***	.08	.07	.05	.22***	-.07	.08	.35***	.02	.01	.07	

Note: N = 559. Entrepreneurial intentions, attitudes, subjective norms and entrepreneurial self-efficacy were 7-point Likert scales (1–7), while self-perceived creativity and its support were 5-point Likert scales (1–5). \sqrt{AVE} estimates for reflective latent variables are presented on the diagonal (PLS measurement models).

ρ_c = composite reliability; α = Cronbach's alpha.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

Self-perceived creativity was measured with the subscale “creative potential” of the Creative Potential and Practiced Creativity scale (CPPC-17) developed by DiLiello and Houghton (2008) (adaptation in Spain by Boada-Grau, Sánchez-García, Prizmic-Kuzmica, & Vigil-Colet, 2014). Creative potential is defined as the creative capacity, skills and abilities that the individual possesses. An example item is: “I have confidence in my ability to solve problems creatively” ($1 = \text{Strongly disagree}$ to $5 = \text{Strongly agree}$). The subscale originally included six items, but the item “I have the talent and skills to do my work well” was excluded due to low factor loading both in the original scale, .33, and in the Spanish version, .47.

Perceived university support for creativity was measured with four items of the CPPC-17 and additional two items taken from Zampetakis et al. (2011). “My organization” (CPPC-17) was substituted with “my university”. An example item is: “In my university you learn to examine old problems in new ways” ($1 = \text{Strongly disagree}$ to $5 = \text{Strongly agree}$). Two of the six CPPC-17 items on organizational support were excluded, “Ideas are judged fairly in this organization” and “People are encouraged to take risks in this organization”, because they were less relevant for the student sample and difficult to adapt to the students’ environment.

Perceived family support for creativity was measured with three items taken from Zampetakis et al. (2011): “My family members are always thinking about new ideas for making their life easier”, “My family members easily adapt to several circumstances” and “I can freely talk to my family members about new ideas” ($1 = \text{Strongly disagree}$ to $5 = \text{Strongly agree}$).

The Entrepreneurial Intention Questionnaire (EIQ) was used to gauge intentions to become an entrepreneur as well as the three components of the TPB (attitudes, subjective norms and self-efficacy). The EIQ was developed in Spain by Moriano (2005) and has been validated in several other countries (Moriano et al., 2012).

Entrepreneurial intentions were assessed with a four-item scale measuring the perceived probability of different aspects about the creation of a firm, for instance, “With what probability do you anticipate creating your own business between now and in five years’ time?” ($1 = \text{Totally improbable}$ to $7 = \text{Totally probable}$).

Attitudes towards entrepreneurship. Attitudes depend not only on beliefs but also on the assessment of these beliefs. Thus, this scale comprises: (a) a set of six items about what creating a new company or becoming an entrepreneur would mean for the participant ($1 = \text{Totally improbable}$ to $7 = \text{Totally probable}$), for example, response options to “Creating a new company or becoming an entrepreneur would mean for you...” such as “facing new challenges” or “obtaining a high income”; and, (b) another set of six items about how desirable these aspects are for the participant ($1 = \text{Not desirable}$ to $7 = \text{Totally desirable}$), for example, response options to “Now, please indicate how desirable are they for you in your everyday life.” such as “facing new challenges” or “obtaining high incomes”. To calculate the overall score, the score on each item of the first set is combined in a multiplicative fashion with the corresponding item of the second set. This score is then divided by 7. High scores indicate a positive attitude towards entrepreneurship.

Subjective norms were measured with the following: (a) a set of three items about the extent to which the participant considers that other significant people (family, friends and colleagues) would agree if the participant decides to become an entrepreneur ($1 = \text{Not at all}$ to $7 = \text{Totally agree}$); and, (b) another set of three items about how the participant assesses the opinions of these significant people with respect to becoming an entrepreneur ($1 = \text{Not important}$ to $7 = \text{Very important}$). This denotes the motivation to comply with expectations of these referent groups. The score on each item of the first set is combined multiplicatively with the corresponding item of the second set, and the overall score is then divided by 7. The higher the global score, the more important the subjective norms.

Entrepreneurial self-efficacy was measured with nine items using a 7-point Likert response format ($1 = \text{Totally ineffective}$ to $7 = \text{Totally effective}$). Participants were asked “If you were to create your own business, to what degree would you be able to complete the following tasks effectively?”, followed by rating items such as “define your business idea and strategy of your company”, “complete the necessary and administrative and bureaucratic work to create your own business” or “develop relationships with key people who are connected to capital sources”.

Finally, socio-demographic background questions covering gender, age, major, work experience and entrepreneurial family models (“Does anyone in your family have their own company?” with response options of “my mother”, “my father”, “other relatives” or “no one”). A group of questions about attendance of entrepreneurship courses and/or creativity courses (if yes, participants indicated the duration and organiser), experience in preparing a business plan and/or experience in starting a firm were collected as well. These variables are operationalised as dichotomous variables: gender ($0 = \text{male}$, $1 = \text{female}$), course attendance, experience in preparing a business plan and/or experience in starting a firm and family role (for these cases, $0 = \text{no}$, $1 = \text{yes}$). Age and work experience were included in the models as continuous variables.

3.3. Data analysis

Data were analysed using SPSS 22 (descriptive statistics, correlations and univariate analysis of variance, ANOVA) and SmartPLS v3.0 software (Ringle, Wende, & Becker, 2015). Partial Least Squares Structural Equation Modelling (PLS-SEM) is a useful technique in cases where complex mediation models are being analysed with a large number of indicators and relationships (Hair, Hult, Ringle, & Sarstedt, 2017). This approach is recommended when the main objective is the exploration and development of new theories, rather than confirmation of previously proposed models. Furthermore, PLS-SEM is a non-parametric technique that allows for the incorporation of reflective and formative measurement models (Hair et al., 2017). Formative models cover the construct domain under study through the aggregation of different indicators, while indicators in reflective models are the effects of the construct. In the present research, the constructs of attitudes, subjective norms and self-efficacy were measured by means of formative indicator scales. In contrast, reflective indicator scales were used for gauging self-perceived creativity, support from family and university as well as entrepreneurial intentions.

We used the bootstrapping procedure and selected 5000 samples and pairwise deletion for missing data. All of the relationships between the reflective indicators and their constructs were significant ($p < 0.001$) and the outer loadings were above the

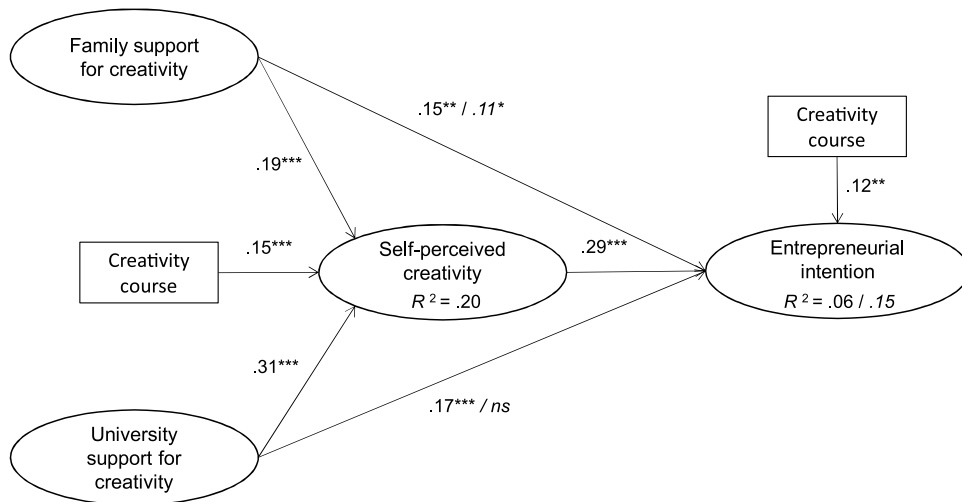


Fig. 2. Structural model: Support for creativity, self-perceived creativity and entrepreneurial intentions.

Note. Indirect effects are displayed in italics.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

recommended value of 0.60 (Hair et al., 2017)¹. Average Variance Extracted (AVE) values were on or above the critical threshold of 0.50, indicating good convergent validity. The AVE measures the amount of variance that is captured by the construct in relation to the amount of variance due to measurement error (Fornell & Larcker, 1981); thus, an AVE value greater than 0.50 indicates that the variance captured by the construct is larger than the variance due to measurement error. In order to assess the constructs' discriminant validity, we examined the indicators' cross loadings, we applied the Fornell and Larcker (1981) criterion, and we ascertained that all the Heterotrait-Monotrait (HTMT) ratios were below 0.85 (Hair et al., 2017). These three criteria coincided to indicate that the reflective measurement models exhibit discriminant validity. Table 1 provides the correlations between constructs, reliability scores and, on the diagonal, the AVE root square value of reflective constructs. Regarding multicollinearity, the maximum values of Variance Inflation Factors (VIF) stayed under the recommended value of 5.

4. Results

Table 1 shows mean scores, reliability scores and correlations between the variables. Participants scored relatively low on entrepreneurial intention ($M = 3.64$, $SD = 1.56$). Considering the self-perceived creativity scale, mean perceived support from family ($M = 3.42$, $SD = 0.91$) and the university ($M = 3.05$, $DT = 0.85$) were moderate. Students more often tended to perceive themselves as more than average creative rather than less than average ($M = 3.44$, $SD = 0.77$). With respect to components of the TPB, the highest mean score corresponded to entrepreneurial self-efficacy ($M = 4.69$, $SD = 0.99$).

Self-perceived creativity correlated strongly with the intention to become an entrepreneur ($r = 0.35$, $p < .001$), as well as with the variables of the TPB model (attitudes, subjective norms and self-efficacy). All variables related to creativity and support from the family or the university had a positive and significant correlation with entrepreneurial intentions. These results are all in line with our hypotheses.

With respect to control variables, all of the variables (gender, age, work experience, experience in creating a business plan or company and having a relative who is an entrepreneur) related significantly to the intention to become an entrepreneur. The correlation between intentions and attendance of a creativity course was 0.17 ($p < .001$) while the correlation with attendance of a course on entrepreneurship was slightly higher ($r = 0.24$, $p < .001$).

We followed a step-by-step analysis of the structural model to test our hypotheses. First, we only focused on the relationships between self-perceived creativity (and support for creativity) and entrepreneurial intentions (hypotheses H_1 , H_{2a} and H_{2b}). Second, we introduced the three components of the TPB (attitudes, subjective norms and self-efficacy) as mediators and assessed the full model (H_{3a} , H_{3b} and H_{3c}).

Fig. 2 depicts the influence of the psychosocial variables of support for creativity (from the family and the university) on entrepreneurial intentions, both directly and mediated by self-perceived creativity. Attendance of a course on creativity was introduced as a control variable. The results of this first model showed that although the family and university support had a significant influence on the intention to become an entrepreneur, this direct model only explained 6.4% of the variance of entrepreneurial intentions. The introduction of self-perceived creativity as a mediating variable increased the explained variance to 15%.

¹ Regarding formative indicators, weights of items "Creating new jobs for other people", "Obtaining high incomes" and "Taking calculated risks" (attitudes), as well as "Complete the necessary and administrative and bureaucratic work to create your own business" (entrepreneurial self-efficacy), were not significant and their loadings did not achieve the minimum cut-off value of 0.50. However, we kept them based on theoretical grounds and that analysing the data without these items did not change the results significantly (Hair et al., 2017).

Table 2
Self-perceived creativity and entrepreneurial intentions: Total, direct and indirect effects.

	Total	Direct effect	Indirect effect (through self-perceived creativity)	VAF
H _{2a} : Family support → Intentions	.16**	.11*	.05***	.34
H _{2b} : University support → Intentions	.14**	.05	.09***	.65

Note: VAF = variance accounted for value.

- * $p < 0.05$.
- ** $p < 0.01$.
- *** $p < 0.001$.

Table 2 illustrates the significance of the total, direct and indirect effects. Self-perceived creativity mediated the university support and entrepreneurial intentions relationship, as well as partially mediated the family support and entrepreneurial intentions relationship.

In the second model (Fig. 3), we introduced the three antecedents of the TPB as mediators: attitudes, subjective norms and self-efficacy, in addition to the control variables. All of the coefficients of latent variables were significant, supporting the hypotheses formulated. However, the coefficient of determination of subjective norms ($R^2 = 0.02$) did not achieve a minimum value of 0.10 (Falk & Miller, 1992). The other coefficients of determination presented low to moderate values ($R^2 = 0.12$ for attitudes, and $R^2 = 0.20$ for self-efficacy), underpinning the predictive validity of this model. Regarding control variables, only having experience in creating a business and attending an entrepreneurship course were significant. This global model explained 32.9% of the variance of entrepreneurial intentions.

We calculated the pseudo t -value and confidence intervals (Nitzl, Roldán, & Cepeda, 2016) to analyse the significance of the total, direct and indirect effects (Table 3). Attitudes and self-efficacy mediated the self-perceived creativity to entrepreneurial intentions relationship. However, subjective norms did not appear to be significant in this model.

To answer the research questions, we conducted four 2×2 ANOVAs (education level: undergraduate vs. postgraduate students x participants' gender: female vs. male) on the following variables: self-perceived creativity, university and family support for creativity and entrepreneurial intentions. Table 4 depicts means and standard deviations of the study variables for undergraduate vs. postgraduate students.

As for self-perceived creativity (RQ 1a and 3a), results revealed a main effect of gender, $F(1, 555) = 5.157, p = .024, \eta_p^2 = .01$, such that male participants ($M = 3.58, SD = 0.74$) showed greater self-perceived creativity than did female participants ($M = 3.34, SD = 0.78$), as well as a main effect of education level, $F(1, 555) = 3.894, p = .049, \eta_p^2 = .01$, such that postgraduate participants ($M = 3.61, SD = 0.76$) reported greater self-perceived creativity than did undergraduate students ($M = 3.41, SD = 0.77$).

Regarding university support for creativity (RQ 1b and 3b), results yielded a main effect of education level, $F(1, 555) = 3.957, p = .047, \eta_p^2 = .01$, such that postgraduate participants ($M = 3.22, SD = 0.82$) perceived greater university support than did undergraduate students ($M = 3.03, SD = 0.86$).

With reference to family support for creativity (RQ 1c and 3c), results revealed a main effect of gender, $F(1, 555) = 4.665, p = .031, \eta_p^2 = .01$, such that male participants ($M = 3.46, SD = 0.87$) perceived greater family support than did female participants ($M = 3.40, SD = 0.93$), as well as a significant education level x participants' gender interaction effect, $F(1, 555) = 4.564, p = .033, \eta_p^2 = .01$, such that postgraduate male participants perceived greater family support ($M = 3.86, SD = 1.12$) than did undergraduate male participants ($M = 3.41, SD = 0.83, p = .027$). Nevertheless, there were no differences for undergraduate or postgraduate female participants ($p = .53$).

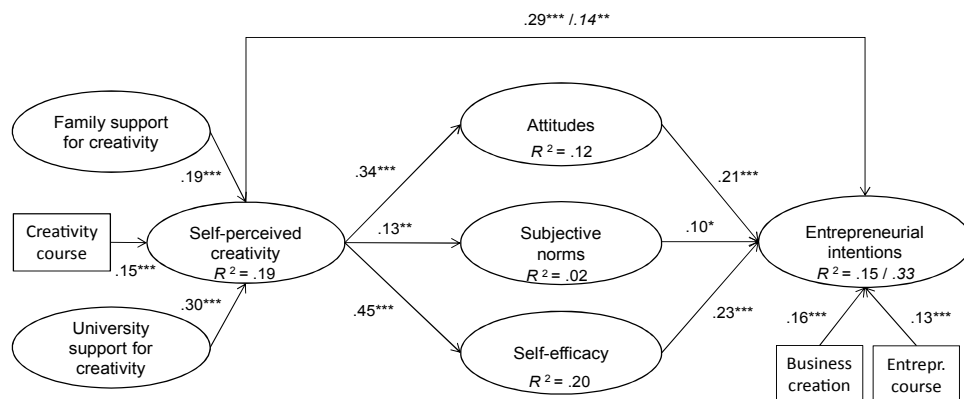


Fig. 3. Structural model: Self-perceived creativity and entrepreneurial intentions (TPB).

Note. Non-significant paths regarding control variables have been omitted. Indirect effect is shown in italics.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Table 3

Overall model: Total, direct and indirect effects.

	Coefficient	95% Confidence interval	t-value	a x b	95% Confidence interval	Pseudo t-value	VAF
Total effect	.32	[.25, .40]	8.54				
H ₁ : Self-perceived creativity → Entrepreneurial intentions	.14	[.04, .22]	3.09				
H _{3a} : Self-perceived creativity → Attitude → Entrepreneurial intentions				.07	[.04, .11]	3.87	.35
H _{3b} : Self-perceived creativity → Subjective norms → Entrepreneurial intentions				.01	[.00, .03]	1.79	.09
H _{3c} : Self-perceived creativity → Self-efficacy → Entrepreneurial intentions				.10	[.06, .16]	4.42	.44

Note: N = 559. Bootstrap = 5000 samples. VAF = variance accounted for value.

Table 4

Means and standard deviations of study variables for undergraduate vs. postgraduate students.

	Undergraduate students (n = 496)		Postgraduate students (n = 63)	
	M	SD	M	SD
RQ 1a Self-perceived creativity	3.42	(0.77)	3.62	(0.76)
RQ 1b University support for creativity	3.03	(0.86)	3.22	(0.82)
RQ 1c Family support for creativity	3.41	(0.89)	3.51	(1.02)
RQ 2 Entrepreneurial intentions	3.61	(1.55)	3.84	(1.64)

	M (n = 209)	F (n = 287)	M (n = 23)	F (n = 40)
RQ 3a Self-perceived creativity	3.57	3.31	3.76	3.54
RQ 3b University support for creativity	3.08	3.00	3.45	3.10
RQ 3c Family support for creativity	3.41	3.41	3.86	3.32
RQ 4 Entrepreneurial intentions	3.80	3.47	4.07	3.71

Note: F = Female participants. M = Male participants.

Last, in spite of the above differences, neither main effects (RQ 2, education level: $p = .11$; RQ 4, gender: $p = .25$) nor interaction effects ($p = .96$) were found as regards entrepreneurial intentions.

5. Discussion

This study set out to increase our understanding of the relationship between self-perceived creativity and entrepreneurial intentions in a sample of Spanish university students. The results show a moderate relationship between self-perceived creativity and entrepreneurial intentions, which partially mediates the relationship between family support for creativity and entrepreneurial intentions and fully mediates the relationship between perceived university support for creativity and entrepreneurial intentions. Moreover, the relationship between self-perceived creativity and entrepreneurial intentions is itself partially mediated by positive attitudes towards entrepreneurship and entrepreneurial self-efficacy.

Our findings attest to the generalizability of the findings of previous studies conducted in Greece and England (Zampetakis & Moustakis, 2006; Zampetakis et al., 2011), which also showed that family support for creativity predicted students' self-perceived creativity, which in turn predicted entrepreneurial intentions. Replicating previous findings is important, given that this is an emerging field of research. We additionally found a direct effect of family support for creativity on entrepreneurial intentions, indicating that it is quite a crucial factor. Family support for creativity showed an even higher correlation with entrepreneurial intentions than being from an entrepreneurial family, which was not a significant predictive background variable in our multivariate path model. This finding indicates that family support for creativity is one of the key elements through which families can stimulate entrepreneurship (Zampetakis et al., 2011).

Furthermore, in contrast to prior studies (Zampetakis et al., 2011), our results indicate that university support for creativity relates to entrepreneurial intentions through self-perceived creativity. University support for creativity associates slightly stronger with self-perceived creativity than family support does. These differences in findings may relate to the characteristics of our sample, which was both more diverse, including not only undergraduate or master's students but also pre-doctoral students and students from other areas besides business administration or technology. In addition, we also had a larger number of participants (559 in our sample vs. less than 200 in other studies); as a result our analyses had more statistical power. Our findings concur well with the prior evidence in work environments that linked perceived organizational support for creativity (Zhou & George, 2001) and emotional and informational support (Madjar, 2008) to employee creativity.

Regarding a mediating role of the TPB antecedents (attitudes towards entrepreneurship, subjective norms and entrepreneurial

self-efficacy), self-perceived creativity proved to have the strongest link to entrepreneurial self-efficacy, and self-efficacy showed the strongest link with entrepreneurial intentions. These results support the premise that students believe creativity is an important prerequisite for becoming an entrepreneur and are more likely to self-select into an entrepreneurial career in case of a higher self-perceived creativity. Students who perceive themselves as being less creative may believe this makes them less capable of performing entrepreneurial tasks, which relates to lower self-efficacy beliefs and subsequently lower entrepreneurial intentions.

Attitudes were a relevant mediator as well. Creativity is related to openness to experience values, which describes someone who seeks out new ideas and alternative standards as guiding principles in his or her life (Zhao et al., 2010). Entrepreneurship provides ample opportunities to live according to these values, as well as opportunities to express ones' creativity, which would be more valued by more creative people. It seems plausible that self-perceived creativity may not only influence more positive attitudes towards entrepreneurship, but it may also predict more innovative types of entrepreneurship. This would be an interesting avenue for future research.

Finally, self-perceived creativity is related to subjective norms as well, but the indirect relationship with entrepreneurial intentions was not significant. Subjective norms appeared to be the weakest predictor of entrepreneurial intentions. This is consistent with previous research (Ajzen, 1991; Armitage & Conner, 2001). In the field of entrepreneurial intentions, not all studies find a significant relationship (Krueger et al., 2000; Liñán & Chen, 2009). Subjective norms are suggested to be the component that is most influenced by culture (Moriano et al., 2012).

Our results defy the so-called “sufficiency hypothesis” of the TPB by showing that self-perceived creativity is not only a distal antecedent but also a direct predictor of entrepreneurial intentions. The overall model explained 32.9% of the variance in the intention to become an entrepreneur. In the specific case of entrepreneurial intentions, the variance explained by the three components of the TPB have been found to range between 20% and 65% (Autio et al., 2001; Kolvereid & Isaksen, 2006; Liñán & Chen, 2009; Liñán, Nabi, & Krueger, 2013). Taking into account that the TPB typically explains approximately 50% of variance in behavioural intentions or less, the inclusion of other variables remains relevant in order to broaden our understanding of what predicts entrepreneurial intentions. Examples are factors linked to employee creativity, such as risk taking propensity and intrinsic motivation (Dewett, 2007). Affect is considered another key process relevant to understanding creativity (Baron & Tang, 2011; George, 2008). Furthermore, positive affect is related to heightened entrepreneurial performance (Fodor & Pinteá, 2017).

Finally, we explored if perceptions of family and university support for creativity and levels of perceived creativity differed across education level (undergraduate vs. postgraduate) and participants' gender. Postgraduate participants reported greater university support and higher self-perceived creativity. As concerns gender, male participants reported higher perceived family support for creativity and self-perceived creativity. Postgraduate male participants in particular perceived greater family support. Interestingly, in our sample these differences did not reflect in higher entrepreneurial intentions for postgraduate nor male students.

5.1. Limitations and future research

All studies have limitations that must be considered. These limitations, in turn, can point to opportunities for future research. One of the main limitations of this research is the use of self-report measures. As concerns the TPB variables, it makes sense to use self-report measures, because these variables refer to subjective experiences. This may be different for creativity. Gauging creativity is a complex research issue, and there is no commonly accepted conceptualisation or operationalisation. Our study focused on self-perceived creative potential. A more objective measure would be to measure actual creative products or achievements (cf. DiLiello & Houghton, 2008; Smith et al., 2016). However, we argue that university environments may not be the best places to stimulate creative output, and our observation that students perceive low university support for creativity may indicate that they do not find many opportunities to implement their creative potential. If an individual's creative output is inhibited by the environment, self-perceived creative potential is a valid measure, because the lack of creative output relates to environmental inhibition and the inability to utilize creative potential will most likely not be observable for others (DiLiello & Houghton, 2008). In addition, prior research has indicated that people honestly report on their creativity scores, and different creativity measures covary highly with each other (Silvia, Wigert, Reiter-Palmon, & Kaufman, 2012). Although students' self-perceived creativity/creative potential may be a valid predictor of entrepreneurial intentions, actual creative output may play a more important role later on in the entrepreneurial process as a predictor of entrepreneurial success (Chen, Chang, & Lo, 2015), performance (Zhao et al., 2010) and innovation (Ahlin, Drnovšek, & Hisrich, 2014; Baron & Tang, 2011). Thus, researchers must always carefully consider what operationalisation to use and match it to the criterion under study.

Second, we analysed if students had attended entrepreneurship and creativity courses, but we did not analyse the duration and contents of these courses in much detail. The duration of course attendance varied from 1 to 200 h. Moreover, only 30.1% of participants indicated they had attended a course about how to create a firm or what it means to be an entrepreneur, and only 16.6% indicated they had attended a course on how to foster creative techniques. In spite of these small percentages, we found that course attendance positively related to self-perceived creativity and entrepreneurial intentions. Attending a creativity course was only a background variable in our study and evaluating the effectiveness of courses differing in content and duration was not the main goal of our study, but it would be an interesting topic of investigation for future research. To evaluate the effects of different courses, a randomised trial experimental design would be preferred.

Finally, cross-sectional studies do not enable inferences of causation. More longitudinal studies in this field are encouraged to investigate developments over time, such as the relationship between entrepreneurial intentions and entrepreneurial behaviour (cf. Kautonen, van Gelderen, & Matthias, 2015, 2013). The role of creativity along other stages of the entrepreneurial process could also be explored in greater depth.

6. Conclusion

Despite its limitations, our study has implications for theory and practice. Our results indicate that the premise of the TPB that attitudes, subjective norms and self-efficacy or perceived behavioural control are sufficient to predict behavioural intentions may be wrong. This provides leeway to investigate the role of additional variables and explanatory mechanisms in more detail. Self-perceived creativity appears to be one of such variables. Assuming that self-perceived creativity reflects a person's actual creative potential to some extent, this may, for example, relate to the identification of more potential business opportunities triggering entrepreneurial intentions.

Regarding practical relevance, promoting entrepreneurial intentions is desirable and feasible (Krueger et al., 2000). As a consequence, entrepreneurship education has rapidly expanded over the last few years. Along with this evolution, some concern has arisen about what should be taught and how it should be taught (Kuratko, 2005). Based on our results among students from a variety of higher educational backgrounds, we conclude that teaching creativity contents and practice are a useful enrichment of entrepreneurship programmes. Creativity can be fostered in university students (Perry & Karpova, 2017), and creativity skills acquired by students during training influence their self-perceptions of creativity.

Moreover, including creativity courses would also be relevant for other specialisation programmes in higher education. Creativity is considered a core competence for employees in a dynamic world, and a means by which organizations can create meaningful, lasting value (George, 2008). Europe may be a region with low levels of entrepreneurship but is highly competitive due to employee intrapreneurship (World Economic Forum & Global Entrepreneurship Monitor, 2016). Employee intrapreneurship refers to “employees’ agentic and anticipatory behaviours aimed at creating new businesses or services for the organization and at enhancing an organization’s ability to react to internal and external developments” (Gawke, Gorgievski, & Bakker, 2017, p. 89). Education supporting creativity may also stimulate intrapreneurship. Studies have shown entrepreneurship courses on creativity and innovation influenced students’ actual creative skills and self-perceived creativity, all of which transferred to their work teams (Gundry, Ofstein, & Kickul, 2014). Despite all of the benefits attributed to creativity, stimulating creativity receives little attention in our university educational systems, providing ample room for improvement (Edwards-Schachter et al., 2015).

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