

# Entrepreneurial intentions and gender: pathways to start-up

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## Abstract

**Purpose** – The purpose of this paper is to revisit the conceptualization and measurement of entrepreneurial intentions. Significant studies anchored in the Theory of Planned Behavior use causal statistical approaches to entrepreneurial intentions. This methodological approach, leads to the conclusion that there is a single pathway for all groups of people to achieve business start-up. Even though theory suggests approaches by women entrepreneurs to start a business may be influenced by different factors from those influencing men, results are inconclusive in these analyses. The authors argue that methodological preferences for linear, causal analytical approaches limit the understanding of gender similarities and differences in the business start-up process. The authors propose that when considering diverse samples, it is unreasonable to assume there is only a single pathway leading to business start-up.

**Design/methodology/approach** – Building on fuzzy-set Qualitative Comparative Analysis (fsQCA) and data set of 2,038 respondents, the authors investigate factors predicting the intentions to start a business and evaluate the alternative conjunctive paths that emerge.

**Findings** – The fsQCA results shows that the relationship among conditions leading to entrepreneurial intentions is complex and is best represented as multiple and conjunctural causation configurations. In other words, there are multiple significant pathways (refers to equifinality) that predict intentions to start a business start-up, and there are significant differences by gender.

**Originality/value** – This study is one of the first to examine the roll of gender as a sperate condition in the analysis. This paper offers implications for theory and future research and highlights the complexity of this domain.

**Keywords** Gender, Entrepreneurship, Fuzzy-set qualitative comparative analysis, Entrepreneurship intentions

**Paper type** Research paper

## Introduction

One of the most important questions in the entrepreneurship domain concerns factors predicting the intentions to start a business. Since the late 1980s, a considerable number of studies have examined entrepreneurship as intentional behavior and analyzed the formation of intentions to start a business as the first step in the launch process (Kautonen *et al.*, 2015; Krueger *et al.*, 2000; Liñan and Fayolle, 2015). Early research on entrepreneurial intentions proposes that intentions are the best predictor of planned behavior, especially when that behavior is difficult to observe, rarely occurs, or involves unpredictable time lags (Krueger *et al.*, 2000, p. 413). To accommodate this claim, Krueger and his colleagues state that entrepreneurship is a proto-typical example of that type of planned behavior, as starting a new venture requires a careful planning, for which the intentions-centered models such as Theory of Reasoned Action (TRA: Fishbein and Ajzen, 1975) and Theory of Planned



Behavior (TPB: Ajzen, 1985) are the ideal choices (Krueger *et al.*, 2000, p. 411; Rueda *et al.*, 2015).

The TPB, developed from the TRA is particularly important in the entrepreneurial domain because it considers personal and social factors to explain behavioral intentions (Maes *et al.*, 2014). Ajzen proposes three independent variables measuring attitudes, subjective norms and perceived behavioral control that determine behavioral intentions (Ajzen, 1985, 1987). He posits that the attitudes variable motivates a person's disposition toward performing a behavior. The subjective norms (SN) variable includes attributes of a person's social environment and situation, and the perceived behavioral control (PBC) variable addresses variation in a person's ability to control the performance of a behavior. According to TPB, behavioral intention is the immediate antecedent of the behavior or the action (Ajzen, 1985, 2002).

Despite the prior contributions of TPB, there is an underlying assumption that the pathway is the same for all regardless of gender. To this end, the vast majority of studies rely on causal modeling, or structural equation modeling, to come up with a single explanatory pathway leading to intentions to start a business. However, the Feminist Theory argues that in fact, there may be systemic and contextual factors that may differentially deprive women of certain resources in the socialization process, specifically, education and networks. This suggests that women may have different configurations of variables leading to intentions than might be predicted for men. Without a better understanding of the possible differences in pathways leading to entrepreneurial intentions by men and women, we risk creating generic prescriptions and practices that apply to everyone, and therefore, we may not be adequately training and supporting women entrepreneurs.

Therefore, in this paper, we argue that it is necessary to re-examine this theory in the context of a diverse sample. We specifically focus on and employ the TPB because it is an important socio-cognitive theory and performs better than alternative theoretical models (Lortie and Castogiovanni, 2015), and it is appropriate for investigating entrepreneurial intentions of students world-wide (Liñán and Chen, 2009). We have three objectives in this study:

- (1) to explain entrepreneurial intentions in a more detailed and consistent way;
- (2) to investigate entrepreneurial intentions in a diverse group of students and explicitly analyze by gender; and
- (3) to integrate two lines of research on entrepreneurial intention, relationships between attitudes and entrepreneurial intention, and research on the connections between self-efficacy and entrepreneurial intentions (Rueda *et al.*, 2015).

The relationship between self-efficacy and behavioral intentions is important because literature shows that a person's belief about her capabilities to exercise control over her own level of functioning in skills and abilities to initiate a task or to perform a task also influence behavioral intentions (Bandura, 1977, 1986, 1997; Cardon and Kirk, 2015). Ajzen (2002) argues that while self-efficacy (SE) and PBC may be seen as similar concepts (both are concerned with perceived ability to perform a behavior or sequence of behaviors), they differ from one another because self-efficacy is rooted in one's confidence in her ability to perform a behavior (e.g. start a new business).

Given recent developments in entrepreneurship research and advances in the research methods (Kraus *et al.*, 2018), we argue that traditional methodologies may not fully recognize the complexity of the interdependencies and conjunctive paths between variables influencing start-up behaviors, and therefore may not fully uncover the potential gender

differences. From a more methodological perspective, the vast majority of research relies on traditional linear based approaches that test the symmetric links between the attitude and intentions towards entrepreneurial career behaviors (Ozaralli and Rivenburgh, 2016). Therefore, for this study, we use an alternative method that goes beyond widely used regression-based analysis. We use fuzzy-set Qualitative Comparative Analysis (hereinafter fsQCA) introduced by Ragin (1987) to seek for the conjunctive causation (Arenius *et al.*, 2017) and the alternative conjunctive paths leading to the outcome (entrepreneurial intentions).

Our results show that contrary to previous research, there are gender differences in the configurations, which are illuminated by the multiple configurations present in the fsQCA approach. But these are not apparent using traditional structural equation modeling. Most interestingly, we provide new insights on the tenet whether self-efficacy is a gendered variable in the analysis. This paper makes several theoretical and methodological contributions. From a theoretical standpoint, in the form of multiple configuration of conditions, the results contribute to the entrepreneurship research by providing new insights into the roles of different variables (conditions). We also show that the variation in conditions influencing the entrepreneurial intentions are sufficiently complex and we cannot assume that existing TPB theory applies equally to men and women. We further contribute to theory by providing new knowledge to the emerging global picture of entrepreneurship and our results show that perceived behavioral control (PBC) and self-efficacy have different effects on the behavioral intentions. From a methodological standpoint, the fsQCA analysis reflects a variety of configurations explaining entrepreneurial intentions rather than just a single significant pathway. In all, our results show a much more detailed picture of the antecedents to entrepreneurial intentions than reflected by linear regression analysis. The remainder of the paper is as follows; first, we present the literature review on entrepreneurship and the theoretical background followed by the research methodology. Next, we discuss and elaborate on configurational theory and then present the results of the fuzzy-set Qualitative Comparative Analysis (fsQCA) and associated results. We conclude with the discussion, conclusion, implications and limitations.

### Literature review

Scores of studies have tested TPB and found that intentions are linked to starting a new business (Gieure *et al.*, 2019), but there remains an underlying assumption that the pathway, once identified, will be the same across all people (Fayolle and Liñán, 2014). However, there is reason to believe that this may not necessarily be true when we consider the role of gender in entrepreneurial ecosystems. Feminist theory and current research is predicated on the assumption that gender is not only a structuring of society but also that the start-up process may differ for men and women either because of overt discrimination and/or systemic factors. For instance, a liberal feminist perspective would suggest that that entrepreneurial ecosystem factors are structurally gendered and therefore might deprive women from vital resources like education or network support (Brush *et al.*, 2018). Alternatively, a social feminist perspective would argue that the women's early and ongoing socialization process (Bird and Brush, 2002) may influence the formation of entrepreneurial self-efficacy (Piperopoulos and Dimov, 2015). Furthermore, the image and belief about entrepreneurs is typically male/masculine, resulting in stereotypes and characteristics associating entrepreneurial behavior with men (Gupta *et al.*, 2009; Ahl, 2006; Henry *et al.*, 2016).

Similarly, there is evidence that women pursue different organizational and economic missions, and that there are significant variations in motivations (necessity versus opportunity) and intentions to start a business world-wide (Jennings and Brush, 2013;

Ladge *et al.*, 2019). In the TPB literature, a relatively small number of studies measure intentions by gender (Aloulou, 2015; Haus *et al.*, 2013) or include gender as a variable in the analysis. Of those that do, most studies using the full model of TPB find that gender is of marginal, indirect or of no significance (Haus *et al.*, 2013; Krueger *et al.*, 2000). On the other hand, studies examining direct or indirect effects of gender on intentions find that it has a direct effect on self-efficacy which mediates the relationship to intentions (Cardon and Kirk, 2015; Ladge *et al.*, 2019) or that the relationship of social environment to intentions is more significant for women than men (Aloulou, 2015). Similarly, a study of desirability and intention found males have higher intentions to create firms (Zhang *et al.*, 2014). Hence, there is an overarching assumption that TPB applies equally to men and women yet we have a theoretical and empirical rationale for expecting that there may be significant gender differences (Fayolle and Liñán, 2014).

### Theoretical background

Abundant research in entrepreneurship draws from TPB finding that the key factors influencing entrepreneurial motivations, are attitudes, behaviors and intentions (Beynon *et al.*, 2016). Notwithstanding that TPB might have some limitations such as being weak in predicting the observed behavior compared to self-reported behavior (Armitage and Conner, 2001), this theory has proven to be a strong theoretical lens, particularly in highlighting the importance of the link between attitude-intentions for entrepreneurs (Haus *et al.*, 2013; Shahab *et al.*, 2019). Some authors such as Souitaris *et al.* (2007) and van Ewijk and Belghiti-Mahut (2019), employing TPB argue that the intention for starting a new business is inspired by entrepreneurship education. By testing an exogenous variable (education) and its influence on the attitude and the intentions towards behavior (self-employment), Souitaris *et al.* (2007) confirm that the attitude-intention link can be investigated through the TPB. However, there are alternative theoretical models which prior studies have used. For example, Zhao *et al.* (2005) developed an integrated model of entrepreneurial experience, risk propensity and perception of formal learning to evaluate the role of self-efficacy and found that taking an entrepreneurship related-course, experience and risk propensity play a particular role on intentions to pursue an entrepreneurial career.

Following is a brief summary of the research on the relationships between constructs in TPB. Because our intent is to examine a diverse sample and consider where gender would make a difference, we indicate why gender might make a difference relative to self-efficacy (SE) and TPB constructs, as these relate more closely to entrepreneurial intentions (Liñán *et al.*, 2011).

#### *Self-efficacy*

According to Bandura (1986, 1997, p. 257), self-efficacy is “*people’s beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives*”. In the context of entrepreneurial career, Bandura (1997) and Wilson *et al.* (2007, p. 389) argue that:

[...] self-efficacy reflects an individual’s innermost thoughts on whether they have the abilities perceived as important to task performance, as well as the belief that they will be able to effectively convert those skills into a chosen outcome.

Bandura (1986) further notes that self-efficacy and PBC are different concepts, while the SE has more direct impact on behavior, and it is concerned with the cognitive perceptions of control based on internal control factors, the PBC reflects on more general and external factors. Self-efficacy, while not an original construct of the TBP, is a well-established

antecedent of entrepreneurial intentions and often seen as a precursor to PBC (Cardon and Kirk, 2015; Krueger *et al.*, 2000; Ladge *et al.*, 2019). Moreover, Boyd and Vozikis (1994, p. 64) and Piperopoulos and Dimov (2015) found that individual self-efficacy plays an important role in the development of entrepreneurial intentions and actions, in other words, it influences the complex process of new business creation.

With regards to gender, social feminist theory, role stereotype and role congruity theory argue that women entrepreneurs would have different attitudes, beliefs and approaches leading to entrepreneurial intentions compared to their male counterparts (Ahl, 2006; Bird and Brush, 2002; Eagly and Karau, 2002). Consistent with role theories, when starting a business, women may perceive they have lower capabilities than men (Austin and Nauta, 2016). Women often underrate their skills and abilities, or believe they are less capable, while also perceiving greater hindrances than men in becoming an entrepreneur (Kelley *et al.*, 2017). Other work argues that individuals with a higher risk propensity are more likely to pursue an entrepreneurial career, given that entrepreneurship is fraught with uncertainty (Zhao *et al.*, 2005). Because the male stereotype of an entrepreneur is associated with “risk-taking”, it is likely women will have less self-efficacy in an entrepreneurial environment which is highly uncertain. Research shows that women often have less confidence in their entrepreneurial skills and capabilities than men (Wilson *et al.*, 2007). Therefore, we not only expect self-efficacy impacts entrepreneurial intentions but also, we believe that the effect of self-efficacy on intention to start a new business start-up will be different across females and males.

#### *Perceived behavioral control*

PBC is one of the main constructs of the TPB and refers to an individual’s perception towards the extent to which performing a behavior is easy or difficult (Ajzen, 1991, p. 83). According to the TPB, the resources and opportunities available to a person must, to some extent, dictate the likelihood of behavioral achievement (Veciana *et al.*, 2005, p. 169). Autio *et al.* (2001) argue that PBC is the sum of the one’s actual control of a behavior and her/his perception regarding this control. Furthermore, we argue that PBC moderates the relationship between intention and behavior specifically where the behavior is not under complete volitional control, for instance the desire to become an entrepreneur (Baron and Kenny, 1986). Armitage and Conner (2001, pp. 472-473) posit that PBC differs from self-efficacy such that in situations where prediction of behavior from intention is likely to be hindered by the level of actual control, PBC predicts behavior directly, while self-efficacy predicts only intentions.

With regards to gender, following Eagly and Karau (2002) and role congruity theory, men and women will choose roles that fit with their personal characteristics. Because women will perceive a mismatch between their personal characteristics and their career role, they may perceive they will perceive higher barriers in starting a business. For instance, the Global Entrepreneurship Monitor (GEM) study shows that women perceive a higher fear of failure than men, especially in innovation economies (Kelley *et al.*, 2017) or other research shows that women do have lower perceptions of control in starting a business (Haus *et al.*, 2013). Therefore, we not only expect PBC impacts entrepreneurial intentions but also, we believe that the effect of PBC on intention to start a new business start-up will be different across females and males.

#### *Subjective norms*

Another construct within the TPB that is expected to influence intentions is subjective norms (Robledo *et al.*, 2015). Subjective norms consist of a person’s beliefs about whether

significant others think she or he should engage in the behavior (Conner and Armitage, 1998). In other words, SN is defined as unwritten rules of conduct within a group, culturally embedded and they indirectly specify desired behaviors (Meek *et al.*, 2010). These attributes stand for the perceived social pressure to perform or not to perform a certain behavior, like starting a new business start-up (Kautonen *et al.*, 2010). In considering gender, social role theory (Eagly, 1987), argues that gender-based expectations lead both men and women to pursue gender stereotypical occupations consistent with their perceived skills. Further, these beliefs about capabilities and skills relative to a particular occupation may influence perceptions of control over behavior in entrepreneurial actions. Cultural values shape societal roles and stereotypes in terms of occupations considered appropriate for men and/or women (de Vita *et al.*, 2014). Because successful entrepreneurs are equated with the male stereotype, this may create a social environment where women are less supported in their entrepreneurial endeavors (Gupta *et al.*, 2009; Marlow and Patton, 2005). Research shows that subjective norms supporting entrepreneurship are higher for men than for women, and this does affect intentions (Lo *et al.*, 2012). Moreover, (Teo *et al.*, 2012) incorporate the demographic factors and subjective norms with the TAM model to investigate the intention to adopt mobile banking and found that SN positively affect the intentions; however, the authors did not find any effect of gender between SN and intentions. Given the nature of the previous studies, we not only expect SN impacts entrepreneurial intentions but also we believe that the effect of SN on intention to start a new business start-up will be different across females and males.

#### *Attitude toward entrepreneurship*

Some authors argue that attitude towards entrepreneurship is a reliable predicting factor of intention (Adekiya and Ibrahim, 2016). Many prior studies have found a positive relationship between intention and actual behavior by conceptualizing the intention as the cause of an action, in which the greater the stated intentions to perform an act, the greater the likelihood of engaging in the act (Ajzen, 2001; Rueda *et al.*, 2015). Moreover, Bandura (1997) posits that people are more likely to engage in behaviors that are believed to be achievable.

Once again when it comes to gender, the stereotype of the successful entrepreneur tends to be associated with characteristics such as aggressiveness, achievement orientation, dominance, and risk-taking, which are perceived as more typical of men than women (Ahl, 2006; Gupta *et al.*, 2009). Hence, women who may identify with these characteristics may also perceive a disconnect between their behaviors and those required to be a successful entrepreneur, creating cognitive dissonance (Eagly and Karau, 2002). Men have a stronger proclivity toward entrepreneurial activity than women (de Bruin *et al.*, 2007) and research shows that men's attitudes towards entrepreneurship are more positive than for women (Karimi *et al.*, 2014). Other research also shows that overall, women have lower positive attitudes toward entrepreneurship (Haus *et al.*, 2013). Therefore, we not only expect attitude towards entrepreneurship impacts entrepreneurial intentions but also believe that the effect of attitude on intention to start a new business start-up will be different across females and males.

#### *Entrepreneurial intentions*

According to Ajzen (1991), entrepreneurial intention is the effort that a person will make to carry out that entrepreneurial behavior, and it measures the degree to which individuals are likely to become an entrepreneur in the future (Liñán and Fayolle, 2015). Entrepreneurial intentions, driven by several personal and social factors, can measure an economy's

favorability towards entrepreneurship (Autio *et al.*, 2001). Santos *et al.* (2016, p. 44) examine the interplay between gender differences and the social environment in the formation of entrepreneurial intentions and find that the formation of entrepreneurial intentions is similar for men and women, but men consistently exhibit more favorable intentions than women.

In sum, significant research draws from TPB finding that the key factors influencing entrepreneurial motivations, are attitudes, behaviors and intentions (Beynon *et al.*, 2016; Carsrud and Brännback, 2011; Zhao *et al.*, 2005). But, there is theoretical rationale to expect that there might be gender differences in the factors leading to entrepreneurial intentions. To date, the vast majority of studies examining TPB use structural equation modeling (SEM) to investigate linear, correlational or symmetrical relationships, assuming that there are few fixed causal pathways to explain intentions toward a new business start-up, with gender often only considered a control variable. In the entrepreneurship domain, conventional methods such as structural equation modeling (SEM), and linear statistical approaches are the most commonly used means of examining entrepreneurial intentions (Haus *et al.*, 2013; Krueger *et al.*, 2000). In some respects, a reliance on a structured causal pathway to elicit narrow approaches to entrepreneurship are generally at odds with what we know about the wide variations in entrepreneurs generally and the heterogeneity of the phenomenon (Bruyat and Julien, 2001). We believe not only the choice of theory but also the choice of methodology matters in our understanding of gender differences.

Therefore, we use fuzzy-set Qualitative Comparative Analysis (Ragin, 1987) to examine conjunctural causation (Arenius *et al.*, 2017) and alternative conjunctive paths leading to the outcome. This method enables us to identify different patterns of causal conditions that produce the desired outcome, rather than how each individual independent variable relates to the outcome. When employing a conventional theoretical model, such as TPB, this method enables researchers to obtain complementary insights (e.g. in-depth insights about the gender differences discussed above and the net effect of each variable) which may not be possible when traditional statistical approaches such as SEM are used. For example, while SEM assesses the effect of variables individually, fsQCA allows the assessment of the effect of variables in terms on logical combinations. Moreover, as entrepreneurship is a heterogeneous phenomenon, by identifying alternative conjunctive paths we are able to answer the question “*how variables combine to cause a certain outcome*” (Liu *et al.*, 2017, p. 64; Mas-Tur *et al.*, 2015, p. 2281; Ragin, 1987, 2000). Notably, when a traditional statistical approach such as SEM is used, researchers often postulate several hypotheses which will be tested during the analysis. But, when fsQCA is used researchers formulate proposition(s) instead of hypotheses. Therefore, in this paper to assess the relationships between the antecedent factors predicting entrepreneurial intentions, we propose the following propositions:

- P1. No single best configuration of the constructs (i.e. self-efficacy, subjective norms, perceived behavioral control and attitude) leads to entrepreneurial intentions, but there exist multiple, equally effective configurations of causal factors.
- P2. Configurations that lead to entrepreneurial intentions will be affected by the presence of gender.

## Research methodology

### *Sample and data collection*

For this research, our sample consisted of students selected from urban universities in eight different countries, Canada, Chile, China, Finland, Germany, Spain, Turkey and the USA. Although, we did not use any pre-qualifying questions or restrictions to avoid unwanted

respondents, we aimed at gathering data only from business students who are considered one step before entering into self-employment, thus targeting them as a sample population in the entrepreneurship research is considered as an appropriate sampling strategy (Shinnar *et al.*, 2012). This assumption is also supported in Liñán *et al.* (2011) research who posit that business students are more likely to pursue an entrepreneurial career when they obtain their degrees and this can be regarded as the primary reason for using business students as a sample in research investigating entrepreneurial intentions. Moreover, it has been argued that business school students with a degree in their hands tend to have higher intentions to pursue an entrepreneurial career (Hisrich *et al.*, 2007). Gieure *et al.* (2019) recently show that it is within the university environment where students can find initial inspiration that together with the education in business and management can generate entrepreneurial intentions. In this regard, we argue that a sample making use of the students for data collection is an appropriate approach when one hopes to understand the behavioral intentions towards a given phenomenon, e.g. entrepreneurial intentions. Before distributing the questionnaire, we performed a pretest with a number of domain experts and knowledgeable researchers to verify the appropriateness of questionnaire items and to avoid ambiguous expressions. We used pen and paper-based survey as an instrument to collect the data. The main questionnaire was developed in English, and then for each country having a different language than English, translation was made to the respective country's official language. The survey was distributed to 2,282 respondents. After removing unengaged responses and responses with the missing values, the final data set comprises 2,038 complete and usable responses (Table I).

*Measures*

To analyze the combined effect of self-efficacy and constructs within the TPB to the outcome variable, entrepreneurial intentions, we use items from well-established and validated scales. The items for measuring self-efficacy are derived from Chen *et al.* (2001) and items for measuring perceived behavioral control are based on the study by Liñán and Chen (2009). To measure self-efficacy, we asked respondents to rate their confidence in their ability to perform a behavior making it different from situation when respondents are asked to rate the degree to which their behaviors are controllable or uncontrollable (i.e. PBC). The items for measuring subjective norms are derived from the work of Kautonen *et al.* (2010), Souitaris *et al.* (2007) and items for attitude towards entrepreneurship and entrepreneurial intentions are derived from Ajzen (1991), Liñán and Chen (2009). These scales are in widespread use in entrepreneurship, especially entrepreneurial intentions research. Definitions for the items (19 in total) are reported in Appendix. A seven-point Likert scale from “Strongly Disagree” (1) to “Strongly Agree” (7) was used to measure each item.

*Descriptive statistics and measurement results*

In the sample, 797 (39 per cent) were females and 1,241 (61 per cent), were males. The respondents' average age was 25 years. More than 31 per cent of the respondents (*n* = 635) had a job in addition to going to school, 136 respondents (67 per cent) ran their own

Country	Spain	Turkey	Canada	Chile	China	Finland	Germany	USA
<i>N</i>	201	474	221	292	278	156	220	96
Gender	F = 110 M = 91	F = 208 M = 266	F = 95 M = 126	F = 107 M = 185	F = 102 M = 276	F = 93 M = 63	F = 53 M = 167	F = 29 M = 67

**Table I.**  
List of countries and # of participants

businesses at the time of the survey, and 748 (37 per cent) indicated that they had previously worked in a business owned by a member of their family. We examined the internal consistency through Cronbach Alpha's values (Nunnally, 1967). Additionally, we performed maximum likelihood analysis to examine the measurement validity, and results show that all items fit their respective factors with loading over 0.7. The convergent validity was measured through average variance extracted (Fornell and Larcker, 1981), AVE indicates the degree to which measures within the constructs related and converged to each other. The results show that the values of internal consistency, i.e. Cronbach's alpha ( $\alpha$ ), composite reliability (CR) and average variance extracted (AVE) for all constructs are above the recommended thresholds of 0.7; 0.7; and 0.5, respectively. The overall results of scale reliability analysis show that Cronbach's alpha values ranged from 0.858 to 0.929. Therefore, we conclude that the measurements and different tests results indicate adequate internal consistency and convergent validity.

We also assessed the discriminant validity, which indicates the degree to which measures of constructs that theoretically should not be related to each other are in fact not related (Trochim and Donnelly, 2000). In other words, when a construct is formed only by the measures within that specific construct, we can argue that discriminant validity is established and our test result confirms this issue. In addition, as with all self-reported data, there is a potential for common method bias (CMB), thus following Podsakoff and Organ (1986), we ran Harmon one-factor test on all five constructs in our conceptual model. The test results showed the highest covariance explained by one factor is 31.65 per cent, this result suggests that common method bias is not likely to pose method bias issue for this analysis. In other words, our data are not affected by the method bias. We also assessed the CMB by including a common method factor whose indicators included all the principal constructs' indicators and calculated each indicator's variances substantively explained by the principal construct and by the method (p. 86). The test results showed that the average substantively explained variance of the indicators and the average method-based variance are 0.54 and 0.21, respectively (Liang *et al.*, 2007, p. 71).

### Configuration theory

We use fuzzy-set Qualitative Comparative Analysis (fsQCA) to assess the possible effect of different combinations of conditions (variables or constructs in terms of SEM approach) on the outcome of interest (entrepreneurial intentions). In entrepreneurship research, fsQCA is increasingly becoming popular (Mezei and Nikou, 2018). This method builds on fuzzy-sets and fuzzy-logic principles with QCA (Ragin, 1987, 2000) and is a robust analytical technique that allows investigating situations in which the outcome of interest may follow from several different combinations of causal conditions. According to Ragin (2013), the relationships between the conditions and the outcome of interest are in terms of sets rather than variables and the core theoretical assumption underlying the methods is that there may be more than one combination of conditions that leads to the desired outcome (Mas-Tur *et al.*, 2015, p. 2281). This is one of the advantages of this method compared to a more traditional approach and is known as "equifinality". Equifinality indicates that a single combination (configuration) of causal conditions cannot explain the outcome, rather a number of different causal paths capture the nuances of the phenomenon under investigation (Fiss, 2011).

Moreover, QCA views the conditions as clusters of interconnected conditions (variables) that must be simultaneously understood as a holistic integrated pattern and provides twofold advantages (Fiss, 2011). First, it accounts for asymmetric relationships between the dependent and independent variables, for example a variable can be considered necessary

condition, but not sufficient for the occurrence of the outcome. Second, it enables measuring the impact of a condition on the outcome when the presence or the absence of another condition(s) is considered to be important (Woodside, 2013). Therefore, conditions associated with the study can be combined in different ways to lead to the outcome (Mas-Tur et al., 2015). The results of fsQCA analysis will be in the form of one or multiple configurations. A configuration, in terms of fsQCA, refers to specific combination of causal conditions that generate the outcome. The fsQCA differs in many ways from the conventional methods primarily because it relies on the researchers' domain knowledge when the choice for the outcome and inclusion/exclusion of the conditions in the analysis should be made. Moreover, fsQCA enables to identify the extent to which a causal condition can be considered as necessary and/or sufficient for the outcome. The fsQCA analysis is comprised of several steps that must be carefully conducted. In the following we discuss the main steps of fsQCA analysis.

*Calibration*

The first step is to transform the measurements scores into fuzzy sets ranging from 0 to 1, this approach is referred to as calibration and is often done in two ways, *direct* or *indirect* calibration (Ragin, 2008, 2000). Direct calibration requires identifying three qualitative breakpoints of the fuzzy sets and indirect calibration requires rescaling the original scores based on the qualitative assessments. During calibration of data into sets, the domain knowledge of the researcher plays a vital role. Depending on the variables' type, transformation into fuzzy sets takes different forms. When calibrating Likert scales, Ragin and Davey (2016) recommend to use three qualitative anchors (0.95, 0.5 and 0.05), representing a (i) full-membership, (ii) the cross-over point (most ambiguous membership), and (iii) a full non-membership. As we used seven Likert scales, we consider the membership value for 7 (full membership) as 0.95, for 4 (the cross-over point) as 0.51, and for 1 (non-full membership) as 0.05 (Fiss, 2007; Ragin, 2000). The other values, that is 2, 3, 5 and 6, are calibrated on the basis of a linear transformation function. We used fsQCA 3.0 software (Ragin and Davey, 2016) and some of the available R packages to calibrate scores into fuzzy sets and perform the analysis (Thiem and Duşa, 2013).

*Necessity analysis*

A necessary condition is one that might be present in majority of the configurations leading to the outcome and a sufficient condition is a condition whose presence guarantee the occurrence of the outcome (Fiss, 2007). Thus, we first examined if there were any conditions that could be identified as necessary for the outcome to occur. The degree to which the necessity relationships are relevant can be assessed through consistency values. Values above 0.90 indicate important relationships (Schneider and Wagemann, 2010). Table II shows there are two conditions, namely, attitude towards entrepreneurship and subjective

Condition	Consistency	Coverage
Self-efficacy	0.881 (0.441)	0.644 (0.749)
Subjective norms	0.912 (0.421)	0.679 (0.607)
Perceived behavioral control	0.758 (0.693)	0.852 (0.596)
Attitude towards entrepreneurship	0.916 (0.479)	0.653 (0.602)
Gender	0.336 (0.634)	0.455 (0.508)

**Note:** The value for negation of a condition is shown in the parentheses

**Table II.**  
The necessity assessment of causal conditions

norms which can be assumed to be necessary for the occurrence of the entrepreneurial intentions. However, before running fsQCA analysis this issue cannot be confirmed.

#### *Truth-table construction*

The next step is to construct the truth-table, which is a data matrix comprising a list of all combinations of causal conditions with respect to the cases (observations) within each combination (Muñoz and Dimov, 2015, p. 644). This means with the  $k$  condition sets, there will be  $2^k$  combinations to be evaluated. For reducing and simplifying the combinations, domain knowledge of the researcher plays a vital role. For example, (i) decision on what to do with the combinations of conditions which have not been empirically observed (i.e. zero observation) and (ii) decision on combinations of conditions which have been observed but with different frequencies. In such situation, a researcher based on her/his knowledge can decide the most appropriate threshold, known as frequency cut-off (Muñoz and Dimov, 2015). Ragin (2008) suggested to set the frequency threshold to three and delete the combinations from the truth-table that do not adhere to this rule. However, this recommendation does not impose a strict rule and researchers depending on the phenomenon under investigation can choose different values for the frequency cut-off. Another scenario requiring a profound domain knowledge is the decision of setting the consistency threshold. Consistency is a fuzzy measure which can be used to assess the extent to which a combination of causal conditions in the constructed truth-table is sufficient to lead to the outcome. Ragin (2008) recommended to use 0.75 for benchmarking the consistency. In this paper, we set frequency cut-off to 3 and consistency threshold to 0.75.

#### *FsQCA solution sets*

The output of the analysis includes three types of solution sets, complex, parsimonious and intermediate (Ragin, 2008). The set of complex solutions is calculated by taking the logical union of sufficient combinations identified in truth-table. Depending on the number of conditions in the analysis, the fsQCA output generates a large number of complex configurations, making the interpretation of the configurations extremely hard, even for knowledgeable scholars. Therefore, the complex solutions can be further simplified into parsimonious and intermediate solutions (Mendel and Korjani, 2013). Combinations which did not comply with the frequency cut-off value and were excluded from the analysis can be used to calculate the set of parsimonious solutions. Although there is a limitation in using insufficient information in combinations which did not satisfy the frequency rule, nevertheless, they are necessary for calculating the intermediate solutions. Parsimonious solutions are causal combinations with the least number of conditions and there is at least one such solution in every complex solution (Liu *et al.*, 2017, p. 70). Ragin (2008) and Fiss (2011) demonstrated how complex and parsimonious solutions, through a counterfactual analysis, can be used to derive the set of intermediate solutions. If a condition is present in both the parsimonious and intermediate solutions, it is referred to a core condition and if is only present in the intermediate solution, it is referred to a peripheral (Fiss, 2011, p. 403).

The following notations are used to demonstrate the fsQCA results: black circles (●) indicate the “presence” of a condition and blank circles (○) indicate its “absence”. Blank spaces indicate “do not care” (Ragin and Fiss, 2008). Moreover, large circles indicate “core conditions”, and small circles refer to “peripheral conditions”. We use the following notations for illustrating the role of gender in the analysis, black circles (●) indicate “female” and blank circles (○) indicate “male”.

**fsQCA analysis results**

For the main part of the fsQCA analysis and to understand better the role of the gender, we first analyzed the data without including the gender, then the second analysis included gender. The relationships between the conditions and the outcome, “entrepreneurial intentions” are depicted in Table III. The results show except for one configuration (solution 4), the presence of perceived behavioral control (PBC) dominates all of the configurations. In solution one, the presence of attitude towards entrepreneurship and PBC lead to the outcome and both are core conditions. In solution two, we observe a support for previous findings in the literature where it has been speculated that PBC and self-efficacy mask each other, in other words, they are the same if not highly similar constructs, as in this solution the presence of condition (PBC) and the absence of another condition (SE) lead to the outcome of interest (Stroe *et al.*, 2018). Based on the results, solution two has the highest consistency value (0.888).

To elaborate further, we posit that regardless of the gender of the respondents, the presence of PBC and the absence of self-efficacy, are enough conditions for the outcome to occur. In this solution, PBC is the core condition. Solution three presents a configuration that implies the presence of both PBC and the subjective norms lead to the occurrence of the outcome, this finding is consistent with results of Straatmann *et al.* (2018) who also found PBC and SN both impact the entrepreneurial intentions. Solution four shows that PBC does not play a role in this configuration, instead we observe the presence of attitude toward entrepreneurship (AT) and subjective norms as well as the absence of self-efficacy lead to the outcome. These two conditions, i.e. AT and SN, are related to how an individual sees/ views her/his surroundings and to what extent others are important to them. The positive remarks from others and how others think a person should perform (subjective norms) supposedly forms a positive attitude toward an entrepreneurial career. The absence of self-efficacy in solution four justifies the importance of subjective norms and attitude in forming the entrepreneurial intentions. This finding is relevant and important because for the subjects in our research, i.e. students who are pursuing business degrees and are considered to be potential future entrepreneurs, the influence of their surroundings (SN) could positively affect their attitudes to pursue an entrepreneurial career. Other researchers such as Basu and Virick (2008) also find similar results where the authors stated that prior exposure to entrepreneurship education has a positive effect on students’ attitudes toward a career in entrepreneurship and on perceived behavioral control or entrepreneurial self-efficacy (p. 84).

Causal conditions	Solution			
	S1	S2	S3	S4
Self-efficacy		○		○
Subjective norms			●	●
Perceived behavioral control	●	●	●	
Attitude towards entrepreneurship	●			●
Raw coverage	0.735	0.468	0.729	0.396
Unique coverage	0.020	0.002	0.007	0.007
Consistency	0.882	0.888	0.880	0.852
Overall solution coverage	0.787			
Overall solution consistency	0.834			

**Table III.** Intermediate solutions of the fsQCA (without gender)

**Notes:** Black circles indicate the presence of a condition, and blank circles indicate its absence. Large circles indicate core conditions; small ones, peripheral conditions. Blank spaces indicate “don’t care”

Overall, when gender of the subjects is not included in the analysis, an important observation in the results is that self-efficacy has no significant influence on intentions in two solutions (solution 1 and 3 in [Table III](#)), and in other two configurations (Solution 2 and 4), the absence of self-efficacy leads to intentions. While, this observation is open to debate, prior studies also provide mixed results. For instance, [Bullough et al. \(2014\)](#) and [Zhao et al. \(2005\)](#) found that self-efficacy positively influences the entrepreneurial intentions, while [Piperopoulos and Dimov \(2015\)](#) and [Hsu et al. \(2019\)](#) found no significant effect of self-efficacy on entrepreneurial intentions.

Taken together, the findings of fsQCA analysis indicate that this method is a superior approach for understanding the combined and complex effect of conditions leading to intentions to create a new business. In terms of overall coverage value, the results show an overall solution coverage score of 0.787. It means that the four configurations of causal conditions explain 79 per cent of the intentions to become an entrepreneur. The overall solution consistency is 0.834.

#### *fsQCA analysis results by gender*

In this section, we report on the fsQCA results when gender is operationalized as a separate condition to uncover its unique effect on the entrepreneurial intentions. This is mainly due to the fact that fsQCA follows an effect-of-causes model and additional conditions are included only if they are strongly associated with the outcome of interest. Gender has been used as moderator in many prior studies applying standard statistical analysis ([BarNir et al., 2011](#)). [BarNir et al. \(2011\)](#) studied the effects of role models and self-efficacy on forming career intentions. Gender was used as a moderator for the overall effect of exposure to role models, such that the direct and indirect effects are different for men and women. The authors found that role models have a significant and positive impact on intention and gender moderated the effects. Therefore, to obtain additional insights regarding the role of gender in formulating entrepreneurship mindset, we include gender as a separate condition in fsQCA analysis to determine if gender has a differential impact on the analysis of the theory of planned behavior (see more e.g. [Maes et al., 2014](#)).

The results of the analysis with gender revealed five solutions. Interestingly, solution one is identical to solution one in the previous step of fsQCA analysis ([Table IV](#)). This finding indicates that the presence of attitude toward entrepreneurship and perceived behavior control suffices for the outcome to occur, regardless of the gender of the subjects. Both of the PBC and attitude (AT) are core conditions. In other words, for both females and males these two conditions are decisive and lead to entrepreneurial intentions. From the coverage value (0.743) standpoint, this solution has the highest value indicating it contains more cases in the solution. Out of four remaining configurations (solution 2-5), three of them are dominated by the males (solutions 2, 3, and 5, see [Table IV](#)). Solution two indicates that for males, the negation of self-efficacy and presence of PBC leads to the outcome. In solution three, again applicable only to males, indicates that the presence of PBC and presence of subjective norms influences the intentions of males to pursue an entrepreneurial career. Solution four, where the consistency value is the highest (0.902), is applicable only to females such that the presence of PBC and SN, the two important constructs of TPB, in addition to presence of self-efficacy are the central conditions for the outcome to occur. This is the only solution in the entire analysis where the presence of self-efficacy plays significant role, and yet applicable only to females.

In solution five, applicable only to males, the absence of self-efficacy and the presence of both attitude towards entrepreneurship (AT) and SN are important conditions for the intentions, in this solution, attitude (AT) is a core condition. This is another intriguing result,

Causal conditions	S1	S2	Solution S3	S4	S5
Gender		○	○	●	○
Self-efficacy		○		●	○
Subjective norms			●	●	●
Perceived behavioral control	●	●	●	●	
Attitude towards entrepreneurship	●				●
Raw coverage	0.743	0.249	0.469	0.393	0.259
Unique coverage	0.138	0.001	0.005	0.001	0.001
Consistency	0.882	0.901	0.890	0.902	0.838
Overall solution coverage	0.773				
Overall solution consistency	0.853				

**Notes:** Black circles indicate the presence of a condition, and blank circles indicate its absence, Large circles indicate core conditions; small ones, peripheral conditions, Blank spaces indicate “don’t care,” Male = ○, Female = ●

**Table IV.** Intermediate solutions of the fsQCA (with gender)

because solution two, four and five support research findings which suggest that self-efficacy has an impact on entrepreneurial intentions and that the impact is gendered such that women have lower self-efficacy (Chen *et al.*, 1998; Gatewood *et al.*, 2002; Wilson *et al.*, 2007) yet the rates for women creating a new business is high, suggesting while self-efficacy may be low, this does not deter women from starting a new business. In terms of overall coverage value, the fsQCA results show an overall solution coverage score of 0.773, which means that the five configurations (solutions) of causal conditions explain 77 per cent of the intentions to become an entrepreneur. The overall solution consistency is 0.853.

The findings provide support for the two propositions we identified earlier. First, more than one configuration exist that leads to entrepreneurial intentions indicating equifinality (P1). Second, the fsQCA results show configurations leading to entrepreneurial intentions, when gender is included in the analysis, are clearly different for females and males. This means that while one condition may be present for females, the same condition may be absent for males, depending on its combination with the other conditions, indicating causal asymmetry (P2).

**Discussion**

Over the past 35 years, research has provided strong support for the utility of the TPB (Liñán *et al.*, 2011). Ample studies examined and investigated individual behavior by making use of one or more validated core constructs, such as self-efficacy and perceived behavioral control (Kautonen *et al.*, 2013, 2015; Krueger and Carsrud, 1993). Current literature (Guerrero *et al.*, 2008) is preponderant with the methodological stance rooted in correlational-based (symmetrical) relationships analysis such as structural equation modeling (SEM) that tend to treat variables as competing in explaining variation in the dependent variable(s). Furthermore, while there are ample of studies with strong support for the gender differences (Diaz-García and Jiménez-Moreno, 2010; Gupta *et al.*, 2009), we argue that traditional methodological approaches such as SEM often fail to uncover the nuances of the role that gender plays in the entrepreneurship research. Previous studies using both the TPB and SEM to assess the role of gender in the path relationships, have found that gender role is of marginal or no significance (Kautonen *et al.*, 2015; Krueger *et al.*, 2000). This is not surprising since these analyses use gender as a moderator. Further, these mixed results suggest that do not make a compelling case for considering gender differences in

creating positive support or attitudes for entrepreneurship. Therefore, we might assume that given the lack of differences, there is no need to consider research on intentions of women entrepreneurs separately or compared to men entrepreneurs. Taking it one step further, this also might suggest that general training programs for both men and women would be designed to provide support and create positive attitudes would be sufficient. Instead, our results support the opposite assumption, that many factors such as entrepreneurial self-efficacy contribute to the disparity between men and women in entrepreneurial career behaviors, and play a key role in determining the level of interest in pursuing such a career (Wilson *et al.*, 2007; Shahab *et al.*, 2019).

By applying the fsQCA, we were able to assess how conditions combined together exhibit different features and lead to different sets of solutions (Fiss, 2007; Mas-Tur *et al.*, 2015, p. 2281). The results demonstrated in Table IV clearly show that with this method we could obtain complementary insights and new knowledge about the role of gender that we often fail to gain with conventional statistical methods. In other words, we found conditions where their presence may be considered important for the females or the absence of the same condition may be considered important for the males or vice versa. In our study, unlike conventional quantitative statistical methods which treat variables as competing in the explanation of variation in outcomes (Mas-Tur *et al.*, 2015, p. 2281), by using fsQCA, we treated variables as partnering together to exhibit different features and leading to outcomes. Moreover, the fsQCA results show that we cannot assume that both men and women have positive attitudes, high perceived behavior control and perceived positive view of subjective norms. Thus, they would be equally likely to have entrepreneurial intentions. It also challenges the assumption that perceived high or low self-efficacy would not be important. With fsQCA approach when gender was not included in the analysis, not only did we find self-efficacy has no role for the outcome to occur in two configurations (solution 1 and 3 in Table III) but also we were able to demonstrate that in other two configurations (solution 2 and 4), the absence (lack) of this condition leads to the outcome. Instead of concluding only that self-efficacy is not significant, we find that the absence can also lead to a significant result. Further, the results show that the core variable may be different in driving the results, and the presence or absence of self-efficacy operates in combination with PBC and subjective norms. As discussed before, the fundamental premise of the fsQCA analysis is based on the synergistic effects and equifinality, therefore, we are able to see how combinations of conditions create the outcome of interest (Fiss *et al.*, 2013).

Our findings seem to be more aligned with literature such as Nowiński *et al.* (2019), showing that there are differences in attitudes of women and men entrepreneurs in terms of self-efficacy, subjective norms and perceived behavioral control, rather than general TPB which suggests it applies to all entrepreneurs equally. Our study supports the notion that there are wide variations not only between men and women but also among groups of women related to motivations (necessity versus opportunity) and intentions to start a business (Kelley *et al.*, 2017). We found only one configuration that applies to both females and males, in that configuration the presence of attitude to entrepreneurship and perceived behavioral control are considered to lead to the outcome (see solution 1 in Table IV). On the other hand, we found for males, the absence of self-efficacy in the configurations and the only thing that matters is whether they have high perceived control, positive attitudes and social support. In contrast, the presence of self-efficacy is important for females at least in one solution (see solution 4 in Table IV), supporting earlier research showing that women have lower self-efficacy and belief in their capabilities and that this perception is linked to lower intentions to start a business and impact fundraising and ultimately performance (Chen *et al.*, 1998; Gatewood *et al.*, 2002).

Our findings with regards to self-efficacy are open to debate and are in contrast to much previous work and somewhat surprising. The results imply that the contemporary dialogue about women being less confidence in business start-up may need to be replaced by consideration of the role of positive attitudes and subjective norms as these relate to women's entrepreneurial intentions. This finding provides support for work showing that a lack of family support, positive cultural norms, role models and culture can be a barrier to women's entrepreneurship (Eagly and Karau, 2002; Shinnar *et al.*, 2012). This is consistent with theoretical work on the role of family and household embeddedness suggesting the family system can drive entrepreneurial approaches (Aldrich and Cliff, 2003). The results suggest that there is more research to be done on the antecedents to intentions, especially as this relates to gender. Further, we cannot assume that variations among groups of women do not exist and that further insights might emerge from a more in-depth analysis of a subgroup of women.

Overall, our paper demonstrates that testing constructs within the TPB in addition to self-efficacy using fuzzy-set qualitative comparative analysis provides better understanding of the conditions under which outcomes occur. The results show that there are different combinations of configurations where the predictor conditions interact together to influence the entrepreneurial intentions. The fsQCA analysis reveals that there are multiple configurations (causal factors) that lead to the outcome (see Tables III and IV), thus providing enough justification for the appropriateness of the method, specifically when the attention is on a case-level receipt. Moreover, our results reveal some of the main weaknesses of correlational-based methods when the focus is on conceptualizing cases as combination of conditions and emphasis that it is these very combinations that give cases their unique nature. This means for entrepreneurs, different combinations of conditions exhibiting different features (e.g. attitude and PBC) may result in entrepreneurial intentions. This is more consistent with theory that suggests entrepreneurs are not motivated by the same things, and that there are a variety of different conditions leading to entrepreneurship (Carsrud and Brännback, 2011). In other words, there is more than one roadway to get to the destination – and usually there are multiple ways of solving a problem.

### Conclusions and implications

Significant research draws from the theory of planned behavior (TPB) showing that attitudes and behaviors influence intentions to start a new business. However, the majority of studies use some form of regression-based statistical analysis which assumes symmetrical relationships and fixed causal pathways to describe intentions to start a new business. This assumption is inconsistent with theory and empirical evidence which shows that entrepreneurship is filled with unexpected and non-linear actions. We argue that even though significant pathways are explicated in the literature to date, current methodologies may not fully explain the non-linear actions and heterogeneity of the entrepreneurship processes, and more importantly ignoring the gender's role in pursuing such a career. In particular, there is a question as to whether the antecedents to entrepreneurial intentions differ by gender. Current studies are inconsistent and tend to assume there are no differences, even though feminist theory and research on women entrepreneurs suggests this is not the case. By employing fsQCA on a sample of 2,038 business school students, we analyzed entrepreneurial intentions. This method provides a robust framework to further understand the contribution of different conditions leading to the occurrence of the outcome, and enabled us to perform an in-depth investigation on the complexity of entrepreneurship. The results of the analysis show that this method can be used to compare and contrast

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entrepreneurial intentions of females and males by demonstrating possible combinations of conditions driving entrepreneurship in terms of gender of individuals.

#### *Implications for theory*

This paper makes several theoretical contributions. First, we contribute to the entrepreneurship literature by providing evidence that gender is an important intervening factor and indeed a significant variable in understanding differences between females and males in pursuing an entrepreneurial career. In the form of multiple configuration of conditions, the results provide detailed picture of entrepreneurial intentions and show that the variation in conditions influencing the entrepreneurial intentions are sufficiently complex, providing support for the research proposition. Contrary to previous research on TPB (which ignores gender), we find gender differences in the configurations, which are illuminated by the multiple configurations present in the fsQCA results. Secondly, we find that the absence of self-efficacy in the results predicts males' intentions to become entrepreneurs (Table IV, Solution 2 and 5). This finding implies new research directions as it relates to intentions because we cannot assume that existing TPB theory applies equally to men and women as most previous research has assumed. More research on additional antecedents other than self-efficacy is suggested. Also, instead of just employing gender as a moderator, it needs to be more fully included in the analyses. This suggests that we might consider re-thinking how gender is a contextual frame for current theories, such as TPB, rather than just an analytical variable, as noted by Ahl (2006) and others. Third, our results suggest that entrepreneurial intentions itself is meaningless if not considered in conjunction with the theory-based variables and other contextual conditions driving it, the conditions leading to the intentions determine whether we should consider them desirable or not. This is extremely important observation, as a more profound understanding of gender differences will help policymakers to strengthen the strategies and their decision making. Finally, the findings of this paper make contribution to the understanding of entrepreneurial intentions research by providing in-depth insight into the roles of different conditions in driving the intentions to start a new business start-up which provides a support for the research proposition. Our research provides a foundation for expanding the literature on conventional theoretical frameworks such as one proposed by Ajzen (1985), the TPB. Our findings make clear that PBC and self-efficacy have different effect on the behavioral intentions, this is in itself a theoretical contribution.

On a more theoretical level, while there has been critiques on using TPB, some even suggest abandoning the model (Snihotta *et al.*, 2014), we still see considerable potential in the model especially if we apply new statistical approaches to the data that allow for different combinations of configurations. The aim of this paper has not been to challenge TPB as such, but to show the complexity it seeks to model. Our research shows that we need more sophisticated methods (like fsQCA) and to consider and accept the possibility that a problem may have multiple solutions (supporting the research proposition). With fsQCA, we allow for and actively seek multiple solutions, whereas with traditional statistical methods we work to minimize and exclude potential noise that would result in complex and messy solutions.

#### *Implications for practice*

The fact, that fsQCA relies on the substantive domain knowledge of the researcher opens up for a truly rich scholarly debate about interpretations of research results, within and across research groups. Moreover, the results of this paper provide new insights to understand better the complexity of managerial behaviors, particularly entrepreneurial behaviors which

should be pursued in future research. If we accept that there are many roadways to the outcome, we may also have to accept that one size does not fit all with respect to policy or training programs. Recent research on education and training of women entrepreneurs shows that factors influencing self-efficacy for women entrepreneurs is different than for men, in particular, when women interact and work with female entrepreneurs their self-efficacy is much higher, but the same is not true for men (Rosendahl-Huber and Bechtold, 2019). Also, there is a need to include female role models in classroom cases, panels and events, as well as ensure that programs are not “gendered” and male dominated (Cochran, 2017). Policy will not only have to adjust to the external economic conditions but also become more sensitive to differences in motivators for nascent entrepreneurs. For instance, the creation of policy for women entrepreneurs needs to consider a bottom up approach whereby women entrepreneurs provide input on their needs and solutions rather than employing simply a top down approach, once size fits all (Brush and Greene, 2016). Our research potentially suggests that there are no easy or quick fixes. Still, the findings of this paper can be used to formulate strategies and public policies, in particular strategies that reinforce and allow sustainable creation of a new businesses. The findings of this study offer a novel practical contribution by identifying multiple recipes necessary to understand better the female intentions to pursue an entrepreneurial career across a diverse sample.

#### *Limitations and future research*

This study is not without limitations. First, it could be argued that students are not representative of the population as a whole; therefore, the use of students as proxies for potential entrepreneurs might be subject to debate, although the appropriateness of using students as more heterogeneous samples has been recommended, particularly in the entrepreneurship context (Liñán *et al.*, 2011). Before, further analysis, we do not claim that the findings of this research can be generalized to any population. Second, our data set comprises multinational data including eight countries, but we did not compare the results at the country levels, so in the future cross-national analysis can be performed to see if differences between countries can be obtained to enhance our understanding of entrepreneurial intentions. Like other statistical methods, fsQCA has also some limitations, for instance the domain knowledge and experience of a researcher play a vital role for the choice of the conditions, calibration of data and in the process of simplifying configurations and interpretation of the results when fsQCA is used. Moreover, the results of fsQCA could be sensitive to the cases included in the analysis, this limitation is especially true when a small sample of cases is used (Berg-Schlosser and De Meur, 2009). Nevertheless, it should be pointed out that this issue is not a limitation in our paper, as we used a large number of cases (i.e. 2038).

Our research opens different avenues for future research looking at managerial behavior. For instance, researchers could employ the fsQCA in their studies to determine if different sets conditions let to similar results. One possibility might be entrepreneurial orientation which is rooted in four variables, competitive aggressiveness, proactiveness, innovativeness and risk propensity (Lumpkin and Dess, 1996). Researchers have examined the multiple ways that this construct is formulated in explaining performance (George, 2011). Scores of studies find different results, the vast majority applying SEM and other causal analytical techniques, suggesting this might be another area where fsQCA could yield new understandings.

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Constructs	Measurement items and descriptions	Sources
Self-efficacy	SE1: When facing difficult tasks, I am certain that I will accomplish them SE2: I believe I can succeed at most any endeavor to which I set my mind SE3: I will be able to successfully overcome many challenges SE4: I am confident that I can perform effectively on many different tasks SE5: Even when things are tough, I can perform quite well	Chen <i>et al.</i> (2001)
Subjective norms	SN1: My family would see it as very positive if I would start my own business SN2: My friends would see it as very positive if I would start my own business	Kautonen <i>et al.</i> (2010), Souitaris <i>et al.</i> (2007)
Perceived behavioral control	PBC1: I am prepared to start a viable firm PBC2: I can control the creation process of a new firm PBC3: I know the necessary practical details to start a firm PBC4: I know how to develop an entrepreneurial project	Liñán and Chen (2009)
Attitude towards entrepreneurship	AT1: A career as entrepreneur is attractive for me AT2: I had the opportunity and resources, I'd like to start a firm AT3: Being an entrepreneur would entail great satisfactions for me AT4: Among various options, I would rather be an entrepreneur	Ajzen (1991), Liñán and Chen (2009)
Entrepreneurial intentions	EIN1: I will make every effort to start and run my own firm EIN2: I am determined to create a firm in the future EIN3: I have very seriously thought of starting a firm EIN4: I have the firm intention to start a firm some day	Ajzen (1991), Liñán and Chen (2009)

**Table A1.**  
Constructs and  
sources of  
questionnaire items

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