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Chapter

The Effect of Entrepreneurship Education, Masculinity, and Femininity on the Entrepreneurial Intention of Students

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Abstract

In the last decade, a lot of studies have focused on the effects of entrepreneurship education on entrepreneurial intentions of students. However, various conclusions are seen in previous literature regarding the impact of entrepreneurship education on the entrepreneurial intentions of students. In a lot of papers regarding the relation between entrepreneurship education and entrepreneurial intentions and behavior, the variable sex (being male or female) is a control variable or studied as moderator. Since sex is not always seen as a sufficient moderator, some researchers split the total test group into two subgroups, based on the gender role orientation of people (masculinity and femininity) rather than the sex differences, although research in this area is quite scarce. This book chapter tackles this research gap and examines the effects of entrepreneurship education on student's entrepreneurial intention, when emphasizing not only on sex but also on masculinity and femininity. Two different empirical studies are integrated. The first study demonstrates that male students have higher entrepreneurial intention compared with female students, and people with high masculinity also score higher in entrepreneurial intention, compared with people with low masculinity. The second study reveals that an elective, lecture-based course especially suited the students with high masculinity.

Keywords: entrepreneurship education, entrepreneurial intention, gender, sex, masculinity, femininity, SEM, theory of planned behavior

1. Introduction

1.1 The importance of entrepreneurship for economic growth

Entrepreneurship has been and will remain an important driver for the economies of all countries. The call for more entrepreneurs has found its way from a side note in
economic research to a strategic topic of key importance in political mission statements of, e.g., the United Nations [1] or the European Commission [2]. More entrepreneurs are needed since entrepreneurship can foster societal benefits such as job creation, innovation, internationalization, individual well-being. Moreover, in modern economies, entrepreneurship is considered to be the far most important factor for economic growth [3].

First, regarding job creation, Zoltan and Szerb [4] examined that exceptionally fast-growing businesses—like often given in the start-up community—are responsible for most job creation and a significant share of economic growth. Also, Malchow-Møller [5] concluded in their research that start-ups in Denmark are responsible for 25% of job creation.

Second, Zhao [6] discussed the reciprocal influence between entrepreneurship and innovation: both interact to help an organization to flourish. Also Henrekson [7] concluded that innovation is important for entrepreneurship and growth, but has to be supported by the government to be able to flourish. In accordance to that, Huggins et al. (2015) claim that entrepreneurship is an important driver of innovation if this relationship is supported by the suitable network and network capital.

Third, entrepreneurship is said to foster internationalization, especially when the start-up is able to rely on the knowledge of foreign markets, by which new chances are met [8]. Also Cavusgil et al. [9] associate rapid internationalization with huge chances in order to create competitive advantages.

Besides those named societal benefits, Phelps [10] also claims that entrepreneurship, combined with creativity and the interest for adventures, can give a positive impact to life satisfaction.

1.2 Sex and gender perspectives in entrepreneurship research

Since entrepreneurship needs to be fostered from a societal perspective, a lot of scholars perform research on this topic. However, previous research mainly focused on male entrepreneurs [11–13], while also women-owned businesses significantly contribute to wealth creation in all economies [14]. So the call for more entrepreneurs has become a greater focus, particularly in research agendas examining how to foster women’s entrepreneurship (e.g., [15]), especially since the European Commission promotes and supports women to become entrepreneurs via the Entrepreneurship 2020 Action Plan [2]. Since the call to emphasize in research also on female entrepreneurship, recent studies have primarily concentrated on the differences between men and women (e.g. [16–18]). This way an empirical emphasis is put on sex analysis (the difference between being a man and a woman).

However, sex analysis is only one side of the coin of entrepreneurship research: among others, Tedmanson, Verduyn, Essers, and Gartner [19] claim that besides the difference in sex, there also needs to be put attention on a gender analysis (the score of every individual regarding their masculinity and femininity characteristics). In fact, with the growing awareness of the historical inattention to women entrepreneurship research from a more nuanced perspective [20, 21], there is plea to address sex and gender from their own distinct or, even more pronounced, combined analysis perspective.

Research traditions have shifted when it comes to the focus within women’s entrepreneurship [22], even though the distinction of sex and gender analysis still has not appeared in many articles. Some conceptual papers focus on gender studies and gendered discourses [23, 24], although empirical papers mostly survey sex, while
surveys on entrepreneurial intentions (EIs) and the effect of gender (i.e., socially constructed masculinity/femininity) remain rare.

In fact, more and more researchers are aware that women’s entrepreneurship should not (only) be limited to sex analysis. Recent research states that gender role orientation (masculinity and femininity) is seen as a better indicator of entrepreneurial intentions and behavior [25]. Carter and Williams [26] present the idea that starting a firm is not only influenced by being a man or a woman, but that more attention should be drawn to the impact of the socially constructed gender and gender role orientation, which find their base in Social Feminist Theory: men and women have different cultural backgrounds and different ways of thinking. Sex is seen as the physiological difference between men and women, while gender refers to culturally specific patterns of behavior, including entrepreneurial behavior [27].

Via gender analysis, the socially constructed aspects of masculinity and femininity have become more prominent when analyzing the genderedness of entrepreneurial contexts [28–31], identities [32], or activities [33]. While this development of a new research agenda is promising, and a lot has in fact happened in politics, academia, and education in the last two decades, there is still much to be done in both the scientific and practical realms [34].

1.3 The lens of entrepreneurship education to foster entrepreneurship

In order to raise entrepreneurship, the European Commission asks for educational programs that stimulate the entrepreneurial mindset (intentions) or the entrepreneurial behavior. The European Commission gathers therefore knowledge and evidence via 91 studies collected from 23 countries in order to get to know how the impact of entrepreneurship education (EE) is achieved. Based on this collection, the European Commission is convinced that entrepreneurship education has a positive influence: students and alumni are more likely to start up their own company and are more successful than students who did not have any entrepreneurship education. If alumni of entrepreneurship education did not choose to start up their own business, they are still more successful in their job and have a lower risk of becoming unemployed. The European Commission also states that on a bigger scale the impact of entrepreneurship education is positive for educational institutions, the economy, and the society (EC, 2015).

Moreover, lots of research has been performed regarding business failure, and this research is very diverse [35–38]. This study gives an answer to the call of Walsh and Cunningham [38] to better understand how business failure can be avoided, since they state that it is important that we learn to benefit from education among other variables such as legislative environment and social support.

In the last decade, a lot of studies have focused on the effects of entrepreneurship education on entrepreneurial intentions of students. However, various conclusions are seen in previous literature regarding the impact of entrepreneurship education on the entrepreneurial intentions of students. Some authors conclude that entrepreneurship education (EE) does not change the entrepreneurial intentions (EIs) of students [39], while other studies found a favorable [40] or unfavorable [41] effect of EE on EI.1

1 Since entrepreneurship education is organized under several formats (e.g., lectures, case studies, action based like making a business model or business plan, hackathons, excursions or a combination of the above), we wanted to variate also in this book chapter and integrate a study about a traditional lecture based course as well as a study about a non-traditional course like a hackathon.
In a lot of papers regarding the relation between entrepreneurship education and entrepreneurial intentions and behavior, the variable sex (being male or female) is a control variable. Most researchers state that male students have initially more entrepreneurial intentions than female students [40, 42] and that sex is a moderator for entrepreneurial intentions and eventually entrepreneurial behavior since female students might be less likely to act on their intentions [43].

1.4 Main research question

Since sex is not always seen as a sufficient moderator, some researchers split the total test group into two subgroups, based on the gender role orientation of people rather than the sex differences. This gender role orientation implies that personal characteristics are not related to being a man or woman, but are related to the masculinity and/or femininity of every person [44]. Marlow and Martinez Dy [33] concluded that the gender agenda of entrepreneurship research should be rethought, with a special focus on masculinity (and also femininity), based on the research of Jones [24] where she states that entrepreneurship education is more linked to images of white male successful entrepreneurs with masculine normative templates. Studies where the effect of entrepreneurship education on entrepreneurial intentions or behavior is measured with an emphasis on the difference between students with high and low masculinity and/or femininity are rare. Addressing this research gap, the following leading question can be posed:

“How can we stimulate the entrepreneurial intention of students via entrepreneurship education if we look at the differences in sex and in gender?”

2. Methodology

In order to give an answer to this central question, this book chapter exists out of a literature review of relevant papers and two empirical analyses after explaining the chosen theoretical frameworks: the Bem Sex Role Inventory (BSRI) Model and the Theory of Planned Behavior (TPB).

The systematic literature review deals with the topic entrepreneurship education and gender when only higher education in Europe is taken into consideration, delivering a total map of research regarding this topic. The two empirical contributions emphasize more on the differences in sex as well as high masculinity and/or femininity scores, starting first with a cross-sectional analysis, followed by a pre-post-study, offering a compiled discussion and conclusion.

2.1 The choice of the Bem sex role inventory model

The conceptual model in order to test masculinity and femininity is the Bem Sex Role Inventory [45], using the shortened version with 20 validated items in the work of Campbell et al. [46]. In particular regarding gender awareness and gender behavior, the construct validation of the Bem Sex Role Inventory is good measurement for this kind of test. The shortened version of the Sex Role Inventory created by Sandra Bem is tested by Campbell et al. [46] on 791 subjects via a confirmatory factor analysis to compare the long (60 items) and shorter (20 items) version: here it is concluded
that the shorter form yields more reliable scores. The 10 masculine items and 10 feminine items are presented in Table 1.

Although some researchers argue that the BSRI could be seen as a rather classical and somehow outdated stereotype of gender analysis, this theoretical framework is ideal compared with others. For example, the theory of Gender Identity and Transgender Identities [47] is an interesting approach to study sex versus gender discourses; however, for these analyses, this is not the core of the research gap we want to address and especially with the empirical characteristics of the samples 2, this theory would take us too far into transgender issues.

Nevertheless, the choice is made for a deeper analysis than only the traditional male versus female approach of the Gender Binary Theory [48]. In a lot of gender discourses, there is a gender analysis approach via the Gender Role Orientation (GRO): the GRO is a construct, which is used over the last years frequently in research papers where a gender analysis is performed. As a first example, Mueller et al. [49] studied the interplay of biological sex and gender roles in relation to the motivation to become an entrepreneur. However, in order to perform the gender analysis, they used the Bem Sex Role Inventory Model since the factors masculinitity and femininity had a strong reliability within their samples. Also Yarnell et al. [50] used the BSRI to classify the participants into a gender role orientation category for their study about gender differences in self compassion. Furthermore, Perez-Quintana et al. [51], who performed a study about starting entrepreneurs, tested the gender role orientation of their sample via the BSRI. All in all we can state that however the gender role orientation construct could be seen as a more recent approach for gender analysis, the questions in the surveys to analyze the GRO are based on the Bem Sex Role Inventory. The choice to use this construct is also discussed in the call of Gupta et al. [52], where

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2 In the two empirical analyses, we asked the students to fill in if they referred to be male, female, or “diverse.” Overviewing all the answers of the students in the different samples revealed that none of them categorized themselves to be “diverse.” Therefore, the traditional dichotomy of being male or female remained as the approach of the sex analysis, while the gender analysis was performed via the Bem Sex Role Inventory. So, although there is no further explanation regarding “diverse” people in the samples, this variable was taken into account by the initial screening of the samples.
they state that they encourage entrepreneurship researchers to use a “lens of gender,” which can be based on the BSRI.

Furthermore, a pilot test is performed in order to investigate whether Flemish students understand the terms of masculinity and femininity and whether the scores are comparable to other studies. The pilot test revealed that students were familiar with terms as assertiveness, leadership, dominant, ... as being masculine and terms as gentle, understanding, sympathetic, ... as feminine. Besides, the scores of masculinity and femininity of both sexes is comparable with the meta-analysis of Donnelly and Twenge [53].

2.2 The choice of the theory of planned behavior

The theoretical framework for the study about the entrepreneurial intention and/or behavior of students is based on the Theory of Planned Behavior (see Figure 1 for the relation between entrepreneurial intention and its three antecedents as part of the total schedule). Overviewing literature regarding the effects of entrepreneurship education on entrepreneurial behavior, two models are often used in literature as a theoretical base [54]: the Theory of Planned Behavior [55] and the Entrepreneurial Event Model [56]. Survey tests show that both models offer strong statistical support in predicting and explaining entrepreneurial intention and behavior [57], and the predicting effect of both models is also comparable [58]. Since the Theory of Planned Behavior (TPB) is seen as very consistent and robust [58] and there has been extensive research on it [59–61], the use theory of planned behavior will be central in this book chapter.

Since entrepreneurship research indicates that entrepreneurial behavior succeeds entrepreneurial intention [58], entrepreneurial intention is a very strong

![Figure 1. Theoretical framework.](image-url)
predictor of planned behavior [62], to such as starting a business or not. Hence entrepreneurship is a type of planned behavior for which these intention models suit ideally [57].

In the Theory of Planned Behavior model, three antecedents or independent predictors of entrepreneurial intention are set up:

- **Attitude Toward Behavior (ATB)** is the attitude a person has toward the behavior (here entrepreneurial behavior): the higher the score for ATB, the stronger it will influence positively the EI of that person.

- **Subjective Norm (SN)** measures the social pressure someone feels from others, in respect of the desired behavior. The more encouragement an individual gets from others, the stronger the EI of that person will become.

- **Perceived Behavioral Control (PBC)** or the belief someone has in order to execute his or her behavior: the perception a person has how easy it is to start up or not. The easier a person thinks it is to start as an entrepreneur, the more likely it will be that he or she becomes self-employed.

To make rigor and relevant use of the TPB framework, the following in literature raised critiques have to be taken into account. Ogden [63] concluded in her pragmatic analysis that the use of social cognition models (where the theory of planned behavior is one of them) raises difficulties. She states that the constructs of these models are too unspecific and that conclusions are often true by definition instead of by observation. Ajzen and Fishbein [64] deepened due to these critics their research and concluded that intentions could be predicted by the three theoretical antecedents together, but that even only one or two of them could be sufficient: the relative importance of every antecedent can vary from one population to another. In other words, in some studies a predictor can have a significant influence while in another contextual setting this may not be the case.

### 2.3 The integration of the theory of planned behavior and the Bem sex role inventory in one model

In Figure 1, the model with the relation between the different variables over the different studies is given.

As stated before, the literature review focuses on recent papers about entrepreneurial intention/behavior with an emphasis on gender (and sex) in the area of entrepreneurship education in Europe.

The first empirical analysis is a cross-sectional study based on a survey of 501 business students. The sample consisted of 268 students of University College Ghent and 233 of student of Ghent University. The University College students were in their third and final bachelor of business administration, and all followed several mandatory courses of entrepreneurship during their education. The students of the Ghent University survey were in their second bachelor year of Business Economics and had already been following some mandatory entrepreneurial courses as well. The main purpose this is to investigate the relation between masculinity, femininity, and sex (as predictors) in relation to entrepreneurial intention (as dependent variable) and its three antecedents: attitudes toward behavior, subjective norms, and perceived behavior control (as mediators) via a structural equation model.
The sample of the second study was taken from an introductory course in entrepreneurship, which is organized over the total university. Here 178 students came from different background (law, economics, engineering) in order to follow this elective course. The course was a combination of lectures regarding business modeling and opportunity recognition combined with testimonials of entrepreneurs.

The main purpose here is to explore the effect of entrepreneurship education on entrepreneurial intention (and its three antecedents), with an emphasis on the difference between students with high and low masculinity via a split plot factorial design.

2.4 Literature review

Since reviews about entrepreneurship education in combination with gender studies are rare, the purpose is to provide a state of the art regarding entrepreneurship education and gender between 2006 and 2016. Two main questions are posed:

What kind of research is performed on entrepreneurship education and gender on the European continent? What are the main general and gender-related issues and key findings regarding this topic?

This literature review is based on a systematic approach according to the work of Pickering and Byrne [65], generating a European map of research. The literature research was performed among international peer-reviewed articles (in English) in the following databases: Web of Science, Science Direct, Business Source Premier, and ABI/Inform. A sample of 87 were integrated into a database to manually examine 54 characteristics of every paper. Deductive and inductive coding approaches were applied for the content analysis based on the work of Epstein and Martin [66].

The 87 articles are found in 42 different journals with disciplines including education, business, entrepreneurship, gender, social sciences, management, and technology. The journals having the most articles are Education and Training (14), Journal of Enterprising Culture (6), International Entrepreneurship and Management Journal (5), and International Journal of Gender and Entrepreneurship (5).

Based on the deductive and inductive coding, six research topics were identified: EE and female entrepreneurship, the impact of EE on students' competencies and/or entrepreneurial propensity, the study of EI and/or its antecedents in relation to EE, the beliefs of students about the characteristics of entrepreneurs, the beliefs and attitudes of students about entrepreneurial courses, and the beliefs and attitudes of students about entrepreneurship (starting up).

Based on the content analysis of the papers, following conclusions are important: women initially show fewer entrepreneurial intentions than men; women have less interest in an entrepreneurial career compared with men; there is no clear conclusion whether entrepreneurship education has a positive impact on intentions or not. One finding in particular is important: in five of the six topics, “gender” is used as a synonym for “sex” while in the topic “the beliefs of students about the characteristics of entrepreneurs,” gender is more based on the masculine and feminine characteristics of individuals. This gives rise to the question what kind of research could be performed when the effect of entrepreneurship education is measured on entrepreneurial intention and behavior when testing for the variable “sex” (being man or woman) as well as for the variable socially constructed “gender” (having masculine and or feminine characteristics).
Therefore, the two performed analyses focus on the impact of sex, masculinity, and femininity as predictors of entrepreneurial intentions and its antecedents.

3. Results

As stated before, two analyses are performed: a cross-sectional study with structural equation modeling and a pre- and post-study from students following an introductory course in entrepreneurship.

3.1 Entrepreneurial intentions of business students

The purpose of this study is to offer new insights regarding the entrepreneurial intention of business students, with an emphasis on their masculine and feminine characteristics (socially constructed gender) besides the usual classification male/female. The following main question is posed: does a higher or lower score in entrepreneurial intention (and its antecedents) depend on the factor whether a person is (1) male or female, (2) has high or low masculinity, (3) has high or low femininity? The Theory of Planned Behavior is used as underlying framework, with entrepreneurial intention as dependent variable and its three antecedents (“attitude toward behavior,” “subjective norms,” and “perceived behavior control”). A survey is administered and filled out by 501 Belgian business students of different universities. Masculinity and femininity are measured by the Bem Sex Role Inventory Model.

3.1.1 Derivation of the hypotheses

Many articles emphasize the difference in entrepreneurial intentions via the Theory of Planned Behavior in the context of sex analysis between men and women. Schwarz, Wdowiak, Almer-Jarz, and Breitenecker [67] found that male students have a significantly higher intention toward entrepreneurship than female students. Joensuu et al. [42] also concluded that female students show a lower level of initial intentions. Kurczweska and Bialek [68] found that female students expressed lower entrepreneurial intentions than their male counterparts. Kourilsky and Walstad (1998) refer to previous studies where women (including female students) have a less positive attitude toward entrepreneurship and a lower desire to start businesses of their own. Other recent studies that affirm this lower-level attitudes toward entrepreneurship are Vukovic [69], Camelo-Ordaz, Diánez-González, and Ruiz-Navarro [70], and Shinnar et al. [43]. Furthermore, Haus et al. [71] showed in their study that there is a mediation effect for attitudes toward behavior, subjective norms, and perceived behavior control between sex and EI. Last, the reason why women show less intention to start up can be due to various reasons: women tend to be more risk averse [72]. Another reason is they do not find easily support from financial institutions [73] by which they have less control over their entrepreneurial situation.

Based on these mentioned articles, we expect that being male has a positive direct impact on EI and also indirect via attitudes toward behavior, subjective norms, and perceived behavior.

When focusing on the relation between masculinity and entrepreneurial intentions, some scholars associate possessing masculine characteristics positively with entrepreneurship and entrepreneurial intention [74]. For example, Gupta, Turban, Wasti, and Sikdar [52] stated that entrepreneurs are perceived as having characteristics similar to
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those of masculine gender-role stereotypes. Their study found similar results about the fact that men and women have higher entrepreneurial intentions when they possess masculine characteristics. Regarding the impact of masculinity on attitude toward behavior, Gupta et al. [52] concluded that entrepreneurs and business people tend to possess a more hostile and predatory attitude, which is seen as masculine. Furthermore, Heilman [73] indicated in her research that a “good” entrepreneur is predominantly described using masculine attributes with a masculine leadership style, which implies an attitude as daring to take risks in a financial or managerial context, daring to take a stand, or being independent [75].

Therefore, we hypothesize that masculinity has a positive direct impact on EI and also indirect via ATB, SN, and PBC.

While literature provides insights that masculine norms, which are of benefit in the start-up world, are linked to higher EI, successful entrepreneurs tend to have also some feminine attributes such as helping others, understanding, being emotional, etc. [76]. Contrary to that, recent studies give raise to the assumption that the dominance of the socially constructed femininity can have a more negative effect to become an entrepreneur. Following Ahl and Nelson [77], insights are given that feminine individuals are socially constructed as the “others” in entrepreneurial (ecosystem) discourses: being inadequate and/or extraordinary without taking into account the social and structural conditions that shape their entrepreneurial intention and action. Accordingly, researchers found that words related to femininity such as gentle, sensitive to the needs of others are associated with attitudes such as cautious and selfless, which are the opposite of entrepreneurial [15, 74]. Hence, feminine-orientated persons show a negative attitude (ATB) toward entrepreneurial behavior.

Therefore, we hypothesize that femininity has a negative direct impact on EI and also indirect via ATB, SN, and PBC.

3.1.2 Methodology and results

The hypotheses were tested using a quantitative questionnaire survey.

Of the effective sample, the Kaiser-Meyer-Olkin test for sample adequacy was high (0.869) and Berlett’s sphericity test was highly significant ($p = 0.00$), so the data are suitable for factor analysis. Besides factor analysis, we tested also the reliability of every variable. For example, Entrepreneurial intention as the dependent variable was measured by the mean score of eight items on a seven-point Likert scale (1 totally disagree; 7 totally agree). Six of the eight items are similar to Liñán and Chen [78]. Two extra items were added based on the research of Kolvereid [79]. Cronbach’s alpha was 0.959, showing a reliable measure, which is comparable to former research [78]. Similarly, reliability checks and factor analyses are performed for the other variables, revealing similar scores.

The dataset was analyzed with SPSS 25, and the structural equation modeling (SEM) is performed with StataMP 15. Adding covariance errors between ATB, SN, and PBC, the model fit is perfect (RMSEA = 0.00, Chi-square = 0.64, NFI = 1.00, CFI = 1.00, standardized RMR = 0.005), and the model is saturated.

The analysis via SEM (Figure 2) makes it possible to detect the direct and indirect impact of effects in the model. Solid lines show the significant relations, dotted lines the insignificant ones for sex, masculinity, and femininity. We see that sex (being male) has a positive direct impact on EI (compared to being female) with $p = 0.000$ and a $T$ value of 4.56. Furthermore, masculinity has a positive direct impact on EI (compared with non-masculinity), with a $T$ value of 2.23 ($p = 0.026$). Finally,
femininity has not a negative direct impact on EI (compared with non-femininity) with $p = 0.182$, so there is no significant change.

Furthermore, a Sobel test was performed in Stata MP 15 to test the indirect effects. We found that sex (being male) has a positive indirect impact on EI via ATB, but not via SN nor PBC. Second, masculinity has a positive indirect impact on EI via ATB and SN, but not via PBC. Finally, femininity has never an indirect negative impact on EI: in fact, femininity has a positive impact on EI with SN as mediator.

In the next part, the effect of entrepreneurial education (lecture-based course) is performed via a pre- and post-test on a different group of students following a lecture-based course in entrepreneurship, with a focus on the difference between students with high masculinity and students with low masculinity.

### 3.2 The effect of an entrepreneurship course on the entrepreneurial intentions of business students with an emphasis on masculinity

This study explores the effects of entrepreneurship education on entrepreneurial intention for students with high and low masculinity. Contrary to previous studies addressing the differences between male and female students, and guided by socially learned stereotype theories, we consider the potential moderating effect of masculinity via a split factorial design.

#### 3.2.1 Derivation of the hypotheses

In many papers regarding the impact of entrepreneurship education on entrepreneurial intentions, sex (referring to being male or female) is a control variable. Most researchers state that male students initially have more entrepreneurial

![The analysis via SEM.](image.png)
intentions than female students [40, 42]. However, some articles conclude that the entrepreneurial intention of male students increases following an entrepreneurship program, while the intentions of female students decrease [39]. In order to understand these different conclusions, some researchers divided the total test group into several subgroups of students not based on sex. Since sex is not always seen as a sufficient moderator, some researchers split the total test group into two subgroups based on the gender role orientation of people instead of their sex differences. Studies where the effect of entrepreneurship education on entrepreneurial intentions is measured with an emphasis on the difference between students with high and low masculinity are rare.

Nwankwo et al. [25] have concluded that masculine individuals have higher EI than others because they display stronger self-esteem and possess more career self-efficacy. Consequently, masculine characteristics are positively associated with entrepreneurship and entrepreneurial intention [74]. But, to our knowledge, no articles have to date achieved conclusions based on quantitative analyses. Splitting a total group into subgroups with high or low masculinity has yet to be performed. The following hypothesis is proposed and is guided by the emphasized implications of research on EI and masculinity: prior to a course, students with high masculinity will have a higher EI score than students with low masculinity.

Since entrepreneurship education significantly influences the development of these kinds of entrepreneurial traits [80], and there is often a positive impact of entrepreneurship education on entrepreneurial intentions in general [81], we expect that masculinity moderates the impact of entrepreneurship education on entrepreneurial intentions. Based on the existing literature, we propose the following hypothesis: when taking an EE course, students with high masculinity will have a higher positive change in EI than students with low masculinity.

3.2.2 Methodology and results

A split plot factorial design [82] within group treatment was used to measure the differences between subjects of high and low masculinity, as well as within the same subjects in the pre-test (t1) and the post-test (t2). An entrepreneurship course was given to all students between t1 and t2. A median split was performed based on the research by Vafaei et al. [83]. A total of 178 students filled in the pretest (at the beginning of the first course session) and post-test (at the end of the last session). Those who scored equal or higher than the median were labeled as the high masculine group (N = 83). Those who scored lower than the median masculinity score were labeled as the low masculine group (N = 95).

Also this time entrepreneurial intention (EI) as the dependent variable was measured by the mean score of eight items on a seven-point Likert scale (1 totally disagree; 7 totally agree). Six of the eight items were similar to Liñán and Chen [78], and two extra items were added based on the research by Kolvereid [79]. Cronbach’s alpha in the pre-test was 0.938 and 0.947 in the post-test, indicating a reliable measure, and which is comparable to previous research [78]. Masculinity was measured via the Bem Sex-Role Inventory [45] using the shortened version with 10 items validated in the work by Campbell et al. [46]. Concerning reliability, a Cronbach alpha of 0.854 in the pre-test and 0.869 in the post-test was measured. Following the approach of Chandler and Lyon [84], factor analysis with varimax rotation was performed on the main variables to evaluate if the items loaded on the appropriate construct, which was the case.
Calculating the means for entrepreneurial intention revealed following results: the overall mean for EI in t1 was 3.54, and 3.55 in t2, which is high or similar compared with other studies in a European setting. In the research by Varamäki et al. [41], EI scored 3.30, while in the research by Liñán and Chen [78], the score in the pre-test was 4.01 and 3.77 in the post-test. An ANOVA test was performed between the means of the initial levels of EI between the two groups in t1. Prior to the course, there was only a marginal significant difference ($p = 0.066$) between the high (3.72) and low masculine (3.35) groups, which the first hypothesis needs to be rejected: prior to the course, students with high masculinity did not have a significantly higher EI score than students with low masculinity.

For the second hypothesis, differences in EI changes were measured using another ANOVA test between the high and low masculine group. Here, the difference in change for each group was measured between periods t1 and t2 (the duration of the entrepreneurial course). The mean score of change in EI of the high masculine group increased by 0.18, while the mean score of DEI of the low masculine group decreased by 0.16. Since $p = 0.007$, the difference in changes in EI between the high masculine group and the low masculine group was significant, by which we accept the second hypothesis. As extra control variables, the difference between sex was tested as well: there was only a significant difference in EI between males and females prior to the course. Finally, also the differences in EI between people with high and low femininity were tested: here there was never a significant difference in EI score between both groups.

4. Discussion and conclusion

This book chapter aimed to contribute to the existing research regarding the impact of entrepreneurship education in order to foster entrepreneurship of students and to avoid business failure in future [38], with a specific emphasis on differences in sex and gender perspectives.

The research question we wanted to answer was: “How can we stimulate the entrepreneurial intention of students via entrepreneurship education if we look at the differences in sex and in gender?”

In order to give an answer to this research question, this book chapter consists of a systematic literature review and two empirical papers. The literature review revealed that research in entrepreneurship and entrepreneurship education has been performed in a very diverse way, but also that “gender” is used as a synonym for “sex” while “gender” can also be seen from a social feminist approach, dealing with the masculine and feminine characteristics of individuals. This gives rise to the question what kind of research could be performed when the effect of entrepreneurship education is measured on entrepreneurial intention and testing for the variable “sex” (being man or woman) as well as for the variable socially constructed “gender” (having masculine and or feminine characteristics), and how this lense of gender can help to avoid business failure.

The first empirical study looks at the differences in sex and gender at a given point in time: the survey comprised students at the end of their bachelor study revealing an important role for masculinity and also femininity besides the difference of being male or female. The second empirical study looked at students before and after they were following an entrepreneurial course (lecture based, elective) where the conclusion was taken that this kind of entrepreneurial course stimulated especially masculine students.
Underneath we want to discuss (1) the most important conclusions and some limitations, (2) the main implications for further research, and (3) the implementation in education.

4.1 Important conclusions

This book chapter gives the insight that entrepreneurship can be fostered by entrepreneurship education but differences of participants regarding their sex and gender should be taken into account. This contribution is important since entrepreneurship is a considerable factor to maintain the well-being of individuals [85] and because it has a positive impact on several aspects of the of the society [2].

The literature review revealed that the impact of entrepreneurship education on entrepreneurial intentions is diverse: some papers state that women profit more than men from entrepreneurship education, while other papers conclude the opposite. Therefore, we aimed with this book chapter to deepen the analysis not only from a sex difference approach, but we integrated also the gender difference approach. The first empirical analysis showed that entrepreneurial intentions are indeed higher for male students compared with female students, but entrepreneurial intentions are also higher if a person has high scores for masculinity. Expanding the research also toward the antecedents of entrepreneurial intentions, we found that high masculinity is a good predictor for entrepreneurial intentions with attitude toward behavior and subjective norms as mediators. Besides, high femininity is a good predictor for entrepreneurial intentions with subjective norms as mediator. The second study revealed that an elective, lecture-based course especially suited the students with high masculinity. This study was performed via split factorial design with a pre-test and a post-test and aimed to give an answer to the different outcomes regarding the impact of entrepreneurship education on entrepreneurial intentions of students. While, prior to the course, students with high masculinity did not show significant higher entrepreneurial intentions than those with low masculinity, the difference in entrepreneurial intentions increased significant while and after following the entrepreneurial course in favor of the high masculine students. This means that this lecture-based entrepreneurial course especially stimulated students with high masculinity compared with those with low masculinity, while other gender or sex differences did not have an important impact.

4.2 Implications for educational practices

Concluding on the insights of the analyses, several implications for education are suggested, on the one hand to educate students better in entrepreneurship and on the other hand to avoid business failure in future since entrepreneurial courses can vary in their specific objective (ranging from informing students about entrepreneurship toward increasing entrepreneurial skills or even starting up): this way courses can be described as being “about,” “for,” “through,” or “in” entrepreneurship [86]. Depending on the outcome the educator aims for, the courses can change regarding the didactical approach. If an educator wants to inform students “about” entrepreneurship, a uniform lecture-based course is a good solution. Depending on the specific goal of the course, the educator can learn the students’ entrepreneurial skills in entrepreneurship, and by doing so increasing the entrepreneurial intentions of especially the masculine students. This means that if an educator wants to persuade all participating students to become more entrepreneurial by increasing
their entrepreneurial intention and behavior, elective entrepreneurial courses should be organized, with customized programs for different groups of participants: this way courses “through,” “for,” or “in” entrepreneurship will stimulate relatively more students than via the traditional approach.

Based on the empirical studies, we suggest that educators should take into account that students have different characteristics, which are important to take into account before setting the aim of the entrepreneurial course.

If educators do not only want to inform their students about entrepreneurship, but also want to increase the entrepreneurial intention of their students, the combination of a sex and gender analysis approach could be a good solution. Screening the initial levels of masculinity and femininity could help to target different groups of students with the same characteristics in order that they feel united with the kind of approach of entrepreneurship education they receive. While a general introduction (first lesson or session) of the entrepreneurial course is still a possibility, the subsequent sessions should be adapted to every subgroup with different sex and gender characteristics. In other words, lessons regarding the idea generation of the product idea, the business model and certainly networking events, and testimonials of entrepreneurs (success stories) could be programmed for every subgroup individually, guided by individual tutor or mentoring sessions per subgroup.

Furthermore, courses “through,” “for,” or “in” entrepreneurship could also help future entrepreneurs to understand better what important decisions they have to make in order to make a success of their business rather than failure. To come back to the work of Walsh and Cunningham [38] where they state that that the better we understand business failure, the greater all stakeholders can benefit in terms of education (among other factors), more attention should be drawn to the impact of different types of courses in entrepreneurship education. The next generation of entrepreneurship should take into account that there are people of different sexes and of different gender types: they should get educated in a proper way where they understand not only how to start up a business, but also to be able to maintain this business as successful as possible.

Gender-based entrepreneurial courses should therefore develop an approach with an adaptation to the needs of different subgroups. Here, more freedom in learning and reducing existing stereotypes is important to promote the self-confidence and individual development of the students. Since entrepreneurs are having characteristics more related to the masculine gender-role stereotypes and since men and women have higher entrepreneurial intentions when they possess masculine characteristics [52], organizing entrepreneurship courses via a lecture-based course (without paying attention to subgroups) could strengthen this discrepancy between people with high versus low masculinity and their entrepreneurial intentions and this rather than the difference between male and female students. Indeed, Langowitz and Minniti [87] state that gender role orientation and explicit masculinity are more important drivers for entrepreneurial intentions than sex. Their research noted how individual displaying characteristics consistent with those of masculine gender role stereotypes would have higher entrepreneurial intentions, and this independent of whether this person is a man or woman.

4.3 Suggestions for future research

The first suggestion for further research is based on the limitation of sample sizes and courses that are surveyed. For the two empirical papers, several surveys were used with different sample sizes and different student groups who followed
entrepreneurial courses in a mandatory or elective way. For the first study, the survey was taken from two different student groups. We could collect this survey one time. A post test was not possible. The students of the second study were able to fill in the survey two times, so a comparison between the pre-test and post-test was possible.

With this in mind, we would like to suggest a more general survey collaboration between different universities and educational programs in order to analyze within the same time frames different mandatory and elective courses. This way differences of approaches regarding entrepreneurial courses could be tested via a pre-test, a post-test, and a follow-up test. The analysis could even be broadened toward other universities of other countries, in order to test on more variables.

A second suggestion for further research is based upon the fact that only quantitative analyses are performed. Therefore, we propose to perform a qualitative analysis with semistructured interviews of students who started up in order to learn what triggered them to start up and also with students who have high entrepreneurial intentions but did not start up yet in order to learn what holds them back. Via a qualitative analysis reasons for not starting up can be collected as well as the triggers that really caused the start up. Hence, upcoming papers should also study the reasons behind these decisions of starting up or not. The central question to be posed then would be if entrepreneurship education can be seen as a potential trigger for actual entrepreneurial behavior as suggested in former research [88, 89].
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