PERCEPTUAL VARIABLES AS DRIVERS OF SUSTAINABLE ENTREPRENEURSHIP: A COMPARATIVE STUDY

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Abstract: Sustainable entrepreneurship distinguishes itself from conventional entrepreneurship by creating environmental and social value, in addition to economic value. To create a better understanding of what characterises individuals who become sustainable entrepreneurs, the effect of key perceptual variables is investigated in comparison to conventional entrepreneurs. Using a 2015 sample of 16.205 entrepreneurs from the Global Entrepreneurship Monitor, a binomial logistic regression is employed, making a distinction between sustainable entrepreneurs and conventional entrepreneurs. The results suggest that sustainable entrepreneurs have higher levels of opportunity recognition and self-efficacy. In practice, this contributes to policy that can stimulate the development of sustainable entrepreneurship.

Keywords: Sustainable entrepreneurship, entrepreneurship, perceptual variables, individual variables

INTRODUCTION

Sustainability is one of the most topical themes of our time. As the world is experiencing increasing effects of climate change, depletion of resources and loss of biodiversity, there is a call for more sustainable practices. Entrepreneurs can contribute to this, by combining sustainability and business into a sustainable venture (Patzelt & Shepherd, 2011). Sustainable entrepreneurship differs from conventional entrepreneurship, in the sense that it focuses on creating value along the triple bottom line. The concept of the triple bottom line suggests that in addition to the traditional way of measuring success by financial performance, businesses should focus on their broader contributions to society and the environment (Savitz & Weber, 2014). As sustainability is becoming an increasingly relevant topic, the academic field of sustainable entrepreneurship is gaining increasing attention as well. Specifically, many academics are interested in what drives people to become sustainable entrepreneurs (e.g. Cuervo, 2005). Understanding the distinctive characteristics of entrepreneurial individuals is key in gaining a broader understanding of the entrepreneurial process (Baron, 2004).

Even though antecedents of entrepreneurship are widely studied in conventional entrepreneurship studies, they have remained relatively unexplored in other contexts. The ability and intention of entrepreneurs to start their own business has been found to be affected by demographic factors, but also by their own values, beliefs, norms, perceptions, personality traits and cognitive factors (Bilgiseven & Kasımoğlu, 2019; Martínez-González, Kobylinska, García-Rodríguez & Nazarko, 2019). As most of these empirical findings are rooted in studies on conventional profit-seeking entrepreneurs, they cannot unambiguously be translated to sustainable entrepreneurs, due to the difference in motives for starting a business. It is therefore relevant to know whether there are skills or traits that distinguish sustainable entrepreneurs from conventional entrepreneurs. Education in business and management, and policy makers, can then stimulate such traits in order to motivate more people to engage in sustainable entrepreneurship (Hockerts, 2017).

Specifically, despite new enterprises becoming increasingly sustainable, little research has been done about how the drivers of sustainable entrepreneurs differ from the drivers of conventional entrepreneurs. Some researchers have looked at social entrepreneurs and their intentions (Hockerts, 2015). However, research on drivers of sustainable entrepreneurship, comprising both environmental and social entrepreneurship (Cohen & Winn, 2007), is more underdeveloped. Moreover, most of these studies look at antecedents of entrepreneurial

intentions, in line with the theory of planned behaviour, yet there remains ambiguity about whether intentions always result in behaviour. Intentions bound, but do not identify a probability that an individual will behave in a given way (Chandon, Morwitz & Reinart, 2005). Furthermore, some studies in the field use samples of which the representability is limited, such as Hockerts (2015), who investigates drivers of social entrepreneurship under business school students. The present research aims to investigate individuals who actually have become entrepreneurs, to become more certain about the concrete effect of the drivers of sustainable entrepreneurship. As such, the key aim of this paper is to develop insight into the determinants of sustainable entrepreneurship.

Multiple studies (Arenius & Minniti, 2005; Fernández-Laviada, López-Gutiérrez & Pérez, 2020) find that a set of perceptual variables affect entrepreneurial behaviour. Perceptual variables define entrepreneurs' subjective judgements about themselves and the environment around them. This set of variables includes perception of opportunities, perception about one's own skills and abilities, perception of cultural support and perception of risk. The purpose of the present study is to extend this knowledge by making a distinction between sustainable and conventional entrepreneurs and investigate whether there is a difference in perceptions about entrepreneurship between the two groups. As such, this study seeks to answer the following research question: *To what extent do perceptions of entrepreneurship affect sustainable entrepreneurship?*

The study provides several theoretical and practical implications. On the theoretical level, it extends current knowledge on antecedents of entrepreneurship, by showing how sustainable entrepreneurs differ from conventional entrepreneurs. Whereas previous literature has primarily focused on personal values driving sustainable entrepreneurship (e.g. Vuorio, Puumalainen & Felthofen, 2018), subjective judgements underlying sustainable entrepreneurial behaviour have remained largely unexplored. On the practical level, the provided insight in perceptual variables can, for instance, be used to adjust entrepreneurial education, in order to stimulate the emergence of more sustainable ventures.

The research question will be investigated using data from the Global Entrepreneurship Monitor (GEM) database. The database provides extensive and detailed survey-based data on entrepreneurial activity, both on an individual and a national level. The data retrieved from the GEM will be employed to conduct a quantitative analysis, using a binomial logistic regression. Quantitative analysis serves to broaden sustainable entrepreneurship as a field of study, as

much previous literature has been based on theory only. Solidifying such theory with large-scale data analysis serves to legitimise sustainable entrepreneurship as a field.

The remainder of the paper is structured as follows. The next section will proceed with outlining previous evidence and theory on antecedents of sustainable entrepreneurship, after which each proposed perceptual variable will be described more extensively, thereby setting up hypotheses accordingly. Subsequently, the methodology will be described and justified. After having shown the empirical results, the findings and their implications will be discussed. The paper concludes by acknowledging limitations and setting up implications for further research.

THEORETICAL FRAMEWORK

Few scientists disagree that human activity, and in particular industry, contributes to climate change and depletes ecosystems, resulting in outcomes that could be irreversible and disastrous for earth and humanity (Rockström et al., 2009). This destructive, unsustainable path will have to change. Entrepreneurship can aid in resolving such socio environmental issues (Dean & McMullen, 2007). Previously, the general paradigm in entrepreneurship and business was that trade-offs exist between sustainability and profitability, but a shift in this paradigm is now occurring (Edwards, 2005). Increasingly common is the idea that doing business along the 'triple bottom line' can lead to a win-win situation, when a long-time perspective is considered (Cohen & Winn, 2007). As such, the idea that entrepreneurial actions can diminish or reverse negative effects of climate change is becoming increasingly popular in academics as well (Dean & McMullen, 2007). This specific line of research is interested in how sustainable entrepreneurs can contribute to environmental and social well-being while also creating economic value. Cohen and Winn (2007) define sustainable entrepreneurship as the examination of *'how opportunities to bring into existence 'future' goods and services are discovered, created and exploited, by whom, and with what economic, psychological, social and environmental consequences'* (Cohen & Winn, 2007: 35). This definition specifically expands on a previous definition of entrepreneurship of Venkatamaran (1997) by considering the consequences of entrepreneurship along the triple bottom line.

A particular subfield in sustainable entrepreneurship seeks to answer the 'whom' part of the definition of Cohen and Winn (2007). It is interested in which individuals become sustainable

entrepreneurs and what underlying mechanisms drive this behaviour. This topic can be divided into two distinct components. Firstly, what drives people to become entrepreneurs? Secondly, why do some entrepreneurs decide to focus their attention on environmental or societal issues? These questions will be explored further in the following sections.

Drivers of Entrepreneurship

An entrepreneur identifies an opportunity in the market and then creates a new venture with the intention of attaining financial value (Nicolás Martínez, Rubio Bañón,& Fernández Laviada, 2019). New venture creation therefore ultimately depends on the initiative of the entrepreneur. Drivers of entrepreneurship are important to understand, as these describe the complex underlying behaviours through which the intention to start a business arises (Krueger, Reilly & Carsrud, 2000). Much literature on this topic is rooted in the theory of planned behaviour, which links an individual's beliefs to their behaviour. It proposes that attitudes towards behaviour, subjective norms and perceived behavioural control can predict behavioural intentions (Ajzen, 1991). Baron (2004) uses a similar reasoning, and proposes that the cognitive perspective, which emphasises that everything we do is influenced by mental processes, is useful in the field of entrepreneurship. Specifically, it allows us to understand better why some individuals choose to become entrepreneurs whereas others do not, why some persons recognise opportunities whereas others do not, and why some entrepreneurs are successful whereas others are not. For example, compared with non-entrepreneurial individuals, entrepreneurs are often characterised by a lower perception of risk, being more susceptible to overweighting small probabilities and other cognitive biases such as optimistic bias (Baron, 2004).

Drivers of Sustainable Entrepreneurship

A sustainable entrepreneur is like a conventional entrepreneur in many ways, yet they differ in their aim when starting an enterprise: a sustainable entrepreneur aims to create environmental or social value, in addition to financial value (Cohen & Winn, 2007). Possibly, their drivers also differ, but as mentioned before, research about this remains scarce. Some researchers have looked at drivers of social entrepreneurs and their intentions. For example, self-efficacy, empathy, and the existence of social support are valid predictors of social entrepreneurship (Hockerts, 2015). Whereas social entrepreneurs aim to benefit marginalized people through an explicit social mission (Hockerts, 2015), sustainable entrepreneurship extends this definition

by including entrepreneurs who focus on environmental issues. Thus, sustainable entrepreneurship is similar to social entrepreneurship in the sense that sustainable entrepreneurs also aim to make a wider contribution to the world, rather than solely focusing on value capture. As such, it is reasonable to expect that sustainable entrepreneurs have similar values and perceptions as social entrepreneurs.

Research that considers the antecedents of sustainable entrepreneurship often focuses on personal values and personality traits as predictors of sustainable entrepreneurship. For example, sustainable entrepreneurship is strongly associated with altruistic values (Vuorio et al., 2018), and there are studies that show that social entrepreneurship can be predicted by personality traits such as openness and agreeableness (Nga & Shamuganathan, 2010). The effect of these values is generally investigated with the aim to develop more suitable educational programs and policy to stimulate sustainable entrepreneurial behaviour (e.g. Nga & Shamuganathan, 2010; Hockerts, 2017), expecting the development of such values to aid emergent sustainable entrepreneurship. In this light, perceptions as predictors are also relevant to investigate in relation to sustainable entrepreneurship. When deciding whether to pursue an entrepreneurial opportunity, individuals do not just gauge whether this is in line with their morals, but perceptual factors also come into play. These perceptual variables express subjective judgements of the entrepreneur of themselves and the environment, but they do not describe objective circumstances necessarily (Arenius & Minniti, 2005). Nevertheless, they influence an individual's entrepreneurial behaviour. This study focuses on the four variables through which the GEM measures perceptions of entrepreneurs: the perceived existence of opportunities, the perception of one's own skills and abilities, the perceived cultural desirability of entrepreneurial behaviour in society, and the perception of risk. The next sections will provide a review of each of these variables and their effect on sustainable entrepreneurship, drawing on previous literature to formulate hypotheses.

Opportunity Recognition

Opportunity recognition is an important step in the entrepreneurial process. Often, the initiative to start a new venture starts when an individual perceives to have recognised a market opportunity that no other person has identified yet. The recognition of sustainable opportunities is affected by prior knowledge about entrepreneurship, personal gain, and altruism (Matzembacher, Raudsaar, de Barcellos, & Mets, 2019). Perceptions of the environment differ

per individual, and therefore, individual perceive unexploited opportunities differently as well (Bacq, Hartog, & Hoogendoorn, 2016).

When looking for opportunity, conventional entrepreneurs are generally searching for a breakthrough of some sort, hoping to realize economic gain (Austin, Stevenson & Wei-Skillern, 2012). On the other hand, for sustainable entrepreneurs, opportunities are likely to be identified within environmental and social issues (Lumpkin, Moss, Gras, Kato & Amezcua, 2013). These issues are often more basic needs that can be tended to through innovative approaches (Austin et al., 2012). Such needs, and thus opportunities for sustainable entrepreneurs, are generally abundant. To illustrate, Austin et al. (2012) states how social enterprises generally cannot meet the demands for social entrepreneurial services and programs.

In addition, sustainable entrepreneurs are more prone to have attention for sustainability issues (Vuorio et al., 2018). Motivation arising from perceived threats to personal wellness by climate change and altruism, drives the recognition of sustainable development opportunities (Petzelt and Shepherd, 2015). As such, sustainable entrepreneurs will be more alert to environmental and social problems and recognise an unexploited opportunity more quickly in this sense. Evidently, sustainable entrepreneurs will often be motivated to be entrepreneurial by a broader identified opportunity, rather than solely by profit-seeking.

To sum up, the scope of opportunities for sustainable entrepreneurs is expected to be broader than for conventional entrepreneurs and due to their specific interest in sustainability issues, they will be more likely to identify them. This leads me to suggest the following hypothesis:

Hypothesis 1. Sustainable entrepreneurs are more likely to be recognisant of opportunities than conventional entrepreneurs.

Self-efficacy

Self-efficacy describes how an individual perceives their own competence (Chen, Gully & Eden, 2001), in this context specifically in relation to entrepreneurship. It might also be loosely described as the extent to which we believe in ourselves (Krueger & Dickson (1994). Self-efficacy positively influences perceived entrepreneurial feasibility, which affects entrepreneurial intentions (Vuorio et al., 2018). Moreover, Krueger & Dickson (1994) find that

perceived self-efficacy increases risk taking, which is also tightly related to entrepreneurship (Antoncic et al., 2018).

Evidently, there is a positive relationship between self-efficacy and conventional entrepreneurship. Therefore, it would be expected to affect sustainable entrepreneurship to an extent as well. For instance, Hockerts (2017) finds that entrepreneurial self-efficacy is related to social entrepreneurial intentions. However, conventional entrepreneurs are more motivated by economic gain and a need for achievement or autonomy than sustainable entrepreneurs (Matzembacher et al., 2019). Sustainable entrepreneurs are motivated by altruism and attitude towards sustainability issues (Vuorio et al., 2018). They are mission driven and aim to solve a specific social or environmental issue (Matzembacher et al., 2019). Being driven by such personal values and focus on a broader mission expectedly diminishes the relevance of whether the individual is actually capable of becoming an entrepreneur. Thus, sustainable entrepreneurs are more likely to become entrepreneurial regardless of self-efficacy, compared with conventional entrepreneurs. This idea is reinforced by Bacq et al. (2016), who find that social entrepreneurs are less convinced of their own entrepreneurial capabilities than their conventional business counterparts. Hence, I propose the following:

Hypothesis 2. Sustainable entrepreneurs are less likely to have high levels of self-efficacy than conventional entrepreneurs.

Cultural Desirability

Perceived cultural desirability, which relates to whether a certain action is deemed attractive, has been found to influence entrepreneurial behaviour (Liñán, Rodríguez-Cohard & Rueda-Cantuche, 2005). If an entrepreneur perceives it desirable to be an entrepreneur in their society, this means that they think the circumstances are right for entrepreneurship. An entrepreneur has perceptions about whether the socio-cultural environment is conducive for engaging in entrepreneurship. They can perceive entrepreneurship to be more desirable in circumstances where entrepreneurship is socially legitimate and viewed as acceptable behaviour (Tominc & Rebernik, 2007). For instance, Stephan, Uhlaner, and Stride (2015) argue how informal institutions, such as postmaterialist values within a nation and informal cultural norms, can affect whether people are likely to engage in social entrepreneurship.

Entrepreneurs assess the social status of entrepreneurship differently in different contexts (Singer, Amoro, & Moska, 2015). This raises the question of whether sustainable entrepreneurs

are more or less likely than conventional entrepreneurs to perceive to have cultural support for entrepreneurship. Sustainable practices can be a means to legitimising an entrepreneurial venture. Schaltegger and Hörisch (2015) find that legitimisation is the predominating rationale for engaging in sustainability practices. For instance, companies may seek to comply with regulations or other types of stakeholder pressures. Therefore, in societies where entrepreneurs do not hold a high status, sustainability can be a means to gain cultural support. Furthermore, Hörisch, Kollat and Brieger (2017) find that entrepreneurs who perceive the social status of entrepreneurs to be low are more likely to be environmentally oriented, which also indicates that sustainable efforts can be used to legitimise entrepreneurship. As such, it is expected that some sustainable entrepreneurs use sustainability to legitimise themselves, when they have low perceptions of the cultural support that entrepreneurial activity holds. This notion is further confirmed by Djupdal and Westhead (2015), who find that environmental certification, as a way of environmental legitimacy, can mitigate the liabilities of young and small firms. If entrepreneurs perceive low cultural support, they may pursue a sustainable path to create legitimacy. This leads me to suggest the following hypothesis:

Hypothesis 3. Sustainable entrepreneurs are less likely to perceive entrepreneurship as culturally desirable than conventional entrepreneurs.

Fear of Failure

Risk has received much attention in the entrepreneurship literature. There is risk associated with the launching and sustaining of new ventures. Even though most new enterprises fail within a short amount of time, individuals generally think they are not as likely to fail as others (Baron, 2004). One measure of risk, as used by the GEM, is fear of failure. This variable identifies whether an individual weighs potential loss from entrepreneurship or potential gains from entrepreneurship more heavily.

Sustainable entrepreneurs differ from conventional entrepreneurs in how they establish their businesses and the start-up problems they face (Hoogendoorn, Van der Zwan & Thurik, 2019). These challenges occur because sustainable entrepreneurs often operate in markets where market imperfections exist (Dean & McMullen, 2007). To overcome such challenges, sustainable entrepreneurs must engage in institutional work to create institutional change (Pinkse & Groot, 2015). Furthermore, sustainable entrepreneurs often experience resource constraints, due to less easy access to more traditional sources of funding, such as bank loans

(Lumpkin et al., 2013). Such challenges affect sustainable entrepreneurs' perception of risk, as they create uncertainty (Hoogendoorn et al., 2019). In the same line of reasoning, Renko (2013) finds that social entrepreneurs face more risk of failure than nascent conventional entrepreneurs whose focus is on economic goals. Evidently, sustainable entrepreneurs face more uncertainty, and therefore risk, than conventional entrepreneurs. If sustainable entrepreneurs are realistic about the amount of risk they face, they may therefore be more conscious of the potential losses that could occur. Moreover, as they are also involved on a deep, personal level with the cause, such affective commitment can increase their fear of failing (Renko, 2013).

In addition, sustainable entrepreneurs are more reliant on social capital, attained from their community and informal ties, than conventional entrepreneurs (McKeever, Jack & Anderson, 2015). They often employ resources from connections within their social circles, as these people are often committed to the same cause. Hence, this heavier reliance on informal relations makes sustainable entrepreneurs more vulnerable to personal losses if they fail. Furthermore, Hoogendoorn et al. (2019) find that sustainable entrepreneurs are more afraid of personal failure, because they feel that their personal relationships are at stake more often. Overall, as sustainable entrepreneurs face more risk in terms of business success and social relationships, it is expected they have higher levels of fear of failure. Hence, the following hypothesis is formulated:

Hypothesis 4. Sustainable entrepreneurs are more likely to be afraid of failure than conventional entrepreneurs.

METHODS

Research Design and Sample

The data used for this research was employed from the Global Entrepreneurship Monitor (GEM). The GEM offers survey-based data on entrepreneurship over the world. As they collect data from entrepreneurs directly, it is a suitable means to investigate the effect of perceptions on sustainable entrepreneurship. The survey provides both global-level factors that affect the context of entrepreneurs, and individual-level characteristics and attitudes towards entrepreneurship. The GEM offers entrepreneurship data on over 200.000 entrepreneurs per year, of which at least 2.000 per country, and is updated annually. The dataset holds 20 years of data, which is comparable and harmonized internationally, allowing for quantitative analysis.

The data used in this paper were collected in 2015, when a special section on social and environmental entrepreneurship was included by the GEM. The data on social and environmental entrepreneurship enables a distinction between sustainable entrepreneurs and conventional entrepreneurs and allows me to make an empirical comparison over the proposed perceptual variables. The final sample that is used for this research contains 16.205 observations from 58 countries, leaving out observations that have individual-level missing data. As the dependent and independent variables are both categorical, there are no outliers in the dataset to be omitted. All respondents in the employed sample are involved in 'Total early-stage Entrepreneurial Activity' (TEA), which is comprised of nascent entrepreneurs and owner-managers of new firms (less than three and a half years old). This is according to the GEM's definition of entrepreneurship, and means that respondents who have been owner of a firm for longer than three and a half years, or for example, intrapreneurs, are excluded from the sample.

Variables

Dependent variable. The dependent variable was coded using the special section on sustainability in the survey from 2015, which asked the following question: *'Are you currently starting or leading any kind of activity, organisation or initiative that has a particularly social, environmental or community objective?*'. According to the GEM, this definition is consistent with academics, policymakers and other platforms (Bosma, Schøtt, Terjesen, & Kew, 2016). For the dependent variable, a dichotomous variable was then created where (1) indicates an individual who identified positively as sustainable entrepreneur according to this definition, and (0) for those who identified negatively, and therefore are conventional entrepreneurs.

Independent variables. The main independent variables were coded into binary variables, which take on either the value of '0' or '1', in which '0' indicates they answered 'no' to the respective question, and '1' indicates they answered 'yes'. For *perceived opportunities* entrepreneurs were asked whether, in their opinion, there will be good opportunities for starting a business in the area where they live, in the next six months. For *self-efficacy,* they are asked whether, in their opinion, they have the skills, knowledge and experience required to start a business. For *fear of failure,* they are asked whether fear of failure would prevent them from starting a business. Lastly, for perceived cultural desirability, the *perceived cultural support* variable was employed. This is an index comprised of the score for three variables of the survey. These are: 1) *In my country, most people consider starting a new business a desirable*

career choice, 2) *In my country, those successful in starting a new business have a high level of status and respect.*, and 3) *In my country, you will often see stories in the public media and/or internet about successful new businesses.* A binary variable was created, which takes on the value of '1' when the respondents answered 'Yes' for all three questions, and '0' if they answered 'No' for one or more of the questions.

Control variables. In addition to the independent variables that were explained earlier, several control variables are used to control for other factors that could influence whether an entrepreneur chooses to engage in sustainable or conventional entrepreneurship. Similar studies that investigate drivers of sustainable entrepreneurship generally use demographic factors to control for other factors. The control variables employed in this study are primarily in line with studies who conducted similar research (Arenius & Minniti, 2005; Nicolás Martínez et al., 2019; Fernández-Laviada et al., 2020). These include *gender* and *age*. In addition, the respondents were asked to provide the highest level of *education* they had completed, either 'None', 'Some secondary', 'Secondary degree', 'Post-secondary' or 'Graduate experience'. Furthermore, respondents were asked to provide their *work status,* which were categorized as 'Student', 'Homemaker', 'Retired/disabled', 'Part time' and 'Full time'. For *income,* respondents' income was recoded into a ranked categorical variable with three categories of the lower, middle, or upper third of the income distribution in their country. Lastly, to control for country and industry-dependent factors, country-level and industry-level effects will be controlled for.

Characteristics of Respondents

Table 1 displays the profiles of the respondents in the sample. Most of the respondents are conventional entrepreneurs (83,61%), which is in line with common literature. A small majority of the entrepreneurs in the sample is male. Most entrepreneurs were between 25 and 45 years old. A large majority, 83,18% of the entrepreneurs works full time, both self-employed and employed by a company. 57,7% of the respondents completed at least secondary education. Retail trade, hotels and restaurants is the largely dominating industry in which most entrepreneurs work (41,08%), after which the respondents are distributed fairly evenly over the rest of the industries.

In terms of the independent variables, 64% of the entrepreneurs perceived opportunities to exist. A large majority of 85,43% thought they had the skills and abilities required to be an

entrepreneur. 72,17% is afraid to fail. Lastly, only 31,78% perceived pursuing entrepreneurship to be culturally supported.

Table 1

Characteristics of respondents

Characteristics	N	%
Type of entrepreneurship		
Conventional	13.815	83,61
Sustainable	2.709	16,39
Gender		
Male	9.338	57,62
Female	6.867	42,38
Age		
18-25	2.949	18,20
25-35	5.022	30,99
35-45	4.197	25,90
45-55	2.654	16,38
55-65	1.240	7,65
65+	143	0,88
Work status		
Full time	13.479	83,18
Part time	917	5,66
Retired, disabled	157	0,97
Homemaker	394	2,43
Student	217	1,34
Not working	1.041	6,42
Income		
Lowest 33%	4.633	28,59
Middle 33%	5.110	31,53
Highest 33%	6.462	39,88
Education		
None	2.389	14,74
Some secondary	2.380	14,69
Secondary degree	5.609	34,61
Post-secondary	4.930	30,42
Graduate experience	879	5,54
Industry		
Agriculture, forestry, fishing	1.285	7,93
Mining, construction	814	5,02
Manufacturing	1.286	7,94
Utilization, transport, storage	510	3,15
Wholesale trade	1.350	8,33
Retail trade, hotels, and restaurants	6.705	41,08
Information and communication	453	2,80
Financial intermediation and real estate	326	2,01
Professional services	903	5,57
Administrative services	486	3,00
Government, health, education, social services	1.784	11,01
Personal/consumer service activities	303	1,87

Opportunities		
Yes	10.371	64,00
No	5.834	36,00
Self-efficacy		
Yes	13.844	85,43
No	2.361	14,57
Fear of failure		
Yes	4.510	72,17
No	11.695	27,83
Cultural support		
Yes	5.164	31,78
No	11.041	68,13

Model Specification

Several models will be used to test the hypotheses that were developed earlier. As shown earlier, the dependent variable is dichotomous. As such, a logistic binomial regression is employed, using STATA software. This form of analysis allows for an outcome that takes on dichotomous values, whereas the independent variables can be either categorical or continuous. In this study, this outcome indicates whether the entrepreneur is a sustainable entrepreneur (No = 0, Yes = 1). The goodness of fit of the model is tested by means of McFadden's Pseudo R^2 and the rate of correct classifications.

Three different binomial logistic models were estimated to test the hypotheses. In Model 1, only demographic factors were included to see to what extent they affect being a sustainable entrepreneur. In Model 2, the isolated effect of how perceptual variables relate to the likelihood of being a sustainable entrepreneur is tested. In Model 3, the demographic variables and perceptual variables are combined in a final model. In Model 1 and Model 3, dummies are included for the respondents' respective industries and countries. The logistic regression results of all three models can be found in Table 3.

RESULTS

Robustness

There were no issues concerning outliers in the dataset, as both the dependent and independent variables are categorical, and can therefore not take on extreme values. The only continuous variable in the dataset is age, over which no extreme values were observed. Furthermore, the dataset contains missing values for multiple variables. However, these are mostly distributed

randomly, with most variables having between 0% and 10% missing values. An exception was the variable for 'cultural support', of which 21% of the observations are missing. However, this higher rate of missing values can be explained by the fact that this variable consists of the responses of three other variables. As such, if any of these variables have missing values, the value of 'cultural support' is also missing. In this light, in addition to the sample being relatively large, the rate of missing values does not raise any concerns about potential bias. Therefore, no imputation methods were employed. STATA automatically leaves out the observations that have missing values for any variable in the regression.

The relevance of the control variables was tested by means of Wald tests, which suggested that all variables in the model should be included. To test for multicollinearity issues, a polychoric correlation matrix was estimated, which is a suitable means for testing for multicollinearity in a dataset that contains categorical variables. The correlations for the variables that are used in this research are depicted in Table 2. From the correlation matrix, no instances of multicollinearity can be observed, which are indicated by a correlation above 0,8. In addition, no VIF scores higher than 10 and a mean VIF of 2.52 indicate that the results are robust to multicollinearity issues. Furthermore, heteroskedasticity is not a problem for logistic regression like it is for, for instance, Ordinary Least Squares regression.

Table 2. Polychoric correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Sust. Ent.	1,000									
(2) Gender	-0,073	1,000								
(3) Age	0,032	-0,017	1,000							
(4) Opp. Rec.	0,134	0,005	-0,077	1,000						
(5) Self-efficacy	0,110	-0,095	0,008	0,232	1,000					
(6) Fear of Failure	-0,054	0,090	0,012	-0,174	-0,305	1,000				
(7) Support	-0,035	0,021	0,005	0,155	0,065	0,073	1,000			
(8) Work status	-0,008	-0,183	0,080	-0,245	0,020	0,003	-0,030	1,000		
(9) Income	0,011	-0,144	0,027	0,087	0,095	-0,071	-0,097	0,185	1,000	
(10) Education	0,028	-0,089	-0,038	-0,006	0,057	0,020	-0,104	0,067	0,266	1,000

Regression Results

The results of the binomial logistic regression analyses are displayed in Table 3. In Model 1, demographic variables were entered. A logit model requires a certain category of a categorical variable to be set as a reference category, against which the coefficients of the other categories can be interpreted. In the logit models, 'None' is taken as the reference category for 'Education'. When interpreting the coefficients and odds levels, they indicate whether other

levels of education are more or less likely to predict the likelihood of being a sustainable entrepreneur, compared to those having no education. Similarly, for 'work status', 'not working' is used as the reference category. Furthermore, the 'lower 33%tile' was the reference category for the 'Income' variable. Model 1 suggests that demo-economic characteristics affect the likelihood of an individual being a sustainable entrepreneur. The overall correct predictions of Model 1 are 84,28%.

From Model 1, it is found that men are more likely to be sustainable entrepreneurs than women. The odds ratio for gender is 0,844, which indicates that women are 16,6% less likely to be sustainable entrepreneurs than men. Furthermore, the likelihood of being a sustainable entrepreneur increases with age. Working full time and being a student are positively related to the likelihood of being a sustainable entrepreneur, whereas being a homemaker, retired or part-time worker does not have a significant effect. The level of income is negatively related to the likelihood of being a sustainable entrepreneur, and the size of this effect increases for a higher level of income. Furthermore, education positively affects whether an entrepreneur is likely to be classified as a sustainable entrepreneur. This effect increases with the level of education. The effect is negative for having some secondary degree, compared with having no education, but this effect is not significant. From the 58 country dummies that are included in the model, 33 are significant. In addition, from the 11 industry dummies, 7 are significant. This suggests that country and industry specific effects can affect the likelihood of someone being a sustainable entrepreneur. Apparently, some countries and industries provide more conducive environments for sustainable entrepreneurs than others.

Model 2 only includes the perceptual variables, which are all significant. Model 3 adds the four perceptual variables from Model 2 to the demographic characteristics from Model 1. The percentage of correctly predicted respondents is higher for Model 3 than for Model 1 (84,36%), and the Pseudo R^2 has increased (0,1271), indicating that Model 3 is better than Model 1 at predicting the likelihood that someone is a sustainable entrepreneur. This suggests that the perceptual variables have a relevant effect on the dependent variable. None of the demographic characteristics lose their significance in this model, and their effect remains similar to the ones in Model 1. However, compared with Model 2, fear of failure and perceived cultural support lose their significance. This suggests that the effects on the likelihood of being a sustainable entrepreneur, that were previously explained by fear of failure and perceived cultural support, are now mostly explained by demographic characteristics. Step-wise regression (Appendix I)

indicates that fear of failure mainly loses its significance when the model controls for income and education. This suggests that income and education supplant the predictive power of fear of failure. In addition, cultural support loses its significance when industry dummies are added to the model, suggesting that cultural support does not significantly affect the likelihood of an individual being a sustainable entrepreneurs when controlling for the industry they operate in. Moreover, the coefficients for self-efficacy and opportunity recognition become smaller in Model 3, suggesting they lose some of their importance when demographic characteristics are added to the model. Model 3 is the final model with the highest prediction rate and the highest Pseudo R^2. Overall, from Model 3 it can be concluded that both demographic characteristics, opportunity recognition and self-efficacy affect whether someone is likely to be a sustainable entrepreneur. This allows me to make conclusions about my hypotheses.

It will be recalled first that sustainable entrepreneurs were expected to be more recognisant of opportunities than conventional entrepreneurs. The results show that perceiving entrepreneurial opportunities to exist is positively related to the likelihood of being a sustainable entrepreneur. It can safely be assumed that therefore, the group of sustainable entrepreneurs is significantly more likely to recognise opportunities. As such, hypothesis 1 is confirmed. The odds ratio for this variable is 1,353, which suggests that those who perceive opportunities to exist are almost 1,4 times more likely to be a sustainable entrepreneur than those who do not.

It was also expected that sustainable entrepreneurs are less likely to have high levels of self-efficacy than conventional entrepreneurs. However, self-efficacy is shown to be positively and significantly related to the likelihood of being a sustainable entrepreneur. The odds ratio for the self-efficacy variable is 1,208. This indicates that those who believe to have the skills and abilities to be an entrepreneur are 1,2 times more likely to be a sustainable entrepreneur than those who do not believe to be capable of being an entrepreneur. In a similar line of reasoning as for opportunity perception, this suggests that sustainable entrepreneurs are more likely to believe in their own skills and abilities than conventional entrepreneurs. These findings contradict hypothesis 2, which predicted that sustainable entrepreneurs are less likely to have high levels of self-efficacy than conventional entrepreneurs.

Thus, opportunity recognition and self-efficacy positively affect the likelihood of being a sustainable entrepreneur. What about fear of failure and perceived cultural support? Because the effect of fear of failure and perceived cultural support failed to reach significance on

Table 3
Regression results

VARIABLES	Model 1 Logit coeff	Odds ratio	Model 2 Logit coeff	Odds ratio	Model Logit coeff	Odds ratio
Sustainable Entrepreneurship						
Demographic characteristics						
Female	-0,170***	0,844***			-0,190***	0,827***
	(0,047)	(0,039)			(0,050)	(0,041)
Age	0,007***	1,007***			0,008***	1,008***
	(0,002)	(0,002)			(0,002)	(0,002)
Work status						
Student	0,419**	1,520**			0,389*	1,476*
	(0,197)	(0,299)			(0,206)	(0,304)
Homemaker	-0,119	0,888			-0,146	0,864
	(0,178)	(0,158)			(0,188)	(0,163)
Retired, disabled	-0,147	0,863			-0,137	0,872
	(0,234)	(0,202)			(0,253)	(0,221)
Part-time only	0,204	1,226			0,135	1,145
	(0,127)	(0,155)			(0,135)	(0,154)
Full time	0,180*	1,198*			0,191*	1.211*
	(0,094)	(0,113)			(0,099)	(0,120)
Income						
Middle 33%tile	-0,185***	0,831***			-0,180***	0,835***
	(0,059)	(0,049)			(0,063)	(0,053)
Upper 33%tile	-0,239***	0,788***			-0,300***	0,741***
	(0,057)	(0,045)			(0,061)	(0,045)
Education						

Some secondary	-0,042	0,959			-0,035	0,966
	(0,093)	(0,089)			(0,098)	(0,094)
Secondary degree	0,256***	1,292***			0,287***	1,333***
	(0,083)	(0,107)			(0,087)	(0,116)
Post-secondary	0,486***	1,626***			0,492***	1,635***
	(0,086)	(0,140)			(0,091)	(0,149)
Graduate experience	0,829***	2,291***			0,858***	2,358***
	(0,112)	(0,258)			(0,120)	(0,282)
Perceptual variables						
Opportunity recognition			0,383***	1,467***	0,302***	1,353***
			(0,044)	(0,064)	(0,052)	(0,070)
Self-efficacy			0,264***	1,302***	0,189***	1,208***
			(0,063)	(0,081)	(0,073)	(0,089)
Fear of failure			-0,102**	0,903**	0,008	1,008
			(0,046)	(0,042)	(0,055)	(0,055)
Cultural support			-0,134***	0,875***	-0,065	0,937
			(0,044)	(0,038)	(0,054)	(0,050)
Model diagnostics						
Constant	-1,688***	0,185***	-2,065***	0,127***	-2,027***	0,132***
	(0,216)	(0,040)	(0,067)	(0,008)	(0,270)	(0,036)
Observations	18.113		18.994		16.205	
Overall % correct predictions	84,28%		83,87%		84,36%	
Pseudo R^2	0,1239		0,0076		0,1271	

sustainable entrepreneurship, both hypothesis 3 and hypothesis 4 can be rejected. There is no evidence that sustainable entrepreneurs are more afraid to fail or perceive cultural support for entrepreneurs any differently than conventional entrepreneurs.

The fact that McFadden's Pseudo R^2 is only 0,1271 in the final model needs some attention. The Pseudo R^2 has a different interpretation than the commonly used R^2 in OLS regressions, and it does not usually approach 1, which illustrates that it is difficult for any model to predict a binary event with certainty. A Pseudo R^2 of 0,2-0,4 indicates an excellent fit of the model (Hensher & Stopher, 1979). However, the Pseudo R^2 of the final model is somewhat lower than this. Most likely, not all relevant variables that predict the likelihood of someone being a sustainable entrepreneur are included. However, this can be partly due to the nature of the dataset that is used, which only includes individual survey-level responses, and does not specify some exact macroeconomic circumstances that can affect the likelihood of someone being a sustainable entrepreneur. Additionally, the Hosmer and Lemeshow's goodness-of-fit test, which observes whether the predicted frequency and the observed frequency match closely, indicates that the model fits the data well (Prob>Chi2 = 0,8186).

Furthermore, remarkably, the Pseudo R^2 for the second model is very low (0,0076), even though the rate of correct predictions is high (83,87%). This can be explained by the fact that Model 2 predicts all observations to be 0, or conventional entrepreneurs. Since 83,87% of the sample identifies as conventional entrepreneur, the rate of correct predictions is also 83,87%. This suggests that the perceptual variables hold little explanatory power on their own. However, combined with the demographic characteristics in Model 3, the Pseudo R^2 is higher than Model 1, which suggests that the perceptual variables improve the goodness-of-fit of the model.

DISCUSSION

The aim of this study was to find out to what extent perceptions distinguish sustainable entrepreneurs from conventional entrepreneurs, as antecedents of sustainable entrepreneurship have remained relatively unexplored in previous research. As such, it was investigated whether opportunity recognition, self-efficacy, perceived cultural support and fear of failure were more prevalent for sustainable entrepreneurs or conventional entrepreneurs. This analysis was conducted by means of binominal logistic regression, of which the results indicated whether these variables increased or decreased the likelihood of someone being a sustainable

entrepreneur, compared with a conventional entrepreneur, thus indicating for which group these variables were more common. The regression accounted for multiple demographic characteristics and used country dummies to control for local influences. The study results indicated that some, but not all, perceptual variables affect whether an individual pursues sustainable entrepreneurship. This suggests that, to an extent, the way individuals perceive themselves and the environment around them, affects in which context they run their businesses. This confirms the notion that entrepreneurship is about people and thus a subjective matter.

Specifically, it can be concluded that sustainable entrepreneurs are more likely to perceive opportunities than conventional entrepreneurs. This is in line with hypothesis 1. For sustainable entrepreneurs, opportunities do not just exist in the form of financial breakthroughs like they do for conventional entrepreneurs (Austin et al., 2012). They also exist in the form of environmental or social gains to be made (Lumpkin et al., 2013), and therefore opportunities will likely be more abundant for sustainable entrepreneurs than conventional entrepreneurs. In addition, sustainable entrepreneurs are often characterised by being more attentive to social and environmental issues (Vuorio et al., 2018), and by being altruistic (Patzelt & Shepherd, 2011), which drives them to recognise opportunities for sustainable entrepreneurship. This can explain how sustainable entrepreneurs are more likely to recognise opportunities than conventional entrepreneurs.

Contrary to the predictions of Hypothesis 2, sustainable entrepreneurs are more likely to have high levels of perceived self-efficacy than conventional entrepreneurs. In a way, this is surprising because sustainable entrepreneurs are mission driven (Matzembacher et al., 2019), which potentially diminishes the importance of the perception of their own skills in the decision to pursue sustainable entrepreneurship. However, the importance of achieving a desired result with respect to the environment or community can also make it even more important to believe in one's own abilities as an entrepreneur. For sustainable entrepreneurs, there is more at stake than solely their financial position, as there are also social relations and environmental goals at risk. As such, it is key that they believe they have the abilities to pursue entrepreneurship when actually doing so. In addition, as reasoned before in the literature review, sustainable entrepreneurs often face more challenges than conventional entrepreneurs, for example with respect to financing and institutional constraints (Lumpkin et al, 2013; Pinkse & Groot, 2015). Therefore, they need to believe in their own abilities and skills to a greater extent to be willing

to face these challenges.

There is no evidence that sustainable entrepreneurs perceive cultural support towards entrepreneurs differently on a significant level, or have a different perception of risk on a significant level, as hypotheses 3 and 4 predicted, respectively. This suggests that even though these perceptual variables both affect entrepreneurship, their prevalence does not vary significantly between sustainable and conventional entrepreneurship. As such, these are not perceptions that policy should aim to target, in order to stimulate emergent sustainable entrepreneurship.

A note should be made regarding the interpretation of the results. The regression analysis indicates whether there is a relationship between the likelihood of being a sustainable entrepreneur and the aforementioned perceptual variables. It should be noted however, that unfortunately, it cannot establish a causal relationship with certainty. For instance, no definitive conclusions can be made about whether being recognisant of opportunities makes someone more likely to be a sustainable entrepreneur, or whether being a sustainable entrepreneur makes someone more likely to be recognisant of opportunities. However, as the results are significant, it can be said with near certainty that there is a relationship between the two variables, and that therefore, sustainable entrepreneurs are more likely to be recognisant of opportunities than conventional entrepreneurs. Of course, the same line of reasoning applies to self-efficacy.

To summarize, some perceptual variables, specifically opportunity recognition and self-efficacy, are more prevalent for sustainable entrepreneurs than for conventional entrepreneurs. These results advance research in sustainable entrepreneurship by providing novel information about the cognitive profile of sustainable entrepreneurs. Previous research found that these perceptual variables affect the likelihood of being a nascent entrepreneur positively (Arenius & Minniti, 2005). This paper makes novel contributions by making a comparison between sustainable entrepreneurs and conventional entrepreneurs and concluding that sustainable entrepreneurs perceive opportunities and their own abilities and skills differently than their conventional counterparts. In addition, this paper contributes to the current state of research by providing evidence on antecedents of sustainable entrepreneur on a quantitative level, which allows for generalization of the obtained results. From this line of reasoning, the results suggest that sustainable entrepreneurs should not just be considered a type of conventional entrepreneur, but that there is significant evidence to assume that they have different

perceptions about themselves and opportunities around them.

These findings have potential policy and educational implications. The results of this study suggest that opportunity recognition and self-efficacy should be considered when aiming to increase sustainable entrepreneurial activity. Therefore, specific attention to self-confidence building can be effective. Different types of learning in entrepreneurial education can stimulate self-efficacy, such as problem-based learning or training divergent thinking (Fuller, Liu, Bajaba, Marler & Pratt, 2018). In addition, extensive exploring of types of opportunities can stimulate opportunity recognition. Specifically, extra attention could be paid to opportunities related to environmental or social problems, in extension to more conventional entrepreneurial opportunities. The present study indicates that if these educational efforts result in (future) entrepreneurs having higher levels of perceived self-efficacy and opportunity recognition, this increases the likelihood of them pursuing a sustainable route in their entrepreneurial career. Furthermore, if the prevalence of the perceptual variables varies per community, this implicates that policies stimulating sustainable entrepreneurship can have different effects depending on local cultures.

Like any research, this research is not without its limitations. Firstly, the division for sustainable entrepreneurship is due to the respondent's own perception and is based on whether the enterprise has a particularly environmental, social or community objective. This is a relatively broad definition of sustainable entrepreneurship. For instance, one could argue that to be a 'truly' sustainable entrepreneur, the sustainable objective should be the enterprises' primary goal and precede financial value creation. However, according to the GEM research team, their definition of sustainable entrepreneurship is consistent with most definitions in the academic field (Bosma, Schøtt, Terjesen & Kew, 2016). In addition, because the individuals have to identify themselves as sustainable entrepreneurs, the variable is somewhat subjective and can thus vary over what respondents think constitutes as an environmental, social or community objective. Secondly, the data that were employed in this research was obtained from a special section in the GEM report of 2015, that only allowed for cross-sectional data analysis. As such, no definitive conclusions can be made about whether these results hold over time. Third, some questions in the GEM questionnaire were optional, which means that some countries could opt to not ask them, which could introduce bias in the sample. However, because the sample used in the present study includes a wide variety of countries still, the obtained results are robust.

Despite these limitations, the results of the study provide avenues for further research. As mentioned before, the definition of sustainable entrepreneurship used in this study was arguably broad. Future research can investigate whether these findings still hold when employing a narrower view on sustainable entrepreneurship, for instance, by only including those who emphasise social or environmental value creation over capturing financial value. It would also be interesting to see how the investigated factors differ over different types of sustainable entrepreneurship. For instance, it can be useful to make a distinction between social and environmental entrepreneurship, if the data allows it. In addition, the quantitative nature of this analysis does not allow for an extensive depiction of the individual stories and perceptions of the interviewed individuals. The results call for a more qualitative in-depth analysis that aims to find out what the exact underlying mechanisms are that are causing sustainable entrepreneurs to have higher levels of self-efficacy and opportunity recognition. Furthermore, this study investigated the prevalence of perceptual variables in order to contribute to the profile of sustainable entrepreneurs. However, how such variables can be developed in an individual in order to stimulate sustainable entrepreneurship, or under which circumstances these perceptions are most prevalent, is beyond the scope of this study and provides another interesting line for future research. Further, the results indicated that some industries and countries are more conducive for sustainable entrepreneurship than others. This provides another interesting avenue for research, which can aim to find out what exactly entails a favourable environment for sustainable entrepreneurship. Lastly, if another GEM section on social entrepreneurship were to be published, future research will benefit from seeing if the obtained results remain robust over a longer period of time.

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APPENDIX I

Step-wise regression: adding demographic variables to perceptual variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES								
Opp. Rec.	0,383***	0,386***	0,405***	0,402***	0,396***	0,387***	0,310***	0,302***
	(0,043)	(0,043)	(0,044)	(0,0445)	(0,047)	(0,047)	(0,051)	(0,052)
Self-efficacy	0,264***	0,253***	0,260***	0,270***	0,291***	0,269***	0,174**	0,189***
	(0,062)	(0,063)	(0,063)	(0,064)	(0,067)	(0,067)	(0,072)	(0,073)
Fear of failure	-0,102**	-0,093**	-0,089*	-0,086*	-0,078	-0,063	-0,004	0,008
	(0,046)	(0,046)	(0,047)	(0,047)	(0,049)	(0,046)	(0,054)	(0,055)
Cultural support	-0,134***	-0,132***	-0,134***	-0,144***	-0,148***	-0,117**	-0,095*	-0,065
	(0,044)	(0,044)	(0,044)	(0,045)	(0,046)	(0,047)	(0,053)	(0,054)
Female		-0,192***	-0,201***	-0,200***	-0,207***	-0,211***	-0,191***	-0,190***
		(0,041)	(0,041)	(0,042)	(0,044)	(0,044)	(0,047)	(0,050)
Age			0,006***	0,006***	0,006***	0,004**	0,008***	0,008***
			(0,002)	(0,002)	(0,002)	(0,002)	(0,002)	(0,002)
Work status								
Student				0,141	0,133	0,107	0,370*	0,389*
				(0,176)	(0,191)	(0,194)	(0,203)	(0,206)
Homemaker				-0,069	-0,073	-0,122	-0,075	-0,146
				(0,155)	(0,161)	(0,162)	(0,177)	(0,188)
Retired, disabled				-0,202	-0,217	-0,263	-0,177	-0,137
				(0,220)	(0,232)	(0,236)	(0,244)	(0,253)
Part-time only				-0,121	-0,091	-0,084	0,129	0,135
				(0,116)	(0,121)	(0,121)	(0,131)	(0,135)
Full time				-0,077	-0,087	-0,119	0,156	0,191*

				(0,081)	(0,085)	(0,085)	(0,096)	(0,099)
Income								
Middle 33%tile					-0,139**	-0,127**	-0,180***	-0,180***
					(0,055)	(0,056)	(0,062)	(0,063)
Upper 33%tile					-0,0443	-0,087	-0,299***	-0,300***
					(0,052)	(0,054)	(0,060)	(0,061)
Education								
Some secondary						-0,670***	0,012	-0,035
						(0,080)	(0,096)	(0,098)
Secondary degree						-0,499***	0,311***	0,287***
						(0,064)	(0,086)	(0,087)
Post-secondary						-0,272***	0,567***	0,492***
						(0,064)	(0,089)	(0,091)
Grad. experience						0,252***	0,969***	0,858***
						(0,092)	(0,116)	(0,120)
Constant	-2,065***	-1,981***	-2,216***	-2,171***	-2,089***	-1,655***	-2,077***	-2,027***
	(0,0669)	(0,069)	(0,095)	(0,122)	(0,130)	(0,140)	(0,250)	(0,270)
Observations	18.994	18.994	18.821	18.485	16.595	16.524	16.524	16.205

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Model 7 adds country dummies. Model 8 adds industry dummies.