

**Motivation for high performance in entrepreneurial  
work roles**

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## DECLARATION

*I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.*

Name and surname: Beverly Dawn Fuller

Signature:

A handwritten signature in black ink, appearing to read 'B Fuller', written over a light grey horizontal line.

Date:

11 November 2019

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## COVER LETTER

The selected journal for submission for publication of the research is the International Journal of Entrepreneurial Behavior & Research (IJEBR). The IJEBR is focused on the publication of original research relating to the human and social dynamics of entrepreneurship, as well as entrepreneurial management in small and growing organisations. The editorial team encourages high-quality submissions that advance the study of human and behavioural dimensions of entrepreneurship. There is constantly increasing academic, business and policy interest in the contributions that entrepreneurship and small businesses make to economic and social development in national and global contexts. The human dimensions of entrepreneurship are central to this. The research has a strong human and behavioural component in its application of self-determination theory, using need satisfaction and motivational styles as these relate to performance in entrepreneurial work roles in a small business context, and the research is therefore well-positioned for submission for publication in the IJEBR.

The IJEBR has been abstracted and indexed in the following:

- Scopus
- Cabell's Directory of Publishing Opportunities in Management
- Emerald Management Reviews
- ABI/INFORM
- Publication Forum
- Australian Business Deans Council Journal Quality List (B)
- Association of Business Schools (United Kingdom)
- ReadCube Discover
- BFI (Denmark)
- CNRS (France)

The journal is rated by the Academic Journal Guide 2018 as follows:

<b>AJG 2028</b>	<b>AJG 2015</b>	<b>ABS 2010</b>	<b>ABS 2009</b>	<b>JCR rank</b>	<b>SJR rank</b>	<b>SNIP rank</b>	<b>IPP rank</b>
2	2	2	2	-	13	9	12

It is confirmed that the article follows the author guidelines of the journal, as stipulated in detail on the journal's web page. The authors are sequenced by relative contribution, with Fuller, B., and Marks, J. as first and second author respectively.

## **CHAPTER 2. LITERATURE REVIEW**

### **2.1 Understanding motivation**

Motivation, generally defined as a force that triggers behaviour, and as the energy and persistence applied in pursuing an objective, is an inherently complex construct, evidenced by the wide array of theories and models to conceptualise, measure, and understand it (Bartol & Martin, 1998; Howard, Gagné, Morin, & Van den Broeck, 2016). Motivation is a critical issue for organisations and employees, and has been inextricably linked with employee productivity and organisational revenue, as well as with factors that cause individuals to experience a sense of optimism, satisfaction, and well-being in their jobs (Van den Broeck, Ferris, Chang, & Rosen, 2016). For Rainey (2009), motivation can simply refer to an individual's willingness to work hard, put in effort, and achieve good results. Motivation can also be viewed from the perspective of psychological forces within individuals that direct and drive effort and persistence, particularly when faced with obstacles (George & Jones, 2012). Psychological forces can be extrinsic and intrinsic and have been applied as far back as Herzberg's (1966) two-factor theory, looking at hygiene factors, which are extrinsic (for example, salary, working conditions), and motivators, which are more intrinsic (for example, personal growth, the nature of the work itself), as well as Maslow's (1954) hierarchy of needs theory, where higher-level need satisfaction such as self-actualisation was deemed to be satisfied by intrinsic factors (Chen, 2016).

### **2.2 Self-determination theory**

The theory of self-determination (SDT) is a broad humanistic lens through which to look at motivation, personality, and well-being (Deci & Ryan, 2000; Ryan & Deci, 2000), and the theory has experienced a wealth of research when it comes to the satisfaction of needs, as well as motivation. It was inspired by the early work of developmental and clinical psychologists such as Maslow and Rogers during the 1960s, and over the years it has been empirically validated in the workplace (Gagné & Deci, 2005). The central notion behind SDT is that human beings are naturally predisposed to exhibit the persistent positive features of agency, effort, and self-determination in their actions and lives (Ryan & Deci, 2000). The premise is that even though these tendencies are natural, they are not necessarily demonstrated under all

conditions and that there are conditions that both support and thwart them (Shir, Nikolaev, & Wincent, 2018). Given its scope and depth, the theory of self-determination offers researchers a comprehensive view of human motivation (Chen, 2016).

### **2.2.1 Basic psychological needs**

SDT posits that every individual possesses three basic psychological needs, namely autonomy, competence, and relatedness (Deci & Ryan, 2000). These needs have been referred to as “innate, organismic necessities rather than acquired motives” (Deci & Ryan, 2000, p. 229). The theory asserts that the fulfilment of all three needs is necessary for individuals to experience psychological growth and an optimal sense of well-being (Deci & Ryan, 2000), which has consequences for positive psychological and behavioural experiences (Deci & Ryan, 2008). Ryan (1995) terms these three needs “nutriments” (p. 410) because they are so integral to psychological development and health. In the same way that a plant needs water and sunlight to grow, humans need these three nutrients for psychological growth and well-being. The three needs are also believed to be innate and natural rather than learned, because they form part of an individual’s psychological make-up. They reflect individuals’ innate needs to feel uncoerced and free in the way they behave, master their environment, and experience meaningful relations with others (Shir et al. 2018).

#### **2.2.1.1 Autonomy**

Autonomy refers to behaviours that are willingly self-endorsed and selected by individuals, rather than forced or pressured upon them (Olafsen, Niemiec, Halvari, Deci, & Williams, 2017). In other words, the behaviours must stem from an individual’s own volition, and in accordance with that individual’s real self and personal values (Chirkov, Sheldon, & Ryan, 2011; Deci & Ryan, 2000). When individuals experience autonomy, they have a sense of ownership of their work (Rigby & Ryan, 2018). When the need for autonomy is frustrated, individuals find themselves having to act against their will as a result of external pressures or factors (Olafsen et al., 2017).

### **2.2.1.2 Competence**

Competence is experienced when individuals feel effective and the master of a task or action (Olafsen et al., 2017). People like to feel a strong sense of their ability to succeed at a job or task - that they have the skills, resources, and expertise to do the job well. They also like to feel challenged and have a sense that they are growing in their work (Rigby & Ryan, 2018). They like to feel that they have the capacity and power to change their environment, and to overcome the challenges presented by such environment using their skills and strengths, so that they can achieve their goals within that environment (Deci & Ryan, 2000; Hofer & Busch, 2011). When the need for competence is frustrated, individuals feel ineffective, resulting in an experience of reluctance to execute tasks and to achieve outcomes (Olafsen et al., 2017).

### **2.2.1.3 Relatedness**

Relatedness occurs when one experiences a mutual connection with others that is caring and supportive (Olafsen et al., 2017). This speaks to the human need to belong and to feel that one matters to others (Rigby & Ryan, 2018). The frustration of this need occurs when an individual fails to experience a sense of communion and connectedness with others (Olafsen et al., 2017). In such cases, the individual feels disconnected and irrelevant to others. It matters to people to be respected, valued, and included by leadership, co-workers, and clients (Rigby & Ryan, 2018).

## **2.2.2 Intrinsic and extrinsic psychological forces**

In developing an understanding of need satisfaction and motivation, there are two types of psychological forces at play - intrinsic and extrinsic (Franken, 1982). Behaviour that stems from intrinsic forces is carried out for its own sake, because it is enjoyable and fulfilling. It gives the person performing the behaviour a genuine sense of satisfaction and achievement (Deci, Connell, & Ryan, 1989). Behaviour that stems from extrinsic forces is performed for reasons external to the individual, such as to obtain praise and reward or to avoid punishment or penalties (Deci & Ryan, 2000). The intrinsic-extrinsic dichotomy is a popular typology in organisational behaviour literature because of its simplicity, and it aligns with Herzberg's (1966) two-factor theory. Intrinsic and extrinsic motivations are not mutually exclusive, which means people can be motivated by both at the same time (Chen, 2016), although extant research has



shown that either one is usually predominant (Gagné & Deci, 2005; Weibel, Rost, & Osterloh, 2010). As convenient as this dichotomy is, it has been criticised for oversimplifying the complex construct of motivation (Chen, 2016). The motivation typology in SDT (Ryan & Deci, 2000) goes beyond the intrinsic-extrinsic dichotomy and offers researchers a more comprehensive approach to understanding human motivation (Chen, 2016).

### **2.2.3 Motivation from a SDT perspective**

By virtue of the fact that SDT has an internal rather than an external focus, it shifts the traditional paradigm in terms of how motivation is conceptualised and understood. Instead of being seen as a unidimensional resource that an individual has more or less of, SDT considers various types of motivation, based on the drivers or motivational forces that underlie an individual's behaviour (Rigby & Ryan, 2018).

From a SDT perspective, motivation can be differentiated into two broad forms - autonomous and controlled motivation (Deci & Ryan, 2008). Autonomous motivation occurs when individuals are engaged in an activity or task willingly and as a result of their own volition or choice. When individuals experience a strong sense of worth in their jobs, feel ownership in carrying out their tasks, and derive clear support and feedback from their environment, they are likely to be autonomously motivated and their performance will be enhanced. The theory postulates that when people genuinely identify with the value and importance of their work, they are more motivated to perform willingly and to deliver quality (Deci, Olafsen, & Ryan, 2017; Manganelli, Thibault-Landry, Forest, & Carpentier, 2018). Research has shown that, on average, autonomous motivation leads to better work outcomes and performance indicators than controlled motivation (Manganelli et al., 2018; Rigby & Ryan, 2018). In contrast, individuals who experience controlled motivation as a result of engaging in tasks from a forced or pressured perspective, and not out of their own volition or willingness, tend to be less engaged in their work and therefore perform less effectively (Deci et al., 2017). By offering extrinsic rewards, for example money, the theory posits that controlled motivation is induced, and whilst this has been shown to motivate behaviour, the persistence and quality of such motivation tends to be less than when an individual is autonomously motivated (Deci & Ryan, 2000). Whilst it is not

impossible for autonomous and controlled motivation to co-exist in individuals, the theory argues that the two types of motivation tend to work against each other, such that an increase in controlled motivation is accompanied by a decrease in autonomous motivation, and vice versa (Chen, 2016; Deci & Ryan, 2008).

In addition to the autonomous-controlled dichotomy, many authors refer to intrinsic and extrinsic motivation in differentiating between different extremes of motivation. Intrinsic motivation in its purest sense is the most autonomous form of motivation and refers to activities where the motivation for the behaviour lies in the behaviour itself, which generates spontaneous interest and enjoyment to such an extent that the activity in itself is a reward. A good example is when children play, they actively engage in the activity without any external prompts or reward mechanisms. This can happen in the workplace too, where parts of a job, if not all aspects thereof, can be so intrinsically motivating that people experience strong feelings of satisfaction such that they display high-quality sustained effort and ultimately performance (Deci et al., 2017). Extrinsic motivation in its purest sense is the most controlled type of motivation, where an individual is motivated by the pursuit of external rewards, namely money or prestige, or to avoid punishment in various forms (Manganelli et al., 2018). Specifically, SDT distinguishes between different types of regulation that can be relatively controlled by external factors or that can be relatively autonomous, namely external regulation, introjected regulation, identified regulation, and integrated regulation (Deci & Ryan, 2000).

### **2.2.3.1 External regulation**

External regulation is the least autonomous of the extrinsic motivations. When individuals are externally regulated, they perceive their behaviour to be controlled by others, usually through contingent rewards or threats, for example avoiding punishment, such as criticism, or obtaining a reward, such as financial benefits or job security. This has the ability to motivate certain behaviours, but research has shown that external regulation decreases autonomous motivation and a sense of well-being, and this has a negative impact on productivity and performance (Chen, 2016; Deci et al., 2017).

### **2.2.3.2 Introjected regulation**

When people are focused on obtaining approval or avoiding disapproval in their jobs, they experience introjected regulation (Deci et al., 2017). Therefore, this type of motivation is not about avoiding physical penalty, but rather a self-created and intangible pressure like shame or anxiety (Chen, 2016). People therefore carry out a task because they feel pressured to act in a particular way, to prove their worth, or to avoid guilt or shame (Manganelli et al., 2018).

### **2.2.3.3 Identified regulation**

Not all extrinsic motivators fall under the umbrella of controlled motivations. Identified regulation is an autonomous form of motivation that occurs when individuals act in ways that will deliver positive identified value. A good example is that of a person who has an extrinsic goal to become an engineer, and will work extra hard at mathematics because of the intrinsic desire to achieve the goal of becoming an engineer, which has positive value. At work, one experiences identified regulation when choosing a job that will facilitate career advancement, development, or that will bring social status (Chen, 2016).

### **2.2.3.4 Integrated regulation**

Integrated regulation occurs when individuals feel genuinely engaged and purposeful about their jobs (Deci et al., 2017). This form of motivation is also termed internal regulation and is very closely aligned with intrinsic motivation in terms of its definition (Chen, 2016).

### **2.2.3.5 Intrinsic regulation**

Intrinsic regulation is the most volitional form of motivation, and the term is often used interchangeably with the broader term *intrinsic motivation* because it is intrinsic motivation in its purest sense (Deci et al., 2017).

## **2.2.4 The self-determination continuum**

These types of motivation can be seen to lie on a continuum of least to most autonomous, with the order from least to most being external, introjected, identified, integrated, and intrinsic regulation. The continuum demonstrates the degree to which



external regulations, whilst amotivation leads to the most unfavourable outcomes, including counterproductive work behaviour and performance (Deci et al., 2017).

It is important to point out that an external motivation force can become autonomous if it becomes internalised into the individual's sense of self. For example, an individual may not necessarily pursue an activity or work task for its own sake, because it is not necessarily pleasurable or enjoyable, but sees the value of doing the task because it is aligned with one's values and it is perceived as being important, and in such case the task becomes integrated or internalised, and therefore autonomous in nature (Manganelli et al., 2018). Identified regulation falls into this category, and hence this form of motivation, whilst extrinsic in terms of the type of motivation, can also be autonomous, as can be seen in Figure 1. This forms the basis of an important premise of SDT, which is that extrinsic motivation can vary in terms of the extent to which it is controlled or autonomous (Olafsen, Halvari, Forest, & Deci, 2015).

Identified regulation, integrated regulation, and intrinsic regulation are also known as self-determined behaviours. On the other hand, non-regulation, external regulation and introjected regulation are termed nonself-determined behaviours (Ryan, 1995).

There has been some criticism of this so-called "continuum" of the different types of motivation, where it is argued that motivation should be seen as more of a multidimensional construct and that the different varieties of motivations are actually conceptually different and distinct, each having different outcomes (Chemolli & Gagné, 2014). However, regardless of the fact that some authors have challenged the continuum methodology, the premise remains that the different types of motivation do exist individually in their definition and manifestation (Sheldon, Osin, Gordeeva, Suchkov, & Sychev, 2017) and they have implications for performance (Manganelli et al., 2018), given that more autonomous forms of motivation have been shown to predict greater persistence, performance quality, and well-being than the controlled forms (Deci et al., 2017).

### **2.3 Correlates of need satisfaction and motivation**

Theory and research shows that the more the three basic psychological needs are satisfied within a particular activity or context, the more people tend to be intrinsically-oriented in their behaviour, which increases their sense of ownership and control of a task or situation, and the more they internalise and integrate the components of the task or situation (Deci & Ryan, 2000; Deci et al., 2017). Dysvik, Kuvaas, and Gagné (2013) found partial support for the three needs having to be in synergy with one another in order to act positively on intrinsic motivation, with autonomy and competence as being most key, and relatedness and autonomy as being second most vital, but they did not find a three-way synergy as the theory posits. Nevertheless, it has been shown that the satisfaction of the three needs increases organisational citizenship behaviours, which leads to improved performance (Baard, Deci, & Ryan, 2004). In the workplace, numerous studies have shown that employees who experience higher levels of need satisfaction function with greater vigour and passion, and perform more optimally than those whose needs are thwarted (Deci et al., 2017; Gagné et al., 2014; Manganelli et al., 2018; Olafsen et al., 2017; Spehar, Forest, and Stensang, 2016; Trépanier, Forest, Fernet, and Austin, 2015; Van den Broeck et al., 2016). Van den Broeck, Vansteenkiste, De Witte, Soenens, and Lens (2010) showed a positive association between need satisfaction and satisfaction on the job, work engagement, energy, and commitment to the organisation. Accordingly, when employees perceive that the leadership and the culture of the organisation supports their need fulfilment, they are more satisfied in their work and with their compensation, and they experience feelings of trust and loyalty towards the organisation, thus showing higher levels of creativity and performance (Guntert, 2015). Kuvaas, Buch, Weibel, Dysvik, and Nerstad (2017) found intrinsic motivation to be associated with positive work outcomes, including work performance and affective organisational commitment, to the extent that they advise organisations to prioritise ways of increasing employee motivation. By involving employees in decision making, listening to them, giving them choices, and offering constructive positive and negative feedback, the three basic psychological needs are addressed, which has a direct impact on intrinsic motivation, and hence this is where the focus should be if organisations are aiming to get the most out of their employees from a performance perspective.

There is substantial research to demonstrate that autonomous, as opposed to controlled motivation presents a range of positive individual and organisational benefits (Gagné & Deci, 2005). Autonomously motivated employees have been shown to have greater levels of well-being (Gagné et al., 2014), happiness (Deci & Ryan, 2008), and energy (Gagné et al., 2014). Studies have shown a positive impact on work performance and productivity when employees are autonomously motivated (Baard et al., 2004; Trépanier et al. 2015), along with higher levels of persistence and effort in their work (Deci & Ryan, 2008; Haivas, Hofmans, & Pepermans, 2013). Such employees were also found to be more innovative and proactive (Devloo, Anseel, De Beuckelaer, & Salanova, 2015). Other positive outcomes include reduced absenteeism, lower turnover, and greater work and organisational commitment (Gagné et al., 2014). In three studies across different industries, Kuvaas et al. (2017) found intrinsic motivation to be positively associated with work performance and affective commitment. On the contrary, controlled motivation has been shown to result in poor performance and lowered persistence (Vallerand, 1997), and lower levels of work engagement (Trépanier et al., 2015). In support of this, Kuvaas et al. (2017) found extrinsic motivation to be either negatively related or unrelated to positive employee outcomes.

In light of these findings and observations, research linking need satisfaction with motivation has demonstrated that work environments and roles that are perceived to fulfil the basic psychological needs of autonomy, competence, and relatedness enhance an individual's autonomous motivation, which in turn results in a strong sense of well-being, and ultimately, high quality performance (Cerasoli, Nicklin, & Ford, 2014; Deci & Ryan, 2000; Gagné & Deci, 2005; Ryan, Bernstein, & Brown, 2010), and this has benefits for the organisation in terms of reduced absenteeism, increased productivity, and profits (Deci et al., 2017). The study by Preenen, Oeij, Dhondt, Kraan, and Jansen (2016) found that employees who experienced high levels of job autonomy positively contributed to the profitability of the company. However, the result was a weak one, highlighting that there could be other factors to explain the increase in the company's revenue, such as the economy and markets. The study motivates the need for similar investigations and relationships to be explored. As Doshi and McGregor (2015) assert, profits are only one component of a successful organisation.

Organisations that have employees who thrive in terms of their sense of wellness and motivation to work results in long-term benefits for the health of the organisation and its customers, as a result of the loyalty, productivity, and financial success that stems from employees that are autonomously motivated. Despite these studies, Deci et al. (2017) are of the view that there have been relatively few workplace studies that have examined both the satisfaction of basic psychological needs and autonomous motivation, and that, as predicted by SDT, employees whose needs are satisfied will also experience enhanced autonomous motivation and expend greater effort, and experience resultant high performance on the job (De Cooman, Stynen, Van den Broeck, Sels, & De Witte, 2013).

#### **2.4 Need satisfaction, well-being, and motivation: an entrepreneurial lens**

Psychological well-being is essential in order to live a full and rewarding life, and is critical in one's capacity to deliver high quality work and to maintain effective relationships throughout life (Wiklund, Nikolaev, Shir, Foo, & Bradley, 2019). The same authors spoke of the importance of understanding psychological well-being from an entrepreneurial perspective, because it complements traditional outcomes of entrepreneurship, namely business success or failure. Entrepreneurship by its very nature is rarely a linear or smooth process (McMullen & Dimov, 2013). Instead, it can be an emotional rollercoaster, punctuated with highs and lows, excitement, stress, and uncertainty (McMullen & Shepherd, 2006). Entrepreneurial work roles are not dissimilar in this description, and hence it is important to understand the impact of psychological well-being on performance and success in entrepreneurial contexts and in entrepreneurial work roles in particular. Given that SDT considers the satisfaction of the basic psychological needs of autonomy, competence, and relatedness as essential for optimal human functioning and well-being (Deci & Ryan, 2000), Shir et al. (2018) argue that entrepreneurial work task engagement, unlike engagement in non-entrepreneurial work, aligns strongly with the satisfaction of basic psychological needs because people experience greater self-motivation as a result of a strong sense of autonomy, competence, and relatedness in such work roles and environments. As a result, they become more intrinsically oriented in their behaviour, which leads to a greater sense of ownership of work tasks and activities, as part of one's psychological profile. In light of this, the very practice of earning an income becomes a deliberately



meaningful objective that is dependent upon the satisfaction of intrinsic psychological needs (Rauch & Frese, 2007). Shir et al. (2018) argue that entrepreneurial work task engagement should, on average, be associated with higher levels of well-being, because entrepreneurial work roles satisfy the psychological nutrients called for by SDT. It is then in this experience of well-being that individuals demonstrate higher levels of vigour and passion in their work, which leads to enhanced performance.

From a pay for performance (PFP) perspective, which is fundamental to entrepreneurial work roles, Cerasoli et al. (2014) showed that intrinsic motivation was moderately to strongly related to performance, irrespective of the type and quantity of incentives being used. However, other research has shown that tangible rewards, particularly those of a monetary nature, potentially undermine a person's intrinsic motivation because they lessen the experience of autonomy by virtue of the external control that they exert over the individual (Deci, 1971) and particularly when they are contingent (Deci, 1972; Deci, Ryan, & Koestner, 1999). Gagné and Forest (2008) proposed a model that analysed the effects of compensation systems on work motivation and found that the greater the amount of variable pay based on performance, the lower the autonomous motivation and the higher the controlled motivation. This outcome, it was argued, was due to the negating effect of incentive pay on the individual's autonomy. In support of this, Kuvaas, Dysvik, and Buch (2014) point out that rewarding people with money in exchange for work does not have any impact on motivational quality, nor does it address the basic psychological needs of the individual. If anything, such a transactional exchange has the opposite effect of eliciting autonomous motivation and is a form of controlled motivation. As a result, loyalty and performance are reduced. A later study by Kuvaas, Buch, Gagné, and Dysvik (2016) further confirmed this, finding that motivational quality, loyalty, performance and well-being actually declined when compensation was the primary motivator. But despite this, the Kuvaas et al. (2016) study showed that autonomous motivation was still a strong predictor of the amount of effort that salespeople put into their jobs, while controlled motivation was a weak predictor. It is therefore inferred that if employees exert greater effort in their jobs, the likelihood of performance being enhanced is increased.

## **2.5 Chapter summary**

In summary, it is evident that substantial research and literature exists to support the theory that human beings are naturally inclined towards intrinsic motivation, and that supporting environments have been found to facilitate such motivation. However, in adopting an entrepreneurial lens in the current study, whereby pay is largely contingent on performance outputs, it is important to consider the impact of compensation on autonomous and controlled motivation. Researchers (e.g. Gagné & Forest, 2008) have shown that the effects that compensation systems have on need satisfaction – and hence on intrinsic and extrinsic motivation – vary greatly and are, at best, inconclusive. The contrasting findings suggest that there is a need to determine whether people in PFP roles, given their entrepreneurial work context, are autonomously motivated, and if they are, whether there is a relationship between being autonomously motivated and high performance as postulated by the theory, or whether the compensation factor negates autonomous motivation, as suggested by Gagné and Forest (2008), Kuvaas et al. (2014; 2016; 2017). In light of the theory and prior research, we propose that the satisfaction of basic psychological needs in the working environment will be associated with higher levels of autonomous motivation as well as performance. This assumption becomes even more relevant when considering the nature of entrepreneurial work tasks, where the importance of the satisfaction of psychological needs is deemed essential to optimal human functioning, to be able to cope with the emotional highs and lows synonymous with such environments, and subsequent demonstration of sustained energy and effort in such work tasks.

## **CHAPTER 4. RESEARCH METHODOLOGY**

### **4.1 Introduction**

This chapter deals with the research methodology of the study, including the research design, population, sample, data collection method and measuring instrument, as well as the approach to analysis. The aim of this chapter is to clearly demonstrate the processes used to achieve the research objectives. This section lends credibility to the study's overall reliability and validity.

### **4.2 Research paradigm**

A research paradigm is a set of fundamental beliefs and assumptions about how the world is perceived, which provides a framework for the thinking and approach of the researcher (Wahyuni, 2012). With this in mind, the current study was conducted from a positivist standpoint or paradigm. Mackenzie and Knipe (2006) state that "It is the choice of paradigm that sets down the intent, motivation and expectations for the research. Without nominating a paradigm as the first step, there is no basis for subsequent choices regarding methodology, methods, literature, or research design" (p. 2). Positivism is often referred to as the scientific method, and adopts a rationalistic, empiricist philosophy, where the assumption is that the social world can be studied in a similar way to the natural world, where causal explanations are provided for effects or outcomes, and where theory is verified or tested (Mackenzie & Knipe, 2006). Positivist researchers look for law-like generalisations, by conducting research in a value-free way, i.e. remaining neutral and detached without influencing the data collection when measuring social phenomena. The belief is that different researchers observing the same factual problem will emerge with a similar result through the use of statistical tests and by applying a similar research process to a large sample (Wahyuni, 2012). In adopting a positivist philosophy, Saunders and Lewis (2018) explain that one can use existing theory as a basis for developing hypotheses, and such hypotheses would then be tested with the expectation that they would be either confirmed, fully or partly, or refuted, leading to further development of the theory that would then be tested in further research. Positivist research is most commonly associated with quantitative methods of data collection and statistical analysis (Mackenzie & Knipe, 2006), and is

usually highly structured in terms of its methodology and data collection, using questionnaires or structured observation (Saunders & Lewis, 2018).

#### **4.3 Approach to theory development**

The current study adopted a deductive approach to theory development. According to Saunders and Lewis (2018), deduction is “a research approach which involves the testing of a theoretical proposition by using a research strategy specifically designed to collect data for the purpose of its testing” (p. 112). This process follows several steps including proposing research questions on the basis of current theory, operationalising these questions - usually by coming up with a testable proposition or hypothesis as to the relationship between one or more variables, collecting data to test these hypotheses, analysing the data to determine whether the relationships specified in the hypotheses supports the theory or suggests a need for the theory to be modified, and finally confirming the initial theory or suggesting modifications to such theory if the results do not confirm the theory (Saunders & Lewis, 2018).

#### **4.4 Choice of methodology**

With the afore-mentioned philosophy and approach in mind, a mono-method quantitative study was undertaken, using a single data collection technique, namely a survey questionnaire, with quantitative data analysis procedures.

The research design was a hybrid between a descriptive and an explanatory study, and is therefore descripto-explanatory in nature. According to Saunders and Lewis (2018), descriptive research seeks to accurately describe persons, events or situations through questions and answers that are quantifiable, and hence make use of measurable, quantifiable data, such as questionnaires, as in the case of the current study. Explanatory research goes a step further to look for an explanation, between two variables, which is a key component of the current study in examining the association between the satisfaction of the basic psychological needs of autonomy, competence, and relatedness, and the different types of motivation and sales performance.

The study was cross-sectional in nature. A cross-sectional study is appropriate for time-constrained research, which provides a 'snapshot' of the research setting, at a point in time (Saunders & Lewis, 2018), the results of which are extrapolated and generalised to other (similar) situations.

The research strategy took on a survey format. A questionnaire, which was used in the current study, is a popular form of survey research. A survey strategy is usually associated with the deductive approach (Saunders, Lewis, & Thornhill, 2009), and allows for the standardised and structured collection of data from a sizeable sample in an economical way (Saunders & Lewis, 2018). The survey strategy also allows for quantitative data to be collected, so that it can be analysed using descriptive and inferential statistics, and the data collected can be effective for suggesting possible reasons for relationships between variables and to produce models that demonstrate these relationships (Saunders et al., 2009).

#### **4.5 Population and unit of analysis**

The population and unit of analysis for the study consisted of estate agents contracted to an international property group in South Africa, who were active between the period of 1 January 2018 and 31 December 2018.

#### **4.6 Sampling method and size**

For the purposes of the current study, non-probability sampling was utilised which, according to Saunders & Lewis (2018), is not as rigorous as probability sampling, and may produce less accurate and less representative samples than what can be obtained from probability or random samples. The non-probability sampling procedure might also limit the generalisability of the findings. In the current study, there was both a purposive approach to the sample selection, as well as a convenience sampling method being applied, given that permission was granted to access data from one company with a number of franchises and branches across the country, and sales (performance) data for each of the 377 estate agents was made available. Each potential participant was invited to participate in the study, with a link to complete an online survey - participation remained voluntary.

#### **4.7 Measurement instrument**

The measurement instrument was prepopulated with demographic data from the pre-selected participants, including name and surname, race, gender, branch, and performance data. The survey took the form of a questionnaire that consisted of sections comprising scales that measure the independent variables, namely the basic psychological needs of autonomy, competency, and relatedness, and motivation (consisting of six subscales). The dependent variable, being performance, was provided by the consenting company, the format of which was captured as a numerical performance score, and these scores were then categorised into four categories, namely A+ (exceptional), A (very good), B (average), and C (below average). The cut-off for each category was determined by the consenting organisation, who ensured that the category allocated to a participant accurately reflected the performance of that same participant. The categorised scores were therefore checked and validated. The performance score was compiled by means of an algorithm, the formula for which was stipulated as being confidential and the intellectual property of the consenting property group. For the purposes of understanding the dependent variable, the score is made up of a weighted average of property listings, mandates, referrals, and sales commission earned during the period for each individual agent.

According to Saunders and Lewis (2018), questionnaires are an effective method for collecting data from a large volume of respondents because they allow for the standardisation of questions and to ask the same questions of every respondent. This allows for effective explanatory research and to test a theory. The data is usually analysed statistically, after having been coded.

All questions in the survey questionnaire were closed-ended. Closed-ended questions allow for respondents to choose their answer from the options provided and to make quick decisions. Closed-ended questions also allow for coding of the data in preparation for statistical analysis (Zikmund, 2003). The questionnaire was divided into two sections - Section A and Section B. Section A consisted of the Basic Psychological Needs Satisfaction at Work Scale (BPNS-W), and Section B consisted of the Work Extrinsic and Intrinsic Motivation Scale (WEIMS). All items applied a Likert-style rating scale. In this instance, the respondent is asked how strongly he or she agrees with a

statement or series of statements, usually on four-, five-, six- or seven-point rating scale (Saunders et al., 2009).

#### **4.7.1 Basic Psychological Needs at Work Scale**

The Basic Psychological Needs Scale (BPNS) assesses the three basic psychological needs of autonomy, competency, and relatedness (Deci & Ryan, 2000). The questionnaire has been adapted for use in the workplace, and the Basic Psychological Needs at Work Scale (BPNS-W) was developed by Deci et al. (2001) after pioneering work in its early days by Kasser, Davey, and Ryan (1992) and Ilardi, Leone, Kasser, and Ryan (1993). The scale has evolved and changed since its first use and the work-specific format allows for easy identification with the items, for example: *“I really like the people I work with”* and *“I am free to express my ideas and opinions on the job”*. The BPNS-W consists of a 21-item scale where participants were asked to indicate how true each of the statements was for them in the past year, given their experience in the job. The 7 point Likert-scale ranged from 1 – Not at all true, to 7 – Very true. Example items included *“I have been able to learn interesting new skills on my job”* and *“Most days I feel a sense of accomplishment from working”*. Nine of the 21 items are negatively worded and thus were reverse-scored prior to the analysis stage. Higher scores denote a higher level of need satisfaction and a lower score indicates a thwarting of the needs. For the purposes of the current study, a high score was evidenced by a score greater than 39 for Autonomy, 34 for Competence, and 45 for Relatedness.

According to Van den Broeck et al. (2016), the BPNS-W is the scale that has been used for most published work on the measurement of basic psychological needs in the workplace. Despite its wide usage in research, the questionnaire has received some criticism for not meeting adequate validation criteria, and some researchers have found problems from a reliability standpoint, with high intercorrelations between the subscales (Gagné, 2003; Greguras & Diefendorff, 2009). The content validity of the scale has also been questioned (Van den Broeck et al., 2010), as some items appear to be assessing antecedents of need satisfaction, while other items seem to assess the outcomes of need satisfaction (Van den Broeck et al., 2016). Despite this, in a recent publication, Shir et al. (2018) state that the scale and its three subscales have

been validated in numerous studies (for example Brien et al., 2012; Chen et al., 2015; Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2008), but further investigation of these studies indicates that such validation assertions are not conclusive, because different measures of basic psychological needs have been used in these studies to what was used in the current study (for example Brien et al., 2012). Furthermore, Van den Broeck et al., 2008 used an adapted version of the original 21-item scale. These authors did not provide reliability coefficients for the individual subscales of the BPNS-W, but reported a Cronbach alpha coefficient of .84 for the adapted 15-item scale in their research. Shir et al. (2018) also used a shortened (10-item) version of the original scale, reporting a Cronbach alpha of .88 for the full version, and .76 for the shortened version. The current study found Cronbach alpha for the full 21-item scale to be .81. The current study found Cronbach alpha for the full 21-item scale to be .81. According to Johnston and Finney (2010), as at the time of writing, there were no known studies that had analysed the factor structure of the BPNS-W (the version used in the current study); the authors state that in personal communication with Dr. Edward Deci on June 12, 2008, the assertion was made that many researchers have assumed validity and reliability of the scale.

Table 1 (Appendix 4) shows the item-total statistics for the 7-item Autonomy subscale of the BPNS-W. In the current study, the Cronbach alpha coefficient .58. Ideally, the Cronbach alpha coefficient should be above .7 (DeVellis, 2012). Therefore, the subscale falls short of adequate reliability criteria. The results indicate that if item 4 is deleted, the Cronbach alpha coefficient will be .63. The Corrected Item-Total Correlation values indicate the degree to which each item correlates with the total score. Low values (less than .3) suggest that the item is measuring something different from the scale as a whole (Pallant, 2016). Items 2, 4, and 5 are all below .3 and therefore raise concerns as to whether these items are measuring something different from the scale as a whole. The mean inter-item correlation for the scale is .19. This does not suggest a strong relationship among the items.

In the current study, the Cronbach alpha coefficient for the 6-item Competence subscale was .52. This indicates that the subscale does not meet adequate reliability criteria. Table 2 (Appendix 4) shows that if item 1 is deleted, the Cronbach alpha



coefficient will remain at .52. There will therefore be no improvement in the reliability score by removing any of the items. The Corrected Item-Total Correlation values show that all items with the exception of item 4 are below .3 and therefore raise concerns as to whether these items are measuring something different from the scale as a whole. The mean inter-item correlation for the scale is .17. This does not suggest a strong relationship among the items.

Finally, the Cronbach alpha coefficient for the 8-item Relatedness subscale was .82. This shows high internal consistency. The results in Table 3 (Appendix 4) indicate that if item 3 were to be deleted, the Cronbach alpha coefficient will improve slightly to .83. It would therefore not be worthwhile removing item 3 as the improvement in the reliability coefficient is very small.

The 21 items of the Basic Psychological Needs at Work Scale (BPNS-W) were subjected to principal components analysis (PCA). Prior to performing PCA, the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. However, there were also many coefficients lower than .3. The Kaiser-Meyer-Olkin value was .85, exceeding the recommended value of .6 (Pallant, 2016) and Bartlett's Test of Sphericity reached statistical significance, supporting the factorability of the correlation matrix. According to Pallant (2016), PCA is similar to Factor Analysis (FA) in that "both attempt to produce a smaller number of linear combinations of the original variables in a way that captures (or accounts for) most of the variability in the pattern of correlations" (p. 182). PCA revealed the presence of five components with eigenvalues exceeding 1, explaining 26.4%, 9.7%, 7.1%, 5.6% and 5.1% of the variance respectively (Table 4, Appendix 4). An inspection of the scree plot revealed a clear break after the third component, with components 4 and 5 just above the eigenvalue of 1. The Component Matrix showed the unrotated factor loadings of each of the items on the five components. It is evident that most of the items loaded quite strongly (above .4), and others moderately (above .3) on the first three components, with very few items loading on components 4 and 5. From this, it confirms that three components would be retained. The three-component solution explained a total of 43.2% of the variance, with component 1 contributing 26.44%, component 2 contributing 9.71%, and component 3

contributing 7.06%. To aid in the interpretation of these three components, varimax rotation was performed. The rotated solution (Table 5, Appendix 4) revealed that the main loadings on component 1 were items from the Relatedness subscale, with the 5<sup>th</sup> item from the Autonomy scale also loading on this component, but less so at .307. The wording for this item is “My feelings are taken into consideration at work” and hence this could explain the reason why this item is loading on the construct “Relatedness” as opposed to “Autonomy”. The items loading on component 2 were made up of three items from the competence subscale, and four items from the Autonomy subscale, one of which, item 6 (Autonomy), had a slightly lower loading of .391, and two items from the Relatedness subscale, item 8 and item 5, both of which were relatively low at .316 and .449 respectively. The main items loading on component 3 were item 6 and item 1 (Competence), which loaded strongly at .743 and .523 respectively. However, item 7 (Autonomy) and item 7 (Relatedness) also loaded on this component. It is pertinent to note that these are reverse scored items, and it may have been possible that respondents did not respond accurately to items that were negatively worded.

#### **4.7.2 Work Extrinsic and Intrinsic Motivation Scale**

The Work Extrinsic and Intrinsic Motivation Scale (WEIMS) is an 18-item measure of work motivation that has been theoretically grounded in SDT (Tremblay et al., 2009). The WEIMS is divided into six subscales, each with three items that measure the six types of motivation according to SDT (intrinsic motivation, integrated regulation, identified regulation, introjected regulation, external regulation, and amotivation). Respondents were asked to indicate the extent to which each of the items corresponds with their reason for doing their particular work, using a 7-point Likert scale, ranging from 1 – Does not correspond at all, to 7 – Corresponds exactly. Example items included “*Because I derive much pleasure from learning new things*” and “*For the satisfaction I experience when I am successful at doing difficult tasks*”.

Whilst most researchers prefer to use a multidimensional approach to work motivation, the use of a single score, such as the work self-determination index (W-SDI) is sometimes useful when researchers want to identify individuals who display a self-determined or a nonself-determined profile (Ryan & Connell, 1989). The formula for determining the W-SDI is:  $W-SDI = (+3 \times IM) + (+2 \times INTEG) + (+1 \times IDEN) + (-1 \times$

INTRO) + (-2 x EXT) + (-3 x AMO). The range of possible scores for the 7-point Likert scale is  $\pm 36$  and the score indicates the individual's relative level of self-determination. A positive score is a self-determined profile, and a negative score is a nonself-determined profile (Tremblay et al., 2009).

The factorial structure and psychometric properties across different organisational contexts have been tested and the tool shows construct, content, and criterion validity for organisational settings. Results also support the tool's ability to predict positive and negative criteria based on one's work motivation, using SDT as the platform (Tremblay et al., 2009). Tremblay et al. (2009) found satisfactory levels of internal consistency across the WEIMS's six subscales, with Cronbach alpha coefficients as follows: intrinsic motivation = .80, integrated regulation = .83, identified regulation = .67, introjected regulation = .70, external regulation = .77, and amotivation = .64. These results are considered to be very good, given that each subscale consists of only three items. Allan, Autin, and Duffy (2016) also found strong evidence of reliability with Cronbach alphas of 0.89 (intrinsic motivation), 0.89 (integrated regulation), 0.76 (identified regulation), 0.75 (introjected regulation), 0.69 (external regulation), and 0.83 (amotivation). In the current study, the Cronbach alpha coefficient for the six subscales was as follows: intrinsic motivation (IM)  $\alpha = .78$ , integrated regulation (INTEG)  $\alpha = .84$ , identified regulation (IDEN)  $\alpha = .72$ , introjected regulation (INTRO)  $\alpha = .69$ , external regulation (EXT)  $\alpha = .62$ , and amotivation (AMO)  $\alpha = .64$ . Most of the subscales in the current study therefore show good internal consistency reliability, and those that do fall short (INTRO, EXT, and AMO) do so only slightly. By removing item 3 in the introjected regulation subscale (INTRO), the reliability coefficient would be .74 (Table 6, Appendix 4). Additionally, deleting item 3 of the external regulation subscale (EXT) would raise the reliability coefficient to .69 (Table 7, Appendix 4), which is more in line with the minimum requirements for internal consistency reliability purposes. For the Amotivation subscale (AMO), deleting any of the items would not increase the reliability coefficient any further (Table 8).

The 18 items of the Work Extrinsic and Intrinsic Motivation Scale (WEIMS) were subjected to PCA. The Kaiser-Meyer-Olkin value was .87, exceeding the recommended value of .6 (Pallant, 2016) and Bartlett's Test of Sphericity reached

statistical significance, supporting the factorability of the correlation matrix. Principal components analysis revealed the presence of five components with eigenvalues exceeding 1 (Table 9, Appendix 4). An inspection of the scree plot revealed a clear break after the third component, with components 4 and 5 just above the eigenvalue of 1. A five-component solution explained a total of 65% of the variance, with component 1 contributing 35.32%, component 2 contributing 10.49%, component 3 contributing 7.65%, component 4 contributing 5.96%, and component 5 contributing 5.56% of the variance. To aid in the interpretation of these components, varimax rotation was performed. The rotated solution (Table 10, Appendix 4) revealed that the main loadings on component 1 were the three items from the integrated regulation subscale, the three items from the identified regulation subscale, two items from the intrinsic motivation subscale, one item from the introjected regulation subscale, and one item from the external regulation subscale. The two subscales with the highest loadings, being integrated regulation and identified regulation, are both forms of autonomous motivation, and therefore synonymous with people who have high work self-determination. Introjected regulation is synonymous with a somewhat weak level of self-determination or autonomous motivation. Hence, the loading of .307 is not high, and neither is the .340 of the external regulation loading. The two items from the intrinsic motivation subscale that load on component 1 are IM\_2 (.459) and IM\_3 (.303), but these items load more strongly on component 2. However, like integrated regulation and identified regulation, the items are part of the broad theme of autonomous motivation or work self-determination. The items loading on component 2 are made up of the three items from the intrinsic motivation subscale, which is the strongest form of self-determination or autonomous motivation, and the loadings of .789, .662, and .726 for IM\_1, IM\_2, and IM\_3 respectively confirm this. The items loading on component 3 are EXT\_1 (.850), EXT\_2 (.746), and EXT\_3 (.422), which are the external regulation subscales, synonymous with low work self-determination and less autonomous, more controlled motivation. Two other items loading on component 3 are from the identified regulation subscale (IDEN\_3 and IDEN\_1), which is more autonomous form of motivation and in direct contrast to the meaning of external regulation. However, one of these loadings is relatively low (.342). The items loading on component 4 are made up of the three items from the amotivation subscale, which is the strongest form of nonwork self-determination, and the loadings of .732, .801, and

.746 for AM\_1, AM\_2, and AM\_3 respectively confirm this. The items loading on component 5 are made up of the three items from the introjected regulation subscale, and the loadings of .857 for INTRO\_1 and INTRO\_2 respectively, supported by a lower loading of .381 for INTRO\_3 confirm this.

#### **4.8 Data gathering process**

Data gathering took place by means of the completion of a self-report questionnaire by each participant. Such questionnaire was made available by email to each of the participants, and therefore adopted an online format, using a link provided by Survey Monkey. Prior to this stage, the Chief Executive Officer sent an email to all Franchisors, Branch Managers, and Principals explaining the purpose of the study, that he had given his permission for the researcher to use the company as a sample, and requested that the researcher be supported as far as possible, as the results could be of benefit to the company in recruiting high performing agents in the future. The researcher then engaged with all participating branches/offices/franchises to inform them of the research and its objectives, so as to obtain support for participation prior to the survey being distributed. Each questionnaire was pre-populated with demographic data of the respondent, such that performance (sales) data could be matched when analysing the results. The questionnaire was accompanied by appropriate proof of ethical clearance and an explanation of the study and its purpose in a covering letter, accompanied by the contact details of the researcher and research supervisor. Respondents were assured of confidentiality. The duration of the survey was clearly indicated as being no more than 10 minutes, and participants were requested to read the instructions clearly before responding to any questions, as well as to be in an environment that was conducive to concentration, and to reflect honestly when responding to the questionnaire items.

Prior to distributing the questionnaire to the respondents, pilot testing was conducted on one branch in the Western Cape, to ensure that the questionnaire was fit for purpose and that the process ran smoothly from a technical standpoint. Pilot testing allows for any errors to be addressed and corrected before the actual research is conducted, and further enables the researcher to ensure that the validity and reliability

of the questionnaire is sufficiently sound to be able to answer the investigative questions of the research (Saunders et al., 2009).

#### **4.9 Analysis approach**

Data analysis is the process by which inferences are drawn from raw data. In a quantitative study, such data is mainly numerical in nature (Wahyuni, 2012). The data was analysed using IBM SPSS Statistics for Windows, Version 25. After coding and cleaning the data, preliminary analyses were run on the data, including descriptive statistics to understand the composition of the sample, as well as reliability analyses and principal components analyses to establish the reliability and validity of the measurements used in the study. Thereafter, inferential statistics were conducted to test each of the proposed hypotheses, using the non-parametric technique of the Chi-square test for independence. Having found that the data did not meet the stringent assumptions for parametric techniques to be used, most notably normality and multicollinearity, it was determined that the Chi-square test was most suited, and additionally for the fact that the data was measured using categorical and ordinal (ranked) scales (Pallant, 2016). The test was therefore used to determine if there was a relationship or association between two categorical variables. For the Chi-square test of independence to be successful, the data needs to meet two assumptions: 1: the two variables should be measured at an ordinal or nominal level (i.e., categorical data), and 2: the two variables should consist of two or more categorical, independent groups (Wegner, 2016). Finally, an independent samples t-test was used to compare the mean scores of two different groups (Pallant, 2016), in this case, high and low performers, in terms of their work self-determination scores.

#### **4.10 Chapter summary**

In summary, the current study adopted a positivist research paradigm, supported by a deductive approach to theory development and a quantitative approach. The research design was best described as descripto-explanatory in nature, applying a cross-sectional, survey-style format of data collection. The combination of non-probability, purposive, and convenience sampling methods was appropriate for the nature of the study and the sample that was made available, and possible limitations were outlined. The measures and evidence for their reliability and validity, and possible shortcomings,

were highlighted. Appropriate data analysis techniques were specified to understand the composition of the sample, as well as to provide solutions to the proposed hypotheses in the study. As Leedy (1993) points out, inherent in such hypotheses is the research problem that the study aims to solve, and the research methodology is fundamental in clarifying the way in which the researcher aims to solve the problem.

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# Drivers of entrepreneurial intentions in sustainable entrepreneurship

Drivers of  
entrepreneurial  
intentions

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## Abstract

**Purpose** – The role of entrepreneurship has changed to include issues beyond economic growth. This has turned attention toward the drivers of entrepreneurial intentions across entrepreneurship types, particularly in sustainable entrepreneurship. The purpose of this paper is to examine the drivers of entrepreneurial intentions in sustainable entrepreneurship. In particular, the paper aims to extend the existing intention models to include work values and attitudes toward sustainability, thereby bringing the model into the context of sustainable entrepreneurship.

**Design/methodology/approach** – Using a quantitative research design, data were collected in three European countries through anonymous questionnaires. The data consist of responses from 393 university students.

**Findings** – The results show that attitude toward sustainability and perceived entrepreneurial desirability enhance sustainability-oriented entrepreneurial intentions. Moreover, adding sustainability into the regression equation adds explanation power, hence suggesting that the theory of planned behavior needs to be adapted when applied to sustainable entrepreneurship. Attitudes toward sustainability are positively impacted by altruism, while perceived entrepreneurial desirability is driven by intrinsic and extrinsic rewards.

**Research limitations/implications** – The study focuses on one particular type of entrepreneurship and one particular age group.

**Originality/value** – The paper contributes to the entrepreneurship literature by applying the entrepreneurial intention model to sustainable entrepreneurship. The results imply that it may be the time to consider the variance in entrepreneurial opportunities in intention models as well as the need to address the conflict between work values. The results show that sustainability-oriented entrepreneurial intentions are driven by attitudes toward sustainability and perceived entrepreneurial desirability. These two attitudes are driven by altruism and extrinsic rewards, and, especially, extrinsic reward plays an opposite role in both drivers of sustainability-oriented entrepreneurial intentions.

**Keywords** Sustainable entrepreneurship, Work values, Entrepreneurial intention, Attitude towards sustainability

**Paper type** Research paper

## Introduction

Entrepreneurship has an important role in economic growth and employment at the societal level (Schumpeter, 1934; Shane and Venkataraman, 2000). However, recently entrepreneurship has been proposed to also have a central role in solving societal and environmental issues, such as poverty, hunger and global warming (e.g. Dean and McMullen, 2007; Porter and Kramer, 2011). Social (Mair and Marti, 2006), sustainable (e.g. Cohen and Winn, 2007; Dean and McMullen, 2007) and environmental entrepreneurship (e.g. Koehn and Polonsky, 1998) are among the various forms of entrepreneurship that have appeared to resolve these issues. As a result, academic interest has arisen in underlying motivations and the intention to become an entrepreneur. Specifically, entrepreneurial intentions are a key to understanding entrepreneurship, since the desire to start or own a business is described through these (Krueger *et al.*, 2000). Despite the interest in entrepreneurial intentions, there is still only limited evidence about entrepreneurial intentions in different entrepreneurship contexts.

This paper forms part of a special section: advancing sustainable entrepreneurship through substantive research.



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Today's young adults ("millennials" or "Generation Y") have been seen as more entrepreneurial and environmentally conscious and also more socially aware than previous generations (Hewlett *et al.*, 2009). This raises a question regarding the drivers of entrepreneurial intentions in sustainable entrepreneurship.

Sustainable and social entrepreneurship differ from conventional entrepreneurship in terms of value creation. While entrepreneurs have previously been thought to focus primarily on economic value creation, in these new entrepreneurship forms, economic value creation is seen as a means to an end or to blend different values (Cohen and Winn, 2007; Dean and McMullen, 2007; Fayolle *et al.*, 2014; Seelos and Mair, 2005; Zahra *et al.*, 2009). Social entrepreneurship focuses on social value creation (Seelos and Mair, 2005; Zahra *et al.*, 2009), while environmental entrepreneurship is about environmental value creation (Koegh and Polonsky, 1998). Sustainable entrepreneurship has been claimed to combine economic, social and environmental value creation (Cohen and Winn, 2007; Dean and McMullen, 2007, Schaltegger and Wagner, 2011), and it has been seen to include both social and environmental entrepreneurship (Hockerts and Wustenhagen, 2010; Schaltegger and Wagner, 2011). However, it should be noted that some forms of social entrepreneurship do not fit under the "umbrella concept" of sustainable entrepreneurship, since they do not pursue economic gain (Dean and McMullen, 2007).

Underlying all entrepreneurship types are entrepreneurial opportunities. Hence, due to the variation in entrepreneurial opportunities, individuals perceive some types of entrepreneurship to be more attractive than others (Baron, 2006) due to value preferences (Schwartz, 1992). The literature has shown that entrepreneurial intentions in social entrepreneurship are positively associated with altruistic values and empathy (Dees, 2012; Hockerts, 2015; Mair and Noboa, 2006; Smith and Woodworth, 2012). Similarly, sustainable entrepreneurship has been proposed to be connected to these softer values, although economic gain and innovativeness are also deemed important (Gibbs, 2009; Linnanen, 2002). As a result, some individuals are more inclined than others toward these new forms of entrepreneurship. Despite the transition in the field of entrepreneurship, there is only limited evidence on how the roles of different values and motivations vary across entrepreneurship types (Carsrud and Brännback, 2011; Fayolle *et al.*, 2014; Lumpkin *et al.*, 2013). Moreover, an interest in entrepreneurial intentions that are specific to a particular type of entrepreneurship has been expressed (Liñan and Fayolle, 2015), but still there is only limited evidence about intention formation in the field of social entrepreneurship (e.g. Hockerts, 2015; Mair and Noboa, 2006; Nga and Shamuganathan, 2010; Urban and Kujinga, 2017) and even less in sustainable entrepreneurship (e.g. Kuckertz and Wagner, 2010; Muñoz and Dimov, 2015). Furthermore, the most commonly used entrepreneurial intention models, the theory of planned behavior (TPB) (Ajzen, 1991) and the theory of the entrepreneurial event (Krueger, 1993; Shapero and Sokol, 1982), have not explicitly included the role of entrepreneurial opportunities in intention formation (Brännback *et al.*, 2007; Jarvis, 2016). Hence, the existing intention models seem unable to answer the call for entrepreneurship type-specific research.

The purpose of this study is to examine the drivers of entrepreneurial intentions in sustainable entrepreneurship. In particular, the aim is to extend and adapt the existing intention models to include work values and attitudes toward sustainability, thereby bringing the model into the context of sustainable entrepreneurship. Within this framework, two focal areas need to be considered. First, the research focuses on the impact of work values and self-efficacy on the antecedents of entrepreneurial intentions – namely, perceived entrepreneurial desirability and feasibility as well as attitudes toward sustainability. Second, the research examines the role of the latter three in the formation of sustainability-oriented entrepreneurial intentions. The paper proceeds with a discussion about entrepreneurial intention models and hypothesizes about the sustainability-oriented entrepreneurial intention model. Next, the results are presented, followed by a discussion of the main results. Lastly, the paper acknowledges the research limitations and proposes areas for future research.

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### Theoretical framework

Since the development of the most widely used entrepreneurial intention models, the TPB and the theory of entrepreneurial event, a growing number of articles have appeared in scientific journals. The entrepreneurial intention literature has focused on five main themes: the core entrepreneurial intention models, the entrepreneurial intention-behavior link, the factors influencing entrepreneurial intentions, including individual-level, regional, cultural and institutional variables, entrepreneurship education, and social and sustainable entrepreneurship (Liñan and Fayolle, 2015). According to these scholars, the last theme about the entrepreneurial intention literature focusing on social and sustainable entrepreneurship has emerged more recently. Furthermore, of these two types of entrepreneurship, less attention has been paid to entrepreneurial intentions in the context of sustainable entrepreneurship.

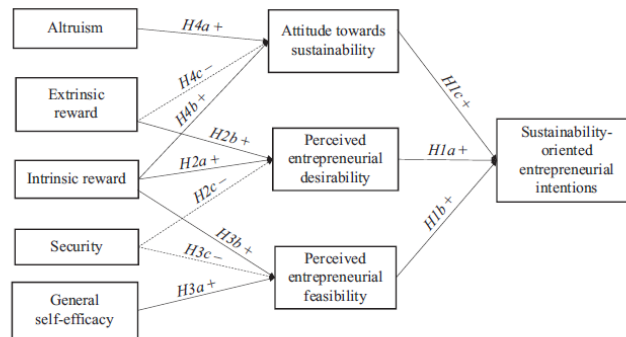
The research thus far has found a positive connection between sustainability orientation and entrepreneurial intentions among science and engineering students but no connection among business students or science and engineering alumni (Kuckertz and Wagner, 2010). Similarly, sustainability orientation has been positively associated with business ideas inclined toward sustainable development but negatively with entrepreneurial intentions (Wagner, 2012). Social entrepreneurial intentions have been examined mainly with regard to education. Engagement in social entrepreneurship or innovation has been found to be positively associated with self-efficacy and shared identity, while these latter two can be influenced through education by allowing mastery experiences and active engagement in a social entrepreneurial project (Smith and Woodworth, 2012). Moreover, social entrepreneurial intentions have been shown to be driven by empathy, self-efficacy and perceived social support (Hockerts, 2015; Mair and Noboa, 2006).

The research regarding entrepreneurial intentions in the context of sustainable entrepreneurship has tended to focus on one or two aspects of value creation (e.g. Cohen and Winn, 2007; Dean and McMullen, 2007; Hockerts and Wustenhagen, 2010; Schaltegger and Wagner, 2011; Shepherd and Patzelt, 2011; Zahra *et al.*, 2009). Variables for sustainability-oriented entrepreneurial intentions and attitude toward sustainability are added to the intention model used in this study to extend the existing models into sustainable entrepreneurship. These variables explicitly include social and environmental value creation, while economic value creation is reflected implicitly through perceived entrepreneurial desirability and feasibility. Following the existing research, perceived behavioral control, feasibility and self-efficacy have been proposed to describe essentially the same issue – perception of the ability to perform a given task (Krueger and Brazeal, 1994; Liñan *et al.*, 2011) – and hence are treated as equal. Similarly, attitude-toward-the-act and subjective norms have been suggested to correspond to perceived entrepreneurial desirability (Krueger *et al.*, 2000). Hence following TPB, it is proposed that attitude-toward-the-act in this study has two parts: attitude toward sustainability and perceived entrepreneurial desirability (see Figure 1). Moreover, perceived entrepreneurial desirability and feasibility together with attitude toward sustainability are proposed to be the drivers of sustainability-oriented entrepreneurial intentions. These drivers, in turn, are suggested to be influenced by work values and general self-efficacy.

#### *Antecedents of sustainability-oriented entrepreneurial intentions*

Positive views about entrepreneurship as a suitable employment option are formed through the evaluation of an entrepreneurial opportunity (McMullen and Shepherd, 2006). As a result, individuals need to assess the adequacy of their skills and abilities (feasibility) to succeed in the case of that particular opportunity as well as the desirability of self-employment over other possible career options (Douglas and Shepherd, 2002).

Figure 1.  
Theoretical model



Perceived entrepreneurial desirability describes the degree of attractiveness an individual perceives in becoming an entrepreneur, and perceived entrepreneurial feasibility is the degree of a person's belief that he or she possesses the necessary skills and knowledge to become an entrepreneur (Krueger, 1993; Shapero and Sokol, 1982). The entrepreneurship literature has provided evidence of a positive relationship between perceived entrepreneurial desirability and feasibility and entrepreneurial intentions (e.g. Krueger, 1993; Krueger *et al.*, 2000; Liñan and Santos, 2007).

Sustainable entrepreneurship differs from commercial entrepreneurship as a result of focus on combining different types of value – namely, social, environmental and economic value (Cohen and Winn, 2007; Dean and McMullen, 2007; Hockerts and Wustenhagen, 2010; Shepherd and Patzelt, 2010). In their recent study, Muñoz and Dimov (2015) proposed two alternative paths to sustainability-oriented entrepreneurial action: that enabled by a supportive operational environment and that generated as a response to an unsupportive environment. The scholars' results show that the first path involves being sustainability-oriented, having sustainability-oriented entrepreneurial ideas, focusing on value creation and perceiving business and social support. Alternatively, the second centers on a high level of entrepreneurial intention toward sustainability, not having sustainability-oriented entrepreneurial ideas and not perceiving social and contextual support. Consequently, in this study as well as in other studies, the entrepreneurial intention model in the context of sustainable entrepreneurship should include attitude toward sustainability, since attitudes, which are shaped by value priorities, shape intentions and the subsequent behavior (Fischer and Schwartz, 2011; Schwartz, 1992). Moreover, individuals who are more oriented toward sustainable development and preserving nature tend also to act according to their values (Bruyere and Rappe, 2007; Wagner, 2012). Although, it has been recognized that under high entrepreneurial self-efficacy and high industry resource-scarcity, individuals do not adhere to their pro-environmental values when evaluating environmental harm caused by seizing opportunities (Shepherd *et al.*, 2013). Hence, preference for social and environmental value creation together with a positive view of entrepreneurship as a career option could be positively related to sustainability-oriented entrepreneurial intentions.

Societal issues and problems are often considered to be very challenging, which implies that the odds of successfully solving them are perceived to be low or even non-existent (Seelos and Mair, 2005). Hence, perceived entrepreneurial feasibility has been proposed to be positively related to entrepreneurial intentions in the field of social entrepreneurship (Mair and Noboa, 2006; Smith and Woodworth, 2012). In light of the theoretical discussion and empirical evidence provided by prior entrepreneurship literature, it is proposed that perceived entrepreneurial desirability and feasibility as well as attitude toward

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sustainability shape sustainability-oriented entrepreneurial intentions. Hence, the following are hypothesized:

- H1a.* Perceived entrepreneurial desirability has a positive impact on sustainability-oriented entrepreneurial intentions.
- H1b.* Perceived entrepreneurial feasibility has a positive impact on sustainability-oriented entrepreneurial intentions.
- H1c.* Attitude toward sustainability has a positive impact on sustainability-oriented entrepreneurial intentions.

#### *The role of work values and general self-efficacy*

Values drive entrepreneurial behavior by acting as a booster and enabler of self-expression (Kirkley, 2016). The emergence of different types of entrepreneurship has turned attention toward differences in the values driving entrepreneurship. Priorities and behaviors are connected to personal values (Schwartz, 1992), which are reflected in the type of entrepreneurial opportunity pursued and attitude toward entrepreneurship. Work values represent outcomes that individuals aim at through their work (Frieze *et al.*, 2006). Moreover, employment choices and work goals are shaped by work values that are particular personal values (Jahoda, 1981), and they are often divided into intrinsic and extrinsic rewards (Ryan and Deci, 2000). Extrinsic reward is associated with personal gain, and a person with extrinsic work values pursues work through which he or she can achieve monetary gains, power, prestige and status (Twenge *et al.*, 2010). By contrast, intrinsic reward is connected to creativity, learning and problem solving. Individuals with intrinsic work values tend to be motivated by solving challenging tasks, opportunities to be creative and learning new skills (Ryan and Deci, 2000).

The literature has identified other work value types beyond extrinsic and intrinsic, including altruism and security. Individuals with altruistic values are motivated by the possibility to help others and the surrounding society as well as care for the environment (Lyons *et al.*, 2010; Twenge *et al.*, 2010). Alternatively, security as a work value reflects the emphasis a person puts on the stability of the work as well as on safety and harmony in the work place (Ros *et al.*, 1999; Twenge *et al.*, 2010). The present study focuses on these four work values (intrinsic reward, extrinsic reward, altruism and security), since these values are closely connected to different aspects of entrepreneurship and different types of value creation. Extrinsic reward and altruism are connected to economic, social and environmental value creation, while intrinsic reward and security are more generally connected to entrepreneurship. As a result, two work values – social relations and leisure (Lyons *et al.*, 2010) – are excluded from the study.

The work values of an individual are connected to occupation choices through motivation and attitudes. More specifically, values and motivations guide an individual's decision to become an entrepreneur. As a result of the personal nature of the decision to embark on self-employment, the decision to become self-employed is likely to vary and take different forms (Jaén and Liñan, 2013; Krueger, 2003). Since work values direct the evaluation of possible ways of action through desirable goals and behaviors, there seems to be a connection between perceived entrepreneurial desirability, describing the attractiveness of entrepreneurship as an occupation option, and work values (Krueger *et al.*, 2000). The literature has connected intrinsic and extrinsic rewards with higher entrepreneurial intention level, while security tends to hinder it. The results of Douglas and Shepherd's (2002) study suggest that individuals with higher entrepreneurial intentions tend to be less risk averse as well as value independence. Similarly, individuals preferring an entrepreneurial career tend to value security less and possess innovative and

risk-taking qualities more than those aiming at employment in a company. Moreover, power and innovativeness are associated with higher entrepreneurial intentions and are hence connected to higher perceived entrepreneurial desirability (Brenner *et al.*, 1991). Based on the empirical evidence and the values associated with entrepreneurship, innovativeness, power and wealth, the following relationships are proposed between work values and perceived entrepreneurial desirability:

*H2a.* Intrinsic reward has a positive impact on perceived entrepreneurial desirability.

*H2b.* Extrinsic reward has a positive impact on perceived entrepreneurial desirability.

*H2c.* Security has a negative impact on perceived entrepreneurial desirability.

The level of perceived competence across different contexts is described through general self-efficacy, a trait-like perception (Chen *et al.*, 2001; Eden, 1988; Gardner and Pierce, 1998; Judge *et al.*, 1998). In the context of entrepreneurship, a person's level of general self-efficacy is connected to the decision to start a business (Shepherd *et al.*, 2015). Moreover, the perceived odds of venture success are based on an entrepreneur's perception of his/her level of knowledge and capabilities (Guth *et al.*, 1991, in Ardichvili *et al.*, 2003, p. 116). More specifically, general self-efficacy and perceived entrepreneurial feasibility are connected, since perceived entrepreneurial feasibility describes the degree to which an individual believes that he/she can succeed in becoming self-employed (Krueger, 1993; Shapero and Sokol, 1982). Additionally, general self-efficacy is about whether or not an individual is able to complete a present task successfully (Boyd and Vozikis, 1994; Judge *et al.*, 1998).

Beyond a definitional connection, the entrepreneurship literature has thus far established a connection between perceived self-efficacy, opportunity recognition and optimism (Krueger and Brazeal, 1994; Krueger and Dickson, 1994). In terms of opportunity recognition, higher conceptions of one's abilities to successfully complete tasks are connected to a greater number of opportunities than threats recognized (Neck and Manz, 1996). Similarly, individuals with higher self-efficacy tend to believe they are more able to reach the set goals (Boyd and Vozikis, 1994), and self-efficacy is positively connected to both propensity toward entrepreneurship and perceived likelihood of becoming an entrepreneur (Arrighetti *et al.*, 2016). Hence, the level of general self-efficacy would appear to be associated with the level of perceived entrepreneurial feasibility. This notion is of particular importance in the context of sustainable entrepreneurship and particularly of entrepreneurial intention formation (Mair and Noboa, 2006; Smith and Woodworth, 2012). Due to the complexity and the magnitude of the societal issues that are attempted to be solved, the odds of success are often seen as minimal (Seelos and Mair, 2005). Similarly, engagement in social entrepreneurship has been proposed to be shaped by self-efficacy (Smith and Woodworth, 2012). In light of the theoretical discussion above and the empirical evidence, in this study the following is proposed:

*H3a.* General self-efficacy has a positive impact on perceived entrepreneurial feasibility.

An entrepreneurial career is associated with risk-taking, autonomy and innovativeness. As mentioned, the degree to which an individual believes he/she can succeed in becoming self-employed is described through perceived entrepreneurial desirability (Krueger, 1993; Shapero and Sokol, 1982), hence suggesting that preferring an occupation that allows an individual to act according to those values is associated with success in that particular occupation. The research results show that risk-taking, independence and innovativeness are connected with entrepreneurial careers (Brenner *et al.*, 1991; Douglas and Shepherd, 2002). This implies that intrinsic reward and security are associated with perceived entrepreneurial feasibility. Since risk-taking is an inherent condition for entrepreneurship, valuing stability at work (security) seems to have a negative connection to perceived entrepreneurial feasibility.



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By contrast, innovativeness and autonomy are also closely connected to entrepreneurial careers, hence implying that individuals valuing intrinsic reward would perceive entrepreneurship to be more feasible than those not preferring intrinsic reward. As a result, the following is hypothesized:

*H3b.* Intrinsic reward has a positive impact on perceived entrepreneurial feasibility.

*H3c.* Security has a negative impact on perceived entrepreneurial feasibility.

Altruistic values play a role in different aspects of sustainable entrepreneurship: work values are connected to attitude toward sustainability, since they shape the emphasis put on social and environmental aspects in value creation and hence on the type of entrepreneurial opportunities recognized. The desire to create social value is essential in social entrepreneurship (Zahra *et al.*, 2009), and, as a result, the role of altruistic values as drivers of behavior toward solving societal problems has been highlighted (Dees, 2012). Similarly, earlier research has suggested that different altruistic values (universalism, altruism and empathy) are associated with more positive environmental attitudes (Hockerts, 2015; Schultz and Zelezny, 1999), the likelihood of opportunity recognition in sustainable development (Patzelt and Shepherd, 2010) and entrepreneurial intentions through perceived desirability and the development of altruistic motivations in social entrepreneurship (Mair and Noboa, 2006; Smith *et al.*, 2010).

Sustainable entrepreneurship is about combining three types of values: social, environmental and economic (Cohen and Winn, 2007; Dean and McMullen, 2007; Schaltegger and Wagner, 2011). Prosocial motivation, together with intrinsic and extrinsic motivation, has been proposed to play a role in the recognition and evaluation process of entrepreneurial opportunities connected to societal and environmental issues (Shepherd, 2015). Sustainable entrepreneurship has been defined as “the discovery and exploitation of economic opportunities through the generation of market disequilibria that initiate the transformation of a sector towards an environmentally and socially more sustainable state” (Hockerts and Wustenhagen, 2010, p. 482). However, when combining social, environmental and economic value creation together, conflicts in underlying values and motivations influencing an individual’s value creation goals are likely to emerge. Despite triple value creation in sustainable entrepreneurship, there seems to be a need to balance between the types of value created. By contrast, to aim primarily at economic gain would be in conflict with aiming at social and environmental value creation. Hence, although extrinsic reward is an important driver of sustainable entrepreneurship, the findings of the prior literature have shown that environmental attitudes are negatively impacted by power and tradition (Schultz and Zelezny, 1999). Contrary to extrinsic reward, intrinsic reward is seen as a driver of attitude toward sustainability. As mentioned, societal and environmental issues are often complex, and traditional solutions do not seem to work (Hockerts, 2015). Moreover, innovation and innovativeness have been connected to social and environmental entrepreneurship as a result of this complexity and willingness to change the industry they are operating in (Austin *et al.*, 2006; Hockerts and Wustenhagen, 2010; Short *et al.*, 2009). Based on the discussion above regarding the connections between different work values and attitude toward sustainability, in this study the following is proposed:

*H4a.* Altruism has a positive impact on attitude toward sustainability.

*H4b.* Intrinsic reward has a positive impact on attitude toward sustainability.

*H4c.* Extrinsic reward has a negative impact on attitude toward sustainability.

#### Data collection and measures

The data were collected using anonymous questionnaires in two rounds in 2015: the first in March in Liechtenstein and Austria and the second in April-May in Finland. Minor changes to

the appearance of the questionnaire (lines and color were added) were made between the two rounds of data collection although the content remained unchanged. To avoid confirmation bias, some items and one intentions scale were reversed. The research focuses on young adults, and hence the age range for respondents was set between 18 and 35 years old. Moreover, the research context is university students, because higher education has been associated with increased entrepreneurial activity (Levie and Autio, 2008). Additionally, education level plays an important role in specific forms of entrepreneurship. An increase in education level has been associated with an increase in the emphasis put on social and environmental entrepreneurial goals, while it tends to decrease the emphasis put on economic entrepreneurial goals (Hechavarria *et al.*, 2017). Similarly, prior research has found that the course of study and entrepreneurial intentions are connected (Kuckertz and Wagner, 2010).

The data sample consists of 415 university students from universities in Liechtenstein ( $n = 81$ ), Austria ( $n = 123$ ) and Finland ( $n = 211$ ). In total, 5 percent of questionnaires were discarded due to incomplete answers and respondents being over the age range limit ( $> 35$ ). This results in 393 responses. The respondents' average age was 23 years, which corresponds to the average age of university students. Of the respondents, 44 percent were female and 56 percent were male. Respondents were mainly studying in three academic disciplines: business (67 percent), architecture (20 percent) and technology (9 percent). In total, 32 percent of the respondents had someone in their circle of friends or family who is an entrepreneur.

First, the scale for entrepreneurial intentions was mostly adopted from Liñan and Chen's (2009) study, while one item, "I am going to start my own business within one year of graduation," was adopted from Autio *et al.*'s (2001) and Davidsson's (1995) studies. Second, perceived entrepreneurial desirability was measured using the scale from Liñan and Chen's (2009) study, while the scale for perceived entrepreneurial feasibility was adopted from Krueger's (1993) and Peterman and Kennedy's (2003) studies. Third, the scale for work values was adopted from Dietz *et al.*'s (2002) and Twenge *et al.*'s (2010) studies. Since Schwartz's (1992) value scale is the base of both scales, items from these two scales were integrated. The scale includes work values for security, extrinsic reward, intrinsic reward and altruism. Fourth, the scale for general self-efficacy was adopted from Chen *et al.*'s (2001) study.

Lastly, since there are only few measurement scales available for entrepreneurial opportunity attributes, and they have not taken into account different types of entrepreneurship, the scales for entrepreneurial goal and attitude toward sustainability were developed for the purposes of this study. Entrepreneurial goal together with entrepreneurial intentions forms the measure for sustainability-oriented entrepreneurial intentions. The first measurement scale for entrepreneurial goal is Osgood's semantic differential scale (Osgood *et al.*, 1975, pp. 25-26), which asked the respondents to evaluate pairs of opposite characteristics of their ideal venture. These characteristics reflecting sustainable entrepreneurship include impact on society's weakest members, environmental problems, the world's poverty problem, sustainable development, the responsible use of natural resources and having a goal that maximizes social good rather than economic gain. These six items were developed based on the sustainable development goals identified by United Nations (UNDP, 2015). The second measure, attitude toward sustainability, asked respondents to rate the extent (from 1 to 7) to which they would consider social and environmental impact when evaluating an entrepreneurial opportunity.

To assess the validity of measurement, the average variance extracted (AVE) for sustainable entrepreneurial goal was examined, and it is 0.56. Since the AVE is above the cut-off value (0.5), it is concluded that there is convergent validity (Hair *et al.*, 1998, p. 612). Moreover, correlations were examined, and all are below squared AVE; hence there is discriminant validity (Henseler *et al.*, 2015; Zait and Berteau, 2011). As a result, it can be concluded that construct is valid (see Table AVII). Summed scales were constructed for work values, sustainable entrepreneurial goal, general self-efficacy, perceived

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entrepreneurial desirability and feasibility and entrepreneurial intention. The detailed composition of factors is presented in Tables AI-AVIII.

Following the suggestion of Bono and McNamara (2011) about the conditions under which a variable should be controlled for, gender and discipline were chosen as control variables. First, gender was controlled for, since the prior literature has found that it plays a role in the level of entrepreneurial attitudes and intentions (Arrighetti *et al.*, 2016; Fellnhofner *et al.*, 2016; Kuckertz and Wagner, 2010; Zhao *et al.*, 2005). However, previous studies have provided mixed results about the role of gender in entrepreneurial intentions and attitudes toward value creation. For example, female business students are found to have higher entrepreneurial intentions, while the level of entrepreneurial intentions is not influenced by gender among science and engineering students (Kuckertz and Wagner, 2010). On the contrary, female MBA students were found to have a lower level of entrepreneurial intentions than males (Zhao *et al.*, 2005). Moreover, gender plays a role in entrepreneurial goals as well as values and behaviors related to sustainability. For example, females are more likely to have social and environmental entrepreneurial goals than males, while males are more likely to have economic entrepreneurial goals than females (Hechavarria *et al.*, 2017). Similarly, males tend to be less emphatic toward others compared to females (Hockerts, 2015). Second, discipline (business, technology, architecture or other) was controlled, since prior research has found differences between business and engineering students in terms sustainability orientation and level of entrepreneurial intentions (Kuckertz and Wagner, 2010).

Following Podsakoff *et al.* (2003), the risk of common method variance was reduced by using different scale types and reversing some items and one scale (see Tables AI-AVIII). Moreover, in this study, Harman's single factor test was used to examine common method variance. The results suggest that there are ten factors in the data and that together they explain 66 percent of the variance. Also, the first factor explains only 20 percent of the variance, hence there does not seem to be any general factor explaining the variance. As a result, it can be concluded that common method variance does not seem to be an issue. The summed scales were created on the basis of a principal component analysis, and the composition of items in each scale was based on communalities, MSA values and cross-loadings (Tables AI-AVIII). All the Cronbach's  $\alpha$ s were above 0.6 and all except one above 0.7 (see Table I). This confirmed the internal consistency of the scales, and hence they could be considered reliable (Hair *et al.*, 1998, p. 118). The two self-developed measures – sustainable entrepreneurial goal and attitude toward sustainability – were internally consistent and could be considered reliable, hence showing promise in terms of measuring attitudes toward types of entrepreneurial opportunities as well as opportunity-specific intentions. As a result, a measure for sustainability-oriented entrepreneurial intentions was created by multiplying measures of entrepreneurial intention by social entrepreneurial goal.

## Results

Through ordinary least squares (OLS) estimation, the proposed relationships in the theoretical framework were tested. On the basis of the fit statistics of the models, it is concluded that the models fit the data at an acceptable level, since all the models are significant and explained 21-42 percent of the variance (Table II). Gender and discipline were controlled for in light of the results of the earlier studies and correlations. Keeping all other things equal, women tend to perceive entrepreneurship as less feasible and desirable while they tend to have a more positive attitude toward sustainability than men. Similarly, non-business students tend to perceive entrepreneurship as more feasible and desirable as well as have a higher level of sustainability-oriented entrepreneurial intentions.

First, the elements of TPB are examined: perceived entrepreneurial desirability and feasibility as well as sustainability-oriented entrepreneurial intentions (SEI\_1 model). The model is significant and explains 21 percent of the variance. The results show that

	SEI	ATS	PEF	PED	GSE	ALT	INTR	EXT	SEC	Gender	DIS
Mean	15.08	3.79	4.24	4.72	3.98	2.96	4.10	3.50	3.82	0.44	0.61
SD	8.17	1.34	1.14	1.59	0.58	0.76	0.65	0.69	0.80	0.50	0.94
Cronbach's $\alpha$	<sup>a</sup>	0.76	0.62	0.94	0.85	0.83	0.75	0.74	0.77	-	-
SEI	-										
ATS	0.19*										
PEF	0.24*	-0.11									
PED	0.45*	-0.09	0.51*								
GSE	0.12	-0.07	0.37*	0.35*							
ALT	0.23*	0.58*	-0.05	0.06	0.09						
INTR	0.12	-0.01	0.27*	0.40*	0.46*	0.16*					
EXT	-0.02	-0.11	0.17*	0.23*	0.32*	0.13	0.29*				
SEC	-0.19*	0.09	-0.15*	-0.18*	0.07	0.18*	0.13	0.27*			
Gender	-0.04	0.22*	-0.27*	-0.26*	-0.10	0.10	-0.10	-0.20*	0.17*		
DIS	0.14	0.07	0.01	-0.02	-0.19	0.06	-0.04	-0.28*	0.07	0.18*	-

Notes: SEI, sustainability-oriented entrepreneurial intentions; ATS, attitude toward sustainability; PEF, perceived entrepreneurial feasibility; PED, perceived entrepreneurial desirability; GSE, general self-efficacy; ALT, altruism; INTR, intrinsic reward; EXT, extrinsic reward; SEC, security; Gender (male = 0, female = 1); DIS, discipline (0 = business, 1 = non-business). <sup>a</sup>Cronbach's  $\alpha$  for entrepreneurial intentions is 0.91 and for sustainable entrepreneurial goal is 0.73; Cronbach's  $\alpha$ s so not contain the omitted items that are presented in Tables AI-AVIII. \* $p < 0.001$

Table I.  
Descriptive analysis

	ATS		PED		PEF		SEI_1		SEI_2	
	Parameter estimate	SE	Parameter estimate	SE	Parameter estimate	SE	Parameter estimate	SE	Parameter estimate	SE
Intercept	1.74***	0.43	1.68***	0.58	2.17***	0.47	1.04	1.69	-4.67**	1.91
Altruism	1.09***	0.07								
Extrinsic reward	-0.31***	0.09	0.42***	0.12						
Intrinsic reward	-0.05	0.09	0.90***	0.12	0.22**	0.09				
Security			-0.51***	0.10	-0.23***	0.07				
General SE					0.57***	0.10				
ATS									1.52***	0.27
PEF							0.47	0.38	0.52	0.36
PED							2.06***	0.26	2.09***	0.25
<i>Control</i>										
Gender	0.33***	0.11	-0.58***	0.15	-0.53***	0.11	1.12	0.80	0.28	0.76
Discipline	-0.07	0.06	0.16**	0.08	0.11*	0.06	0.95**	0.41	0.92**	0.38
$R^2$	0.42		0.29		0.23		0.21		0.28	
Adj. $R^2$	0.41		0.28		0.22		0.21		0.27	
F-test (df)	52.23***		28.89***		32.38***		24.55***		27.91***	
	(5)		(5)		(5)		(4)		(5)	

Model difference (F-test)

1.18\*\*

Table II.  
OLS-regression results

Notes: SE, self-efficacy; ATS, attitude toward sustainability; PEF, perceived entrepreneurial feasibility; PED, perceived entrepreneurial desirability; SEI, sustainability-oriented entrepreneurial intentions; Discipline: 0 = business, 1 = non-business; Gender: 0 = male, 1 = female. \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

perceived entrepreneurial desirability positively affects the level of sustainability-oriented entrepreneurial intentions, while perceived entrepreneurial feasibility does not have a significant relationship with sustainability-oriented entrepreneurial intentions. Moreover, the fifth regression model contains attitude toward sustainability as a driver of sustainability-oriented entrepreneurial intentions. The variance explained increases from 21 to 38 percent ( $F \leq 5.19$ ,  $p = 0.05$ ), hence suggesting that the model with attitude toward sustainability is better. Both attitude toward sustainability and perceived entrepreneurial desirability have a positive and significant impact on sustainability-oriented entrepreneurial intentions. When attitude toward sustainability improves by one unit, sustainability-oriented entrepreneurial intentions increase by 1.52 units. Similarly, an increase of one unit in perceived entrepreneurial desirability more than doubles the level of sustainability-oriented entrepreneurial intentions (2.09 units). These results lend support to *H1c* and *H1a*, proposing that attitude toward sustainability and perceived entrepreneurial desirability have a positive impact on sustainability-oriented entrepreneurial intentions. Surprisingly, in this study, no connection is detected between perceived entrepreneurial feasibility and sustainability-oriented entrepreneurial intentions. As a result, *H1b* is not supported.

Second, perceived entrepreneurial desirability and work values were examined. As hypothesized, both intrinsic and extrinsic rewards are positively associated with perceived entrepreneurial desirability. Hence, *H2a* and *H2b* are supported. Moreover, security has a negative effect on perceived entrepreneurial desirability. This lends support to *H2c*, suggesting that security has a negative impact on perceived entrepreneurial desirability. The third model examined work values, general self-efficacy and perceived entrepreneurial feasibility. As expected, the results lend support to *H3a*, proposing that general self-efficacy has a positive impact on perceived entrepreneurial feasibility. A higher level of general self-efficacy is associated with higher perceived entrepreneurial feasibility ( $p < 0.01$ ). Similarly, intrinsic reward has a positive effect on perceived entrepreneurial feasibility ( $p < 0.05$ ), and hence *H3b* is supported. Moreover, the results show that when an individual's valuation of security increases by one unit, the level of perceived entrepreneurial feasibility diminishes by 0.23 units, supporting *H3c*.

Finally, the results show support for *H4a*, proposing that altruism has a positive impact on attitude toward sustainability. A higher level of altruism is associated with a more positive attitude toward sustainability ( $p < 0.01$ ). As hypothesized, extrinsic reward has a negative effect on attitude toward sustainability, hence providing support for *H4c*, suggesting a negative connection between extrinsic reward and attitude toward sustainability. Contrary to *H4b*, intrinsic reward has no significant connection with attitude toward sustainability. This contradicts *H4b*, suggesting that intrinsic reward has a positive impact on sustainability, and hence the hypothesis is not supported.

## Discussion

The purpose of the present study was to examine sustainability-oriented entrepreneurial intentions by extending and adapting the intention model to sustainable entrepreneurship. In this study, the drivers of sustainability-oriented entrepreneurial intentions as well as the antecedents of those drivers were identified through regression analysis. The results of the study are summarized in Table III.

First, in line with TPB, sustainability-oriented entrepreneurial intentions are driven by perceived entrepreneurial desirability and attitude toward sustainability. Thus, the results lend support for *H1a* and *H1c*. These results are partially in line with the prior findings in the context of social entrepreneurship (Hockerts, 2015; Urban and Kujinga, 2017). Their results show that perceived entrepreneurial desirability and feasibility have positive impact on social entrepreneurial intentions. Contrary to earlier findings, no relationship between perceived entrepreneurial feasibility and sustainability-oriented entrepreneurial intentions was detected.

Table III.  
Summary of  
hypotheses results

Hypotheses	$\beta$	Result
<i>H1a</i> : desirability → sustainability-oriented EI	2.40*	Supported
<i>H1b</i> : feasibility → sustainability-oriented EI	0.33	Not supported
<i>H1c</i> : sustainable attitude → sustainability-oriented EI	1.51*	Supported
<i>H2a</i> : intrinsic reward → desirability	0.95*	Supported
<i>H2b</i> : extrinsic reward → desirability	0.37*	Supported
<i>H2c</i> : security → desirability	-0.48*	Supported
<i>H3a</i> : intrinsic reward → feasibility	0.28*	Supported
<i>H3b</i> : security → feasibility	-0.23*	Supported
<i>H3c</i> : self-efficacy → feasibility	0.54*	Supported
<i>H4a</i> : altruism → sustainable attitude	1.10*	Supported
<i>H4b</i> : intrinsic reward → sustainable attitude	-0.08	Not supported
<i>H4c</i> : extrinsic reward → sustainable attitude	-0.30*	Supported

Notes: Sustainable attitude, attitude toward sustainability. \* $p < 0.01$

As a result, *H1b* is not supported. Our findings also provide support for the results of the social entrepreneurship literature (e.g. Ayob *et al.*, 2013) about the insignificant role of perceived entrepreneurial feasibility on entrepreneurial intentions. Similarly, Schlaegel and Koenig (2014) found only partially significant and positive relationship between perceived feasibility and entrepreneurial intent. Their results also show that the influence of perceived entrepreneurial feasibility on entrepreneurial intention is mediated by perceived entrepreneurial desirability. By contrast, a negative interaction between perceived entrepreneurial feasibility and desirability has been reported in the entrepreneurship literature by Fitzsimmons and Douglas (2011). They found that the positive relationship between perceived entrepreneurial desirability and entrepreneurial intentions is stronger when the level of perceived entrepreneurial feasibility is low and weaker when it is high. Hence, our results together with the findings of the prior literature reinforce the notion that the relationship between perceived entrepreneurial desirability, feasibility and intentions may be more complex than a simple linear relationship. Alternatively, the insignificant impact of perceived entrepreneurial feasibility may imply that specific measures for the sustainable entrepreneurial context should be developed. Both perceived entrepreneurial desirability and feasibility might need to be developed in a way that takes into consideration different types of entrepreneurial opportunities, and hence they would be more context-specific.

Second, the findings of the study show that intrinsic and extrinsic reward have positive impact on perceived entrepreneurial desirability, while security tends to have negative effect on it. Thus, the results lend support for *H2a-H2c*. These results are in line with the findings of prior literature that has shown that individuals aiming to become entrepreneurs or acting entrepreneurially tend to appreciate independence, power, innovativeness and risk-taking (Brenner *et al.*, 1991; Douglas and Shepherd, 2002; Kirkley, 2016). Similarly, *H3a-H3c* are supported by the results of the study. Regarding self-efficacy, the results of the study show a positive connection between general self-efficacy and perceived entrepreneurial feasibility (*H3a*). This is in line with the prior entrepreneurship literature that has tended to connect self-efficacy to entrepreneurial intentions (e.g. Schlaegel and Koenig, 2014; Zhao *et al.*, 2005). However, the prior literature has tended to examine the role of entrepreneurial self-efficacy, which is a domain specific form of self-efficacy, as a driver of entrepreneurial intentions. Thus, the results extend the findings of the prior literature by examining general self-efficacy as a driver of perceived entrepreneurial feasibility. Furthermore, the results show positive connection between intrinsic reward and perceived entrepreneurial feasibility (*H3b*), while security tends to decrease its level (*H3c*). These results are in line with the findings of the prior literature by showing that individuals highlighting security tends to

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have lower entrepreneurial intentions than those who value independence and innovativeness (Brenner *et al.*, 1991; Douglas and Shepherd, 2002). Similarly, Kirkley (2016) has found that independence, choosing own goals and creativity were connected to underlie entrepreneurial behavior.

Third, the results of the study lend support for *H4a* and *H4c*, but they do not support *H4b*. Regarding the *H4a*, the study shows that altruism seems to play the most important role in driving attitude toward sustainability. These results are in line with the social and environmental entrepreneurship literature (Mair and Noboa, 2006; Patzelt and Shepherd, 2010; Schultz and Zelezny, 1999; Smith *et al.*, 2010). Similarly, following the findings of the prior literature (Schultz and Zelezny, 1999), the results show a negative relationship between extrinsic reward and attitude toward sustainability. The prior research has shown that power and tradition decrease entrepreneurial attitude. Surprisingly, intrinsic reward is not connected to attitude toward sustainability. Although the literature has connected innovativeness and creativity with social and environmental value creation, attitude toward sustainability is not affected by valuing intrinsic reward (Austin *et al.*, 2006; Hockerts and Wustenhausen, 2010; Short *et al.*, 2009). However, when looking at the results regarding attitude toward sustainability and perceived entrepreneurial desirability, a contradiction in the role of extrinsic reward driving the antecedents of sustainable entrepreneurship. Extrinsic reward enhances the level of perceived entrepreneurial desirability, while it tends to hinder attitude toward sustainability.

Fourth, the results additionally reveal that gender and disciplinary differences are present in sustainable entrepreneurship. On average, women tend to have more positive attitudes toward sustainability, while men tend to perceive entrepreneurship as more desirable and feasible. These results are supported by the findings of the prior literature, which has found that females tend to hold more altruistic values than males (Hechavarria *et al.*, 2017; Hockerts, 2015). Surprisingly, there are no gender differences when it comes to the level of sustainability-oriented entrepreneurial intentions. Similarly, as suggested by the findings of the prior literature, non-business students tend to perceive entrepreneurship in more positive light and have a higher level of sustainability-oriented entrepreneurial intentions than business students. Our findings support the results of Kuckertz and Wagner (2010), who also found differences among disciplines when it comes sustainability orientation and entrepreneurial intentions.

### Conclusions

The need to adapt intention models and how they apply to entrepreneurship type-specific intentions has been raised in the entrepreneurial intention literature (Liñan and Fayolle, 2015). The focus of this paper was on sustainable entrepreneurship and the applicability of TPB on this particular type of entrepreneurship. Hence, the purpose of the study was to examine entrepreneurial intentions in sustainable entrepreneurship, and a model for sustainability-oriented entrepreneurial intentions is proposed. The results of the study contribute to the sustainable entrepreneurship literature and entrepreneurship literature in three ways, as discussed below. The findings of the study also have implications for public policies and society through education. Especially, the findings of the study have implications for educating young adults about sustainable entrepreneurship and influencing their attitudes toward becoming sustainable entrepreneurs.

First, this study contributes to the entrepreneurship literature by showing that entrepreneurial intention models need to be adapted to fit the chosen context. Entrepreneurial opportunities are the underlying assumption in entrepreneurial intention models (Ajzen, 1991) although the heterogeneity in entrepreneurial opportunities is not reflected in the existing models (Brännback *et al.*, 2007). Despite the introduction of a context-specific entrepreneurial intention model (Elfving, 2008) that includes both opportunity evaluation and entrepreneurial

goal, the idea seems to have attracted only limited attention. The findings of the study provide support for the notion that the adaption of TPB is needed when examining entrepreneurship-specific entrepreneurial intentions. The results of the study show that the variance explained is higher when attitude toward sustainability is included as a driver of sustainability-oriented entrepreneurial intentions. In this study, the sustainable entrepreneurship literature is extended by providing a sustainability-oriented entrepreneurial intention model, which can also be extended to the other entrepreneurship types. To conclude, the research findings imply that it may be time to consider adapting the entrepreneurial intention models to include and to take into account the variance in entrepreneurial opportunities.

Second, the findings of the study provide new insights to the sustainable entrepreneurship literature by showing how the dual or triple goal-setting in sustainable entrepreneurship is also reflected in work values. The findings of the study support the notion proposed in the literature (e.g. Shepherd *et al.*, 2013) that sustainable entrepreneurship is associated with the internal balancing of values, motives and perceived capabilities. That is, from one perspective people need to earn a living and want to be successful; but by contrast, they want to have a positive influence on societal and environmental issues despite the loss in personal economic gain. All in all, the findings of the study highlight the value aspects of sustainable entrepreneurship. Sustainable entrepreneurship, as well as social and environmental entrepreneurship, are strongly associated with altruistic value (Dees, 2012; Gibbs, 2009; Hockerts, 2015; Mair and Noboa, 2006; Linnanen, 2002; Smith and Woodworth, 2012) although sustainable entrepreneurship is connected to triple value creation (Cohen and Winn, 2007; Dean and McMullen, 2007; Schaltegger and Wagner, 2011).

Third, the findings of the study extend the results of the sustainable entrepreneurship literature by showing the connection between values, attitudes and intentions. Krueger (2007) has proposed that entrepreneurial intentions are based on attitudes, which hold roots in cognitive structures and deep beliefs. Deep beliefs are deeply rooted, strong assumptions, such as values, that guide individuals' way of understanding the world around them and making decisions. The prior entrepreneurial intention literature has tended to focus on the drivers of intentions present in the TPB and EEM (e.g. Krueger, 1993; Krueger *et al.*, 2000; Liñan and Santos, 2007; Schlaegel and Koenig, 2014), while this study also includes values. Thus, the results suggest that there is a connection between altruism, attitude toward sustainability and sustainability-oriented entrepreneurial intentions. Altruism is positively associated with attitude toward sustainability, and attitude toward sustainability is positively connected to sustainability-oriented entrepreneurial intentions. Moreover, the connection between extrinsic reward, perceived entrepreneurial desirability and sustainability-oriented entrepreneurial intentions highlights another aspect of sustainable entrepreneurship: economic gain.

The study has policy-level implications regarding the role of sustainable enterprises at the societal level. Sustainable entrepreneurship as a particular form of entrepreneurship is perceived as a resolution to social inequality and environmental degradation, while, conventionally, entrepreneurship has been seen as a cause for these problems (Dean and McMullen, 2007). Sustainable entrepreneurship takes into account the external costs of its operations and even turns them into positive externalities (Cohen and Winn, 2007). In other words, sustainable enterprises may improve the state of the environmental or social community instead of merely enjoying the benefits of utilizing natural and social resources. As a result, the internalization of externalities opens up new entrepreneurial opportunities, and, indirectly, through these entrepreneurial opportunities sustainable entrepreneurs contribute to the development of society. Simultaneously, attention should be paid to supporting and removing barriers for entrepreneurship to promote entrepreneurial activity via public policies.

The findings of the study also have implications for entrepreneurship education. If the aim is to increase the level of sustainable entrepreneurial activity through education,



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attention should be paid to making entrepreneurship be perceived as more desirable and improving attitudes toward sustainability. Attitudes toward sustainability are highest among females, who tend to hold altruistic values and do not put emphasis on extrinsic reward. Alternatively, perceived entrepreneurial desirability is highest among male non-business students, who tend to emphasize extrinsic and intrinsic rewards and not care about security. Moreover, if the gender differences are to be taken into consideration in an attempt to increase the level of sustainability-oriented entrepreneurial intentions, women are more prone to the sustainability aspect of the equation, while when it comes to men, the business side is more likely to be influenced. Thus, including sustainability-focused courses in education programs and providing students with positive experiences related to entrepreneurship are possible ways to influence the level of sustainable entrepreneurial intentions. Furthermore, since female students are more attracted to the sustainability aspect of sustainable entrepreneurship, there is a need to educate female students about entrepreneurship and encourage them in this direction. At the same time, there is a need to educate male students about sustainability-related issues and through education influence their attitude toward sustainability. Additionally, non-business students should be encouraged toward entrepreneurship, and entrepreneurial courses need to be included in educational programs. It seems that individuals from fields other than business are more prone toward sustainable entrepreneurship and that they have more positive views about sustainability and entrepreneurship. Hence, it seems that to enhance sustainable entrepreneurship, non-business students should be targeted to promote entrepreneurship as a career option.

Alternatively, perceived entrepreneurial desirability has the largest influence on sustainability-oriented entrepreneurial intentions, hence providing positive images about entrepreneurship and utilizing role models that provide positive experiences could be a way to improve the level of sustainability-oriented entrepreneurial intentions. The insignificant role of perceived entrepreneurial feasibility and the importance of perceived entrepreneurial desirability and attitude toward sustainability suggest that perception about a person's capability, skills and know-how in regard to becoming an entrepreneur may not be as important as in the context of conventional forms of entrepreneurship, and a key to enhancing sustainable entrepreneurship is positive views about entrepreneurship and sustainability in the context of university students. All in all, attitudes are important drivers of sustainability-oriented entrepreneurial intentions. Hence, attitudes should be highlighted, and ways to improve them should play a key role in entrepreneurship education.

Moreover, the contradictory role of extrinsic reward in attitude toward sustainability and perceived entrepreneurial desirability merits special consideration. As a result, there is a need to develop ways to help aspiring sustainable entrepreneurs to balance the value struggle between extrinsic reward and altruism. Furthermore, the findings of the study imply that the specific goal pursued through entrepreneurship education needs to be carefully defined. If the goal is to increase the perceived desirability of entrepreneurship, then different motivations need to be addressed compared to increasing attitude toward sustainability. This highlights the need to include both extrinsic reward and altruism when examining entrepreneurial intentions in the context of sustainable entrepreneurship. The results of the study imply that to enhance sustainable entrepreneurship by influencing attitude toward sustainability, altruistic values are essential. Moreover, the importance of intrinsic reward as a driver of perceived entrepreneurial desirability and the role of altruistic values in enhancing attitude toward sustainability imply that attention should be paid to teaching soft skills. Moreover, the university students in the study on average perceived intrinsic reward to be more important than extrinsic reward, while altruistic values were, on average, considered to be less important than extrinsic reward. Hence, it seems that

university students value freedom and innovativeness, while ability to help others is not perceived to be as important. This suggests that attention should be paid to ways of leveraging altruistic values to influence attitudes toward sustainability.

All in all, to enhance sustainable entrepreneurship through education, there is a need to find ways to address the underlying values. Moreover, depending on the type of value addressed, different aspects of sustainable entrepreneurship may be influenced, keeping in mind the dual role of extrinsic reward in sustainable entrepreneurship. Alternatively, altruism and intrinsic reward as the most important drivers of attitudes toward entrepreneurship and sustainability highlight the importance of values. "Millennials" (or "Generation Y" – those born between 1979 and 1994) have been proposed as being more entrepreneurial and sustainability-conscious (Hewlett *et al.*, 2009) and have been shown to seek more than merely monetary compensation from work (Ng *et al.*, 2010). Hence, this suggests that sustainable entrepreneurship would provide a purposeful work option which reflects their values.

The research has some limitations, each of which opens up avenues for future research. First, the relationships proposed in this study are limited to a particular entrepreneurial context – namely, sustainable entrepreneurship and sustainable value creation. To provide more support for the proposed relationships, future research should examine these relationships across different entrepreneurial opportunities that reflect different entrepreneurship types. Second, the research is limited to the context of young adults participating in higher education. Including individuals from different age categories, non-students and those who already are entrepreneurs would provide more support for the model. Third, the data sample is limited to small European countries, and thus to generalize the findings, research in larger and less sustainability-oriented countries is needed.

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#### Further reading

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Appendix

Evaluate following claims about different aspects of setting up a firm on a scale from 1 to 7. If I would set up a firm, it probably would ...

Items	Loading	MSA	Comm.
1. Impact on society's weakest members (1) – not have any impact on society's weakest members (7)	0.62	0.75	0.38
2. Reduce environmental problems (1) – not create any environmental problems (7)	0.84	0.67	0.70
3. help the World's poverty problem (1) – not have any impact on World's poverty (7)	0.81	0.71	0.65
4. Enhance sustainable development (1) – not impact sustainable development (7)	0.69	0.71	0.64
5. Maximize societal good rather than economic profit (1) – maximize economic profit rather than societal good (7)	–	–	–
6. Use natural resources responsibly (1) – be sourced through the most cost-effective way (7)	–	–	–

Table AI.  
Social entrepreneurial goal

Below is a list of some of these things. Please read each statement, and indicate how important each characteristic of work is for you (1=not very important, 5=extremely important)

Work value	Item	Loading	MSA	Comm.
Altruism	1. A job that provides an opportunity for preserving nature	0.81	0.79	0.66
	2. A job where you can respect the environment	0.86	0.78	0.73
	3. A job where I can be close to the nature	0.75	0.87	0.57
	4. A job that gives you an opportunity to be directly helpful to others	0.67	0.86	0.45
	5. A job that is worthwhile to society	–	–	–
	6. A job which makes the world a better place	0.77	0.82	0.59
Intrinsic reward	1. A job that provides enough challenges	0.75	0.67	0.56
	2. A job where you can learn new things, learn new skills	0.75	0.71	0.59
	3. A job where you have the chance to be creative	–	–	–
	4. A job where you get a chance to participate in decision-making	–	–	–
	5. A job where I can work in my own way	0.72	0.65	0.52
	6. A job where I can make my own decisions	0.82	0.67	0.67
Extrinsic reward	1. A job that provides you with a chance to earn a good deal of money	–	–	–
	2. A job well paid for	0.57	0.82	0.57
	3. A job where the chances for advancement and promotion are good	0.59	0.69	0.50
	4. A job that has high status and prestige	0.79	0.72	0.74
	5. A job that most people look up to and respect	0.73	0.73	0.66
	6. A job that provides a generous total compensation	0.64	0.89	0.52
Security	1. A job that offers a reasonably predictable, secure future	0.85	0.74	0.73
	2. A job that secures employment for me	0.86	0.69	0.76
	3. A job that will exist also in the future	0.71	0.79	0.56

Table AII.  
Work values

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**Table AIII.**  
Perceived  
entrepreneurial  
desirability

Evaluate the following statements regarding self-employment (1=completely disagree, 7=completely agree)

Items	Loading	MSA	Comm.
1. Being an entrepreneur implies more advantages than disadvantages to me	-	-	-
2. A career as entrepreneur is attractive for me	0.92	0.86	0.85
3. If I had the opportunity and resources, I would like to start a firm	0.91	0.88	0.82
4. Being an entrepreneur would entail great satisfactions for me	0.93	0.85	0.86
5. Among various options, I would rather be an entrepreneur	0.92	0.87	0.84

**Table AIV.**  
Perceived  
entrepreneurial  
feasibility

Evaluate the following questions regarding starting your own business

\*Item reversed

Items	Loading	MSA	Comm.
1. How sure of yourself would you be if you would start your own business? (1=very sure of myself, 7=very unsure of myself)*	0.74	0.65	0.55
2. How hard do you think it would be to start your own business? (1=very hard, 7=very easy)	-	-	-
3. If you started your own business, how overworked would you be? (1=very overworked, 7=not overworked at all)	-	-	-
4. If you started your own business, how certain of success are you? (1=very certain of failing, 7=very certain of success)	0.74	0.65	0.55
5. Do you know enough to start your own business? (1=know absolutely nothing, 7=know enough)	0.78	0.62	0.61

**Table AV.**  
General self-efficacy

Evaluate the following statements regarding self-efficacy (1=strongly disagree, 5=strongly agree)

Items	Loading	MSA	Comm.
1. I will be able to achieve most of the goals that I have set for myself	0.78	0.86	0.55
2. When facing difficult tasks, I am certain that I will accomplish them	0.78	0.86	0.61
3. In general, I think that I can obtain outcomes that are important to me	0.74	0.88	0.54
4. I believe I can succeed at most any endeavor to which I set my mind	0.74	0.88	0.55
5. I will be able to successfully overcome many challenges	0.74	0.86	0.61
6. I am confident that I can perform effectively on many different tasks	-	-	-
7. Compared to other people, I can do most tasks very well	-	-	-
8. Even when things are tough, I can perform quite well	0.74	0.87	0.55



Evaluate the following statements regarding self-employment (1=completely agree, 7=completely disagree)  
\*Item reversed

Items	Loading	MSA	Comm.
1. I am ready to do anything to be an entrepreneur*	0.90	0.86	0.81
2. I will make every effort to start and run my own business*	0.92	0.85	0.84
3. I'm determined to create a firm in the future*	0.90	0.83	0.81
4. I have very seriously thought in starting a business*	0.89	0.85	0.78
5. I've got the firm intention to start a firm someday*	—	—	—
6. I'm going to start my own business within one year of graduation*	0.70	0.93	0.50

Table AVI.  
Entrepreneurial intentions

If you had the required time and resources, to what extent would you consider the following issues, when evaluating the entrepreneurial opportunity (1=not at all, 7=my main concern)

Items
1. Social impact (poverty reduction, employment, and increasing equality) that the venture would have
2. Environmental impact (e.g. use of natural resources, protecting biodiversity, and energy type) that the venture could have

Table AVII.  
Attitude towards sustainable entrepreneurship

	Shared variance among constructs											
	CR	AVE	SG	INT	ATS	PEF	PED	GSE	ALT	INTR	EXT	SEC
SG	0.83	0.56	0.75									
INT	0.94	0.75	0.06	0.87								
ATS	0.90	0.81	0.47*	-0.07	0.90							
PEF	0.80	0.57	-0.03	0.39*	-0.11	0.75						
PED	0.60	0.85	-0.01	0.60*	-0.09	0.51*	0.92					
GSE	0.89	0.57	0.02	0.16*	-0.07	0.37*	0.35*	0.75				
ALT	0.88	0.60	0.41*	0.01	0.58*	-0.05	0.06	0.09	0.77			
INTR	0.85	0.60	-0.02	0.18*	-0.03	0.30*	0.43*	0.46*	0.16*	0.76		
EXT	0.80	0.45	-0.04	0.05	-0.11	0.17*	0.23*	0.37*	0.13	0.33*	0.67	
SEC	0.85	0.66	-0.02	-0.21*	0.09	-0.15*	-0.18*	0.07	0.18*	0.09	0.27*	0.81

Note: \* $p < 0.05$

Table AVIII.  
Construct validity

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## Appendix C Questionnaire

### Basic Psychological Needs Satisfaction at Work Scale (BPNS-W)

*How do you feel about your work?*

The following statements concern your feelings about your job in the last year. Please indicate how true each of the following statements is for you, given your experience in this job. Please use the following scale in responding to the items.

1	2	3	4	5	6	7
Not at all true			Somewhat true			Very true

1. I feel like I can make a lot of inputs to deciding how my job gets done
2. I really like the people I work with
3. I do not feel very competent when I am at work
4. People at work tell me I am good at what I do
5. I feel pressured at work.
6. I get along with people at work.
7. I pretty much keep to myself when I am at work.
8. I am free to express my ideas and opinions on the job.
9. I consider the people I work with to be my friends.
10. I have been able to learn interesting new skills on my job.
11. When I am at work, I have to do what I am told.
12. Most days I feel a sense of accomplishment from working.
13. My feelings are taken into consideration at work.
14. On my job I do not get much of a chance to show how capable
15. People at work care about me
16. There are not many people at work that I am close to.
17. I feel like I can pretty much be myself at work.
18. The people I work with do not seem to like me much.
19. When I am working I often do not feel very capable.
20. There is not much opportunity for me to decide for myself how to go about my work.
21. People at work are pretty friendly towards me.

Scoring Information. Form three subscale scores by averaging item responses for each subscale after reverse scoring the items that were worded in the negative direction. Specifically, any item that has (R) after it in the code below should be reverse scored by subtracting the person's response from 8. The subscales are:

Autonomy: 1, 5(R), 8, 11(R), 13, 17, 20(R)

Competence: 3(R), 4, 10, 12, 14(R), 19(R)

Relatedness: 2, 6, 7(R), 9, 15, 16(R), 18(R), 21

## Work Extrinsic and Intrinsic Motivation Scale (WEIMS)

*Why do you do your work?*

Using the scale below, please indicate to what extent each of the following items corresponds with the reasons why you are presently involved in your work.

1	2	3	4	5	6	7
Does not correspond at all			Corresponds moderately		Corresponds exactly	

1. Because this is the type of work I chose to do to attain a certain lifestyle.
2. For the income it provides me.
3. I ask myself this question, I don't seem to be able to manage the important tasks related to this work.
4. Because I derive much pleasure from learning new things.
5. Because it has become a fundamental part of who I am.
6. Because I want to succeed at this job, if not I would be very ashamed of myself.
7. Because I chose this type of work to attain my career goals.
8. For the satisfaction I experience from taking on interesting challenges
9. Because it allows me to earn money.
10. Because it is part of the way in which I have chosen to live my life.
11. Because I want to be very good at this work, otherwise I would be very disappointed.
12. I don't know why, we are provided with unrealistic working conditions.
13. Because I want to be a "winner" in life.
14. Because it is the type of work I have chosen to attain certain important objectives.
15. For the satisfaction I experience when I am successful at doing difficult tasks.
16. Because this type of work provides me with security.
17. I don't know, too much is expected of us.
18. Because this job is a part of my life.

Note for scoring: Intrinsic motivation 4,8,15; integrated regulation 5,10,18; identified regulation 1,7,14; introjected regulation 6,11,13; external regulation 2,9,16; amotivation 3,12,17. Add the scores for each response to obtain the six subscale scores.

## Appendix D Supplementary statistical data

**Table 1.** Item-total statistics – Autonomy subscale

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
AUT_1	32.42	27.141	.351	.536
AUT_2R	33.95	25.529	.209	.587
AUT_3	32.54	24.116	.546	.470
AUT_4R	33.75	26.285	.131	.625
AUT_5	33.37	25.376	.294	.548
AUT_6	32.67	26.222	.353	.531
AUT_7R	32.35	24.707	.392	.513

**Table 2.** Item-total statistics – Competence subscale

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
COM_1R	29.09	17.700	.204	.517
COM_2	29.26	18.998	.288	.462
COM_3	28.95	19.683	.287	.466
COM_4	29.39	19.057	.385	.428
COM_5R	29.24	17.826	.239	.491
COM_6R	28.75	18.895	.272	.469

**Table 3.** Item-total statistics – Relatedness subscale

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
REL_1	37.98	48.472	.695	.780
REL_2	37.76	50.161	.562	.794
REL_3R	39.58	47.056	.357	.834
REL_4	38.92	44.584	.612	.783
REL_5	38.61	45.830	.624	.782
REL_6R	39.09	46.421	.463	.809
REL_7R	37.76	50.204	.504	.800
REL_8	37.92	48.115	.683	.780

**Table 4.** Total variance explained – BPNS-W

Component	Total	Initial Eigenvalues	
		% of Variance	Cumulative %
1	5.553	26.442	26.442
2	2.039	9.711	36.153
3	1.483	7.064	43.217
4	1.172	5.581	48.798
5	1.075	5.118	53.916
6	.989	4.710	58.626
7	.897	4.271	62.897
8	.875	4.169	67.066
9	.838	3.990	71.056
10	.784	3.736	74.792
11	.697	3.319	78.111
12	.644	3.069	81.179
13	.607	2.891	84.070
14	.582	2.769	86.839
15	.568	2.705	89.544
16	.470	2.238	91.783
17	.455	2.164	93.947
18	.362	1.725	95.672
19	.343	1.634	97.307
20	.299	1.424	98.730
21	.267	1.270	100.000

**Table 5.** Rotated Component Matrix – BPNS-W

**Rotated Component Matrix<sup>a</sup>**

	Component				
	1	2	3	4	5
REL_1	.731				
REL_8	.730	.316			
REL_4	.682				
REL_2	.651				
REL_7R	.649		.306		
REL_6R	.645				
REL_5	.599	.449			
REL_3R	.545				
COM_2		.710			
AUT_5	.307	.648			
AUT_3		.632			
COM_4		.621			
AUT_1		.602			
COM_3		.480			-.427
AUT_6		.391			
COM_6R			.743		
COM_1R			.523		
AUT_7R			.446	.434	
AUT_2R				.727	
COM_5R				.523	.360
AUT_4R					.856

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.<sup>a</sup>

a. Rotation converged in 9 iterations.

**Table 6.** Item-total statistics – Introjected regulation subscale

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
INTRO_1	11.71	6.523	.558	.571
INTRO_2	10.98	7.452	.635	.447
INTRO_3	10.60	11.020	.403	.737

**Table 7.** Item-total statistics – Extrinsic regulation subscale

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
EXT_1	10.20	6.300	.506	.413
EXT_2	9.58	7.662	.483	.491
EXT_3	11.35	5.534	.358	.685

**Table 8.** Item-total statistics – Amotivation subscale

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
AMO_1	3.86	5.615	.411	.597
AMO_2	4.22	6.387	.523	.470
AMO_3	3.87	5.368	.435	.564

**Table 9.** Total variance explained – WEIMS

Component	Total	Initial Eigenvalues	
		% of Variance	Cumulative %
1	6.358	35.323	35.323
2	1.889	10.493	45.816
3	1.377	7.648	53.464
4	1.074	5.969	59.433
5	1.001	5.562	64.995
6	.799	4.439	69.434
7	.704	3.911	73.345
8	.689	3.826	77.171
9	.666	3.700	80.871
10	.523	2.907	83.778
11	.521	2.896	86.674
12	.457	2.541	89.215
13	.430	2.387	91.602
14	.366	2.033	93.635
15	.330	1.836	95.471
16	.311	1.730	97.201
17	.280	1.553	98.754
18	.224	1.246	100.000



**Table 10.** Rotated Component Matrix – WEIMS

	Component				
	1	2	3	4	5
INTEG_3	.827				
INTEG_1	.749	.340			
IDEN_2	.749				
INTEG_2	.713				
IDEN_3	.587		.342		
IM_1		.789			
IM_3	.303	.726			
IM_2	.459	.662			
INTRO_3	.307	.523			.381
EXT_1			.850		
EXT_2			.746		
IDEN_1	.431		.585		
EXT_3	.340		.422		
AMO_2				.801	
AMO_3				.746	
AMO_1				.732	
INTRO_1					.857
INTRO_2					.820

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.<sup>a</sup>

a. Rotation converged in 6 iterations.