



An integrative model for understanding the sustainable entrepreneurs' behavioural intentions: an empirical study of the Italian context

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Abstract

Intention is a mental state that powerfully predicts and explains human thought and behaviour. Therefore, to support and encourage sustainable entrepreneurship, which is directly linked to achieving sustainable development goals, it is essential to bridge the gap in our knowledge of the factors that lie behind sustainable entrepreneurial intention. Consequently, employing data from Italy, the primary aim of this study is to provide insights into the factors that affect sustainable entrepreneurs' behavioural intentions. This study looks to extend existing research on how the subconscious goals, subjective motivations (SSMs) and personality traits of sustainable entrepreneurs influence their behavioural intentions towards sustainable business. For this purpose, a holistic map of the SSM of sustainable entrepreneurship was designed, and the mechanisms behind the relationships between personality traits and SSM and the predictive power of the personality traits on SSM were analysed. The findings revealed the importance of the joint and non-alternative use of SSM and personality traits to better understand the antecedents of sustainable entrepreneurship. Further, the findings revealed the most relevant cognitive factors and personality traits and the influential role of personality traits in some SSM factors. This study provides a theoretical and empirical contribution to the debate on intention towards sustainable entrepreneurship and offers useful reflections for policy-makers and entrepreneurship education.

Keywords Cognitive motivations · Subconscious and subjective motivations · Sustainable entrepreneurship · Personality traits · Sustainable entrepreneurial intentions · Italy

1 Introduction

Sustainable entrepreneurs have been described as the driving force of sustainable development (Lawal et al. 2016; Parrish 2010). In particular, sustainable entrepreneurs identify, develop and exploit opportunities to effect a socially, economically and environmentally sustainable society through their entrepreneurial behaviour (Belz and Binder 2015a; Cohen

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et al. 2008; Cohen and Winn 2007; Dean and McMullen 2007; Dyllick and Hockerts 2002; Hahn et al. 2010; Lawal et al. 2016; Majid and Koe 2012; Schaltegger and Wagner 2011; Thompson et al. 2011; Yitshaki and Kropp 2016).

In light of the fact that “entrepreneurship is mainly about people” (Alonso et al. 2016, p. 5), it is pivotal to investigate the individual factors that drive entrepreneurs to engage in sustainable business (Belz and Binder 2015b). Consistently, previous research on sustainable entrepreneurship focused on the motivation, personality traits and intention as antecedents of entrepreneurial behaviour (Kautonen et al. 2015).

An in-depth analysis of the motivations of sustainable entrepreneurs is crucial (Estay et al. 2013) since: (a) they could be “the spark that transforms a latent intention into real action and therefore the missing link between intentions and action” (Carsrud and Brännback 2011, p. 12), (b) “motivational differences influence the entrepreneurial process” (Shane et al. 2003, p. 260) and (c) they are driven by conscious and unconscious goals (Austin et al. 2006; Latham and Pinder 2005; Linnanen 2002; Locke 2000a; Locke and Latham 2002; Murray 1938; Pervin 2003; Prince-Gibson and Schwartz 1998; Schaltegger and Wagner 2011) that enable the classification of entrepreneurs (Thompson et al. 2011), thus differentiating between traditional and sustainable entrepreneurs. In particular, the unconscious goals are affected by the subjective knowledge—that is deeply embedded in personal beliefs, attitudes, values—and relate to all schemes, mental models and to the individual’s perceptions of reality and of the world in which he lives (Polanyi 1979; Popper 1972). For these reasons, the analysis of their motivations is crucial to explain, from a cognitive perspective, the antecedents of sustainable entrepreneurs’ intention.

Furthermore, entrepreneurship is a multidimensional process in which personality traits are considered pivotal for the existence and development of entrepreneurial intentions (Dinis et al. 2013; Espíritu-Olmos and Sastre-Castillo 2015; Leutner et al. 2014; Sušanj et al. 2015; Wang et al. 2016a) and are connected to entrepreneurial intentions in sustainable entrepreneurship (e.g. Gagnon 2012; Shepherd et al. 2009). Personality traits, which remain fairly stable over time (Cobb-Clark and Schurer 2011; Roccas et al. 2002), are suggested to be good predictors of behaviour in a specific situation (Kolb and Wagner 2015) and of the decision to become an entrepreneur (Wang et al. 2016a).

However, the research on entrepreneurial intention in sustainable entrepreneurship is still emerging (Muñoz and Dimov 2015; Shepherd and Patzelt 2011), and the study of sustainable business intentions is an incipient area of research in the literature on entrepreneurial intentions (Liñán and Fayolle 2015). To address this issue, although some previous studies have aimed to examine characteristics that affect behaviour geared towards sustainable business practices among entrepreneurs (Koe et al. 2014; Schaltegger and Wagner 2011), the psychological aspects of the sustainable entrepreneur, such as intention and motivation (Majid et al. 2017), as well as personality traits, have not been fully researched in the current literature. The current literature on sustainable entrepreneurship offers insufficient insight into how and what psychological factors trigger people’s intention to engage in a sustainable entrepreneurial activity (Easterly 2006; Lundstrom et al. 2013; Majid et al. 2017; Richomme-Huet and de Freyman 2014; Shepherd and Patzelt 2011). This gap in this field is caused by insufficient knowledge of both subconscious goals that give force to the motivation of the sustainable entrepreneur and the joint contribution of the latter with the personality traits of the sustainable entrepreneur.

This article contributes to the stream of research on sustainable entrepreneurship. In particular, this research aims to fill the gap in the current literature about the personal factors affecting sustainable entrepreneurship (antecedents). Specifically, this study has a two-fold objective. First, based on existing literature, an integrative theoretical framework of

the antecedents of sustainable entrepreneurial behaviour was developed. On the basis of the two primary psychological perspectives (entrepreneurs' personality traits and the influence of contextual factors that reflect on entrepreneurship) (Alonso et al. 2016; Robinson et al. 1991), we developed a map of sustainable entrepreneurial behaviour antecedents. This map highlights how the subconscious and the subjective motivations of sustainable entrepreneurs (SSMs) and their personality traits influence their behavioural intentions. By developing this map, this article contributes to the emerging field of sustainable entrepreneurship and offers useful considerations for practitioners and policy-makers.

Second, based on this framework, a quantitative study was conducted with a sample of 109 Italian sustainable entrepreneurs to identify the correlations and dependencies between sustainable cognitive antecedents and personality traits. Given the history and the Italian civil, social and political traditions that have created an orientation towards sustainable entrepreneurship, the analysis of Italian entrepreneurs is useful to the aim of this study.

The goal is to investigate the possible joint use of the two perspectives in the understanding of sustainable entrepreneurship antecedents and to ascertain whether personality traits positively influence the SSM.

The remainder of this paper is organised as follows: (a) literature review, (b) hypotheses development and research mode, (c) methodology, (d) results, (e) discussion and (f) conclusion.

2 Literature review

2.1 The sustainable entrepreneur's intentions

Sustainable entrepreneurship (Dean and McMullen 2007; Parrish 2010) is understood as part and parcel of entrepreneurship (Koe and Majid 2014) that aims to improve social and ecological well-being through entrepreneurial activities (Cohen and Winn 2007; Young and Tilley 2006). Sustainable entrepreneurs are focused on a "triple bottom line" (Cohen et al. 2008; Schaltegger and Wagner 2011; Thompson et al. 2011) and in accordance with Sardianou et al. (2015), are seen "as individuals that combine economic, environmental and social aspects into their business" (2015, p. 858).

Entrepreneurship and sustainable entrepreneurship are processes that begin with the recognition of opportunities (Kirzner 1997; Wang et al. 2013). Likewise, Majid and Koe (2012, p. 300) see sustainable entrepreneurship as "a process in which entrepreneurs exploit the opportunities in an innovative manner for economic gains, society equity, environmental quality and cultural preservation on an equal footing". This step has been the subject of much research and debate concerning the "way", the "when" and the "how" some—but not others—discover entrepreneurial opportunities (Donnellan et al. 2006). This issue has long been viewed as a black box (Adcroft et al. 2004; Corbett 2007; Dutta and Crossan 2005; Vaghely and Julien 2010; Wang et al. 2013), and it has been investigated by scholars focusing on antecedents and analysing the different factors that lead to entrepreneurial behaviour (Propstmeier 2011; Wang et al. 2013).

Psycho-sociology is particularly crucial for predicting behaviour since it informs about the process through which individual and contextual factors influence intention (Tounés et al. 2015). Parker (2004) defined intention as the individual's specific propensity to perform an action or a series of actions. Thus, the intention is "central to understanding the behaviours that individuals engage in" (Propstmeier 2011, p. 65).

The research on entrepreneurial intention was conducted on the basis of two primary psychological perspectives (Alonso et al. 2016). From the personality perspective, personality traits may influence individuals to exploit entrepreneurial opportunities that are discovered (and not sought) (De Carolis and Saparito 2006; Wang et al. 2013) and are considered to be determinants for both the start-up and following phases of entrepreneurship (Alonso et al. 2016; Schein 1983). Moreover, entrepreneurship is primarily concerned with people (Mortan et al. 2014), is “fundamentally personal” (Baum et al. 2007, p. 1), is a self-motivated behaviour and is generated by individual will, which is, in turn, subject to personality, much more so than to economic or social constraints.

From the perspective of the influence of the contextual factors that are reflected in entrepreneurship (Robinson et al. 1991) and according to a large body of entrepreneurship studies that focus on social psychological theories (Bird 1992; Gird and Bagraim 2008; Kautonen et al. 2013; Kolvereid 2006; Krueger 1993; Liñán and Chen 2009; van Gelderen et al. 2008), becoming an entrepreneur is an intentional process that involves a complex cognitive and decision-making process (Carr and Sequeira 2007; Carter et al. 1996; Krueger et al. 2000; Lafuente et al. 2007).

Both of the above perspectives aim to explain entrepreneurial business concepts and should be understood as complementary rather than alternative (Alonso et al. 2016).

Notwithstanding the interest in entrepreneurial intentions, the evidence of entrepreneurial intentions in different entrepreneurship contexts, such as sustainable entrepreneurship, is limited (Kuckertz and Wagner 2010a, b; Liñán and Fayolle 2015; Muñoz and Dimov 2015).

The need to investigate the intention in a sustainable entrepreneurial context arises from the differences between sustainable and conventional entrepreneurs. First, sustainable entrepreneurs have a broader view that results in a mentality that is different from that of traditional entrepreneurs. Second, they differ in terms of their focus on different types of values and beliefs (social, environmental and economic), which significantly affect the environmental considerations of sustainable entrepreneurs and induce people’s engagement in sustainable practices (Gagnon 2012; Schlange 2006a; M. Spence et al. 2011; Tilley 1999). Third, they have different motivations (Dean and McMullen 2007; Hockerts and Wüstenhagen 2010; Muñoz 2017; Shepherd and Patzelt 2011). Different goals emerge from the sustainable entrepreneurs’ values and motivation (Cohen and Winn 2007; Schlange 2006b), and it is from these that the diverse classification between sustainable and traditional entrepreneurs and their intentions derive, which, in turn, affect the kind of opportunities they recognise and the way in which they turn their values into action (i.e. sustainable entrepreneurial behaviour) (Elfving et al. 2009; Thompson et al. 2011).

The literature review that supported this study focused on four important areas, as follows: (a) the cognitive perspective of sustainable entrepreneur’s intentions, (b) personality perspectives of the sustainable entrepreneur’s intentions, (c) the sustainable entrepreneur’s motivations and (d) the sustainable entrepreneur’s goals. A visual representation of the literature review is depicted in Fig. 1.

2.2 Cognition perspective

Based on the theoretical cognition perspective (Allinson et al. 2000; Goodwin and Wofford 1990; Mitchell et al. 2002; Sánchez 2011; Yitshaki and Kropp 2016), several models have been used to explain and conceptualise entrepreneurial intention (Bird 1988; Douglas and Shepherd 2000; Shapero and Sokol 1982; Wmpgc and Gunatissa 2014), arguing that the

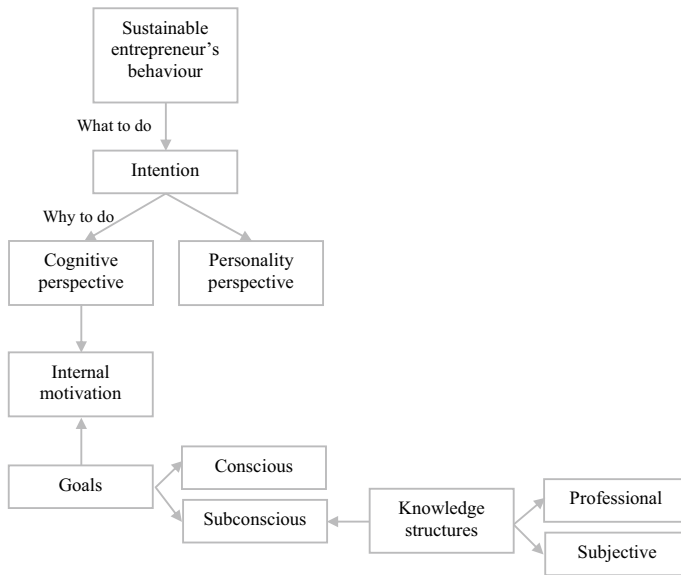


Fig. 1 The visual representation of the literature review

intention represents the cognitive state immediately prior to executing a behaviour (Fayolle and Gailly 2004; Krueger 2003). Entrepreneurship, and also sustainability entrepreneurship, is an intentional process and planned behaviour (Hockerts 2017; Krueger et al. 2000) that individuals plan to carry out after being subjected to stimuli and after careful thought.

Two theories have emerged from within this psychological approach: the entrepreneurial event theory (Shapero and Sokol 1982) and the theory of planned behaviour (TPB). The latter is the dominant model for conceptualising human intentions (Ajzen 1985, 1991; Ajzen and Madden 1986; Armitage and Conner 2001; Krueger et al. 2000; Liñán and Chen 2009; Lortie and Castogiovanni 2015; Moriano et al. 2012; van Gelderen et al. 2008). The TPB is based on three personal and social factors deemed to be the best predictors of behaviour (antecedents of entrepreneurial intentions) (Krueger et al. 2000): the personal attitude (perceived desirability), the subjective norm (perceived social norms) and the perceived behavioural control (perceived feasibility). The entrepreneurial intention represents the proclivity or the potential for starting a new business (Uddin and Bose 2012), which depends on the perceived desirability and feasibility of the venture opportunity (Fitzsimmons and Douglas 2011). Both of these relate to the entrepreneur's prior knowledge and sustainability orientation (Muñoz and Dimov 2015).

Some authors have recently stressed the need to go further into research on entrepreneurship (Carsrud and Brännback 2009). From this perspective, longitudinal studies have been carried out and new applications, discrepancies and specifications of the entrepreneurial intention framework have emerged (Armitage and Conner 2001; Carr and Sequeira 2007; Carsrud and Brännback 2009, 2011; Ernst 2011; Hardeman et al. 2002; Kautonen et al. 2013; Krueger 2007, 2009; Krueger and Carsrud 1993; Krueger and Day 2010; Liñán and Chen 2009; Nisbet and Gick 2008; Rutter and Quine 2002; Webb et al. 2010). The first attempt to develop a model inspired by TPB that can explain the social entrepreneurial intention formation process is that of Mair and Noboa (2006), according to which such process is understood to be a reliable predictor for the creation

of social entrepreneurial activity. The authors highlighted that, on the one hand, empathy and moral judgment predict perceived desirability while, on the other hand, social support predicts perceived feasibility. Still, in the context of social entrepreneurship, VanSandt et al. (2009), testing the social intention formation, suggest that three catalysts (effectual logic, enhanced legitimacy through appropriate reporting metrics and information technology) can be enablers for predicting social entrepreneurial intentions.

Further, Ernst's study (2011) focused on social entrepreneurial intention antecedents, such as role models, age, gender, education and experience, the effects of which are mediated by the variables of the theory of planned behaviour. However, the author did not find any link between empathy and social entrepreneurial intention. Forster and Grichnik (2013) adopted and refined the framework of Mair and Noboa (2006), replacing the perceived social support with perceived collective efficacy (i.e. the type of environment and guidance organisation provided to explore opportunities and to develop social ties). Hockerts (2015) developed and validated four antecedents of Mair and Noboa's framework (empathy, moral judgment, self-efficacy and social support) as being central to increasing both their explanatory and predictive value and the relevance of the domain of social entrepreneurship. Tiwari et al. (2017) tested cognitive styles (i.e. thinking styles) and self-efficacy as antecedents of social entrepreneurial intention among Indian students in the light of three mediator factors (the attitude towards becoming a social entrepreneur, subjective norms and perceived behavioural control). Their findings showed the need for both intuitive and analytical cognitive styles in shaping social entrepreneurial intentions and a strong relationship between self-efficacy and all three mediating factors. Recently, Wahid et al. (2018) have provided a literature review on social entrepreneurship intention on the basis of the eight intention predictors most commonly identified in the social entrepreneurship field, that is, personality traits, perceived social support, self-efficacy, moral obligation, attitude towards behaviour, subjective norm, perceived behaviour control and empathy.

Krueger (2009) has called for significant rethinking of research on entrepreneurial intentions theory, suggesting that the robustness of the results of current research may arise from a model that captures "a static snapshot of a significantly dynamic process" (n.d., p. 53) where, in reciprocal causation, the intent influences the attitudes, which, in turn, influences the intent. Furthermore, only a small number of successful studies have shown that "changes in the antecedents of intent actually led to change in intent" (*ibid.*) and most studies have failed to find or have found a weak influence of social norms on intent (e.g. Yurtkoru et al. 2014). Moreover, Krueger (2009) asks the question, "If entrepreneurs move forward with limited resources and must improvise with what they perceive as available, then what does that mean for how we model intent?" (n.d., p. 58). Despite these considerations, the entrepreneurial intention theory has been reinforced by some research avenues that have expanded and consolidated the usefulness and applicability of models of entrepreneurial intention (Fayolle et al. 2014). For example, Esfandiar et al. (2017) used an intention-based model to explain that individuals' intentions predict entrepreneurial behaviour. They showed that entrepreneurial intentions predict both entrepreneurial goal orientation and whether to engage in entrepreneurial ventures such as business start-ups. Kautonen et al. (2015) demonstrated the relevance and robustness of the TPB in predicting the intention to start up a business. Kuckertz and Wagner (2010a, b) and Urbig et al. (2012) analysed the relationship between entrepreneurial intentions and the level of social and environmental concerns.

Another crucial consideration within the cognitive perspective is that human decision-making depends only in part on mindful processing.¹ Due to significantly bounded rationality, individuals operate well below the level of mindfulness, requiring their mind to fill the gaps with deeply seated assumptions (Krueger et al. 2011). These assumptions (a) are “the critical architecture of how we structure our knowledge” (Krueger et al. 2011, p. 279), (b) include cognitive scripts, schemas and maps (Krueger 2007; Mitchell et al. 2007) and (c) affect the intentional process and determine why some and not others identify opportunities from real signals or other phenomena (Shane 2003; Shane and Venkataraman 2000).

In short, to understand how to further develop and stimulate the recognition of sustainable entrepreneurial opportunities it is necessary to apply an intentions-based approach (Krueger et al. 2011) since this can shed light on the cognitive processes at work in decision-making that—despite having so far been neglected by research (Zachary and Mishra 2011)—play a vital part in engaging sustainable entrepreneurship (Koe et al. 2014). Therefore, sustainable entrepreneurship begins with the recognition of sustainable opportunities and research needs to undertake in-depth investigations of the cognitive scripts,² schemas and maps (Krueger 2007; Krueger et al. 2011; Mitchell et al. 2009) that allow such recognition.

From these considerations, it emerges that the crucial element to be investigated is the motive that “is the frame of mind in which agents act—the desires and other passions that propel him” (Nardin 2006, p. 10). The motive is “the actual driving force behind the action” (Krieg 2012, p. 28) and refers to “why” an action was performed. In contrast, the intent is a conscious effort to do something and responds to the question of “what to do?”. This explains what a person wants to achieve and overlooks the question of why he wants to achieve it (Krieg 2012; Nardin 2006; Sheeba 2015). In other words, the intention is a person’s desire for something or to do something, whereas the motivations explain why a person has that desire.

2.3 Motivations and goals of sustainable entrepreneurs

Motivation is a crucial factor in directing an individual into an entrepreneurial life path (Tyszka et al. 2011). Ryan and Deci (2000) view motivation as the core of biological, cognitive and social regulation and state that motivation involves the energy, direction and persistence of activation, as well as intention. Motivation and cognition act within a continuum. The motivation draws strength from the fulfilment of needs and values to turn them into intentions, while cognition—through mental processes—generates the aims, goals and, finally, develops the strategies needed to approach these goals. Motivations are

¹ Cognition is an emergent and crucial theoretical perspective (Goodwin and Wofford 1990; Sánchez 2011) that helps us to recognise and react to opportunities and problems in the environment. It is defined as “all processes by which sensory input is transformed, reduced, elaborated, stored, recovered, and used” (Neisser 1967, p. 4). Mitchel et al. (2002) consider that “entrepreneurial cognitions are the knowledge structures that people use to make assessments, judgments, or decisions involving opportunity evaluation, venture creation, and growth” (2002, p. 97). Furthermore, through cognition, people develop hypotheses about themselves and their identity, thereby influencing their choice of goals and strategies (Latham 2007).

² A script is a cognitive structure that is used by entrepreneurs to act and to make decisions. It is composed of highly developed and organised knowledge structures that are employed to simplify mental models in a bid to link previously unconnected information, thereby making assessments and decisions regarding the appraisal of opportunities and creating and cultivating an enterprise (Krueger 2003; Mitchell et al. 2000; Sánchez et al. 2011).

connected to both intentions and behaviour (Carsrud and Brännback 2011) since the internal stimulus that drives a person—and acts as the motivation to search for a way of reducing the internal state of tension—could lead to a higher entrepreneurial intention (Fayolle et al. 2014; Festinger 1957; Freud 1924; Murray 1938).

Many authors, including Schaltegger (2002), have investigated the drivers that motivate entrepreneurs into undertaking a sustainable venture. Within this context, Walley and Taylor (2002) have developed a theory that allows different levels of commitment to sustainability issues to be highlighted and that differentiates entrepreneurial motivations according to distinct context variables (Schlange 2006a). The authors identify two dimensions, the external and the internal influences of entrepreneurial behaviour, whose intersection outlines four ideal types of “green entrepreneurs”. Schlange (2006a) reviewed this approach and found that (a) the primary drivers for sustainable entrepreneurs’ motivation are structured along social and environmental dimensions and (b) “the external dimension are too general and do not appear to be valid for sustainable entrepreneurs exclusively [and do not] sufficiently differentiate between sustainable and traditional entrepreneurship” (2006a, p. 3). According to Antonioli et al. (2016), extrinsic motivation (i.e. the motivation that comes from external sources such as monetary rewards) of a higher order is represented by monetary payoffs, that is, the core motivation of the traditional entrepreneur (desire to make money) (Linnanen 2002). For these reasons, “sustainability would mainly be explained by internal factors, i.e. by the entrepreneurial mindset” (Schlange 2006a, p. 4).

In the same vein, addressing the research call to investigate the role played by motivations in entrepreneurial behaviours (Carsrud et al. 2009; Carsrud and Brännback 2011; Elfving et al. 2017), scholars have shown that internal motivations (Kuckertz and Wagner 2010a, b; Masurel 2007; Walley and Taylor 2002) play a pivotal role in sustainability entrepreneurship. Indeed, they (a) can better explain the differences between sustainable and traditional entrepreneurship (Schlange 2006a), (b) are pervasive and act as energisers for behaviour, and can explain why some individual are “motivated for some activities and not others, and not everyone is intrinsically motivated for any particular task” (Ryan and Deci 2000, p. 3) and (c) draw strength from goals that “activate people in ways that often serve as the important link between intention and action” (Carsrud and Brännback 2011, p. 12).

From the above considerations, to analyse the internal motivation of sustainable entrepreneurs it is necessary to investigate their goals (Baum 2013) inasmuch, on the one hand, they offer a cognitive explanation for internal motivation and, on the other hand, ascertaining the goals is the most common method used to identify the type of entrepreneur (Thompson et al. 2011) (i.e. sustainable, social, environmental, traditional).

The goal represents what a person wants to achieve, an “internal representations of desired states” (Austin and Vancouver 1996, p. 338) that translates personal values and needs within a particular situation (Locke 2000a; Prince-Gibson and Schwartz 1998) (including sustainability). The goal is “the mechanism by which values lead to action” (Latham and Pinder 2005, p. 491), thus playing a role in predicting human behaviour (Murray 1938; Pervin 2003). The individual has the desire to perform a specific task because its result (i.e. the achievement of a goal) is in accordance with the person’s belief system or fulfils a wish and thus, he attaches importance to it. According to the theory of goal setting (Baum et al. 2001; Baum and Locke 2004; Carsrud et al. 2009; Latham 2012; Latham and Locke 1991; Locke et al. 1988; Locke and Latham 2002; Shane et al. 2003), goals (a) lead motivations not to be a simple collection of unrealised desires, (b) are the mechanisms that operationalise motivation by using them to focus attention, exert effort and engage in strategy development and (c) have an immediate regulatory effect on human behaviour since they determine the outcome to be achieved (content), as well as the energy and resources

needed to accomplish them (intensity) and therefore, the intention to act (Borgogni and Dello Russo 2008; Locke and Latham 1990, 2002).

The entrepreneurs' goals help to differentiate between traditional and sustainable entrepreneurs. Given that most entrepreneurs have more than one objective concentrating on the main objective can better guide its placement in one of the categories. Traditional entrepreneurs tend to have an economic goal and efficiency and profits are believed to be the main goal (Knight 1921), whereas sustainable entrepreneurs focus on a "triple bottom line" and their primary objective is the creation of "sustainable development through entrepreneurial corporate activities" (Schaltegger and Wagner 2011, p. 224). This goal provides strength for the core motivation, i.e. to "contribute to solving societal and environmental problems through the realisation of a successful business" (Schaltegger and Wagner 2011, p. 224). This difference in goals between traditional and sustainable entrepreneurs leads to potentially different entrepreneurial intention. This is because "entrepreneurial intentions are first and foremost a result of superordinate [i.e. main] goal [and the latter] affects both perceptions of entrepreneurial desirability and perception of entrepreneurial feasibility" (Elfving et al. 2009, pp. 29–30), which, in turn, has a strong impact on entrepreneurial intention, new venture creations and individual engagement in civic activities (Diouchon et al. 2002; Fitzsimmons and Douglas 2011; Guerrero et al. 2008; Koe et al. 2014; Mair and Noboa 2006; Summers 2000; Weber et al. 2004). Moreover, the main goal affects "what kinds of opportunities the entrepreneurs recognize" (Elfving et al. 2009, p. 30) and transposes their value into action.

In sum, the main goal (a) affects both peoples' level of interest and attraction towards practising sustainability (perceived desirability) (Koe et al. 2015, p. 268), (b) affects peoples' level of belief in their ability to succeed in specific situations or to accomplish a task³ (i.e. perceived feasibility (Bandura 1982, 1991)), which, in turn, plays a pivotal role in how they address tasks and challenges in influencing their entrepreneurial intention and in predicting entrepreneurial behaviour (Chen et al. 1998; Koe et al. 2014), (c) translates personal values and needs within the situation (Locke 2000a; Prince-Gibson and Schwartz 1998) and (d) leads motivation. For these reasons, the influence of the main goal (which in the context of sustainable entrepreneurship concerns the creation of sustainable development) should not be neglected in understanding people's intention towards sustainable entrepreneurship and in predicting sustainable entrepreneurship behaviour.

From the theoretical perspective of cognition, a further level of the analysis of internal entrepreneurial motivation is the distinction between conscious and subconscious goals (Locke and Latham 2002). This distinction is necessary because (as stated above) the entrepreneurial behaviour is not always consciously controlled, and the subconscious goal is the real driving forces behind many people's behaviours, particularly when information processing resources are scarce (Bargh et al. 2001; Latham et al. 2010).

The goals that a person consciously desires to achieve represent the purpose of the action and influence the action itself (Locke and Latham 1990, 2002, 2006). By this, we mean that conscious sustainability goals arise from the desire to change the world through

³ According to Elfving (2008), the superordinate goals affect the entrepreneur's confidence in his abilities to perform the tasks (i.e. perception of entrepreneurial feasibility in the Shapero and Sokol (1982) model, and self-efficacy in the Theory of Planned Behavior model of Ajzen (1985)). This assumption deriving from Elfving's (2008) empirical observations can be explained by the fact that the goals affect persistence since individuals continue to strive until when they have achieved the goal, and the higher the goal, the greater the persistence of the entrepreneur Elfving. The persistence through the many obstacles in doing business is driven by the self-efficacy (Shane et al. 2003).

the creation of sustainable entrepreneurial corporate activities (Linnanen 2002; Schaltegger and Wagner 2011), whereas the subconscious goals refer to the particular combination of needs, values, experiences, practices, mental scripts or different conceptions that the individuals have of themselves. These can activate internal goals (subconscious) that guide subsequent conscious goals and behaviours. This process can occur without the person realising the leading role of cognition—through mental processes—in attaining the subconscious goal (Locke and Latham 2002).

Moreover, the analysis of subconscious goals requires a further level of examination. Since the subconscious goals of entrepreneurs are driven by cognition and because entrepreneurial cognitions are the interplay between explicit and implicit (tacit) knowledge structures (Clarke 2005), these two constructs are crucial to an investigation of the antecedents of the sustainable entrepreneurs' intentions. The knowledge structures have high importance in the entrepreneurial context since (a) they are the key to entrepreneurial opportunity recognition, which is the initial step in the entrepreneurship process (Baron 2004; Renko et al. 2012), (b) are the basis "that people use to make assessments, judgments, or decisions involving opportunity evaluation, venture creation, and growth" (Mitchell et al. 2002, p. 97) and (c) their absence (together with belief) results in motivation leading to random or unproductive action (Locke 2000b).

Explicit knowledge is the tip of the iceberg of the entire body of possible knowledge (Polanyi 1979) and is structured according to rules and procedures. Explicit knowledge refers to relational and social dimensions, both objective and theoretical, and can easily be transmitted as it takes the form of language. Tacit knowledge is deeply embedded in personal beliefs, insights, attitudes, values, experiences and the capabilities inherent in the person's mind and subdivides into professional and subjective (relative/cognitive) knowledge (Polanyi 1979; Popper 1972). Professional knowledge represents a technique that includes a set of skills, know-how and expertise that is not formalised and is complex to understand and describe. In contrast, subjective knowledge (a) refers to all schemes, mental models, beliefs and perceptions about reality and the world in which the individual lives, (b) is seen as "justified true beliefs" and refers to the individual's perception and representation of reality (what is) and their beliefs and vision of the future (what will be) and (c) in addition to being the determinant of whether the opportunity is discovered, it also conditions the next development in the entrepreneurial venture (Alvarez and Busenitz 2001; Buenstorf 2007).

From these considerations, to investigate the intentions of sustainable entrepreneurs from the cognitive perspective, we need to work backwards, analysing sustainable entrepreneurs' internal motivations that draw strength from goals and, in particular, from subconscious goals. The latter, being a specific combination of needs, values, experiences, practices, mental scripts or different conceptions that individuals have of themselves, is driven by cognition, which plays a leading role in subjective knowledge, that is, the determinant of opportunity discovery. Since both entrepreneurship and sustainable entrepreneurship are a process of opportunity discovery, we decided to focus on sustainable subjective knowledge as a key element to understand the antecedents of sustainable entrepreneurship from the cognitive perspective.

As has recently been emphasised by scholars of organisation and management theory, "theory borrowing" from other disciplines may not be done blindly (Oswick et al. 2011). Because of this, our understanding of sustainable subjective knowledge is grounded in the field of management and psychology but then adapted to the specifics of sustainability entrepreneurship. Specifically, we use the TPB (Ajzen 1991) and the subsequent models it has inspired (i.e. Hockerts 2017; Mair and Noboa 2006) to adapt their antecedents and

provide a new framework of sustainable entrepreneurial intention formation. Thus, within the category of sustainable subjective knowledge, we include the four antecedents of the TPB (sustainable perceived desirability, self-efficacy, behavioural control and subjective norms) since they are crucial determinants of new business creation (Koellinger et al. 2007). In addition to these constructs, we add risk-taking and the attitude towards sustainability. Because it differs between conventional and sustainable entrepreneurs (Hoogendoorn et al. 2017), the first of these is associated with the entrepreneur's motivation at venture start-up (Block et al. 2015). The second is a cognitive input that plays a crucial role in the exercise of the entrepreneurial activity of sustainability, predicting its propensity (Koe et al. 2014; Kuckertz and Wagner 2010a, b; Schick et al. 2016; Tonglet et al. 2004).

2.3.1 "Sustainable" perceived desirability

Perceived desirability is the expression of the level of attractiveness that a person perceives about entrepreneurial behaviour (Liñán et al. 2005; Shapero and Sokol 1982). This has a strong impact on entrepreneurial intention (Fitzsimmons and Douglas 2011; Guerrero et al. 2008; Summers 2000) and is an influential factor for new venture creations (Diochon et al. 2002). In this context, perceived desirability "refers to the level to which a person perceives that practising sustainability in business is interesting and attractive" (Koe et al. 2015, p. 268). Vuorio et al. (2017) found that sustainable perceived desirability improved sustainability-oriented entrepreneurial intentions. Therefore, in accordance with Koe et al. (2015a, b), to understand people's propensity for sustainable entrepreneurship, it is necessary to investigate the influence exerted on it by sustainable perceived desirability.

2.3.2 "Sustainable" perceived behavioural control

Perceived behavioural control is a construct used to "attempt to deal with situations in which people may lack complete volitional control over the behaviour of interest" (Ajzen 2002, p. 666). This antecedent can be used as an additional direct predictor of behaviour since it reflects the personal perception of one's ability to perform and control behaviour (Ajzen 2002; Hagger and Chatzisarantis 2005). Perceived behavioural control is superordinate with respect to two other antecedents (Armitage and Conner 1999a, 1999b; Hagger and Chatzisarantis 2005; Manstead and van Eekelen 1998; McCaul et al. 1993; Norman and Hoyle 2004): perceived self-efficacy and perceived controllability.

Perceived self-efficacy (i.e. perceived feasibility in the entrepreneurial event model of Shapero and Sokol (1982) (W. Wang et al. 2011)) exerts a significant influence on entrepreneurial intention and is a predictor of entrepreneurial behaviour, individual engagement in civic activities or whistleblowing and new venture creations (Chen et al. 1998; Diochon et al. 2002; Koe et al. 2014; MacNab and Worthley 2008; Mair and Noboa 2006; Weber et al. 2004). Perceived self-efficacy concerns the individuals' beliefs about their own capabilities "to exercise control over their own level of functioning and over events that affect their lives" (Bandura 1991, p. 257) and "to organize and execute the courses of action required to produce given levels of attainments" (Bandura 1998, p. 624). Controllability indicates the degree to which a person has access to the means to exert control over the target behaviour. Cheung and Chand (2000) conducted a meta-analysis showing that while "self-efficacy measures accounted for additional variance in intentions as well as behaviours, controllability items predicted intentions only when combined with self-efficacy items" (Ajzen 2002, p. 675).

This paper defines “sustainable self-efficacy” as the measure of an individual’s belief in his capacity to generate a significant social and environmental impact combined with the pursuit of profit and “sustainable perceived controllability” as the perception of having sufficient control over the resources needed to cope successfully with the challenges. This paper considers “sustainable self-efficacy” and “sustainable behavioural control” to be the antecedents of sustainable entrepreneurship intention.

2.3.3 Subjective norm

Subjective norms, delineated by Ajzen (1991) in the TPB, refer to the individual’s perceived normative beliefs about whether most people disapprove or approve of a specific behaviour (Cialdini et al. 1990; Forster and Grichnik 2013). The subjective norms are controlled by the individual’s internal psychological mechanisms as “the perceived social pressure to perform or not to perform the behaviour” (Ajzen 1991, p. 188), and these can strengthen or weaken intention (Schlaegel and Koenig 2014). In the framework of Mair and Noboa (2006), the perceived social norms are measured according to moral obligation (Ajzen 1991, 2002). Hockerts (2015) criticised this choice, claiming that moral obligation “describes the extent to which a person feels a sense of responsibility to act in line with the social norms of [their] societal peers when faced with an ethical challenge” (2015, p. 265). Despite perceived moral beliefs being identified as important determinants of intention and behaviour (Forster and Grichnik 2013; Kaiser 2006; Ravis et al. 2009) in the context of social entrepreneurship (Bornstein 1996; Hemingway 2005; Nga and Shamuganathan 2010; Yiu et al. 2014), the debate regarding the influence of normative social behaviour remains ongoing (Hechter and Borland 2001). The current findings are somewhat contradictory in that some studies have found that perceived social norms did not influence entrepreneurial intentions (Ernst 2011; Hockerts 2017; Krueger et al. 2000) or that they had a limited relationship with intentions (Walker et al. 2013).

Moral obligation appears to be an external dimension that depends on the degree to which society establishes a moral stance (social norm) as being correct, that is, a specific response to an ethical situation (Haines et al. 2008). A sense of individual moral responsibility generates a response to an ethical situation only after the evaluation of its adherence to social norms. Furthermore, the measurement of the extent of moral obligation requires the adoption of a societal level of analysis in order to avoid confusion with self-efficacy (Hockerts 2015). However, in so doing, the analysis risks becoming abstract and makes no allowance for the “beliefs” (sustainable subjective implicit knowledge) that stimulate the subconscious towards sustainable entrepreneurial behaviour.⁴

Due to the ambiguity of results regarding the analysis of subjective norms, as well as previous contradictory findings, the subjective norm will not be analysed in our empirical research. This interesting avenue of research will be postponed for a future study.

⁴ For example, a person can say that it is right and proper that the government encourages a business to be conducted in a sustainable manner—thereby satisfying their own need to be accepted through behaviours that are in line with social norms—when, in reality, the business owner is unwilling to implement sustainable entrepreneurial behaviours if this results in a decrease in profits due to behaviours aimed at protecting the environment and supporting society.

2.3.4 Risk-taking

The literature on entrepreneurship has long focused on the theme of risk-taking (Busenitz 1999; Wang and Poutziouris 2010), albeit sometimes with uncertain results (Frese et al. 2000). According to Rohrmann (1998), risk-taking is a general orientation towards taking or avoiding risks when people have to choose what to do in situations with uncertain outcomes. People differ considerably in their attitude towards risks, ranging from cautiousness to risk-seeking (2005), thus differentiating the entrepreneur from the manager and the employee (Drucker 2014; Hvide and Panos 2014; Stewart and Roth 2001; Stewart and Roth 2007). Individuals characterised by risk-taking, low fear of failure and by not being surprised when they achieve success, also tend to perceive opportunities in a professionally distant context and to view a new venture as an opportunity (Baron 2006; Foo 2011; Li 2011).

Sitkin and Pablo (1992) assume that risk perception and risk propensity—outlined as a confluence of dispositional tendencies, cognitive inputs and experience—are two key inputs in risk-taking.

Risk perception concerns the subjective level of risk. According to Hoogendoorn et al. (2017), the entrepreneur's perception of different types of risk affects his motivation. In examining the issue of risk for sustainable entrepreneurs from a broad perspective, the authors found differences between traditional and sustainable entrepreneurs. In particular, while they did not observe significant differences between conventional and sustainable entrepreneurs in terms of the perceived financial risk (possibility of loss of income and bankruptcy), they did find that the non-financial risk (personal reputation and personal failure) of sustainable entrepreneurs is higher than that of conventional entrepreneurs. Risk propensity is an attitude towards taking risks in a condition of low probability of success but with high rewards, although the latter will only be achieved after a long period (Abad et al. 2011; Vermeulen and Curseurseu 2010). Risk propensity is a significant determinant of a person's ability to exercise entrepreneurial activity since entrepreneurs have to work in situations with a high degree of financial, management and personal risk. Sustainability entrepreneurship requires the effective management of financial, social and environmental risks, which derive from activities that have a long-term scope as well as a return on investments that may take some time (İyigün 2015). Nicholson et al. (2002) identified three facets of risk propensity that make it possible to investigate risk not only from an economic perspective but also according to (a) physical status—threats to self or physical well-being, (b) lifestyle—social and recreational risk and (c) livelihood—career and financial risk. Given that both risk propensity and risk perceptions have a crucial impact on new business creation (Koellinger et al. 2007), this paper aims to investigate them in the context of sustainable entrepreneurship from a broader perspective that includes both financial and non-financial risks.

2.3.5 Attitude towards sustainability

The sustainable development literature indicates sustainability orientation as a factor affecting sustainable entrepreneurial behaviour and as an antecedent of sustainable entrepreneurial intention (Dean and McMullen 2007; Gibbs 2009; Kuckertz and Wagner 2010a, b; Parrish 2010). Sustainability orientation comprises the principles of economic, ecological and social-ethical sustainability (Walley and Taylor 2002), the balance of which

requires specific orientation for guiding the venture design process. According to Kuckertz and Wagner (2010a, b), a sustainability orientation depends on attitudes and convictions concerning environmental protection and social responsibility and is correlated with the intention to start a sustainability-oriented new business. In a study of environmental practices, Tonglet et al. (2004) highlight attitude as the primary predictor of pro-environment intentions and, therefore, as an essential determinant for exercising sustainability practices within a business context (Schick et al. 2016). In this regard, a sustainability attitude predicts the propensity for sustainable entrepreneurship (Koe et al. 2014). For this reason, this construct is included in our framework of the cognitive antecedents of sustainable entrepreneurship.

2.4 Personality traits

Several authors that have investigated entrepreneurial behaviour have described entrepreneurs as somewhat unique where “this uniqueness [is] rooted in certain personality traits” (Elfving 2008, p. 53), hence focusing their research on the personality traits of entrepreneurs (Espíritu-Olmos and Sastre-Castillo 2015; Gartner 1989; Leutner et al. 2014; McClelland 1961; Wang et al. 2016a). İrengün and Arıkoğça (2015) defined the personality “as sui generis reflection of factors affecting the emotions, thoughts, and behaviours of an individual. Personality is under perpetual influence of inner and outer factors and consists of physical, intellectual, spiritual, generic and learned capabilities, instincts, emotions, desires, habits, way of thinking and any kind of behaviour such as perception and attention” (2015, p. 1187). Traits are mental structures that define the personality and are inferred from the observation of behaviour. Character traits represent all aspects of behaviour and attitudes (both good and bad) that make up a person. Traits are unique if they occur in only one person or common if they are shared within a culture and appear in the behaviour of many persons, allowing both the sharing of values and beliefs and enabling comparisons between people. Personality traits enable good predictions of the behaviour of a person in a specific situation (Kolb and Wagner 2015) since they remain fairly stable over time (Cobb-Clark and Schurer 2011; Roccas et al. 2002).

On this basis, scholars have highlighted that personality traits (a) have an impact on the development of entrepreneurial intentions (Jakopec et al. 2013; Leutner et al. 2014; Sušanĵ et al. 2015), (b) are more reliable influencers of the decision to become an entrepreneur (Wang et al. 2016a, b) and (c) can be useful for understanding the elements necessary for the creation of new businesses (Altınay et al. 2012). For example, Brandstätter (2011) conducted a meta-analytical study that found a strong association between personality traits and entrepreneurship, particularly in terms of two dependent variables: business creation and business performance. These findings provide evidence of the influence of personality traits on business success, as shown by Leutner et al. (2014).

Since the 1980 s, the five-factor model (FFM) of personality (or the “Big Five” dimensions of personality) has been the predominant reference system and is a widely accepted model of personality traits (Ariani 2013; Cohen et al. 2008; Costa and McCrae 1992; Digman 1990; Goldberg 1990; John et al. 2008a, b; Wang et al. 2016a). A large number of entrepreneur-personality studies have been developed based on this model (Brandstätter 2011; Collins et al. 2004; Lans et al. 2010; Zhao et al. 2010). The Big Five framework is a hierarchical model that represents personality at the broadest level of abstraction and allows for the classification of human personality differences according to five broad,

empirically derived domains (John et al. 2008a, b): openness, conscientiousness, extraversion, agreeableness and neuroticism.

Extraversion includes characteristics such as being assertive, energetic, dominant, active, talkative, gregarious, enthusiastic, ambitious, optimistic, sociable, enjoying interaction with other people and large groups, seeking out excitement and stimulation and lively activities. In contrast, introverts tend to appear reserved, quiet, low-key, deliberate, unfriendly and less involved in the social world (Ariani 2013; Costa and McCrae 1992; Matthews et al. 2009; Rothmann and Coetzer 2003; Zhao and Seibert 2006). Several studies have shown that entrepreneurs with entrepreneurial intentions have a high degree of extraversion (Brandstätter 2011; Liang et al. 2015; Zhao et al. 2010).

Neuroticism is a tendency towards emotional states such as anxiety, depression, sadness, fear, moodiness, worry, hostility, envy, frustration, jealousy, irritability, vulnerability, loneliness, impulsivity and applying poor coping strategies in stressful situations (Major et al. 2006; Rothmann and Coetzer 2003; Thompson 2008). In contrast, people who have emotional stability (those who exhibit low levels of neuroticism) are self-confident, calm, relaxed and able to face stressful situations without becoming upset (Zhao and Seibert 2006). Lower levels of neuroticism are associated with a high level of entrepreneurial intention (Brandstätter 2011; Liang et al. 2015; Zhao et al. 2010).

Agreeableness includes attributes such as trust, kindness, altruism, being compliant, warm, caring, prone to having positive interpersonal relationships, affection, cooperation, prosocial behaviours and helpful nature. Agreeable people are sometimes seen as naive or submissive (Ariani 2013; Ferguson et al. 2011; Toegel and Barsoux 2012; Wang et al. 2016a; Zhao and Seibert 2006). Low levels of agreeableness are found among competitive or challenging people who are manipulative or sceptical of other people's intentions and who are self-centred, ruthless and egocentric; such individuals can be viewed as argumentative or untrustworthy (Rothmann and Coetzer 2003; Toegel and Barsoux 2012). Agreeableness positively predicts entrepreneurial intentions and is positively related to the likelihood of being a social and sustainable entrepreneur (İrengün and Arikboğa 2015; Nga and Shamuganathan 2010; Wang et al. 2016a).

The conscientiousness dimension includes high levels of thoughtfulness, a significant degree of organisation, persistence, self-control, responsibility, ambition, reliability and hard work, as well as the active process of planning and performing tasks with good impulse control and goal-directed behaviours (Barrick et al. 1993; Zhao and Seibert 2006). In contrast, a low degree of conscientiousness refers to people who are not necessarily devoid of moral principles but who apply them with less rigour (Rothmann and Coetzer 2003). According to previous studies, entrepreneurs are highly motivated to achieve goals, which, in turn, indicates high levels of conscientiousness (Collins et al. 2004; Stewart and Roth 2004).

Openness to experience (sometimes referred to as "intellect") characterises people who have imagination and insight, a preference for a variety of experiences and novelties, aesthetic sensitivity, intellectual curiosity, independent judgment, non-traditional and unusual ideas and who are creative, can successfully adapt to change and can be perceived as unpredictable and unfocused (Ariani 2013; Rothmann and Coetzer 2003; Wang et al. 2016a; Yap et al. 2012). In contrast, individuals with low openness are pragmatic and data-driven, have a narrow range of interests, behave conventionally, and non-analytically (Rothmann and Coetzer 2003; Zhao and Seibert 2006) and can be perceived as dogmatic and closed-minded.

Among the different shorter Big Five measures, the Mini-IPIP has greater psychometric properties than the other short FFM measures and is useful in critical assessment situations

(Cooper et al. 2010, p. 688; Donnellan et al. 2006). This tool comprises a 20-item short form of the 50-item IPIP-FFM, and it has acceptable reliability and a clearly interpretable factor structure (Goldberg 1999). Furthermore, it can be used when the time is limited, in cases where longer measures are simply not feasible or even when “long questionnaires may increase the likelihood that participants will decide not to complete the study” (Donnellan et al. 2006).

3 Hypotheses development and research mode

The purpose of this article is to develop a deeper conceptual understanding of the factors that influence entrepreneurial sustainability intention. To this end, we used an integrative model based on both the cognitive psychological causes of an action in a sustainable business environment (i.e. the sustainable motivation that is the actual driving force behind the sustainable action) and the personality traits of a sustainable entrepreneur.

From the perspective of the cognitive psychological causes, previous research has shown that the specific motivational structure could make a difference to the person’s capability to perceive opportunities and to create a new business (Carsrud and Brännback 2011; Vesalainen and Pihkala 1999). Furthermore, a positive link has been found between the analysed SSM. In particular, according to Shook and Bratianu (2010), the personal attitude (which this framework refers to as the attitude towards sustainable venture creation and belief about becoming a sustainable entrepreneur) depends on individual’s belief about the results. This belief is linked to the individual’s perception of the ease or difficulty, defined in this context as the perceived sustainable behavioural control, which includes both perceived efficacy and controllability. These two cognitive constructs play a fundamental role in sustainable entrepreneurship since (a) more people believe in their own ability to control the environment in matters that are of importance to them and in which they are more motivated to exercise their self-efficacy, which, in turn, enhances the likelihood of success and (b) a strong belief in controllability promotes a positive effect on self-efficacy beliefs (Carsrud and Brännback 2011; Vesalainen and Pihkala 1999). Moreover, Koe et al. (2015a, b) found a positive correlation between sustainable attitude, perceived feasibility and perceived desirability, while Zhao et al. (2005) found that risk propensity positively relates to entrepreneurial self-efficacy. Based on these findings, it is possible to assume that all of the SSM included in the model act together and in the same direction to give strength to the subjective goals.

Hypothesis 1 All SSMs (sustainable perceived desirability, perceived self-efficacy, perceived controllability, attitude and risk propensity) are positively correlated with each other.

Previous studies of the five personality traits have shown that they are good predictors of entrepreneurial behaviour and contribute to the ability to sense and act on an opportunity. This can suggest the reason why people become sustainable entrepreneurs (Llewellyn and Wilson 2003; Quast 2016; Rauch and Frese 2007). Individuals with entrepreneurial intention score high on extraversion, openness, conscientiousness and emotional stability and comparatively lower on agreeableness (Brandstätter 2011; Chao-Tung et al. 2015; Zhao et al. 2010). However, agreeableness (defined as being altruistic, cooperative, caring, gentle, friendly, sympathetic towards and eager to help other people

and a preference for positive interpersonal relationships) is positively related to the possibility of being a social and sustainable entrepreneur (İrengün and Arıkboğa 2015; Nga and Shamuganathan 2010; Wang et al. 2016a).

Previous studies, even in non-entrepreneurial contexts (cfr. Ali 2019; Oz 2015), have analysed the role of personality traits, noting a correlation between them. Without going into the causal relation among five personality traits, and based on these studies, this paper assumes that all five personality traits act in unison and the same direction and strengthen each other in influencing the sustainable entrepreneur.

Hypothesis 2 All personality traits (extraversion, agreeableness, conscientiousness, emotional stability and assessing openness) are positively correlated with each other.

As noted previously, the entrepreneurial intention has been analysed by different schools of thought: on the one hand, by those who study the personality traits identifying them as the most influential element in the decision to become an entrepreneur; on the other, those who explain and conceptualise the entrepreneurial intention through the theoretical cognition perspective. Alonso et al. (2016) claimed it is necessary to consider both perspectives as complementary in the explanation of the entrepreneurial business concepts. In effect, whether both perspectives have shown the influence of their key elements on the entrepreneur's intention—as well as the sustainable entrepreneur's intention—they must operate simultaneously. In accordance with this approach, the assumption is that (a) sustainable entrepreneurship behaviour derives from sustainable entrepreneurship intention, which, in turn, (b) derives from both sustainable motivation (resulting from the unconscious and conscious goals that differentiate sustainable and traditional entrepreneurs and, ultimately, from the SSM) and personality traits.

These links are represented in Fig. 2, which shows our integrative model of sustainable entrepreneurial antecedents.

Through this model, this paper aims to contribute to the literature on sustainable entrepreneurship in two ways. First, it shows how sustainable motivations and personality traits influence entrepreneurs' sustainable behavioural intentions, and second, it endorses the joint use of the two constructs to explain the process that generates the intention of sustainable entrepreneurship behaviour.

Hypothesis 3 All SSMs are positively correlated with personality traits.

The integration of the two perspectives stems from the acknowledgement that sustainable entrepreneurship is a self-motivated behaviour generated by individual willpower. The latter is subject to personality traits that induce emotional, cognitive and behavioural patterns, revealing the psychological characteristics of a person that exhibits them (İrengün and Arıkboğa 2015; Mount et al. 2005). We adopt the stance that the individual personality traits of sustainable entrepreneurs provide the impetus for having the required willpower that drives people's passions and innovativeness towards triple bottom line dimensions, thereby sanctioning their choice and ability to integrate these dimensions in the enhancement of the sustainable value of an enterprise (Goss 2005, 2008; Kurucz et al. 2008; Nga and Shamuganathan 2010; Rhee and White 2007). Accordingly, we assume that personality traits have predictive power for the cognitive patterns and, thus, for all five SSMs.

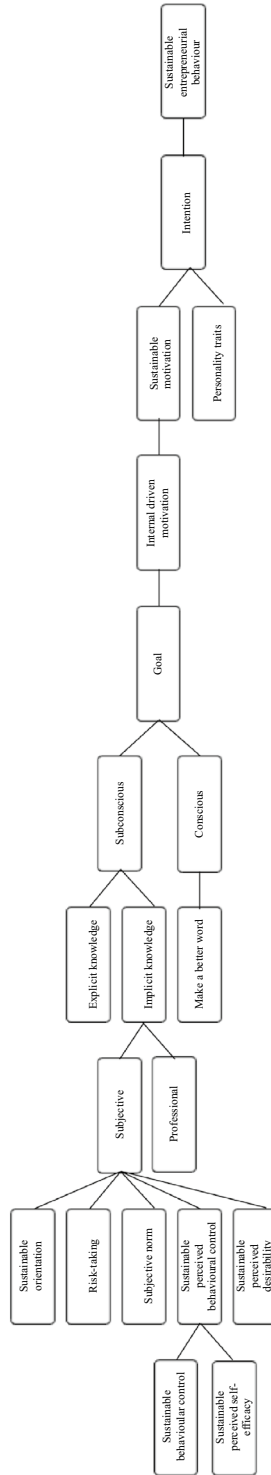


Fig. 2 The integrated model of antecedents of sustainable entrepreneurial intention

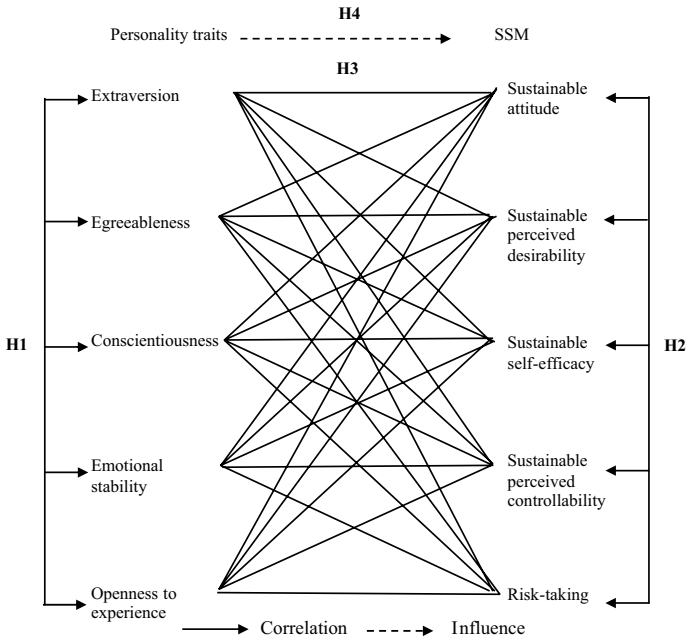


Fig. 3 Hypothesis research model

Hypothesis 4 All personality traits generate a significant positive influence on all SSMs (Fig. 3).

4 Research methodology

4.1 Methodology

The analysis presented in this study was developed using a quantitative research approach with a focus on firms operating in Italy. With a GDP of €1,8016 bn in 2015, Italy was the fourth largest industrial economy in the Euro area after Germany (€3358 bn), the UK (€2849 bn) and France (€2422 bn). Throughout history, Italy’s civil, social and political traditions have created an orientation towards sustainable entrepreneurship. The latter is also encouraged by a positive link to the territory and the environment, a good level of social cohesion and the proximity of stakeholders. Italy’s socio-economic environment is characterised by a rich fabric of small towns and SMEs (Small and Medium Enterprise) that serve as the backbone of the Italian economy (Del Baldo 2014). SMEs embody the ethical values of entrepreneurs that drive them towards the adoption of CSR (Corporate Social Responsibility) and sustainability practices and strategies (Ciasullo and Troisi 2013; Del Baldo 2006; Spence 1999; Vyakarnam et al. 1997), and to contribute to sustainable development (Johnson and Schaltegger 2016; Revell et al. 2010). Accordingly, the authors believe that Italy can be appropriately applied for testing the research hypotheses of this study.

The analysis was structured into two stages. The goal of the first stage was to investigate the existence of a positive correlation, both internally and between the two analysed constructs (SSM and psychological factors), to validate the research framework and justify their joint use in explaining the process that generates the intention of sustainable entrepreneurship behaviour (see “Appendix 1” for a brief definition of variables). To this end, the SSM factors were investigated via the identification of items adapted from various established studies to ensure the content validity of the scales. Personality traits were measured using the Mini-IPIP five-factor model (Donnellan et al. 2006), which has been shown to be a useful measure in cases where time is limited and short assessment is required, as in the case of lengthy questionnaires (Cooper et al. 2010). The validity of the constructs was determined using exploratory factor analysis, while Cronbach’s alpha was employed to identify the internal consistency of the items in the questionnaire. We applied multiple correspondence analyses—an extension of correspondence analysis—that permit an analysis of the interrelationships between three or more discrete variables, either categorical or ordinal. In the second stage of the study, a regression analysis investigated whether personality traits might influence SSM factors.

4.2 Sample

This research aims to investigate the psychological factors behind sustainable entrepreneurial intention. To this end, we examined sustainable entrepreneurs according to the definition of Sardianou et al. (2015).

Since we want to investigate a specific part of the totality of Italian entrepreneurs (as specified above) and to achieve a sample that is as representative as possible of our population, we used a purposive sampling approach (Black 2010). This form of sampling “focuses on one particular subgroup in which all the sample members are similar [...]. Characteristics of the selected participants are similar, allowing them to be explored in greater depth and minor differences to be more apparent” (Bernard 2012, p. 288).

Specifically, a homogeneous purposive sampling approach was employed to consciously identify and select data sources (Patton 2002) that have a significant link to the phenomenon of interest (Creswell and Clark 2011). This type of sampling strategy was specially chosen because it (a) allows the researchers to concentrate on particular characteristics within a population and best enables us to answer our research questions and (b) is useful when the research aim is to develop a model for a generalised application (Black 2010; Teddlie and Yu 2007; Bernard 2012).

In the event, we identified four primary data sources of potentially interesting firms to focus on Italian entrepreneurs that would best enable us to answer our research question: (1) the CSR Manager Network, (2) the Sodalitas Foundation, (3) the National Report of Good Practice and (4) Premio Impresa Ambiente. The authors presumed that the entrepreneur whose company is included in these data sources is led by sustainable values.⁵ To

⁵ In terms of the relationship between corporate sustainability (CS) and corporate social responsibility (CSR) (Ebner and Baumgartner 2006; van Marrewijk 2003), we believe that the two concepts are closely interrelated and interdependent (Linnanen and Panapanaan 2002). CS, viewed as the condition for the survival and development of a company, presupposes the four responsibilities of CSR (Carroll 1991), which the organisation can apply in order to balance the three dimensions of sustainability (Wempe and Kaptein 2002; Willard 2005). From this perspective, CSR is the foundation on which the three pillars of CS rest (Kaptein and Wempe 2002; Siano 2012).

select entrepreneurs, we collected and analysed the organisations' websites to find relevant email addresses. Excluded from the sample were organisations without a website, those that had only a contact form on their website and those that were state-owned enterprises or banks. As a result of this selection, 580 enterprises were included in the research. The survey was in the field for more than two months (1 September–10 November 2015). During this time we sent two reminders, the first after one week of sending the email to request survey participation and the second after two weeks. By 10 November 2015 (the closing date for survey responses), a total of 116 answers were recorded.

To ensure that the sample only included sustainable entrepreneurs that paid attention to all three dimensions of sustainability (Sardianou et al. 2015), those who agreed to participate in the survey were subjected to a pretest (see "Appendix 2"). To this end, eight dichotomous questions (true/false) were asked about the three pillars of sustainability and only the entrepreneurs who answered affirmatively to all eight items were included in the sample. This allowed us to distinguish sustainable entrepreneurs from social and green entrepreneurs.

First, it was verified that (a) the interviewed entrepreneurs believe that companies have a responsibility for solving global problems and contributing to sustainable development (item 1) and (b) that their company is driven by the balance of the three pillars.

Second, we checked the involvement of the respondents in the three pillars (item 2). The three questions that focused on the "people pillar" (items 3–5) are based on previous studies that stress that sustainable business ventures are driven by motivated entrepreneurs and aimed at solving social problems. This was operationalised through the attention paid to the workforce, the involvement in community development and the development of responsible citizenship that provides economic benefits to the wider community through product quality and innovation (Bell and Stellingwerf 2012; Cohen and Winn 2007; Gerlach 2003; Perrini 2005). The two questions related to the "planet pillar" (items 6–7) are focused on the entrepreneurs' aims to market products that are harmless in respect of environmental issues and that adopt material and energy-responsible policies (Bell and Stellingwerf 2012; Crowther and Aras 2008).

Finally, the "profit pillar" (item 8) is focused on the entrepreneur's belief in the possibility of making a profit while generating positive externalities.

Following the pretest, 109 valid questionnaires were retrieved, yielding a response rate of 21.46% and signalling an interest in the aims of the study.

4.3 Research tools

This study employed a survey method for the collection of data. We emailed the owners the link for completing the online questionnaire, which was posted using the Google Docs survey tool.

The questionnaire comprises two parts. The first part concerns the pretest that is devoted to checking whether the respondents are truly sustainable entrepreneurs. The second part of the questionnaire consisted of closed-ended questions divided into seven sections (respondents' profile, sustainable attitude, perceived sustainability desirability, perceived sustainability self-efficacy, perceived sustainability behavioural control, risk-taking and personality traits) and 97 closed-ended questions adapted from various established studies developed for this purpose (see "Appendix 2"). All items used a five-point Likert-type rating scale (1 = "strongly disagree" to 5 = "strongly agree").

4.4 Data analysis

All statistical analyses were performed using the SPSS software. The variables referred to the questions posed to sustainable entrepreneurs. Before analysing the data collected, data normality was assessed to check for the possible violation of the assumptions underlying multivariate normality. The normality of the distribution was investigated using skewness and kurtosis.

Factor analysis was employed to detect the validity of the questionnaire. Indeed, this method allows substantiating a given construct based on multiple indicators. The factorial analysis allows simplifying a complex set of data and grouping a large set of variables into macro-categories without losing initial information.

The points considered when performing a factor analysis were:

- Starting with 90 variables (excluding those relating to the respondents' profiles), firstly, two groups of variables are identified, namely 20 variables related to personality traits and 70 variables related to SSM;
- The principal component analysis (PCA) was used as extraction methods (with an eigenvalue greater than one) for both groups of variables. Through this method, N macro-categories able to represent a considerable proportion of the variance of the original variables (questionnaire's items) are derived;
- The varimax rotation was used as rotation method to identify which variables belong to which macro-categories;
- A "semantic" meaning has been attributed to the macro-components;
- KMO (to measure of sampling adequacy) and Bartlett's test of sphericity (that is the test for the null hypothesis that the correlation matrix has an identity matrix) was made;
- Cronbach's alpha (α) was used to determine the reliability of the collected data.

The Pearson correlation (r) was employed to investigate the existence of a positive relationship between SSM antecedents and personality traits that justify their joint use for a better understanding of the sustainable intention process. This analysis allowed for the evaluation of the linear relationship between two continuous variables and for describing both the strength and the direction of this relationship. Pearson correlation coefficients range from -1.00 through 0.00 to $+1.00$. The descriptive significance of the magnitude of the absolute value of the coefficient was interpreted using the following criteria (Hatcher and O'Rourke 2013): (1) $r=0.00$ indicates that there is no statistical association, (2) $r\pm 0.20$ indicates a weak association, (3) $r\pm 0.50$ indicates a moderate association, (4) $r\pm 0.80$ indicates a strong association and (5) $r=1.00$ indicates a perfect association. The correlation was evaluated by synthesising both the five cognitive variables and the five personality trait variables of each participant using a measuring position, represented by the arithmetic mean.

Multiple linear regressions analysis was performed to answer the second research question. Multicollinearity among all variables was controlled, showing that there were no problems with multicollinearity. Each of the five variables represents an SSM factor, which is indicated by entrepreneurs representing a dependent variable, while the five variables of personality traits served as predictors that were assumed to influence SSM.

5 Findings

5.1 Respondent profiles

Table 1 presents descriptive analyses of the enterprise owners' background information. With regard to the total sample, males owned more than two-thirds of sustainable entrepreneurship (77.98%), and more than 78% of owners had established their enterprises before the age of 40. The majority of enterprises have outgrown the start-up phase (57.8% had been established more than 15 years ago) and, therefore, came across as successful enterprises. The breakdown by sector of interviewed enterprises shows that the 45% of them relate to the food and beverage industry, followed by textile and chemical firms (28%), construction firms (16%), hotels and restaurants (6%) and firms belonging to other sectors (5%). The dominant educational attainment of the interviewed sustainable entrepreneurs was a high school diploma (48.78%), followed by a degree (24.39%) and almost 50% of the sustainable entrepreneurs had been an employee before starting their enterprise. It was also found that more than 70% believed in God.

5.2 Data exploration and reliability test

To identify the internal consistency of the items in the questionnaire, thereby validating the reliability of the research instrument, a factor analysis with varimax rotation was performed. The factor analysis of each set of variables indicated the validity of the questionnaire. The factor analysis of the SSM factors revealed a five-factor solution that accounted for 66.89% of the total variance and revealed that the KMO (Kaiser–Meyer–Olkin) was 0.794; Bartlett's test of sphericity was significant at 0.000. The five primary SSM factors are labelled as sustainable attitude (SA), sustainable perceived desirability (SP), sustainable self-efficacy (SS), sustainable perceived controllability (SC) and risk-taking (RT).

The factor analysis of personality traits revealed that the five-factor solution accounted for 72.91% of the total variance, the KMO was 0.726, and Bartlett's test of sphericity was significant at 0.000. The five main personality trait factors are labelled as extraversion (EX), agreeableness (AG), conscientiousness (CO), emotional stability (RS) and openness to experience (OE). Cronbach's alpha (α) was employed to identify the internal consistency of the items in the questionnaire. The reliability of all of the variables was acceptable, above the threshold of 0.7 (George and Mallery 2003) (Table 2).

To assess the normality of the data, descriptive statistics were performed by analysing skewness and kurtosis. A distribution is normal when the measures of both skewness and kurtosis fall between ± 1.0 . Further, the data were found to be approximately normally distributed, regardless of whether the skewness ratio and kurtosis ratio were between ± 2.58 (Burns and Burns 2008; Hair 2006; Leech et al. 2008). Both indices showed that the data were normal as all of the values were found to be within an acceptable range (Table 3).

Based on the tests conducted, the questionnaire can be used to verify the research hypotheses.

Table 1 Background of respondents

Characteristics	N= 109	
	F	%
Age at the start of the enterprise		
Less than 30	45	41.28
30–39	41	37.61
More then 40	23	21.10
Educational qualification at the start of the enterprise		
Elementary and secondary school diplomas	7	6.42
High school diplomas	52	47.71
Degree	28	25.69
Master and postgraduate courses	22	20.18
Owner's gender		
Male	85	77.98
Female	24	22.02
The owner carries out other work		
Yes	22	20.18
No	87	79.82
Years of Establishment		
Less than 5	9	8.26
5–10	18	16.51
11–15	19	17.43
More than 15 ^a	63	57.80
Sector		
Food and beverage	49	44.95
Industry (textile and chemical)	31	28.44
Construction	17	15.60
Hotel and restaurant	7	6.42
Others	5	4.59
Work experience before starting the enterprise		
No work experience	5	4.59
Stage	6	5.50
Employee	53	48.62
Ownership enterprise	26	23.85
Other	19	17.43
Religious belief		
God	77	70.64
Superpower entity	16	14.68
Atheist	16	14.68

^aFollowing Kidd (1992) and Praneetvatakul et al. (2001), sustainability is a prominent concept at present but not a new idea. In particular, although the notion of sustainable entrepreneurship was first introduced almost twenty years ago (Schaltegger 2000), this does not mean that even before, some entrepreneurs did not embrace the three pillars of sustainability. In Italy, in particular, due to both the civil, social, and political traditions that have created a good level of social cohesion, and the positive roots to the territory and the environment, as well as the close proximity between stakeholders, enterprises have historically within they the seeds of the sustainable entrepreneurship' orienta-

Table 1 (continued)

tion. Just think of the Italian reality of the industrial districts, which represent a large part of the Italian production base. They are a socio-territorial entity in which communities and businesses tend to merge and which aims to generate both social and territorial value (Becattini 1989; Garofoli 1991). For these reasons, it is reasonable to consider that firms founded more than fifteen years ago are driven by entrepreneurs oriented to sustainability pillars since their establishment

Further consideration about the “old firms” may be concerning the antecedent of self-efficacy (which describes the individual’s confidence in own ability to achieve an outcome, to set their own work conditions under high autonomy, and perform activities crucial in starting and running a new venture (Porcar and Soriano 2017). An individual who becomes a sustainable entrepreneur must have a certain self-efficacy level, which plays a crucial role not only in the individual level of effort but also in their amount of perseverance (Chen et al. 2004). It is, therefore, possible to suppose that although self-efficacy can change over time, it must always be such as to guarantee so that the entrepreneur will continue to operate, in this case, for over fifteen years. So the difference that can exist between self-efficacy at the time of start the venture and the interview moment does not justify removal from the sample of the companies established more than fifteen years ago

Table 2 Reliability test

Variables	No. of items	Cronbach’s α
Sustainable attitude	15	0.76
Sustainability perceived desirability	7	0.70
Sustainability self-efficacy	18	0.72
Sustainability perceived controllability	18	0.80
Risk-taking	12	0.73
Extraversion	4	0.71
Agreeableness	4	0.73
Conscientiousness	4	0.72
Emotional Stability	4	0.73
Assessing openness	4	0.75

Table 3 Kurtosis and Skewness

Variable	Skewness	Skewness ratio	Kurtosis	Kurtosis ratio
SA Sustainable attitude	-0.456	-1.971	-0.244	-0.532
SP Sustainability perceived desirability	0.125	0.542	-0.059	-0.128
SS Sustainability self-efficacy	0.413	1.786	-0.556	-1.211
SC Sustainability perceived controllability	0.532	2.299	0.270	0.588
RP Risk propensity	-0.352	-1.521	0.212	0.462
EX Extraversion	-0.229	-0.988	-0.283	-0.617
AG Agreeableness	-0.100	-0.433	-0.861	-1.876
CO Conscientiousness	0.485	2.097	0.187	0.407
ES Emotional Stability	-0.207	-0.894	-0.478	-1.041
AO Assessing openness	0.237	1.023	0.681	1.485
Standard Error	0.231		0.459	

5.3 Mean, standard deviation and correlation analysis

In order to answer our first three hypotheses, the Pearson correlation analysis is adopted. The Pearson correlation coefficients (r), as well as the mean scores (M) and the standard deviation values (SD) of the variables, are presented in Table 4.

The results obtained from this analysis validate the first hypothesis, as it shows that all SSMs were significantly positively correlated with each other (p value < 0.01). This means that there is a systematic relationship between all SSMs and that these are mutually reinforcing because as one variable increases, the others also increase. The intensity of the relationship between variables is moderate. In particular, two correlations show values above 0.5. From the data, it emerges that the variability of sustainability perceived desirability (SP) is explained for 52.5% by the variability of sustainability attitude (SA) and for 56.7% by the variability of sustainability perceived controllability (SC).

The results of the correlation matrix allow also validating the second hypothesis. Also, in this case, all variables are significantly positively correlated with each other (p value < 0.01), meaning that there is a systematic relationship between all personality traits. The linear relationships between personality traits are moderate, showing the more significant relationship ($r > 0.5$) between assessing openness and conscientiousness, and assessing openness and agreeableness.

Finally, the correlation matrix also allows validating the third hypothesis, showing that there is a significantly positive relationship between the cognitive perspective and personality traits, inasmuch as there is a positive and significant correlation between all ten variables. The strength of the relationships is moderate. In particular, eight correlations show values greater than 0.5 (CO and SA , SP , SS , RT ; EX and RT ; EM and SP ; AO and SS , SC).

These results prove our research model of the joint efficacy of the motivation generated from subjective implicit knowledge and the personality traits in explaining the intentional process of sustainable entrepreneurship.

Further analysis is made to investigate the distribution of means and standard deviation for all variables. Interestingly, among the SSM, the risk-taking secured the highest mean ($M=4.12$; $SD=0.39$), followed sequentially by sustainable perceived desirability ($M=3.98$ $SD=0.38$), sustainable attitude ($M=3.94$; $SD=0.31$), sustainability self-efficacy ($M=3.78$; $SD=0.25$) and sustainability perceived controllability ($M=3.64$; $SD=0.28$). The individual mean value for all items was above 3.50 (on a scale from one to five). Similar scores are founded among the variables related to personality traits, where the individual mean value for all items was above 3.84. The extraversion recorded the highest mean score ($M=4.19$; $SD=0.31$), followed sequentially by agreeableness ($M=4.13$; $SD=0.34$), conscientiousness ($M=4.03$; $SD=0.35$), emotional stability ($M=3.94$; $SD=0.39$) and assessing openness ($M=3.84$; $SD=0.26$).

5.4 Multiple linear regression analysis

Regression analysis shows the significant impact of a set of independent variables (predictors) on the dependent variables (Hair 2011). This statistical tool shows the extent to which variance in a continuous dependent variable can be explained by a set of predictors, allowing for the identification of the influence of personality traits on SSM. Therefore, multiple linear regression analysis was deemed appropriate to test the fourth hypothesis.

Table 4 Means, standard deviations and correlations

	M	SD	SA	SP	SS	SC	RT	EX	AG	CO	EM
SA Sustainable attitude	3.94	0.31	1								
SP Sustainability perceived desirability	3.98	0.38	.525**	1							
SS Sustainability self-efficacy	3.78	0.25	.370**	.426**	1						
SC Sustainability perceived controllability	3.64	0.28	.401**	.567**	.445**	1					
RT Risk-taking	4.12	0.39	.399**	.346**	.443**	.329**	1				
EX Extraversion	4.19	0.31	.499**	.339**	.401**	.320**	.584**	1			
AG Agreeableness	4.13	0.34	.376**	.400**	.298**	.348**	.304**	.435**	1		
CO Conscientiousness	4.03	0.35	.509**	.542**	.615**	.323**	.503**	.469**	.491**	1	
EM Emotional Stability	3.94	0.39	.466**	.634**	.325**	.486**	.489**	.363**	.357**	.347**	1
AO Assessing openness	3.84	0.26	.371**	.411**	.569**	.519**	.378**	.469**	.543**	.561**	.374**

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Multicollinearity, which can render data unreliable, was detected. Table 5 shows that there were no problems concerning multicollinearity due to the large tolerance values (> 0.50) and the small variance inflation factor (VIF) values (< 2).

Table 6 presents the results of the regression analysis used to test the fourth hypothesis and includes five different models, each related to the five different personality traits. Each model offered results based on the “enter method” according to which all independent variables were entered into the equation at the same time. This analysis is appropriate for dealing with a small set of predictors and also for when it is not known which independent variables will create the best-predicted equation.

The results showed that the F -test for each model was significant.

Our fourth hypothesis posits that personality traits influence the subjective knowledge of sustainable entrepreneurs. The results in Table 6 show that only some personality traits have a significant influence on cognitive constructs. The result can be analysed from two perspectives.

From the SSM point of view, the regression analysis showed that the personality traits explain 40.7% of the variance of sustainable attitudes, 52.3% of sustainable perceived desirability, 47.4% of sustainable self-efficacy, 37% of sustainable perceived controllability and 47.7% of risk propensity.

Three personality traits influence the sustainable attitude; these are extraversion, conscientiousness and emotional stability (P value < 0.01). The findings show that conscientiousness is the best predictor of sustainable attitude (CO $\beta = 0.296$; ES $\beta = 0.268$; EX $\beta = 0.264$). Only two predictors explained the variables sustainable perceived desirability, sustainable self-efficacy and sustainable perceived controllability. Sustainable perceived desirability depends on conscientiousness and emotional stability, and the former had a higher impact than the latter (ES $\beta = 0.500$; CO $\beta = 0.350$). Self-efficacy is influenced by conscientiousness (CO $\beta = 0.439$), followed by assessing openness (AO $\beta = 0.350$). Sustainable perceived controllability is significantly and positively influenced by assessing openness (AO $\beta = 0.389$) and emotional stability (ES $\beta = 0.336$). Finally, risk propensity was significantly and positively influenced by extraversion, conscientiousness and emotional stability. In particular, extraversion had a higher impact than emotional stability and conscientiousness (ES $\beta = 0.403$; ES $\beta = 0.290$; CO $\beta = 0.272$).

From the perspective of personality traits, the first result that emerges is that agreeableness does not affect any SSM variables. Extroversion only influenced two SSM, i.e. sustainable attitude and risk propensity. Conscientiousness does not affect the extent to which a sustainable entrepreneur perceives that the performance is up to him (perceived controllability). The trait of emotional stability does not influence sustainable entrepreneurs' belief in their capabilities to generate a significant impact on three sustainability dimensions (sustainable self-efficacy). The openness to experience that may guide the

Table 5 Test of collinearity

	Tolerance	VIF
Sustainable attitude	0.675	1.481
Sustainability perceived desirability	0.623	1.606
Sustainability self-efficacy	0.597	1.675
Sustainability perceived controllability	0.790	1.267
Risk-taking	0.557	1.796

Table 6 Multiple regressions results

Independent variables	Dependent variables														
	Sustainable attitude			Sustainability perceived desirability			Sustainability self-efficacy			Sustainability perceived controllability			Risk-taking		
	Beta	T	Sig.	Beta	T	Sig.	Beta	T	Sig.	Beta	T	Sig.	Beta	T	Sig.
Extraversion	0.264	2.859	0.005	-0.039	-0.477	0.635	0.077	0.883	0.379	0.021	0.22	0.826	0.403	4.643	0
Agreeableness	0.044	0.455	0.65	0.061	0.701	0.485	-0.167	-1.849	0.067	0.024	0.243	0.808	-0.099	-1.092	0.277
Conscientiousness	0.296	3.01	0.003	0.35	3.967	0	0.439	4.747	0	-0.034	-0.334	0.739	0.272	2.95	0.004
Emotional Stability	0.268	3.135	0.002	0.5	6.532	0	0.073	0.909	0.365	0.336	3.816	0	0.29	3.622	0
Assessing openness	-0.043	-0.423	0.673	0.013	0.142	0.887	0.35	3.658	0	0.389	3.712	0	-0.019	-0.194	0.847
<i>R</i> ²	0.407			0.523			0.474			0.37			0.477		
Adjusted <i>R</i> square	0.379			0.499			0.448			0.339			0.452		
<i>F</i> Statistics	14.156			22.553			18.564			12.075			18.789		
<i>p</i> <	0.00			0.00			0.00			0.00			0.00		

Table 7 Summary of the results related to the fourth hypothesis (personality traits influence SSM)

Variable dependent	Sustainable attitude	Sustainability perceived desirability	Sustainability self-efficacy	Sustainable perceived controllability	Risk-taking
Variable independent					
Extraversion	Supported	Not supported	Not supported	Not supported	Supported
Agreeableness	Not supported	Not supported	Not supported	Not supported	Not supported
Conscientiousness	Supported	Supported	Supported	Not supported	Supported
Emotional stability	Supported	Supported	Not supported	Supported	Supported
Openness to experience	Not supported	Not supported	Supported	Supported	Not supported

entrepreneur to find new opportunities and unconventional ways to achieve organisational goals (De Hoogh et al. 2005), does not influence either the sustainable attitude or the sustainable entrepreneurs' perception of the attractiveness of practising sustainability in business (sustainable perceived desirability), as well as the risk propensity.

Table 7 summarises the findings of the regression analysis and shows which personality traits generate a significant positive influence on SSM. The data negate our fourth hypothesis.

6 Discussion

Sustainable entrepreneurship is an emergent field of research and knowledge about the factors that affect entrepreneurs' behaviour towards sustainability, and their decision to formulate and exploit sustainability-oriented opportunities is insufficient (Hockerts et al. 2018; Muñoz and Dimov 2015; Shepherd and Patzelt 2011). Previous studies have recognised the need for in-depth research on entrepreneurial intention in particular types of entrepreneurship (Liñán and Fayolle 2015; Lundstrom et al. 2013). However, despite numerous studies of sustainable entrepreneurship (Muñoz and Cohen 2018), knowledge of the antecedents of entrepreneurial intention in sustainable entrepreneurship is still limited (Kuckertz and Wagner 2010a, b; Muñoz and Cohen 2018). This paper adds to the current discussion of the drivers of entrepreneurial intentions in the context of sustainable entrepreneurship following two primary psychological perspectives (Alonso et al. 2016), that is, the cognitive perspective and personality traits. Moreover, the paper seeks to extend the existing intention models by developing and testing a framework that integrates the two perspectives.

The analysis of the cognitive perspective revolves around the assumption that the entrepreneurs' goals play the primary role in their intention formation process. First, the entrepreneurial intentions are first and foremost a result of the main goal—which, in this context, is to contribute to sustainable development through entrepreneurial corporate activities (Muñoz and Cohen 2018; Schaltegger and Wagner 2011)—that influences the typology of opportunities recognised by entrepreneurs and transposes their value into action (Elfvig et al. 2009). Second, according to the theory of goal setting, the leading motivation of the goal determines the outcome to be achieved, the energy used to achieve it and the resulting intention to act (Borgogni and Dello Russo 2008; Locke and Latham 1990, 2002). Third, the differences between conventional and sustainable entrepreneurs derive from their different goals, motivations and values (Muñoz 2017). Fourth, the sustainable entrepreneurial intentions emerge from a combination of economic and non-economic motivations (Schaltegger and Wagner 2011) deriving from the aim to create value for both themselves and other stakeholders (Shepherd 2015).

The goals' influence on motivation and, in turn, on intention is exercised consciously or unconsciously (Locke and Latham 2002). In particular, the subconscious goal plays a crucial role since it is driven by knowledge structures (Clarke 2005) that are the key to the recognition of entrepreneurial opportunities and whose absence causes motivations that lead to causal or unproductive actions (Locke 2000b).

In light of the above and building on the theory of planned behaviour (TPB) and specific knowledge structures—which consider the role of goals and motivation in the

sustainable entrepreneurship context and overcome the criticism related to the absence of explicitly taking account of motives in the TPB (Brännback et al. 2007)—five subject knowledge structures are at the centre of the cognition perspective: sustainable perceived desirability, self-efficacy, behavioural control, risk-taking and the attitude towards sustainability.

The analysis of the first four constructs is of considerable importance since they incorporate subjective perceptions, which play a decisive role in the creation of new enterprises (Koellinger et al. 2007), while the attitude towards sustainability measures the entrepreneur's orientation towards environmental protection and social responsibility within an entrepreneurial context. The choice of these drivers has certain implications. First, a distinction has been made between perceived sustainability self-efficacy and perceived sustainability controllability, thus moving away from previous research (Koe et al. 2015). Second, we included risk since it is a pivotal cognitive driver in the exercise of new business creation (Koellinger et al. 2007). However, we adopted not only the economic connotation of risk but also the definition elaborated by Tounés et al. (2015) in the context of environmental entrepreneurship (financial and temporal risks, the non-reimbursement of loans, the non-availability or lack of skills on the part of personnel and the cost of training employees). Based on previous research (Abad et al. 2011; Hoogendoorn et al. 2017; Nicholson et al. 2002; Rohrman 2005; Zhao et al. 2005), we included both approaches to risk-taking. Risk perception was analysed from both a financial and a non-financial perspective, and risk propensity was subdivided into three facets “that spanned a variety of domains, and could be used to test relationships with personality” (Nicholson et al. 2002, p. 6).

Previous studies have found relationships between some of the subjective knowledge analysed within this framework (Carsrud and Brännback 2011; Koe et al. 2015; Shook and Bratianu 2010; Vesalainen and Pihkala 1999; Zhao et al. 2010). This led us to formulate the first research hypothesis. (All categories of subject knowledge are positively correlated with each other.) The findings contribute to the entrepreneurship literature by providing evidence of the positive and significant correlation between all SSM. The strongest correlations were found between the variables of perceived controllability and perceived desirability ($r=0.567$) and the latter with the sustainable attitude ($r=0.525^{**}$). The findings allow validation of our theoretical framework that conceived of these five constructs as being bound together with regard to explaining the internally driven motivations of sustainable entrepreneurs. Our findings confirm the study of Koe et al. (2015a, b), according to which the sustainability attitude, perceived desirability and perceived feasibility are correlated with one another and with the propensity to be sustainable, and they offer a further level of analysis that distinguishes between perceived self-efficacy and sustainable perceived controllability. Also of relevance is the result recorded by the factor, “risk-taking”, which obtained the highest mean score ($M=4.12$; $SD=0.39$). This result can arise from the fact that implementing sustainable entrepreneurship behaviours means taking risks in respect of unknown future results and “making trade-offs in all three dimensions of sustainability” (Divito and Bohnsack 2016). The sustainable entrepreneur exploits opportunities in the markets that are typified by imperfection and environmental and societal challenges (Hoogendoorn et al. 2017) and may have to accept risky strategies with a long-term return on investment. To accept these challenges and compromises, the sustainable entrepreneur must have a high risk-taking propensity in both financial and non-financial terms.

With regard to the research field that is focused on the influence of personality traits on entrepreneurial intention and behaviour and also in light of the Big Five theory (Conejo

et al. 2015; Saeed et al. 2013; Zhao et al. 2010), few studies have been conducted in the field of sustainable entrepreneurship (Nga and Shamuganathan 2010; Wood 2012).

Based on previous studies of the intentions of conventional and sustainable entrepreneurs (Brandstätter 2011; Chao-Tung et al. 2015; İrengün and Arıkboğa 2015; Nga and Shamuganathan 2010; Wang et al. 2016a; Zhao et al. 2010), we hypothesised a relationship between all of the personality traits of sustainable entrepreneurs (Hypothesis 2). Our findings showed that all of the personality traits, in their positive sense, are moderately and positively correlated with each other, thus, in combination, exerting their influence on the intentional process of the sustainable entrepreneur. These results validate our second hypothesis.

Moreover, we investigated the score of all of the personality traits of sustainable entrepreneurs. While previous studies on entrepreneurship have found that individuals with entrepreneurial intentions scored highly on extraversion, openness, conscientiousness and emotional stability but had low levels scores of agreeableness, the present study shows that sustainable entrepreneurs have a high level of agreeableness, ranking second after extraversion. This result confirms previous studies (İrengün and Arıkboğa 2015; Nga and Shamuganathan 2010; Wang et al. 2016a) that explain the sustainable entrepreneur as an altruist and a cooperative, caring, empathetic and gentle individual. Moreover, while Zhao and Seibert (2006) found that entrepreneurs generally score higher in conscientiousness and emotional stability, our results see these two constructs in third and fourth place. Openness showed the lowest score. This result can be derived from the fact that this personality trait has been found to be negatively correlated with the long-term sustainability of a venture (Ciavarella et al. 2004).

With the objective of advancing knowledge about the influence of psychological perspectives on sustainable entrepreneurship, a further aim of this paper was to validate the assumption of Alonso et al. (2016) in context of sustainable entrepreneurship. We supposed that the cognitive perspective of sustainable entrepreneurs (analysed through their SSM) and their personality traits could be complementary to understanding the antecedents of sustainable entrepreneurs (Hypothesis 3). The results of the Pearson correlation showed that all SSM factors fluctuate positively with all personality traits. This finding demonstrates the complementarity and compatibility of the perspectives offered by the entrepreneurial psychology that concentrates, on the one hand, on the research of personality traits and, on the other hand, on cognition and, in particular, on the internal sustainability motivations underlying the entrepreneur's intention towards a sustainable venture. The positive correlation between the two perspectives confirms the assumption of Kozubíková et al. (2015), according to which "the business environment is determined by personality characteristics and motives of individual entrepreneurs" (2015, p. 42) and also allows us to validate our conceptual framework, showing the necessity to approach the topic from a multi-viewpoint perspective.

Finally, our integrated framework is based on the assumption that personality traits influence the sustainable entrepreneur's willpower and induce emotional, cognitive and behavioural patterns, therefore becoming powerful predictors of entrepreneurs' intention and behaviour (Conejo et al. 2015; Nga and Shamuganathan 2010; Saeed et al. 2013; Wood 2012; Zhao et al. 2010). On this basis, we posit that personality traits, having a predictive power on cognitive patterns, positively affect the SSM antecedents (Hypothesis 4).

The multiple linear regression analysis suggests that personality traits do not influence all SSM factors. Although the results do not allow us to validate our fourth research hypothesis, they do provide a significant contribution to the debate on the antecedents of the intention of sustainable entrepreneurship.

The sustainable attitude that is a significant and strong determinant of entrepreneurial intention (Moriano et al. 2012; Phan et al. 2002), pro-environment intention (Tonglet et al. 2004) and sustainability engagement (Schick et al. 2016), depends on the traits of extraversion, conscientiousness and emotional stability. This means that individuals who have the intention to start a sustainability-oriented new business (Kuckertz and Wagner 2010a, b) are people that need a great deal of social interaction, that are comfortable in the social environment, dependable, motivated to accomplish their goals, have stable moods, are emotionally mature, self-confidence, demonstrate stability in their plans and are affectionate.

“Sustainable” perceived desirability is affected by conscientiousness and emotional stability. Therefore, the degree to which entrepreneurs perceive the practice of sustainability in business as attractive and interesting depends on the personal characteristics of meticulousness, conformity to rules/procedures and a continued obsession about maintaining high standards of performance, a strong sense of responsibility and industriousness, optimism and emotional intelligence.

“Sustainable” perceived behavioural control—the importance of which derives from the fact that it motivates the individual “to try to perform the behaviour and increases the likelihood that they will expend effort and persevere in their attempts [and] has important implications for interventions that seek to improve socially relevant behaviours” (Yzer 2012, p. 102)—is influenced by the personality trait of openness to experience. Accordingly, individuals’ judgments of their own ability to organise and execute a given sustainable behaviour depend on the liberal value system of sustainable entrepreneurs, which embraces their “intellectual curiosity and affinity towards novelty of new experiences are welcomed” (Nga and Shamuganathan 2010, p. 267), as well as their lack of fear, versatility, imagination and high level of creativity (Llewellyn and Wilson 2003; Yong 2007). A detailed analysis of “sustainable” perceived behavioural control has found similarities and differences between the two constructs that compose it.

“Sustainable” self-efficacy depends on the personality trait of conscientiousness, as verified by previous research (Lee and Klein 2002). This means that the sustainable entrepreneur’s belief in his own capacity to generate a significant social and environmental impact depends on his ability to exhibit a tendency towards self-discipline, dependability, a strong work ethic (DeYoung et al. 2007), an aim to achieve and engage in social behaviour, to act dutifully and with deliberation (the tendency to think carefully before acting), perseverance and responsibility towards others. All of these aspects facilitate the task and the goal-oriented adaptation and may be important for managing new ventures (Cantner et al. 2011). However, the results contrast with previous studies that have indicated that both agreeableness and extraversion can predict levels of self-efficacy (Nauta 2004; Tams 2008).

Conversely, “sustainable” perceived controllability is affected by emotional stability, and thus, the sustainable entrepreneur’s perception of having sufficient control over the resources needed to cope with challenges successfully is affected by self-confidence, calm, even-temperedness, relaxed resilient and being well-adjusted. These are prerequisites for entrepreneurs as they have to operate in a context of insecurity (Brandstätter 1997).

The risk-taking of sustainable entrepreneurs is affected by three personality traits: extraversion, conscientiousness and emotional stability. This result means that the sustainable entrepreneur’s attitude towards taking a risk is linked to an energetic approach to the social and material world, to being sociable, active, assertive and with having positive emotions—all of which are essential elements for exercising sustainability practices within a business context (Schick et al. 2016)—being self-confident, resilient and well-adjusted, dependable

and able to persevere, tending towards self-discipline, to thinking carefully before acting and to accepting delayed gratification.

Unfortunately, this study gave rise to at least one contradictory result. First, the agreeableness, “considered as the most important personality trait for social entrepreneurship drive, sustainment of social entrepreneurship and efficient use of the human resources” (İrengün and Arikboğa 2015, p. 1190), did not influence any SSM. Previous studies have found that agreeableness is a positive predictor of entrepreneurial intentions (İrengün and Arikboğa 2015; Wang et al. 2016a) and that a minimum level of this trait is necessary to receive the required support to start a new venture (Leonelli et al. 2017). Moreover, altruism, which is an element of agreeableness, influences the attitude towards sustainability (Vuorio et al. 2017). Our findings showed that sustainable entrepreneurs have a high score of agreeableness, which is a significant result given that being kind and caring about the needs of others is considered an essential factor in sustainable business, but this trait does not have any effect on the sustainable entrepreneur’s subject knowledge. The absence of the influence of agreeableness on the SSM can be interpreted in light of the work by Zhao et al. (2010), according to which this trait is not associated with the intention to start a business. It could be argued that this personal feature is pivotal to the sustainable entrepreneur (Nga and Shamuganathan 2010) but not so much as to determine the intention to start a sustainable business.

Second, the openness to experience of sustainable entrepreneurs, which involves their use of imagination, intuition, intellectual curiosity and preference for novelty and variety, only positively influences their belief in their ability to organise and perform a particular sustainable behaviour (perceived “sustainable” behavioural control). This result is surprising since we could easily assume that imagination and curiosity influence the level to which a person perceives that practising a given behaviour (i.e. starting a new sustainable business or practising sustainability in one’s existing business) is interesting and attractive, stimulating the search for new knowledge and experiences. This finding can be justified by the fact that our sample is represented by entrepreneurs who are already operating in the market and that this trait has been indicated as negatively correlated with the long-term sustainability of a business venture (Ciavarella et al. 2004).

7 Conclusion

The literature on sustainable entrepreneurship and entrepreneurial intentions is still emerging, and sustainable entrepreneurial intentions are a prominent research area (Liñán and Fayolle 2015). Despite the call for an in-depth exploration of the different processes by which individuals are engaged in sustainable entrepreneurial activity (Easterly 2006; Shepherd and Patzelt 2011) and for research on sustainability and entrepreneurial cognition (Muñoz 2017), the process that leads to becoming a sustainable entrepreneur and the mechanisms that make it possible are, as yet, little known (Lundstrom et al. 2013).

This paper contributes to entrepreneurship research by providing a structured literature review of the identifying factors that affect the sustainable entrepreneur’s intention, and it extends previous research findings on entrepreneurial intention, entrepreneurial cognition, personality traits and sustainable entrepreneurship.

First, the paper extends the findings of entrepreneurial intention research by proposing a model of entrepreneurial intentions that has overcome the criticisms made of the TPB model that it only implicitly includes motivation factors (Brännback et al. 2007). The

starting point was to highlight the difference between motivation intentions, elucidating why sustainable entrepreneurship is mainly explained by internal motivations, which, in turn, is cognitively explained through goals. The main goal helps to differentiate between traditional and sustainable entrepreneurs and from this derives the entrepreneurial intentions (Elfving et al. 2009, pp. 29–30). In particular, we highlighted that the subconscious main goal is driven by the knowledge structures of the entrepreneur, which are key to entrepreneurial opportunity recognition (Baron 2004; Renko et al. 2012) and ensure that motivations do not result in random or unproductive action (Locke 2000b). By proposing an intentions model of sustainable entrepreneurship that includes the individual's general attitudes towards sustainable entrepreneurship and his subjective perceptions—seen as crucial determinants of new business creation (Koellinger et al. 2007) (“sustainable” perceived desirability, self-efficacy, controllability and risk)—motivational factors are explicitly brought into the intention formation of the sustainable entrepreneur. Moreover, the research provides new insights into the connection between the subjective knowledge structures of sustainable entrepreneurs and hence, responds to the call by Muñoz (2017) regarding future research on sustainability and entrepreneurial cognition. The results of this study suggest that sustainable entrepreneurship intention is propelled by subconscious motivations that operate alongside one another.

Second, this paper contributes to the still limited research that focuses on understanding the effects of sustainable entrepreneurs' characteristics (Nga and Shamuganathan 2010; Wood 2012). Hence, the findings provide a new understanding of the sustainable entrepreneur's personality, showing that sustainable entrepreneurs are characterised by high levels of extraversion and agreeableness and low level of openness to experience.

Third, this paper responds to the call for research for a model of entrepreneurial intention that better reflects the full complexity of the entrepreneurship processes (Krueger 2009) in particular types of entrepreneurship (Liñán and Fayolle 2015; Lundstrom et al. 2013). Specifically, this paper has developed an integrated intention model of sustainable entrepreneurship that offers new insights into the antecedents of entrepreneurial intention in sustainable entrepreneurship. Through the integration of the two dominant psychological perspectives of an entrepreneur's intention in sustainable entrepreneurship, this paper (a) contributes an attempt to resolve the conflicting arguments (Alonso et al. 2016) and (b) provides evidence of entrepreneurship research on the importance of the joint use of the internal motivation of the sustainable entrepreneur and his personality traits as a means to better and more fully understand the antecedents of sustainable entrepreneurship. Hence, the research allows light to be shed on both the complementarity of the two perspectives and also on which of the personal traits of sustainable entrepreneurs influence their motivation to engage in a sustainable venture. The findings refer to sustainable entrepreneurs that have already started their businesses (and not on potential sustainable entrepreneurs), thus facilitating stronger considerations concerning the relationship between the constructs of the two perspectives, i.e. on the factors that really affect sustainable entrepreneurs' intention to engage in the creation of a sustainable venture.

The findings of this paper have implications for both policy-makers and entrepreneurship educators who wish to stimulate a change of paradigm towards sustainability and a new way of looking at businesses.

The policy-level implications concern the encouragement and supporting of the sustainable entrepreneurial activity growth given its influence on the societies' development. First, with the awareness that the entrepreneur's strong internal motivations can influence current institutional structures that stimulate changes in the regulative, normative and cultural-cognitive structures of an institutional environment (Scott 2008), this paper provides new

insight into internal motivation formation and shows how the different perceptions of the sustainable entrepreneur act together to affect his subconscious goal and internal motivation. The findings have shown that the subconscious goal of a sustainable entrepreneur is mainly influenced by both his perception that practising sustainability in business is interesting and attractive and his propensity towards sustainable practices and risk-taking. Subjective perceptions are crucial determinants in the creation of new businesses (Koellinger et al. 2007), and the attitude towards sustainability is a pivotal driver of sustainability-oriented entrepreneurial intentions (Vuorio et al. 2017). These results point to the desirability of implementing public policies and incentives that make sustainable entrepreneurship attractive and that foster environmental and social values since these are closely linked to attitude (Krueger 2007; Vuorio et al. 2017). By exploring both risk perception and propensity, we draw attention to the importance not only of the sustainable entrepreneur's attitude towards taking risks but also to his perception of different types of risks since they affect his motivation (Hoogendoorn et al. 2017). In adopting a broader perspective, we have analysed both constructs. Addressing risk attitude from both a financial and a non-financial point of view requires a different support approach that takes not the only account of the economic perspective of risk but also the fear of personal failure. For example, it is possible to develop training in entrepreneurial skills or programmes that aims to create entrepreneurship awareness of social and environmental issues and increase positive attitudes towards sustainable entrepreneurship since it is directly correlated with the perceived risks to business start-ups. The analysis of risk perception gives rise to significant consideration regarding the lifestyle dimension. Entrepreneurial programmes that highlight the social recognition and prestige that derive from engagement in sustainable entrepreneurship (Pineiro-Chousa et al. 2016) can increase the perception of vantage compared to the risks deriving from the engagement in sustainable venture creation. Future research could determine whether this broader perspective of risk shows any similarities or differences between sustainable and regular entrepreneurs.

Second, since entrepreneurship understanding requires an in-depth knowledge of entrepreneurs (Alonso et al. 2016), to develop and maintain sustainable entrepreneurship, policy-makers need to know which factors can positively or negatively influence the choice to become a sustainable entrepreneur (Richomme-Huet and de Freyman 2014). The findings of this study advance knowledge of the mechanisms that might affect sustainable venture creation and survival by identifying the factors that influence the sustainable entrepreneur's motivation. It has been shown that although all personality traits are correlated with sustainable entrepreneurs' perceptions and attitudes, they influence the individual perceptions and attitudes differently. The research was conducted with a sample of companies that were already operating. This allowed us to grasp not only the profile of the sustainable entrepreneur and the motivations that push him to exploit sustainability opportunities but also to understand how the two constructs interact among individuals who are already engaged in sustainable entrepreneurial behaviour, rather than only manifesting a sustainable intention. This understanding can help policy-makers in the formulation of programmes to assist with the creation of sustainable businesses that continue over time. These programmes should be based on both the profile of the sustainable-oriented entrepreneur—given that personality traits and characteristics are central to the process of effecting change towards a sustainable society (Crnogaj et al. 2014; Sardianou et al. 2015)—and the subjective knowledge influenced by his characteristics, which, precisely because of this influence, could be strong factors in stimulating the entrepreneurial intention.

The implications for educational institutions relate to the design of educational programmes that aim to increase and promote entrepreneurial intentions towards sustainable

behaviours. To make the promotion of behaviour change more effective, it is necessary to analyse which factors cause these behaviours (Steg and Vlek 2009). Previous studies have shown that educating about sustainability “in general” has less utility than programmes that focus on the strong predictors of sustainable behaviour (Heeren et al. 2016) and that subjective perceptions are a fundamental key to new business creation (Koellinger et al. 2007). This paper suggests which factors educational institutions need to take into account in order to stimulate the creation of new sustainable businesses, highlighting the pivotal role not only of the sustainable attitude (which can be stimulated through programmes that aim to disseminate social and environmental values) but also of the subjective perceptions of the attractiveness of sustainable behaviour, the belief in one’s own capabilities to exert control over the target behaviour and to generate a significant social and environmental impact, as well as the perception of the benefits deriving from the assumption of different types of risks. Instituting educational programmes that aim to improve these perceptions and attitudes might be a way to educate students that could become future sustainable entrepreneurs.

Furthermore, to date, the European authorities have neglected the importance of entrepreneurial attitudes and perceptions as tools that can stimulate entrepreneurial activity and create a positive impact on economic growth (Draghici et al. 2014). Educational programmes aimed at increasing sustainable attitudes and “sustainable” subject perceptions would have positive impacts on countries’ economies and could give rise to positive social and environmental externalities. Moreover, such educational programmes would be in line with the role assigned by the Green Paper on Entrepreneurship in Europe by providing education that leads to an improvement in the skills required to develop an entrepreneurial mindset.

This research is not without its limitations. First, the adoption of sustainable entrepreneurship practices was analysed by focusing only on intentions generated by internal motivations and personality traits. Thus, in order to evaluate the actual influence of soft and hard external factors (Schlange 2006a), further research is needed on sustainable entrepreneurship and its specific characteristics. Second, the SSM variables used in the empirical models did not include subjective norms. Future research should examine these antecedents to clarify whether they are internal or external factors and should try to address previous contradictory studies of their influence on the intentional process of sustainable entrepreneurship. Third, the sample of sustainable entrepreneurs was taken from Italian data without taking into account the differences between sectors. The findings are, therefore, specific to Italy and cannot be generalised. Future research in this area should examine whether there are differences between countries and between sectors.

Furthermore, future research should also expand the research framework by integrating non-sustainable entrepreneurs and analysing the differences between different categories of entrepreneurs. Finally, a further limitation concerns the response rate of the survey that does not allow us to discount the issue of potential respondent bias fully. However, practitioners may be confident about the study’s findings that subjective knowledge, personality traits and the interactions among them are appropriate to sustainable entrepreneurs as we interviewed individuals who were already practising sustainable entrepreneurship, rather than potential entrepreneurs, thus enabling us to advance knowledge about the mechanisms that affect the possibility of becoming sustainable entrepreneurs.

Appendix 1

Antecedents of sustainable entrepreneurial intention	Definitions
Motivation	Motivation explains why people have a desire to do something and makes them put effort and to achieve it. Sustainable entrepreneurs' motivation is primarily structured along social and environmental dimensions of sustainability
Internal-driven motivation	Entrepreneur's internal motivation (internal stimulus that induces a person to search for a way of reducing the internal state of tension) (1) refers to his mindset, (2) can better explain why some person and not others are intrinsically motivated for some activities and the differences between sustainable and traditional entrepreneurship, (3) is pervasive and act as energisers for behaviour
Personality traits	Personality traits indicate the characteristic patterns of people that persist over time and across situations and refer to thoughts, feelings and behaviours
Extraversion	Assertive, sociable, optimist, dynamic and directive
Emotional stability	Self-confident, calm, stable and balanced
Agreeableness	Trust, altruism, friendly, cheerful, accommodating and supportive
Conscientiousness	Self-control, reliability, persistence, hard work, achievement-oriented
Openness to experience	Creative, inquisitive, non-conforming and independent judgment
Conscious sustainability goals	It arises from the desire to change the world through the creation of sustainable entrepreneurial corporate activities
Subconscious sustainability goal	Subconscious goals (1) refer to all schemes, mental models and to the individual's perceptions of reality and of the world in which he lives; (2) are affected by the subjective knowledge that is deeply embedded in personal beliefs, attitudes, values to the particular combination of needs, values; (3) are the real driving forces behind many people's behaviours
Implicit knowledge structures	Subconscious sustainability goal is affected by sustainable subjective knowledge The knowledge structures are the key to entrepreneurial opportunity recognition and the factors used to assess, judge and decide about venture creation and growth. Implicit (tacit) knowledge (professional and is subjective) is deeply embedded in personal beliefs, insights, attitudes, values, experiences and the capabilities inherent in the person's mind Subjective implicit knowledge refers to all schemes, mental models, beliefs and perceptions about reality and the world in which the individual lives as well as his vision of the future

Antecedents of sustainable entrepreneurial intention	Definitions
Sustainable perceived desirability	The personal level of perception of practising sustainability as interesting and attractive
Sustainable entrepreneur's perceived self-efficacy	The personal level of belief in one's capacity to generate a significant social and environmental impact
Sustainable entrepreneur's perceived controllability	The perception of having sufficient control over the resources needed to cope successfully with the challenges
Risk-taking	It is a general orientation towards taking or avoiding risks when people have to choose what to do in situations with uncertain outcomes. It refers to both risk perception (the subject level of perception of risk) and risk propensity (an attitude towards taking risks in a condition of low probability of success but with high rewards, although the latter will only be achieved after a long period)
Sustainable attitude	It refers to the individual's set of beliefs, emotions and manner of feeling and thinking about sustainability

Appendix 2

First part

Construct	Variable	Item	Source
General	Business responsibility	I believe that business should take greater responsibility for solving today's global problems	Authors' elaboration
	Balancing of the three pillars	I believe that the entrepreneur should extend his/her goals to encompass ecological and social concerns through entrepreneurial behaviour that balances these three dimensions, and it is this approach that drives my business	Tilley and Young (2009) and Authors' elaboration
People	Workforce welfare	It is important to me that my firm contributes to the welfare of the workforce	Perrini (2005) and Gerlach (2003)
	Community development	It is important to me that my firm be actively involved in the community development	Schaltegger and Wagner (2011) and Martínez-Ferrero and García-Sánchez (2015)
	Economic benefits to the community	It is important to me that my firm give economic benefits to the larger community through our products and/or services	Cohen and Winn (2007) and Gerlach (2003)

First part

Construct	Variable	Item	Source
Planet	Environmental harmless' products	For me, it is crucial that my firm's products are environmentally friendly	Bell and Stellingwerf (2012)
	Resource responsible policies	For me, it is crucial that my firm adopt responsible materials and energy policies (i.e. reduce waste; production process that uses resource efficiently)	Crowther and Aras (2008)
Profit	The creation of profit and positive externalities can coexist	I believe that companies can combine profit with having a positive social impact.	Tilley and Young (2009)

Second part

Item	Description	Source
<i>Background of respondents</i>		Authors' elaboration
1	Age at the start of the enter	
2	Educational Qualification at the start of the enterprise	
3	Owner's Gender	
4	The owner carries out other work	
5	Years of Establishment	
6	Work experience before starting the enterprise	
7	Religious belief	
<i>Sustainable attitude</i>		Braun (2010)
1	Nature copes with minimal impacts of modern industrial	
2	The balance of nature is weak and easily damaged	
3	Humans have the right to modify the natural environment to suit their needs	
4	Plants and animals have right	
5	Often, human interference with nature produces disastrous results	
6	If things do not change, we will soon experience a major environmental disaster	
7	Environmental crisis has been exaggerated	
8	The space and resources of the earth are limited	
9	Humans are subject to the laws of nature	
10	Humans rule over nature	

Second part

Item	Description	Source
11	The earth is reaching the maximum supportable limit of people	
12	Humans are severely abusing the environment	
13	The earth has plenty of natural resources if we just learn how to use them better	
14	Humans will learn enough about how nature works to be able to control it	
15	Human intelligence will make the earth a better place to live	
<i>Perceived sustainability desirability</i>		Nasurdin et al. (2009), Moriano et al. (2012) and Koe et al. (2014)
1	I love to operate sustainable business	
2	I enjoy to operate sustainable business	
3	I enthusiastic to operate in a sustainable business	
4	How desirable are to face new sustainability challenges for you in your everyday life?	
5	How desirable are to create new sustainability products for you in your everyday life?	
6	How desirable are to be creative and innovative for you in your everyday life?	
7	How desirable are to obtain high incomes for you?	
<i>Perceived sustainability self-efficacy (How much confidence do you have in your ability to)</i>		McGee et al. (2009) and Ajzen (2002)
1	Identify the need for sustainability product/service	
2	Design sustainability product/service that will satisfy customer	
3	Estimate customer demand for sustainability product or service	
4	Determine a competitive price for sustainability product/service	
5	Estimate the amount of funds and working capital necessary to my sustainable business	
6	Design an effective marketing/advertising campaign for a sustainability product/service	
7	Get others to identify with and believe in my vision and plans for sustainability business	

Second part

Item	Description	Source
8	Make contact on sustainability issues	
9	Clearly and concisely explain verbally/in writing my sustainable idea	
10	Supervise employees towards sustainability	
11	Recruit and hire employees who practice sustainability	
12	Delegate sustainability tasks and responsibilities to employees in my business	
13	Deal effectively with day-to-day sustainability problems	
14	Inspire, encourage, and motivate my employees towards sustainability	
15	Train employees for sustainability	
16	Organise and maintain financial records of my business	
17	Manage the financial assets of my business	
18	Read and interpret financial statements	
	<i>Perceived sustainability perceived controllability (What do you think is your degree of access to the resources needed to exercise control over)</i>	McGee et al. (2009) and Ajzen (2002)
1	Identify the need for sustainability product/service	
2	Design sustainability product/service that will satisfy customer	
3	Estimate customer demand for sustainability product or service	
4	Determine a competitive price for sustainability product/service	
5	Estimate the amount of funds and working capital necessary to my sustainable business	
6	Design an effective marketing/advertising campaign for a sustainability product/service	
7	Get others to identify with and believe in my vision and plans for sustainability business	
8	Make contact with sustainability issues	
9	Clearly and concisely explain verbally/in writing my sustainable idea	
10	Supervise employees towards sustainability	

Second part

Item	Description	Source
11	Recruit and hire employees who practice sustainability	
12	Delegate sustainability tasks and responsibilities to employees in my business	
13	Deal effectively with day-to-day sustainability problems	
14	Inspire, encourage, and motivate my employees towards sustainability	
15	Train employees for sustainability	
16	Organise and maintain financial records of my business	
17	Manage the financial assets of my business	
18	Read and interpret financial statements	
<i>Risk-taking^a</i>		Nicholson et al. (2002); Rohrmann (2005); Zhao et al. (2005) and Abad et al. (2011)
<i>Risk perception (How do you think is low the risk related to the following sentences for your decision to engage in your activity?)</i>		
1	I follow the motto, "nothing ventured, nothing gained" (<i>Financial</i>)	
2	Proving myself to other (<i>Non-financial</i>) <i>Risk propensity</i> (In general, what is your propensity for accepting risk to obtain what is indicated in the following sentences?)	
3	I'm propensed for accepting financial risks to earn additional income (<i>Livelihood</i>)	
4	I'm propensed for accepting riskier strategies that have less probability of success if I can reap more benefit, even if after a considerable amount of time (<i>Livelihood</i>)	
5	I enjoy the excitement of uncertainty and risk (<i>Lifestyle</i>)	
6	I want to keep up with my peers (<i>Lifestyle</i>)	
7	Others urged me to take part in the activity (<i>Lifestyle</i>)	
8	Don't want to be seen as 'cowardly' (<i>Lifestyle</i>)	
9	To seek new work experiences gives me satisfaction because I gain in myself-confidence (<i>Livelihood</i>)	

Second part

Item	Description	Source
10	To seek new work experiences gives me satisfaction because it is a personal challenge (opportunity to test my own limits) (<i>Livelihood</i>)	
11	I am willing to take a significant risk if the possible rewards are high enough (<i>Physical status</i>)	
12	I enjoy to attract attention (<i>Physical status</i>)	
<i>Mini-IPIP test</i>		Donnellan et al. (2006)
1	Am the life of the party	
2	Sympathise with others' feelings	
3	Get chores done right away	
4	Have frequent mood swings	
5	I Have a vivid imagination	
6	Don't talk a lot	
7	Am not interested in other people's problems (<i>R</i>)	
8	Often forget to put things back in their proper place (<i>R</i>)	
9	Am relaxed most of the time (<i>R</i>)	
10	I Am not interested in abstract ideas (<i>R</i>)	
11	Talk to a lot of different people at parties	
12	A Feel others' emotions	
13	Like order	
14	Get upset easily	
15	I Have difficulty understanding abstract ideas (<i>R</i>)	
16	Keep in the background (<i>R</i>)	
17	Am not really interested in others (<i>R</i>)	
18	Make a mess of things (<i>R</i>)	
19	Seldom feel blue (<i>R</i>)	
20	I Do not have a good imagination (<i>R</i>)	

^aFor a better understanding, we indicate in italics the type of examined resource

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