

Anna Vuorio

## **OPPORTUNITY-SPECIFIC ENTREPRENEURIAL INTENTIONS IN SUSTAINABLE ENTREPRENEURSHIP**

Thesis for the degree of Doctor of Science (Economics and Business Administration) to be presented with due permission for public examination and criticism in the Auditorium of the Student Union Building at Lappeenranta University of Technology, Lappeenranta, Finland on the 2<sup>nd</sup> of January, 2018, at noon.

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# **Abstract**

**Anna Vuorio**

## **Opportunity-Specific Entrepreneurial Intentions in Sustainable Entrepreneurship**

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The thesis focuses on opportunity-specific entrepreneurial intentions in sustainable entrepreneurship using a multiple-method approach. Due to recent developments towards sustainable development and sustainability in entrepreneurship, purpose-driven forms of entrepreneurship have emerged. As a result, attention has been paid to the drivers of entrepreneurial intentions in the context of sustainable entrepreneurship. This research aims to integrate the individual-opportunity nexus into entrepreneurial intention research by proposing a model for opportunity-specific entrepreneurial intention formation. Hence, the objective of the thesis is to examine opportunity-specific attitudes and entrepreneurial intentions in the context of sustainable entrepreneurship.

Through a multiple-methods approach, the findings of the thesis show young adults are more inclined to sustainable entrepreneurship than older adults because they tend to value sustainable value creation over economic value creation. Furthermore, young adults perceive entrepreneurial opportunities through four distinct combinations of opportunity-specific attitudes towards sustainable or economic value creation. Second, opportunity-specific entrepreneurial intentions in sustainable entrepreneurship are driven by perceived entrepreneurial desirability and attitude towards sustainability. The drivers of opportunity-specific attitudes and general attitudes towards entrepreneurship are, to some degree, contradictory in sustainable entrepreneurship. Lastly, the results show four distinct change combinations of opportunity-specific attitudes that are associated with a high level of new venture idea completeness, hence, providing evidence of the connection between perceptions of entrepreneurial opportunities and entrepreneurial intentions.

The results contribute to the entrepreneurial intention literature by proposing a model for opportunity-specific entrepreneurial intentions, which includes both motivation and entrepreneurial opportunities. In addition, the thesis extends the entrepreneurial opportunity literature by proposing a novel typology for entrepreneurial opportunity templates, which takes into account sustainable value creation. Moreover, the results

provide evidence related to change in entrepreneurial opportunity templates and hence provide new insights about change in knowledge structures. The thesis contributes to sustainable entrepreneurship by providing evidence about entrepreneurial intention formation in this context. The thesis results also have implications for entrepreneurship policies regarding how to enhance entrepreneurial activity and entrepreneurship education through education design.

**Keywords:** opportunity-specific entrepreneurial intentions, entrepreneurial opportunity, entrepreneurial intentions, opportunity-specific attitudes, sustainable entrepreneurship

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Anna Vuorio

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Vantaa, Finland

*To my husband*





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## Abstract

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## List of publications

This thesis is based on the following five papers. The rights have been granted by publishers to include the papers in dissertation. Three out of these papers are journal publications (JUFO 1), and two are conference papers. In the international journal quality ranking, Journal for International Business and Entrepreneurship Development is at C-level and International Journal of Entrepreneurial Behavior and Research is at B-level.

**PUBLICATION 1:** Vuorio, A. (2017) Young Adults and Sustainable Entrepreneurship: The Role of Culture and Demographic Factors. *Journal for International Business and Entrepreneurship Development*, Vol 10. No. 3, pp. 209-230.

The author was responsible for the idea finding, the research plan, the literature review, data collection, data analysis and writing most of the paper. The author was also responsible for the communication with the editor after one round of reviews and is the corresponding author.

**PUBLICATION 2:** Kunttu, A., Puumalainen, K. and Fellnhöfer, K. (2017). Socially-oriented entrepreneurial goals and intentions – the role of values and knowledge. *Journal for International Business and Entrepreneurship Development*, DOI: 10.1504/JIBED.2018.10005610.

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The author was responsible for the idea finding, the research plan, the literature review, data analysis and writing most of the paper. The author was also responsible for presenting the paper in the conference, and is the corresponding author.

**PUBLICATION 5:** Vuorio, A. and Puumalainen, K. (2017), Change in Entrepreneurial Opportunity Templates and New Venture Ideas. *Proceedings of 2017 ECIE Conference*, pp. 1-10. Paris, ACPI.

The author was responsible for the idea finding, the research plan, the literature review, data analysis and writing most of the paper. The author was also responsible for revising the paper and presenting the paper in the conference, and is the corresponding author.

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## Nomenclature

EOT	entrepreneurial opportunity template
TPB	the theory of planned behaviour
PED	perceived entrepreneurial desirability
PEF	perceived entrepreneurial feasibility
GEM	Global Entrepreneurship Monitor
WVS	World Value Survey





# 1 Introduction

*“Opportunity is about seeing the future for what it could be through our aspirations and imagination in ways that other people don’t see.”*

(Hunter, 2013, p. 128)

## 1.1 Background and motivation

Entrepreneurship is one of the central drivers of economic development through wealth creation and employment (Wennekers and Thurik, 1999; Shane and Venkataraman, 2000). The idea of entrepreneurship as a driver of economic growth can be traced back to Schumpeter in 1934, and his idea of an entrepreneur as a creator of economic change through creative destruction (Hebert and Link, 1989; Spencer et al., 2008). Traditionally, the literature on the outcomes of entrepreneurial activity has focused on economic wealth creation and growth (Bruton et al., 2013). However, despite global economic growth (World Bank, 2017), inequality has increased (Keeley, 2015). As a result of persisting societal and environmental issues in the world, including global warming, inequality and poverty, the role of entrepreneurship in societies has shifted to include environmental and social issues (e.g., Dean and McMullen, 2007; Porter and Kramer, 2011). Environmental (Koegh and Polonsky, 1998), social (Mair and Marti, 2006) and sustainable entrepreneurship (Schaltegger and Wagner, 2011) are among the various types of purpose-driven entrepreneurship that have appeared as part of this shift.

The phenomena of sustainability and sustainable development are more than just types of entrepreneurship. Sustainability requirements range from demands to operate in a sustainable and transparent manner to providing sustainable consumer goods and services. As a result, companies, regardless of their size, simply cannot afford to avoid engaging in sustainability. For example, a recent study shows that in the U.S. grocery industry, 68 percent of the growth in total sales (USD) between 2010 and 2013 was accounted for by organic, natural, ecological and fair trade products (BCG, 2017). Indeed, it seems that acting in an environmentally-conscious manner also pays off in economic gains for small firms (Clemens, 2006). Furthermore, the failure to comply with demands for sustainability creates severe consequences, from reputational risks to economic losses, which have been reflected in media attention towards companies mistreating their employees, neglecting human rights or causing harm to the environment.

This demand for sustainability and the shift in the role of entrepreneurship come largely from young adults. In a recent study (Deloitte, 2017), 77 percent of millennials in Nordic countries believe that business success should not be measured only by economic success, but, through other impacts, as well. This is also reflected in work engagement, as the

intention to change jobs for millennials is lower among employers that demonstrate a social impact. Millennials feel that large organisations, such as the EU and UN, have the potential to solve these social and environmental challenges, although positive impacts are made by charities and NGOs, individuals and local companies. Moreover, only 35 percent of millennials in Nordic countries perceive that they are enabled to contribute to charities or good causes in their workplace. Their demands for sustainability spring from the set of values they possess. Young adults (Generation Y or millennials, referring to those born between 1979-1994) are more socially and environmentally aware than previous generations (Hewlett et al., 2009). College-educated millennials in Nordic countries perceive climate change, environmental protection and natural disasters as major concerns. In Finland, 37 percent of millennials see climate change as an issue that worries them (Deloitte, 2017). Furthermore, young adults' social and environmental awareness is accompanied with their positive views on entrepreneurship. Young adults are believed to be more prone towards entrepreneurship than previous generations as a result of their need for independence. For example, Singaporean entrepreneurs belonging to Generation Y believe that entrepreneurship is a way to generate a societal impact beyond profits by creating a business venture based on one's passion (Khor and Mapunda, 2014).

However, regardless of their values, it seems that young adults do not see entrepreneurship as a career option. In Europe, only 48.5 percent of young people see self-employment as desirable, and 41 percent perceive self-employment as feasible (Eurofound, 2015). According to Eurofound, the most important reasons behind this are perceived to be a lack of available financial support and complex administrative procedures. These attitudes are reflected in self-employment rates. Youth self-employment remains low in Europe. Only 6.5 percent of young adults (between 15 and 29 years-old) were self-employed in 2013. In Finland, the youth self-employment rate is even lower at only 4.9 percent in 2013, although this has slightly increased since 2008 (Eurofound, 2015). A low youth self-employment rate only becomes a problem when combined with high youth unemployment rates. Youth unemployment in Europe was 18.7 percent in 2016 (Eurostat, 2017). This is lower than in the two previous years when youth unemployment was over 20 percent. However, when looking at the youth unemployment ratio, which is the youth share of unemployment from the total youth population, the situation seems a bit better. Only 7.7 percent of the youth population in Europe is unemployed. Despite a decrease in the youth unemployment, the youth unemployment ratio is now higher than it was in 2008, suggesting that young adults are facing some difficulties in finding jobs. This implies that young adults are forced to find alternative ways to make a living. One option could be purpose-driven entrepreneurship. In Western Europe, there were larger percentage of nascent social entrepreneurs than commercial entrepreneurs among young adults in 2015 (Bosma et al., 2015, p. 22). Furthermore, similarly to the rest of the world, there were more operating social entrepreneurs than commercial entrepreneurs among young adults in Western Europe. Hence, suggesting that purpose-driven entrepreneurship is enabling young adults to follow their values.

Becoming an entrepreneur has been perceived to be mainly economically motivated (Fayolle et al., 2014). The emergence of purpose-driven entrepreneurship has questioned this assumption, and as a result, the role of motivation has been highlighted. Softer values such as altruism, empathy, morality, freedom and equality have been connected to entrepreneurial intentions in social entrepreneurship (e.g., Dees, 2012; London, 2010; Mort et al., 2003; Smith et al., 2010; Hockerts, 2017), and different aspects of sustainable entrepreneurship (Shepherd et al., 2009; Gagnon, 2012). This has turned attention towards the drivers of sustainable entrepreneurship. Entrepreneurial intentions in sustainable entrepreneurship have been connected to sustainability orientation (Kuckertz and Wagner, 2010), while in the field of social entrepreneurship, entrepreneurial intentions are driven by empathy, self-efficacy and perceived social support (Hockerts, 2017). Moreover, the connection between the Big Five personality factors and social entrepreneurship characteristics is recognised (Nga and Samuganathan, 2010). For example, openness and agreeableness enhance social vision, while sustainability is increased by agreeableness and consciousness. It is evident that entrepreneurial intention research in sustainable entrepreneurship is still emerging, and sustainable entrepreneurial intentions have been proposed to be an emerging area of research in the entrepreneurial intention literature (Liñan and Fayolle, 2015).

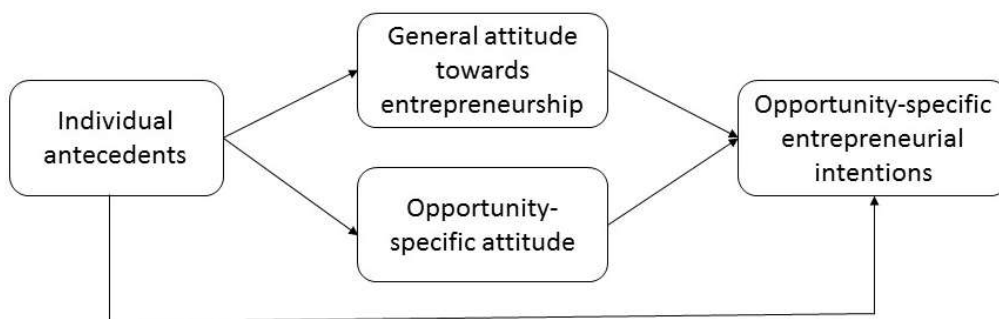
Considering these recent developments, it is surprising that there is insufficient understanding about the drivers of entrepreneurial intentions in purpose-driven enterprises. Furthermore, it seems that Europe is facing a situation, in which there seems to be both demand for purpose-driven entrepreneurship and a supply of individuals who seem to possess the qualities of purpose-driven entrepreneurs. However, it seems that means of bringing this demand and supply together have been missing. This doctoral thesis seeks to provide some insights about the supply side of sustainable entrepreneurship and how young adults actually perceive sustainable entrepreneurship by analysing the individual-opportunity nexus and entrepreneurial intentions in the context of sustainable entrepreneurship.

## 1.2 Research objectives

Given the shortcomings briefly discussed in the previous section of the thesis, this study attempts to extend the understanding of the connections between perceptions of entrepreneurial opportunities and intentions. Entrepreneurship takes different forms in society, but there seems to be only limited knowledge about what drives these different types of entrepreneurship and how individuals perceive different market signals or changes as potential opportunities for entrepreneurship. Both entrepreneurial intentions and the perception of an entrepreneurial opportunity is required for the initial steps toward entrepreneurship to occur. Variation in entrepreneurial opportunities combined with value preferences reveal answer why some individuals recognise particular entrepreneurial

opportunities while others do not. Hence, research connecting perceptions of entrepreneurial opportunities to entrepreneurial intentions is needed.

More precisely, this doctoral thesis aims to fill the gap in the entrepreneurship literature on sustainable entrepreneurship, perceptions of entrepreneurial opportunities and entrepreneurial intentions. This is done by examining opportunity-specific entrepreneurial attitudes and intentions in the context of sustainable entrepreneurship. However, opportunity-specific attitudes are also viewed on a more general level in an attempt to generate a wider picture of how different opportunity-specific attitudes work together. In other words, the purpose of the thesis is to examine opportunity-specific attitudes in two ways: in the context of sustainable entrepreneurship and more generally. Hence, the objective of the thesis is to introduce the individual-opportunity nexus into entrepreneurial intention research by examining opportunity-specific entrepreneurial intentions in the context of sustainable entrepreneurship. Through this objective, the thesis aims to demonstrate the importance of taking into consideration variation in entrepreneurial opportunities when looking at different aspects of entrepreneurship. Building on the theory of planned behaviour (TPB) and a cognitive view on entrepreneurial opportunities, a model for opportunity-specific entrepreneurial intention formation is developed and tested in the context of sustainable entrepreneurship. The overall theoretical framework and the connections examined in the thesis are presented below (Figure 1).



**Figure 1:** Theoretical framework of the thesis

The theoretical framework for the thesis proposes an opportunity-specific intention model, which includes three sets of factors. First, opportunity-specific entrepreneurial intentions describe intentions towards a particular type of entrepreneurial opportunity and hence reflect the goal to become a particular type of entrepreneur. Second, opportunity-specific attitudes reflect an individual's perception regarding a particular entrepreneurial

opportunity and its characteristics, while general attitude towards entrepreneurship describes an individual's perceptions about the attractiveness and feasibility of an entrepreneurial career. Third, individual-level antecedents include individual characteristics such as demographic factors, general self-efficacy and work values.

The model proposes several connections between different factors. First, opportunity-specific entrepreneurial intentions are driven by opportunity-specific attitude and general attitude towards entrepreneurship. Second, general attitude towards entrepreneurship and opportunity-specific attitude are driven by individual antecedents. To highlight the need to introduce an individual-opportunity nexus into intention research, the opportunity-specific intention model is contrasted with a general entrepreneurial intention model in the context of sustainable entrepreneurship. Sustainable entrepreneurship differs from conventional forms of entrepreneurship by focusing on three types of value creation, namely economic, social and environmental value creation (Hall et al., 2010; Patzelt and Shepherd, 2011; Schaltegger and Wagner, 2011; Shepherd and Patzelt, 2011; Tilley and Young, 2009), and as a result, individuals pursuing career as an entrepreneur with sustainable focus through sustainable entrepreneurial opportunities tend to differ from conventional entrepreneurs in terms of motivations and values (Shepherd, 2015; Shepherd and Patzelt, 2017). By including opportunity-specific attitude as a driver, namely attitude towards sustainability, and examining how the influence of individual-level factors differ between opportunity-specific attitude and general attitude towards entrepreneurship, the opportunity-specific intention model is used to provide new insights about the connection between perception of entrepreneurial opportunities and entrepreneurial intentions.

### 1.3 Research problem and research questions

The phenomenon of entrepreneurship is not confined to the practices of economic entities but rather also relates to an individual's behavioural characteristics (Wennekers and Thurik, 1999). Entrepreneurial behaviour requires two things—an entrepreneurial opportunity and an individual who recognises, evaluates and exploits that entrepreneurial opportunity (Shane and Venkataraman, 2000). Hence, entrepreneurial behaviour originates from an individual but is actualised through ventures. As a result, enterprising individuals and entrepreneurial opportunities have been the focus of entrepreneurship research since Shane and Venkataraman (2000) proposed their meaning to the field. This study examines the nexus of three research fields, namely entrepreneurial intentions, entrepreneurial opportunities and sustainable entrepreneurship. Entrepreneurial opportunities and intentions are important factors in shaping the first steps towards becoming an entrepreneur. Entrepreneurial intentions predict entrepreneurial behaviour (Kautonen et al., 2015), while knowledge structures describing entrepreneurial opportunities are suggested to be key in entrepreneurial opportunity recognition, which is the first step in the entrepreneurship process (Renko et al., 2012; Baron, 2004).

Entrepreneurial opportunity literature is still emerging (Dimov, 2007; Hill and Birkinshaw, 2010), and as a result of confusion regarding the nature and definition of entrepreneurial opportunities (Hansen et al., 2011), entrepreneurial opportunity research has been struggling to systematically build on prior theorising about entrepreneurial opportunities and test the proposed theories (Vogel, 2017). Early research on entrepreneurial opportunities was characterised by debate regarding the nature of entrepreneurial opportunities, whether they are discovered or created (Alvarez and Barney, 2007). The discovery theory suggests that individuals with unique information are able to discover objective entrepreneurial opportunities (Shane and Venkataraman, 2000), while the creation theory postulates that individuals create opportunities through interaction with the surrounding environment, and hence entrepreneurial opportunities are subjective (Alvarez and Barney, 2007). This on-going debate has caused problems for the entrepreneurship literature. Entrepreneurial opportunity is an elusive concept, and hence, entrepreneurial opportunities are seen as difficult or even impossible to measure (Dimov, 2011; Davidsson, 2015). To overcome these issues, a cognitive view on entrepreneurial opportunities has emerged.

According to the cognitive view, entrepreneurial opportunities emerge when individuals combine seemingly unrelated pieces of information to form a pattern in their minds (Baron and Ward, 2004; Baron, 2006; Barreto, 2012). Despite the debate about the nature and definition of entrepreneurial opportunities, the research on entrepreneurial opportunities agrees on one matter—it is practically impossible to measure entrepreneurial opportunities *ex ante* due to uncertainty (Shepherd and Patzelt, 2017). Hence, it is only possible to measure perceptions of entrepreneurial opportunities and opportunity belief (Dimov, 2007; Shepherd and Patzelt, 2017). Regardless of the progress made in entrepreneurial cognition research, it seems that only limited attention has been paid to the origins of cognitive variables; instead this research has focused on how different aspects of entrepreneurial cognition influence entrepreneurial outcomes (Gregoire et al., 2011; Gregoire et al., 2015).

Second, the development of entrepreneurial intention is the underlying assumption behind entrepreneurial behaviour (Douglas 2013), and hence opportunity, motive and means are required for entrepreneurial behaviour to occur (McMullen and Shepherd, 2006). However, the connection between these three concepts has remained only as underlying assumptions in TPB, and as a result this theory has been criticised for not explicitly containing motivational aspects and perceptions of entrepreneurial opportunities (Brännback et al., 2007), although a connection between deep beliefs (e.g., values), knowledge structures, attitudes and intentions has been proposed by Krueger (2007). As a result, the need to enhance entrepreneurial intention research by examining the connection between different knowledge structures and entrepreneurial intentions has been proposed in the entrepreneurial intention literature (Fayolle and Liñan, 2014).

Entrepreneurship research has not clarified how perceptions of entrepreneurial opportunities and entrepreneurial intentions are connected. To examine this connection, focus is directed to opportunity-specific entrepreneurial intentions and attitudes, with the

intention of overcoming the deficiencies of TPB. Hence, this doctoral thesis aims to bring the opportunity-individual nexus into intention formation, and based on that aim, the main research question is formulated as follows:

RQ: How are perceptions of entrepreneurial opportunities and entrepreneurial intentions connected?

To answer the main research question and focus the research specifically on sustainable entrepreneurship and young adults, three sub-questions were formed. The sub-questions deal with three perspectives, (1) nature, (2) drivers and (3) temporal stability related to opportunity-specific attitudes and entrepreneurial intentions among young adults in the context of sustainable entrepreneurship.

First, attitudes play an important role in shaping individuals' perceptions about entrepreneurial opportunities and entrepreneurial intentions. Attitudes towards entrepreneurship (perceived entrepreneurial desirability (PED) and feasibility (PEF)) are the key drivers in entrepreneurial intention formation (Krueger et al., 2000). The emergence of purpose-driven entrepreneurship, such as sustainable and social entrepreneurship, has further highlighted the need for opportunity- or context-specific attitudinal components in entrepreneurial intention formation (Liñan and Fayolle, 2015) because TPB emphasises intentions towards a specific behaviour, and context plays an important role (Ajzen, 1991). Hence, a concept of opportunity-specific attitude is proposed, which describes an individual's disposition towards a particular opportunity-type. Sustainable entrepreneurship research is still emerging, and as a result, there is insufficient knowledge about the drivers of sustainable entrepreneurship (Shepherd and Patzelt, 2011; Muñoz and Dimov, 2015). Moreover, only limited attention has been paid to triple goal setting in sustainable entrepreneurship, and the focus of prior sustainable entrepreneurship literature has been on social and environmental value creation (Kuckertz and Wagner, 2010; Zahra et al., 2009). In the context of sustainable entrepreneurship, attitude towards sustainability would represent an opportunity-specific attitude, while general entrepreneurial attitudes reflect an individual's disposition towards the economic value creation. Simultaneously, young adults (Generation Y) are seen as more entrepreneurial as well as socially and environmentally conscious (Hewlett et al., 2009; Deloitte, 2017). It seems that sustainable entrepreneurship would provide young adults an avenue to actualise their values and attitude towards sustainability.

Furthermore, regardless of the attention paid to entrepreneurial opportunity recognition and evaluation, descriptions of entrepreneurial opportunities have tended to focus on conventional attributes of opportunities, namely novelty, risks and economic value potential. As a result, only limited attention has been given to alternative forms of value creation (e.g., Shepherd et al., 2013). However, the emergence of purpose-driven

entrepreneurship has showed that entrepreneurs do not primarily focus on economic value but rather aim to create other types of value also for themselves and other stakeholders (Shepherd et al., 2015). Hence, it seems that knowledge structures describing entrepreneurial opportunities do not reflect the variance in types of entrepreneurship.

As mentioned above, purpose-driven entrepreneurship (for example social and sustainable entrepreneurship) has turned attention towards the drivers associated with opportunity-specific entrepreneurial intention formation. Young adults (between 18 and 34 years-old) today seem to differ from previous generations in terms of their values. However, it remains unclear whether age influences opportunity-specific attitudes, and as a result, there is a need to examine the type of opportunity-specific attitudes young adults have. In other words, there is a lack of understanding whether age plays a role in opportunity-specific attitudes. Based on the discussion above, the following sub-question is formulated:

SRQ1: What kind of opportunity-specific attitudes do young adults hold?

Second, a need to study entrepreneurial intentions to engage in a particular type of entrepreneurship has been recognised in the entrepreneurial intention literature (Liñan and Fayolle, 2015). TPB has been criticised for not explicitly including entrepreneurial opportunities and motivations in entrepreneurial intention formation (Brännback et al., 2007; Jarvis, 2016). Moreover, willingness to act on a specific entrepreneurial opportunity can be described through entrepreneurial intentions (Dimov, 2007), suggesting that recognised entrepreneurial opportunity attributes ought to be taken into consideration in entrepreneurial intention formation.

Changes in the role of and demands for entrepreneurship have influenced the entrepreneurship research. There has been an emergence of studies focusing on different types of purpose-driven entrepreneurship. Among these, social entrepreneurship research has been growing rapidly, while, as mentioned above, research on sustainable entrepreneurship is still emerging (Shepherd and Patzelt, 2011; Muñoz and Dimov, 2015). However, despite increased academic interest, consensus about the definitions of each types of purpose-driven entrepreneurship is still lacking. As a result, purpose-driven entrepreneurship research has progressed only recently (e.g. Muñoz and Dimov, 2015; Hockerts, 2017). Additionally, the majority of purpose-driven entrepreneurship research has been qualitative, focusing on describing the nature of sustainability-driven enterprises and entrepreneurs. Few studies (e.g. Kuckertz and Wagner, 2010; Nga and Shamuganathan, 2010; Hockerts, 2015; Hechavarria et al., 2017) have utilised quantitative methods to study sustainable entrepreneurship.



Prior research has tended to focus on different aspects of value creation (Dixon and Clifford, 2007; Spence et al., 2010; Hechavarria et al., 2017) and their impact (Shepherd et al., 2009; Parrish, 2010; Shepherd et al., 2013). At the enterprise level, purpose-driven entrepreneurship research has examined areas such as organisational design and type of capital employed (Parrish, 2010; Mair et al., 2012; Liu et al., 2015), as well as the role of institutions in enabling purpose-driven entrepreneurship (Spence et al., 2010; Desa, 2012). There is only limited evidence about creation of purpose-driven ventures, such as sustainable ventures. Prior research has shown that social entrepreneurial opportunities emerge from a spark notion and are developed further (Corner and Ho, 2010), while others have examined the business practises of sustainable entrepreneurs throughout venture development (Choi and Gray, 2008). More recently, Muñoz and Dimov (2015) recognised individual-level factors such as perceptions, sustainable orientation and sustainable entrepreneurial intentions to be associated with new sustainable venture ideas, objectives for sustainable action and sustainability-driven exchange relationships. However, there is only limited evidence about the drivers of entrepreneurial intention in purpose-driven entrepreneurship (Kuckertz and Wagner, 2010; Nga and Shamuganathan, 2010; Hockerts, 2017).

Moreover, the emergence of purpose-driven entrepreneurship has turned attention towards the underlying motivations that are associated with sustainable entrepreneurship. Prior research has proposed that positive attitudes towards the environment (Schultz and Zelezny, 1999; Hockerts, 2017), entrepreneurial intentions through attitudes towards entrepreneurship (Mair and Noboa, 2006; Smith et al., 2010), and the probability of recognising opportunities in sustainable development (Patzelt and Shepherd, 2011) are connected to different altruistic values such as universalism, altruism and empathy. Recently, a need to examine values associated with sustainable entrepreneurship has been raised (Gast et al., 2017). In addition to values and motivations, entrepreneurial attitudes and intentions have been connected to several individual-level antecedents such as knowledge, demographic factors and self-efficacy.

Entrepreneurial opportunity recognition is associated with knowledge differences. Differences in human capital are connected to the ability to recognise and evaluate entrepreneurial opportunities (Venkataraman, 1997; Shepherd et al., 2015). In other words, the perceived attractiveness of an entrepreneurial opportunity is partially dependent on what is known about that opportunity. There are two types of knowledge, special interest knowledge and work experience knowledge, associated with the recognition of entrepreneurial opportunities (Sigrist, 1991, in Ardichvili et al., 2003, p. 114). In the context of purpose-driven entrepreneurship, knowledge about social, environmental and sustainability issues surrounding community and environment are proposed to be connected to opportunity recognition and its likelihood (Foley, 2003; Robinson, 2006; Patzelt and Shepherd, 2011; Prahalad, 2010). Conversely, business experience has been found to weaken the relationship between sustainability orientation and entrepreneurial intention (Kuckertz and Wagner, 2010). Hence, there seems to be some controversy in the role of knowledge as a driver of opportunity-specific entrepreneurial attitudes and intentions in the context of sustainable entrepreneurship.

Despite identifying purpose-driven entrepreneurship as being driven by factors other than conventional entrepreneurship, there is still only limited understanding of entrepreneurial intention formation in social entrepreneurship (e.g., Hockerts, 2017; Mair and Noboa, 2003; Nga and Shamuganathan, 2010; Urban and Kujinga, 2017) and even less in sustainable entrepreneurship (e.g., Kuckertz and Wagner, 2010; Muñoz and Dimov, 2015). Similarly, entrepreneurial opportunities have aroused only limited interest in the sustainable entrepreneurship literature (Hanohov and Baldacchino, 2017). Furthermore, attention should be paid to similarities and differences in mental models connected to socially- and environmentally-oriented decision-making (Muñoz, 2017). Hence, it seems that the existing intention models are unable to answer the call for opportunity-specific entrepreneurial intention research, and as a result, the intersection between entrepreneurial opportunities and entrepreneurial intentions in sustainable entrepreneurship remains unexplored. The following research question summarises the research problem described above:

SRQ2: What are the drivers of opportunity-specific entrepreneurial attitudes and intentions in sustainable entrepreneurship?

Third, entrepreneurial cognition has been perceived as a stable, trait-like condition in the entrepreneurship literature (Gregoire et al., 2015). Prior entrepreneurship research has tended to examine knowledge structures in a particular moment in time (e.g., Haynie et al., 2009; Gruber et al., 2015). However, knowledge structures have been recognised to develop over time as a result of learning through experience, and hence entrepreneurial cognition is perceived to be dynamic (Baron and Ensley, 2006; Krueger, 2007; Gregoire et al., 2015). As a result, there is a need to examine change in entrepreneurial cognition (Gregoire et al., 2015). The following sub-question is formulated based on the discussion above:

SRQ3: How do opportunity-specific attitudes change?

The summary of the research questions and corresponding publications that contribute to answering them are presented in Table 1 below.

**Table 1:** Summary of research questions, theoretical foundation and contributions

Research question	Publication	Theoretical foundation	Contribution
What kind of opportunity-specific attitudes do young adults hold?	I, IV	Generation subculture and life stage theory  Cognitive view on entrepreneurial opportunities	<ul style="list-style-type: none"> <li>- Individuals tend to hold multiple value creation goals</li> <li>- Young adults are more prone towards sustainable entrepreneurship than older adults</li> <li>- Dominant goal within sustainable entrepreneurship differs; young adults prone to hold economically and socially oriented sustainable entrepreneurial goals</li> <li>- Four types of entrepreneurial opportunity templates (EOTs) are identified</li> </ul>
What are the drivers of entrepreneurial attitudes and intentions in sustainable entrepreneurship?	I, II & III	Generation subculture and life stage theory  TPB  The role of knowledge	<ul style="list-style-type: none"> <li>- Demographic factors influence the odds of having a sustainable entrepreneurial attitude</li> <li>- Socially oriented entrepreneurial intentions and general entrepreneurial intentions are driven by different types of knowledge and work values</li> <li>- Altruism drives social entrepreneurial goals and socially oriented entrepreneurial intentions</li> <li>- Entrepreneurial experience “cancels out” the positive influence of environmental knowledge</li> <li>- There seems to be a connection between EOTs, intentions, attitudes and work values</li> </ul>
How do opportunity-specific attitudes change?	V	Opportunity development  Cognitive view on entrepreneurial opportunities	<ul style="list-style-type: none"> <li>- Connection between change in EOT and new venture ideas were identified</li> <li>- Changes in EOTs and new venture ideas are align</li> <li>- Evidence about entrepreneurial opportunity development</li> </ul>

## 1.4 Scope and key definitions

This research is nested at the intersection of three distinct research streams of the entrepreneurship literature, namely entrepreneurial intentions, the cognitive view on entrepreneurial opportunities and sustainable entrepreneurship. The research focuses on the individual-opportunity nexus and aims to integrate it into entrepreneurial intention research by introducing a model for opportunity-specific entrepreneurial intentions. This doctoral thesis builds on TPB as a model for intention formation because TPB reflects intention formation in a particular context, and there is evidence of its extension and applicability in the context of social entrepreneurship. Moreover, the thesis focuses on the cognitive view of entrepreneurial opportunities. Although there are two other dominant perspectives on entrepreneurial opportunities (discovery and creation theory), the cognitive perspective overcomes the measurement issues present in other views on entrepreneurial opportunities (Dimov, 2011; Davidsson, 2015). Following the cognitive view on entrepreneurial opportunities enables the integration of the individual-opportunity nexus and entrepreneurial intentions, and the development of an opportunity-specific intention model.

As a result of the theoretical choices made in this doctoral thesis, entrepreneurial opportunities and entrepreneurship are defined as follows. Following the cognitive view, entrepreneurial opportunities remain only potential opportunities formed in the mind of an individual by combining external changes into patterns; by exploiting that potential opportunity, it is possible to determine whether it was an actual opportunity or not. As a result, only perceptions of entrepreneurial opportunities and opportunity belief can be measured in opportunity recognition. Hence, entrepreneurship is defined as a process leading to entrepreneurial action through which individuals recognise, develop and exploit potential entrepreneurial opportunities (Shane and Venkataraman, 2000; Bakker and Shepherd, 2017).

The doctoral thesis centres on four key concepts: entrepreneurial opportunity templates, opportunity-specific attitudes, entrepreneurial intentions and sustainable entrepreneurship. These concepts are defined and discussed in more detail below.

### *Entrepreneurial opportunity template*

Entrepreneurial opportunity templates (EOTs) are organised knowledge structures that describe an individual's perception of entrepreneurial opportunities and their composition (Walsh, 1995; Barreto, 2012). In this doctoral thesis, EOTs are seen to comprise several *opportunity-specific attitudes*. Opportunity-specific attitudes reflect an individual's view on the attributes of an entrepreneurial opportunity. In other words, EOTs describe through opportunity-specific attitudes how important different attributes of an entrepreneurial opportunity are perceived to be.

*Entrepreneurial intentions*

Ajzen (1991) has defined intentions as indications of an individual's perseverance and effort towards performing a given behaviour. In other words, intentions describe the motivational aspects affecting a particular behaviour by indicating how hard individuals are aiming to work to perform that behaviour and how long they are willing to try to succeed in it. In the context of entrepreneurship, entrepreneurial intentions refer to the level of intention to start a new venture (Krueger, 2009).

*Opportunity-specific entrepreneurial intentions* reflect the level of entrepreneurial intentions oriented towards particular types of perceived entrepreneurial opportunity, for example, sustainability-oriented entrepreneurial intentions. Hence, opportunity-specific entrepreneurial intentions reflect an individual's willingness to start a particular type of a new venture.

*Sustainable entrepreneurship*

Sustainable entrepreneurship is a particular type of entrepreneurship aimed at the triple bottom line by creating social, environmental and economic value (Hall et al., 2010; Schaltegger and Wagner, 2011; Tilley and Young, 2009). Sustainable entrepreneurship aims at recognising, whether by discovering or creating, and exploiting entrepreneurial opportunities that enable the sustenance of nature and community, as well as value generation for self and others through creation of new products and services (Patzelt and Shepherd, 2011; Shepherd and Patzelt, 2011).

Sustainable entrepreneurship is defined broadly in this doctoral thesis; it covers those forms of entrepreneurship that aim to create economic and non-economic value, whether social, environmental or both. However, one or two of these values can be more dominant, but the dominance of a particular value may change as a result of business development. Sustainable entrepreneurship as a concept is closely related to social and environmental entrepreneurship, and these two have been proposed to fit under the concept of sustainable entrepreneurship (Dean and McMullen, 2007). Environmental entrepreneurship is seen as a special form of sustainable entrepreneurship that focuses on environmental and economic value creation. However, the connection between social entrepreneurship and sustainable entrepreneurship is more complex. Social entrepreneurship aims at social value creation through a social mission (Dacin et al., 2011; Dart, 2004), although the inclusion of economic value creation as an aim for social entrepreneurship depends on whether it is defined broadly or narrowly (Thompson, 2002; Austin et al., 2006). Hence, forms of social entrepreneurship that aim at both social and economic value creation can be included under the concept of sustainable entrepreneurship.

By defining sustainable entrepreneurship broadly, for-profit social entrepreneurship is seen as a specific form of sustainable entrepreneurship. As a result, two concepts are used

for opportunity-specific entrepreneurial intentions and goals in the context of sustainable entrepreneurship: 1) socially- and sustainably-oriented entrepreneurial intentions and 2) social entrepreneurial goals and sustainable entrepreneurial goals. In this doctoral thesis, social and sustainable, and socially-oriented and sustainably-oriented are utilised interchangeably to describe the same opportunity-specific phenomenon. As a result, the two types of entrepreneurial goals and intentions actually measure the same phenomenon, opportunity-specific entrepreneurial goals and intentions. Sustainable entrepreneurship provides the research context in which opportunity-specific entrepreneurial intentions and attitudes are examined. However, this context also confines the research findings to sustainable entrepreneurship. The context of sustainable entrepreneurship was chosen for two reasons. First, sustainable entrepreneurship is a specific form of entrepreneurship that differs from conventional views on entrepreneurship, allowing a demonstration of the shortcomings of existing intentions models. Second, sustainable entrepreneurship aims to create three types of value that are connected to different attitudes and values, and hence exist in complex combinations of values and attitudes.

This doctoral research is limited to the context of university students. This population was chosen based on results of recent research regarding young adults and their values. A recent international study by Deloitte (2017) shows that young adults tend to hold values that are in line with sustainable entrepreneurship and that they are concerned about global environmental issues, which could be solved or influenced through sustainable entrepreneurship. The context of the doctoral work is further supported by the findings of publication I, which shows that young adults with a high education level are more likely to hold sustainable entrepreneurial goals than commercial entrepreneurial goals in countries with postmaterialist values. Hence, university students represent a promising population for examining sustainable entrepreneurship and sustainably-oriented entrepreneurial intentions.

## 1.5 Contribution

The thesis contributes to literature on entrepreneurial intentions, entrepreneurial opportunities and sustainable entrepreneurship. First, the thesis contributes to the entrepreneurship literature by introducing an opportunity-specific entrepreneurial intentions model, which takes into account opportunity-specific attitudes and general attitudes towards entrepreneurship. Additionally, the research includes work values as drivers of entrepreneurial and opportunity-specific attitudes. Existing entrepreneurial intentions models have tended to include motivational factors and entrepreneurial opportunities only implicitly: hence, the proposed opportunity-specific entrepreneurial intention model extends our understanding of entrepreneurial intention formation. Second, the doctoral thesis extends entrepreneurship research regarding the cognitive view on entrepreneurial opportunities. A novel typology for EOTs, which reflects different entrepreneurship types and variation in entrepreneurial opportunities, is

proposed and tested among young adults. The typology has a strong connection to prior entrepreneurship research—it was developed based on entrepreneurship literature focusing on the cognitive view of entrepreneurial opportunities and different forms of entrepreneurship. Prior research on knowledge structures of entrepreneurial opportunities has not found conceptual consensus and has tended to focus on conventional attributes of entrepreneurial opportunities. Hence, the thesis contributes to entrepreneurship research by extending the attributes of entrepreneurial opportunity perceptions beyond conventional characteristics of entrepreneurship. Third, prior entrepreneurship literature has tended to treat entrepreneurial cognition as stable (Gregoire et al., 2015), although the results of prior research regarding perceptions of entrepreneurial opportunities have shown that they develop over time (Baron and Ensley, 2006; Krueger, 2007; Gregoire et al., 2015). The thesis contributes to the entrepreneurship literature by answering a call for research about change in entrepreneurial cognition (Gregoire et al., 2015) and potential entrepreneurial opportunities (Shepherd, 2015).

The sustainable entrepreneurship literature has been suggested to need further examination of cognitive conditions associated with development of new ventures and whether mental models possessed by founders leading to socially- and environmentally-oriented decision-making differ from and resemble other mental models (Muñoz, 2017). Furthermore, entrepreneurial opportunities and their recognition has received only limited attention in sustainable entrepreneurship (Hanohov and Baldacchino, 2017). This thesis extends sustainable entrepreneurship research in three ways. First, applying the opportunity-specific intention model to sustainable entrepreneurship provides new insights about the drivers of sustainability-oriented entrepreneurial intentions. Second, the findings of the thesis highlight the importance of the connections between values, attitudes and intentions, and simultaneously demonstrate the complex combination of value creation aims in sustainable entrepreneurship. There is a clear connection between altruistic values, attitudes towards sustainability and sustainability-oriented entrepreneurial intentions. Similarly, an individual's emphasis on extrinsic rewards increases perceived entrepreneurial desirability, which in turn enhances the level of sustainability-oriented entrepreneurial intention. Third, the findings regarding EOTs also extend our understanding of sustainable entrepreneurship by showing how sustainable value creation is positioned in relation to other attributes of entrepreneurial opportunities, and the association between a particular EOT, entrepreneurial attitudes and entrepreneurial intentions.

## 1.6 Structure of the thesis

The thesis is divided into two parts, an overview and original publications. The table below summarises the structure of the thesis and shows connections between the original publications and sub-questions of the research.

**Table 2:** Structure of the doctoral thesis

<b>PART 1 – OVERVIEW</b>	
Chapter 1	Research motivation, gap, objective and questions
Chapter 2	Theoretical base of the study focusing on cognitive view of entrepreneurial opportunities, the TPB and sustainable entrepreneurship
Chapter 3	Research design and justification for methodological choices
Chapter 4	Summary of the results
Chapter 5	Summary of the contribution, limitations and suggestion for future research
<b>PART 2 – ORIGINAL PUBLICATIONS</b>	
Publication I	SRQ1: What kind of opportunity-specific attitudes do young adults hold?  SRQ2: What are the drivers of opportunity-specific entrepreneurial attitudes and intentions in sustainable entrepreneurship?
Publication II	SRQ2: What are the drivers of opportunity-specific entrepreneurial attitudes and intentions in sustainable entrepreneurship?
Publication III	SRQ2: What are the drivers of opportunity-specific entrepreneurial attitudes and intentions in sustainable entrepreneurship?
Publication IV	SRQ1: What kind of opportunity-specific attitudes do young adults hold?
Publication V	SRQ3: How do opportunity-specific attitudes change?

Publication I examines the first sub-question regarding different opportunity-specific attitudes related to value creation, while publication IV takes a broader view on opportunity-specific attitudes. Regarding the second sub-question, publication I focuses on demographic and cultural factors as drivers of opportunity-specific attitudes related to



value creation, while publication II examines the effects of work values, perceived knowledge level and self-efficacy on opportunity-specific entrepreneurial intentions in sustainable entrepreneurship and general entrepreneurial intentions. Furthermore, publication III applies an opportunity-specific entrepreneurial intention model to sustainable entrepreneurship and hence examines both the antecedents of opportunity-specific attitudes and entrepreneurial intentions. Publication V focuses on changes in opportunity-specific attitudes utilising the opportunity-specific attitudes identified in publication IV.

The thesis continues as follows. First, the theoretical foundation of the doctoral thesis is discussed by presenting the cognitive view on entrepreneurial opportunities, the TPB and the connections between entrepreneurial intentions and opportunities. Next, sustainable entrepreneurship and its connections to entrepreneurial intentions and entrepreneurial opportunities is explored. This is followed by an introduction to the methodology and a justification for the methodological choices made in the thesis. Moreover, descriptions of the questionnaire design, measurements and data samples are provided. Then, the objectives and results of the five original publications are presented, followed by the conclusions. This section includes answers to each research question, an elaboration of the theoretical contribution of the thesis, implications for practitioners, the research limitations and suggestions for future research. Lastly, the five original publications are presented.



## **2 Theoretical points of departure**

This research focuses on entrepreneurial cognition by examining the role of entrepreneurial opportunities in entrepreneurial intention formation through entrepreneurial opportunity templates, particularly in the context of sustainable entrepreneurship. Hence, the objective of this research provides the motivation for the theoretical choices made. The research builds on four theories from cognition research, namely pattern recognition theory, signal detection theory, regulatory focus theory and TPB. The main focus is on pattern recognition theory and TPB, while signal detection theory and regulatory focus theory are used to describe how entrepreneurial opportunity recognition occurs and the role of the cognitive framework in opportunity recognition. The context of sustainable entrepreneurship provides unique characteristics to these theoretical views, and as a result, it is also incorporated in the theoretical discussion.

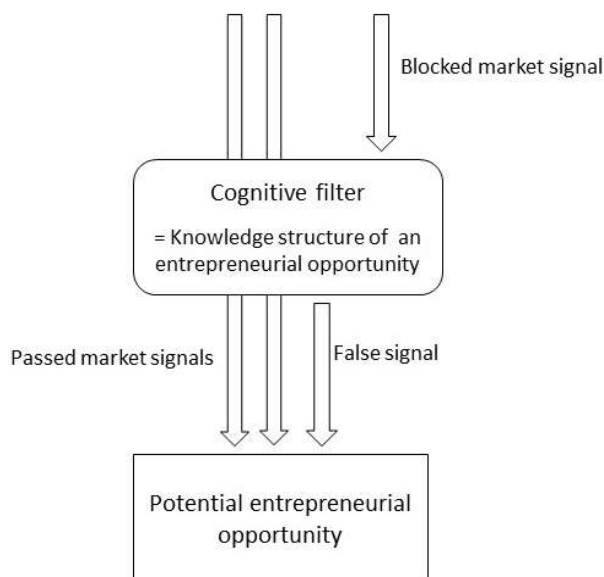
This chapter begins by describing the cognitive view on entrepreneurial opportunity recognition and entrepreneurial opportunities; it also presents the findings of prior entrepreneurial cognition literature regarding mental models. The subsequent sections present TPB, the extended intentions models and sustainable entrepreneurship. Lastly, the positioning of the study in the intersection of three literature streams and each original publication in relations to the theoretical framework are presented.

### **2.1 The cognitive view on entrepreneurial opportunities and their recognition**

The cognitive view on entrepreneurial opportunities and their recognition is based on three theories of cognition: pattern detection theory, signal detection theory and regulator focus theory (Baron, 2004). Pattern detection theory suggests that several external events in the world catch individuals' attention, and by utilising experience-based cognitive frameworks, individuals decide whether there is a connection between these events, and hence notice a pattern (Baron, 2006). Therefore, entrepreneurial opportunities emerge as individuals perceive coherent wholes in changes in the external environment such as developments in technology, markets, policies and demographics (Baron, 2006; Baron and Ward, 2004). This means that external changes can only be seen as potential entrepreneurial opportunities until one or more individuals recognises a pattern among them. These patterns are created in the minds of individuals.

Signal detection and regulatory focus theory relate to how individuals process external stimuli or signals (Baron, 2004). According to signal detection theory, there are two types of signals, "real" signals and false signals, and two distinct ways to process these signals, recognition and blocking. Regulatory focus theory proposes that individuals tend to have promotion or prevention focus when interpreting signals (Brockner et al., 2004). Individuals with promotion focus tend to highlight gains, and as a result, they aim to

balance the reality with the ideal by reinforcing their views about obtaining possible gains. Conversely, individuals with prevention focus avoid pain, which results in focusing on minimising the chance for losses in order to balance the ideal and reality. Combining pattern recognition and signal detection theory helps to explain entrepreneurial opportunity recognition. Entrepreneurial opportunity recognition, as a cognitive process, centres on cognitive frameworks in a form of mental models (Barreto, 2012; Renko et al., 2012; Gruber et al., 2015). Individuals utilise these mental models as knowledge filters through which actual market signals are processed and, as a result, perception of an entrepreneurial opportunity is created (Renko et al., 2012). More specifically, the recognition of potential entrepreneurial opportunities is about interpreting different market signals through knowledge structures that operate as perceptual filters (Baron, 2006; Barreto, 2012; Renko et al., 2012). Hence, individuals utilise and build on these knowledge structures, which are based on past experiences, when interpreting information to make decisions about whether something constitutes a potential entrepreneurial opportunity (Santos et al., 2015). Mismatch between a market signal and a knowledge structure results in a blocking of the market signal (Renko et al., 2012). However, occasionally these knowledge structures generate false signals in the form of biases, which are formed without actual market signals and hence shape the perception of an entrepreneurial opportunity. The process of signal detection and pattern recognition is depicted in Figure 2 below.



**Figure 2:** Signal detection and pattern recognition process (adopted from Renko et al., 2012)

## **2.1 The cognitive view on entrepreneurial opportunities and their recognition 37**

More recently, two additional views on entrepreneurial recognition, structural alignment theory (Gregoire et al., 2010) and interpretation (Barreto, 2012), have been proposed in the literature. Structural alignment theory proposes that when faced with new information, individuals tend to compare this new information to what they already know (Gregoire et al., 2010). This comparison occurs at two levels, namely attributes and connections between different attributes within a mental representation (Gentner, 1995; Gregoire et al., 2010). Similarly, interpretation refers to the process of translating surrounding or related information and events to make sense out of them (Daft and Weick, 1984). Hence, entrepreneurial interpretation is a process of deriving meaning from surrounding and related external and internal information shocks, which consist of incomplete and contradictory knowledge, by applying knowledge structures and simplification (Barreto, 2012). These two views on entrepreneurial recognition have clear connections to signal detection and pattern detection theory, described above.

Literature on entrepreneurial opportunity recognition has provided some empirical evidence about knowledge structures and how they change. For example, novice and experienced entrepreneurs have been found to differ in terms of their perceptions of an entrepreneurial opportunity (Baron and Ensley, 2006). Novice entrepreneurs tend to perceive entrepreneurial opportunities in a simpler manner than experienced entrepreneurs. Moreover, the difference in perception is reflected in the importance of perceived entrepreneurial opportunities' attributes. Experienced entrepreneurs focus on the viability and economic potential of the potential entrepreneurial opportunity through manageable risk, cash flow and ability to solve a customer's problem. Conversely, novel aspects and product superiority are attributes of potential entrepreneurial opportunities that are highlighted by novice entrepreneurs. Similarly, the results of opportunity development research show that solutions to customer problem and consumer segment are the most often developed aspects, while only limited attention is paid to developing the technology-related attributes of an entrepreneurial opportunity (Sanz-Velasco, 2006). More recently, likelihood of investment has been connected to economic value potential, knowledge relatedness (the similarity between required knowledge for entrepreneurial opportunity exploitation and possessed knowledge), opportunity timeframe and the perceived number of potential opportunities (Mitchell and Shepherd, 2010), while the decision to launch a new venture is positively influenced by the perceived distinctiveness and viability of an entrepreneurial opportunity (Santos et al., 2015).

Similarly, entrepreneurial opportunity evaluation literature on cognition has focused on mental models, the role of individual propensities, knowledge and experience in opportunity evaluation, stakeholders' influence on opportunity evaluation and opportunity evaluation as an indication of entrepreneurial action (Wood and McKelvie, 2015). Hence, the focus of research on cognitive views of entrepreneurial opportunities has been on the cognitive processes through which entrepreneurial opportunities are recognised. Different knowledge structures have thus been at the centre of cognition research regarding entrepreneurial opportunity recognition and evaluation. Entrepreneurial opportunity recognition and evaluation are interconnected (Shepherd and Patzelt, 2017), although they have different focus areas. Where entrepreneurial

opportunity recognition is about connecting separate pieces of information to perceive a potential opportunity (Baron and Ward, 2004; Baron, 2006), entrepreneurial opportunity evaluation focuses more on whether a recognised potential opportunity is something an entrepreneur is willing and capable to pursue (Shepherd and Patzelt, 2017). In both cases, the focus is on attributes of entrepreneurial opportunities.

The entrepreneurial cognition literature has discussed the knowledge structures describing entrepreneurial opportunities using several concepts. These include entrepreneurial opportunity template (Barreto, 2012), entrepreneurial opportunity prototype (Baron, 2006; Baron and Ensley, 2006; Santos et al., 2015), image of an opportunity (Mitchell and Shepherd, 2011) and perceived entrepreneurial opportunity (Renko et al., 2012). For example, entrepreneurial opportunity templates are mental templates comprised of structured knowledge related to a particular information entity, through which individuals give meaning to that information domain (Dutton and Jackson, 1987; Walsh, 1995). Prototypes refer to sets of patterns that describe the essential nature of an object or concept (Baron, 2006), while an image is a script-like information structure that describes the content and process of an actor's performance (Gioia and Poole, 1984; Mitchell and Shepherd, 2011). The mental model concepts used in the entrepreneurship literature seem to essentially refer to the same notion, organised knowledge structures, which are utilised by individuals to understand the complex world around them (Dutton and Jackson, 1987; Baron and Ensley, 2006; Barreto, 2012).

As described above, an EOT is a knowledge template that depicts how an individual perceives an entrepreneurial opportunity (Walsh, 1995; Barreto, 2012). More specifically, EOTs act as lenses through which individuals create perceptions about the world (Baron, 2006; Renko et al., 2012). Hence, individuals perceive potential entrepreneurial opportunities through EOTs. EOTs also explain why some individuals are attracted to entrepreneurial opportunities and others tend to ignore these opportunities (Gruber et al., 2015). Additionally, the composition of entrepreneurial opportunity attributes is reflected through EOTs, and this composition depicts the nature of entrepreneurial opportunities. The entrepreneurship literature has identified several attributes for knowledge structures describing entrepreneurial opportunities, such as novelty, growth potential, riskiness and economic value potential (e.g., Baron and Ensley, 2006; Haynie et al., 2006; Gruber et al., 2015; Santos et al., 2015). These attributes reflect the conventional definition of entrepreneurship; however, they do not take into account different forms of entrepreneurship such as high-impact, international and sustainable entrepreneurship. Only limited attention has been paid to growth and impact potential (e.g., Haynie et al., 2009; Gruber et al., 2015), as well as the scope of the market (Zahra et al., 2005; Companys and McMullen, 2007; Gruber et al., 2015), although growth, high-impact and international entrepreneurship have been recognised as a distinct forms of entrepreneurship (Zahra et al., 2005; Acs, 2010). Similarly, alternative value creation potentials, namely social and environmental value potential, have not been included as attributes in knowledge structures (Shepherd et al., 2013). However, more recently, the inclusions of different aspects of value creation as attributes of entrepreneurial

opportunity has been proposed (Shepherd et al., 2015). A more detailed review of knowledge structures attributes is presented in publication IV.

## 2.2 Entrepreneurial intentions

Entrepreneurial behaviour is described as intentional behaviour that is predicted via entrepreneurial intentions (Krueger et al., 2000; Tegtmeier, 2006). Entrepreneurial intentions reflect an individual's willingness and readiness to make an effort to become an entrepreneur (Ajzen, 1991; Krueger, 2009). As a result, the decision to start a business has been found to be influenced by entrepreneurial intentions (Liñán and Chen, 2009; Peterman and Kennedy, 2003). In other words, the development of entrepreneurial intentions underlies entrepreneurial behaviour (Douglas, 2013). Hence, for entrepreneurial behaviour to occur, a combination of opportunity, motive and means is needed (McMullen and Shepherd, 2006).

Research on entrepreneurial intention has mainly relied on two models, TPB and the model of entrepreneurial event; this research has provided evidence about the applicability of these models in entrepreneurship in multiple contexts (Krueger and Brazeal, 1994; Kolvereid, 1996; Krueger et al., 2000; Autio et al., 2001; Souitaris et al., 2007; Kuehn, 2008; van Gelderen et al., 2008; Liñán and Chen, 2009; Thompson, 2009; Liñán et al., 2011; De Clercq et al., 2013; Wurthmann, 2014; Liñán and Fayolle, 2015). There is contradictory evidence supporting the advantage of one model over the other—while Krueger et al. (2000) showed that the model of entrepreneurial event better explains the variance in entrepreneurial intentions, more recently, Schlaegel and Koenig (2014) have suggested the opposite. Conversely, combining these two models seems to overcome this debate, because using a model, in which TPB drives the model of entrepreneurial event, explains variance in entrepreneurial intentions better than either of the models can alone (Schlaegel and Koenig, 2014). While the drivers of entrepreneurial intentions have gained considerable attention, only a handful of the entrepreneurial intention research has examined the intentions-behaviour relationship (e.g., Kautonen et al., 2015). In the 2000s, entrepreneurial intention research has tended to focus on five categories: core entrepreneurial intention models, the impact of the personal-level variable, context and institutions, entrepreneurial education and entrepreneurial process (Liñán and Fayolle, 2015). Recently, entrepreneurial intention research has included alternative antecedents for entrepreneurial intentions such as cognitive and metacognitive cultural intelligence, as well as bicultural identity integration (Dheer and Lenartowicz, 2016).

This doctoral thesis primarily builds on the TPB, which is discussed in more detail below. However, following the results of Krueger et al. (2000), subjective norms were not included in the developed entrepreneurial intention model for sustainable entrepreneurship as a result of the context of the study and findings of the

entrepreneurship literature. Hence, following the entrepreneurship research, the three concepts describing perception of the ability to perform a given task, namely PEF, entrepreneurial self-efficacy, and perceived behavioural control are treated as equal in this thesis, since they have been proposed to depict fundamentally the same issue (Krueger and Brazeal, 1994; Liñan et al., 2011). Moreover, PED has been proposed to encompass both attitude-toward-the-act and subjective norms (Krueger et al., 2000). As a result, following TPB and the existing entrepreneurial intention literature, in this thesis, general attitude towards entrepreneurship consists of PEF and PED. Moreover, PED as a general attitudinal component and opportunity-specific attitude reflect attitude-toward-the-act (see Figure 1). Moreover, perceived entrepreneurial desirability and feasibility together with attitude toward sustainability are proposed to be the drivers of opportunity-specific entrepreneurial intentions.

### 2.2.1 Theory of planned behaviour

TPB describes and predicts human behaviour over which individuals have limited intentional control in a particular context (Ajzen, 1991). An example of such behaviour is entrepreneurship. Entrepreneurial behaviour is partially dependent on an individual's own will; however, it is also dependent on external events that are not controlled by the individual. The focal point of TPB is the concept of intentions, which indicate an individual's willingness and perseverance to perform a particular behaviour, and as such reflects the motivation towards the behaviour (Ajzen, 1991). Hence, an individual is more likely to perform the behaviour in question when intention towards that behaviour is strong. TPB proposes that intentions towards an act are driven by three factors, attitude-toward-the-act, subjective norms and perceived behavioural control. Attitude-toward-the-act describes the degree to which an individual perceives the behaviour in question to be favourable or unfavourable, while perceived behavioural control depicts the degree to which an individual perceives performing the behaviour as easy or difficult, i.e., perceived feasibility. Subjective norms refer to the degree to which the behaviour is perceived to be socially acceptable or not. Hence, intentions to perform a given task are strong when performing a particular behaviour is perceived to be easy and socially acceptable and the individual perceives the behaviour to be desirable.

However, there is criticism towards TPB, which springs from its two underlying assumptions. First, motivation, opportunities and required resources are only included in TPB as implicit assumptions (Ajzen, 1991). More precisely, intentions reflect motivational aspects, although opportunities and resources are depicted via perceived behavioural control. Second, perceived behavioural control is a key driver of intentions and shapes the relationship between intentions and behaviour. Hence, TPB has been criticised because in it the intention formation process does not explicitly take into account opportunities and motivations (Brännback et al., 2007; Jarvis, 2016).



Drivers of entrepreneurial intentions in TPB differ from those in Shapero and Sokol's (1982) model of the entrepreneurial event (Liñan and Fayolle, 2015). In the TPB, intentions are driven by attitude-toward-the-act, subjective norms and perceived behavioural control, while perceived entrepreneurial feasibility, propensity to act and perceived entrepreneurial desirability influence entrepreneurial intentions in the model of entrepreneurial event. Krueger et al. (2000) and Liñan et al. (2011) have recognised connections between drivers of entrepreneurial intentions in these two entrepreneurial intention models. First, entrepreneurial self-efficacy, perceived behavioural control and PEF have been perceived as parallel descriptions of perception of an individual's capability to perform a particular task (Krueger and Brazeal, 1994; Liñan et al., 2011).

Second, PED reflects both social norms and attitude-toward-the-act (Krueger et al., 2000). Furthermore, social norms are seen as elusive: social norms are clearly connected to entrepreneurial intention formation, but the connection has been proposed to be indirect, occurring through motivation, PED and self-efficacy (Elfving et al., 2009). Social norms have been also seen as difficult to measure and being strongly connected to culture (Elfving et al., 2009; McGrath and MacMillan, 1992). Furthermore, in the case of social norms, reference group that an individual refers to plays an important role (Elfving, et al., 2009). However, as Ajzen (1991) notes, the importance of drivers in intention formation is context specific. This means that in some contexts and behaviours all drivers are important, but for others only attitude-toward-the-act or perceived feasibility may matter. For example, empirical results have shown that subjective norms do not seem to play a role in the formation of entrepreneurial intentions (Krueger et al., 2000). Furthermore, it has been proposed that in the student-context, subjective norms may not play as an important role as among general population (Kautonen et al. 2015).

A positive relationship between PED, PEF and entrepreneurial intentions has been found in the entrepreneurship literature (e.g., Krueger, 1993; Liñan and Santos, 2007). However, more recently, Fitzsimmons and Douglas (2011) have found evidence that PEF shapes the relationship between PED and entrepreneurial intentions for MBA students, whereas Schlaegel and Koenig (2014) provided evidence in their meta-analysis that the influence of PEF on entrepreneurial intentions is mediated through PED. Conversely, in the context of social entrepreneurship, no relationship between PEF and entrepreneurial intentions has been found (Ayob et al., 2013).

### 2.2.2 Entrepreneurial intentions and opportunities

An evaluation of entrepreneurial opportunities plays a central role in forming entrepreneurial intentions (McMullen and Shepherd, 2006). This means that individuals need to evaluate the degree of feasibility of a particular entrepreneurial opportunity and the desirability of an entrepreneurial career (Douglas and Shepherd, 2002). In other words, individuals evaluate whether or not they possess the necessary capabilities to successfully exploit the recognised entrepreneurial opportunity and whether they see an

entrepreneurial career as more attractive than other career options. Moreover, entrepreneurial behaviour, like other types of human behaviour, is perceived to be driven by goals (McMullen et al., 2007). Specifically, entrepreneurial behaviour is shaped by entrepreneurial goals (Cardon et al., 2009) because the underlying motivation to pursue an entrepreneurial opportunity is reflected in entrepreneurial goals (Krueger, 2000). Hence, the entrepreneurial opportunity pursued shapes an entrepreneurial goal (Elfving et al., 2009). Similarly, individual entrepreneurial goals may be achieved through entrepreneurial opportunities (McMullen et al., 2007) because the type of entrepreneurial opportunity that is being pursued reflects the motivation to pursue that opportunity through values. For example, individuals with prosocial and altruistic motivations tend to pursue entrepreneurial opportunities that enable them to help others (Shepherd, 2015).

However, the entrepreneurial intentions-entrepreneurial opportunity nexus has drawn less academic interest than entrepreneurial intentions or different knowledge structures that describe entrepreneurial opportunities. The connection between intentions and the perception of an entrepreneurial opportunity was proposed by Krueger (2009). In the adopted entrepreneurial intention model, perceived entrepreneurial desirability and feasibility shape the perception of an opportunity, which in turn is connected to entrepreneurial intentions. However, the relationship between perception of an entrepreneurial opportunity and intention is shaped by the propensity to act. There are only a few entrepreneurial intention models that include entrepreneurial opportunities in one form or another (e.g., Elfving et al., 2009; Liñan et al., 2011; Tsai et al., 2016). Elfving et al. (2009) proposed the context-specific entrepreneurial intention model in response to the shortcomings of the intention model proposed by Krueger and Brazeal (1994). Their intention model extends existing intention models by including motivation, goal and opportunity evaluation. More recently, the perception of entrepreneurial opportunities has been connected to entrepreneurial intentions. The perceived existence of entrepreneurial opportunities enhances the odds of having entrepreneurial intention, as does self-efficacy, role models and general positive environment towards entrepreneurship (Liñan et al., 2011). Moreover, perceived capabilities have been found to influence entrepreneurial intentions through the perceived opportunity to start a business (Tsai et al., 2016). However, these studies have either been conceptual (Elfving et al., 2009) or have focused on individuals' perception of the existence of entrepreneurial opportunities.

### 2.3 Sustainable entrepreneurship

Sustainable entrepreneurship focuses on social, environmental and economic value to the entrepreneur and others (Hall et al., 2010; Patzelt and Shepherd, 2011; Schaltegger and Wagner, 2011; Shepherd and Patzelt, 2011; Tilley and Young, 2009). This focus on sustainable development differentiates sustainable entrepreneurship from other types of entrepreneurship (e.g. Patzelt and Shepherd, 2010; Schaltegger and Wagner, 2011).

Actions sustaining communities, sources of life support and the natural environment allow sustainable entrepreneurship generate both non-economic and economic gains, and as a result, economic gains are enhanced through social and environmental value (Shepherd and Patzelt, 2011). Sustainable entrepreneurs have been described as individuals who sustainably create wealth by combining social, environmental and economic goals (Tilley and Young, 2009; Schaltegger and Wagner, 2011). Innovation enables sustainable entrepreneurs to change industries by introducing sustainable ways of operating and as a result, change the operating standards in a particular industry (Cohen and Winn, 2008; Hockerts and Wüstenhagen, 2010). Entrepreneurship is a complex phenomenon; however, the role of sustainable entrepreneurship in transforming industries through innovation and the focus on triple bottom line seem to make understanding sustainable entrepreneurship even more complex (Muñoz and Dimov, 2015).

As described above, sustainable entrepreneurship is connected to three types of value, namely economic, environmental and social value. First, social value refers to a positive impact on social issues such as education, inequality and child mortality generated via business operations (Patzelt and Shepherd, 2011) and affecting a range of individuals, from a limited group of individuals to entire societies (Shepherd and Patzelt, 2011). Improvements in peace, justice and institutions, as well as alleviating hunger and poverty, are examples of social value creation (United Nations, 2016). Second, environmental value refers to enhancing the state of the natural environment, for example through business operations that improve water and air quality or overexploited aquatic environments that result in value created for the entrepreneur and others (Patzelt and Shepherd, 2011). Examples of environmental value created by entrepreneurs include the development of technologies based on solar power and the selection of environmentally friendly production methods. Third, economic value depicts the monetary gains generated via sustainable business operations for society, and possibly the entrepreneur (Patzelt and Shepherd, 2011; Shepherd and Patzelt, 2011). More precisely, economic value in sustainable entrepreneurship is, first and foremost, connected to economic gain for others; economic gains for the entrepreneur are inessential but not excluded (Patzelt and Shepherd, 2011). As a result, increases in financial wealth and employment are included as forms of economic value creation.

Because this type of entrepreneurship aims to generate non-economic gains, the sustainable entrepreneurship research has proposed that sustainable entrepreneurs are driven by three types of motivation: altruistic or prosocial, intrinsic and extrinsic motivation (Shepherd, 2015; Shepherd and Patzelt, 2017). Sustainable entrepreneurship has been connected to values such as morality (Gagnon, 2012), agreeableness and conscientiousness (Nga and Shamuganathan, 2010). More recently, Muñoz and Dimov (2015) have found two distinct types of paths to venture development in sustainable entrepreneurship: conformist and insurgent. Sustainable venture ideas in the conformist path arise from supportive social context and sustainable action based on the aim of holistic value creation, perceived supportive business context and strong sustainability orientation. These two are supported by sustainability-driven exchange relationships, which are enabled by the supportive business context. Conversely, the insurgent path

consists of deficiency in sustainable venture ideas, an aim towards sustainable action that arises from a perceived lack of social support and sustainability-driven exchange relationships that result from a high level of sustainable entrepreneurial intention and perceived lack of social support. Hence, path to sustainable ventures are complex combinations of environmental and individual factors, which are guided by mixture of values.

### 2.3.1 Sustainable entrepreneurship and entrepreneurial opportunities

Entrepreneurial opportunities in sustainable entrepreneurship have been proposed to arise from environmentally and socially relevant market failures reducing sustainability (Dean and McMullen, 2007) or market imperfections caused by inefficient firms, externalities, flawed pricing mechanisms, imperfect knowledge distribution, environmental problems or uncertainty and imperfect resource allocation (Cohen and Winn, 2007; York and Venkataraman, 2010). Moreover, sustainable development opportunities, those opportunities that sustainable entrepreneurs recognise, evaluate and exploit, preserve the social and/or natural environment, while simultaneously generating economic, social and environmental gain for others (Patzelt and Shepherd, 2011). However, others have defined sustainable entrepreneurship via sustainable innovations that are a way for sustainable entrepreneurs to move industries towards more sustainable ways of operating, and act as game changers (Cohen and Winn, 2007; Hockerts and Wüstenhagen, 2010; Schaltegger and Wagner, 2011). Similarly, Shepherd and Patzelt (2011) have noted that sustainable entrepreneurship focuses on developing future goods and services that generate sustainable gains. The social and environmental issues targeted by sustainable entrepreneurship are so complex and multifaceted that conventional solutions to these issues will not work (Hockerts, 2017). Hence, potential entrepreneurial opportunities in sustainable entrepreneurship are characterised by two attributes, sustainable value creation potential, including economic, social and environmental value, and a high level of innovativeness. Moreover, sustainability-oriented venture ideas have been associated with either perceived social support for sustainability that is supported by knowledge about sustainability issues, holistic value creation aims and sustainable orientation, or holistic value creation aims that are re-enforced by knowledge about sustainability issues, sustainable entrepreneurial intention, sustainable orientation and a lack of support for sustainable business operations (Muñoz and Dimov, 2015). This implies that because perceptions of entrepreneurial opportunities underlie new venture ideas, it seems that perceptions about sustainability-oriented entrepreneurial opportunities are enabled by a supportive social community and supported by an individual's pursuit to create sustainable value for oneself and others, although these need to be supported by several other factors.

The entrepreneurial process, that is recognition, evaluation/development and exploitation, has received less attention than how individuals recognise sustainable entrepreneurial opportunities. First, the literature suggests that potential entrepreneurial opportunities to

create sustainable value are created rather than discovered (Pacheco et al., 2010; Korsgaard, 2011). Conversely, the social entrepreneurship literature on entrepreneurial opportunity recognition has followed both a discovery and creation view (Lehmer and Kansikas, 2012). Moreover, Corner and Ho (2010) have found that entrepreneurial opportunities for social value creation are developed over time via a process ranging from effectuation to causation as a result of collective effort based on prior experience. Second, the sustainable entrepreneurial opportunity recognition literature has proposed factors that influence recognition by creating a model for the recognition of sustainable development opportunities (Patzelt and Shepherd, 2011). According to the model, recognising sustainable development opportunities is directly influenced by a perceived threat to the natural or communal environment, altruism and knowledge of the natural or communal environment and indirectly influenced by entrepreneurial knowledge. The level of entrepreneurial knowledge is suggested to influence the relationship between recognition of sustainable development opportunities and its three drivers. Beyond, knowledge and motivation, entrepreneurial opportunity identification in the context of social entrepreneurship requires more innovativeness and proactiveness due to the complexity of social problems (Lumpkin et al., 2013). However, this has not been found to be the reason why the entrepreneurial process in social entrepreneurship is different from other contexts; instead, this is attributed to the presence of multiple stakeholders and their requirements.

The results of prior research show that individuals with pro-environmental values tend to give more weight to the information about the environmental harm caused by the perceived opportunity than others (Shepherd et al., 2013). However, it seems that information about harm to the natural environment is not perceived as an attribute but rather an outcome of exploiting a potential entrepreneurial opportunity. More recently, a model for the sustainable entrepreneurship process has been developed (Belz and Binder, 2017). According to the model, nascent sustainable entrepreneurs perceive environmental and social problems resulting from market imperfections to be entrepreneurial opportunities and develop relevant solutions, i.e., developing the perceived opportunity that is in line with values of the desired customer group. This is followed by exploiting the perceived sustainable entrepreneurial opportunity by finding funding, founding a sustainable venture and entering a sustainable market, pre-existing or created by the venture.

To conclude, prior sustainable entrepreneurship literature seems to have reached consensus regarding the origins of perceived entrepreneurial opportunities. Moreover, the literature agrees that potential sustainable entrepreneurial opportunities are innovative, which enables the transformation of industries. However, this literature debates how sustainable entrepreneurial opportunities are recognised reflecting the debate in the entrepreneurship research, and hence social and environmental value creation are not included as an attribute of perceived entrepreneurial opportunity. Moreover, the cognitive view on entrepreneurial opportunities has received only limited attention, and as a result, the operationalisation of perceived entrepreneurial opportunities or knowledge structures describing them has tended to ignore social and environmental value creation. Similarly,

the entrepreneurship research focusing on entrepreneurial opportunities and their recognition has paid only limited attention to sustainable entrepreneurial opportunities (Hanohov and Baldacchino, 2017). Therefore, by examining opportunity-specific entrepreneurial attitudes generally and in the context of sustainable entrepreneurship, this doctoral thesis extends our understanding about perceptions of entrepreneurial opportunities in the context of sustainable entrepreneurship.

### 2.3.2 Sustainable entrepreneurship and entrepreneurial intentions

Entrepreneurial intentions in sustainable entrepreneurship focus on enhancing social and environmental well-being (Parrish and Foxon, 2009, Hockerts and Wüstenhagen, 2010; Schaltegger and Wagner, 2011). Sustainable entrepreneurial intentions have been associated with both new sustainable venture ideas and objectives for entrepreneurial action (Muñoz and Dimov, 2015). Due to the triple goal setting in sustainable entrepreneurship, there is combination of economic and non-economic motivation involved in the formation of sustainable entrepreneurial intentions (Schaltegger and Wagner, 2011). However, there is only limited evidence about the drivers of entrepreneurial intentions in sustainable entrepreneurship. Kuckertz and Wagner (2010) show that sustainability orientation increases the level of entrepreneurial intentions only among science and engineering students, but in the context of business students and science and engineering alumni, this connection does not exist. Hence, business experience seems to have a negative influence on the relationship between sustainability orientation and entrepreneurial intentions. Similarly, for business students, sustainability orientation has been found to decrease entrepreneurial intentions, while it enhances the likelihood of having a sustainability-related business idea (Wagner, 2012).

In the context of social entrepreneurship, a model of social entrepreneurial intention formation has been proposed (Mair and Noboa, 2006). According to this model, behavioural intentions towards sustainable entrepreneurship are driven by perceived feasibility and desirability. Moreover, perceived desirability is influenced by cognitive and emotional factors that include empathy and moral judgement, while perceived feasibility is connected to enabling factors through self-efficacy and social support. More recently, Hockerts (2017) has adopted and tested the model of social entrepreneurial intention formation in the context of social entrepreneurship aimed at employing marginalised people. The findings of the study show that social entrepreneurial intent is enhanced by empathy, self-efficacy and perceived social support, while moral obligation is not connected to entrepreneurial intent. The drivers of social entrepreneurial intent are all positively influenced by prior experience with social problems. However, the results of Hockerts (2017) further contradict Mair and Noboa's (2006) proposed model in regards to perceived desirability and feasibility due to problems with divergent validity. Other research has shown that perceived desirability and feasibility are enhanced by a positively perceived regulatory environment (Urban and Kujinga, 2017)

Empathy is not the only value connected to sustainable entrepreneurial intention formation. Sustainable orientation is also found to be enhanced by morality (Gagnon, 2012). While, sustainable identification is increased by frugality and morality, only morality increases sustainable commitment. Moreover, values such as freedom, solidarity, tolerance, equality, respect for nature and shared responsibility are linked to sustainable entrepreneurship via sustainable development (Shepherd et al., 2009). Positive environmental attitudes are connected to altruistic values such as universalism and altruism (Schultz and Zelezny, 1999). In social entrepreneurship, social vision is enhanced by openness and agreeableness, while sustainability is increased by agreeableness and consciousness (Nga and Shamuganathan, 2010). Similarly, orientation towards financial returns is positively connected to openness, agreeableness and consciousness. In the context of environmentally-oriented entrepreneurship, entrepreneurs have been shown to be motivated by both green values, passion and economically-oriented motivations (Kirkwood and Walton, 2010)

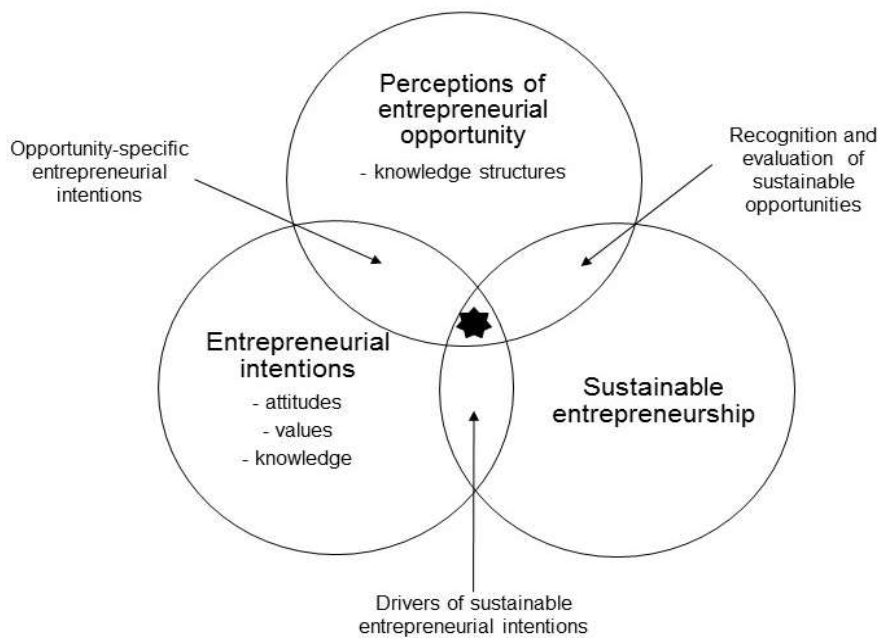
The trinity of aims in sustainable entrepreneurship combined with multiple motivations of individuals pursuing sustainable entrepreneurial opportunities, which are associated with those aims, creates a complex combination of cognitive factors, which are connected to sustainable behaviours (Hockerts, 2015). Hence, decision-making in sustainable entrepreneurship should balance three types of objectives for the purpose of sustainable value creation (Muñoz and Dimov, 2015), which results from decisions that are context-specific, value-laden and focus on social actions (Martin, 2015). This complex combination of multiple motivations, values, and goals and, as a result, complexity in decision-making is what sets sustainable entrepreneurship apart from other forms of entrepreneurship (Muñoz, 2017). Hence, sustainable entrepreneurial decision-making is connected to sustainability-oriented motivations, values, opportunity-awareness, entrepreneurial intentions and entrepreneurial self-efficacy.

Literature on sustainable entrepreneurship and entrepreneurial intentions is limited and still emerging. Sustainable entrepreneurial intentions are seen as a prominent research area (Liñan and Fayolle, 2015), and more research on the role of values in sustainable entrepreneurship has been called for (Gast et al., 2017). Therefore, by examining opportunity-specific entrepreneurial intentions in the context of sustainable entrepreneurship, this thesis provides more understanding about the drivers of sustainable entrepreneurial intentions.

## 2.4 Positioning of the study

This study is positioned at the intersection of three research areas in the field of entrepreneurship, namely entrepreneurial opportunities, sustainable entrepreneurship and entrepreneurial intentions. In particular, the thesis aims to explore connections between perceptions of entrepreneurial opportunities and entrepreneurial intentions by applying an opportunity-specific entrepreneurial intentions model in the context of sustainable entrepreneurship.

The positioning of the study at the intersection of three literature streams is presented in Figure 3 below.

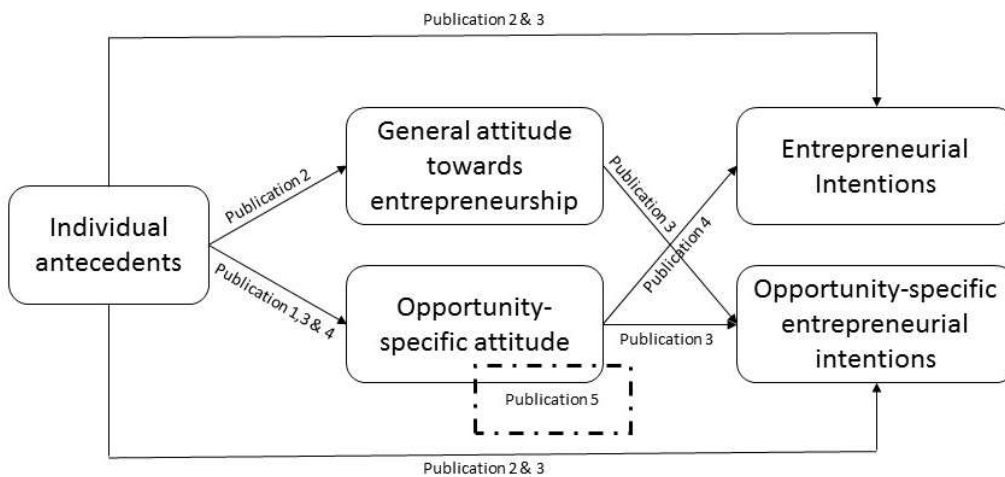


★ Denotes the positioning of the thesis: opportunity-specific entrepreneurial intentions in sustainable entrepreneurship

**Figure 3:** Positioning of the study



Publication I and IV are guided by the first research sub-questions about young adults' opportunity-specific attitudes. Publication I examines the connection between demographic factors and sustainable entrepreneurial goals, while publication IV focuses on combinations of opportunity-specific entrepreneurial attitudes via EOTs. Publications I, II and III focus on the second research sub-question by examining the drivers of opportunity-specific entrepreneurial intentions and attitudes in sustainable entrepreneurship. Lastly, publication V focuses on the third sub-research question about the changes in opportunity-specific entrepreneurial attitudes and hence is positioned at the intersection of perceived entrepreneurial opportunities and sustainable entrepreneurship. Figure 4 depicts connections between the theoretical framework and each original publication.



**Figure 4:** Positioning of original publications in relations to the theoretical framework

Since entrepreneurial opportunities take different forms, this thesis focuses on a particular type of entrepreneurial opportunity, namely sustainable entrepreneurial opportunity. More specifically, publication I focuses on the connection between individual antecedents and opportunity-specific attitudes through examining the impact of demographic factors on different types of sustainably-oriented entrepreneurial goals. Moreover, publication II examines the influence of individual-level antecedents on general and opportunity-specific entrepreneurial intentions. Particularly, the role of knowledge, general self-efficacy and values in formation of social entrepreneurial goal, general entrepreneurial intentions and socially-oriented entrepreneurial intentions. Publication III focuses on testing the proposed opportunity-specific entrepreneurial intention model in the context

of sustainable entrepreneurship. Publication IV is extended beyond the proposed opportunity-specific intention model by focusing on entrepreneurial opportunity templates, which consist of different opportunity-specific attitudes. More specifically, publication IV provides a broader view on opportunity-specific attitudes and how values, and general entrepreneurial intentions and attitudes are connected to specific entrepreneurial opportunity templates. Similarly, publication V is extended beyond the opportunity-specific entrepreneurial intention model by examining the change in entrepreneurial opportunity templates and how these relate to the change in new venture ideas.

### 3 Methodology

This chapter describes and explains the methodological choices made in this study. This research applies multiple research methods and comprises five publications, of which four utilise a quantitative research design and one is qualitative. These publications use different data sets, two cross-sectional data sets and one repeated measures data set. Prior entrepreneurial intentions and opportunity perception research has relied on both surveys and experiments (e.g., Souitaris et al., 2007; Kuckertz and Wagner, 2010; Wood and McKelvie, 2015). Due to the lack of existing measures for EOTs, opportunity-specific attitudes, opportunity-specific entrepreneurial intentions and entrepreneurial goals, surveys were used to collect the data for most parts of the thesis. This data collection method facilitates the development of novel measurement instruments.

The summary of the research design is presented in the table below.

**Table 3:** Research design

Publication					
	P1: Young adults and sustainable entrepreneurship: the role of culture and demographic factors	P2: Socially-oriented entrepreneurial goals and intentions: the role of values and knowledge	P3: Drivers of entrepreneurial intentions in sustainable entrepreneurship	P4: A typology for entrepreneurial opportunity templates	P5: Change in entrepreneurial opportunity templates and new venture ideas
Role	Exploring young adults' preference for sustainable entrepreneurial goals over commercial goals	Measuring the effect of knowledge and work values on social entrepreneurial goals and socially oriented entrepreneurial intentions	Examining intention formation in the context of sustainable entrepreneurship	Developing and measuring EOTs	Examining the change in EOTs and connecting it to new venture ideas
Method and analysis	Quantitative Logistic binomial regression	Quantitative Linear regression	Quantitative Linear regression	Quantitative Cluster analysis	Qualitative csQCA Content analysis
Data	GEM data set with 129,543 individuals	Cross-sectional survey data with 338 university students	Cross-sectional survey data with 393 university students	Cross-sectional survey data with 39 university students	Repeated measures data with 32 Finnish university students

Note: csQCA denotes crisp-set qualitative comparative analysis

This chapter continues as follows: First, the research approach in terms of the ontological view taken in this thesis is described, and summary of the research design is provided. Then, the questionnaire design and measures utilised in the survey are presented. Next, data samples and data collection are described. This is followed by a discussion of the analysis of the data samples used in this thesis. Lastly, the validity and reliability of the quantitative results as well as trustworthiness of qualitative results are discussed.

### 3.1 Research approach

This thesis combines positivist and interpretivist philosophy of science. There are two main reasons for this dual view. First, from a theoretical perspective, a cognitive view of entrepreneurial opportunity recognition builds on both of these epistemological views. As discussed in the previous chapter, in the cognitive view of entrepreneurial opportunities, discovery and creation are seen complimentary approaches to entrepreneurial opportunities rather than alternatives (Gregoire et al., 2010). While the discovery view is based on realism, the creation view is built on evolutionary realism (Alvarez and Barney, 2007). More recently, Ramoglou and Tsang (2016) have proposed that realism is a response to the continuing debate regarding the nature of entrepreneurial opportunities. These theoretical points of departure also influence the chosen approach to this research and the ontology followed. Hence, this study combines an objective and subjective view of reality. Although this study mainly builds on positivism, realism is the starting point for understanding how entrepreneurial opportunities are perceived to combine objectivity and subjectivity.

### 3.2 Questionnaire design

The data for the thesis was mainly collected through a cross-sectional survey instrument, although a repeated measures survey, mainly based on the same measures and scales than the cross-sectional survey instrument, was also used. These survey instruments were designed to capture the essence of the constructs in the study via multi-item scales. Following the suggestions of Hockerts (2017) and Mair and Noboa (2006), who have adopted entrepreneurial intentions models for social entrepreneurship, the entrepreneurial intentions model in sustainable entrepreneurship was extended to include values and attitude towards sustainability. Moreover, the survey instrument was designed in a way that balances novel, self-developed measurement instruments and adopts established scales from the entrepreneurship literature. Following prior entrepreneurial intention research, established scales for entrepreneurial intentions, PEF and PED were selected for the survey. However, there are no existing measurement instruments for entrepreneurial opportunity templates and attitudes towards sustainability, sustainability-

oriented entrepreneurial intentions and sustainable entrepreneurial goals. Hence, these measurement scales were developed for this study.

Cross-sectional survey instruments can result in a concern for common method variance. In order to avoid common method variance, the procedure of Podsakoff et al. (2003) was followed. This was reflected in the design of the survey instrument and testing for common method bias. First, the respondents of the survey were assured anonymity in order to enable unconstrained responses. Second, the cross-sectional survey instrument included different types of measurement scales (Osgood and Likert scale) and varying ranges for the scales (1 to 5 and 1 to 7). Moreover, the order of the scales and measurement instruments was random to minimise respondents' ability to perceive connections between different scales and measurement instruments. Third, some items in PEF and the entire entrepreneurial intent scale were reversed in order to avoid confirmation bias. To test whether common method variance was present, a Harman's single factor test was performed; the results show that common method variance was not present. Hence, based on the measures taken and the results of the analysis, the influence of common method variance is mitigated in this thesis.

### 3.3 Measurements

#### *Individual antecedents*

Individual antecedents measured in this thesis include work values, general self-efficacy, knowledge level and demographic factors. First, the work values included in this study are altruism, security, extrinsic reward, intrinsic reward, social relations and free time. These were measured using a scale combined from Dietz et al. (2002) and Twenge et al. (2010). Second, general self-efficacy was measured via a scale developed by Chen et al. (2001). Third, the scale measuring perceived knowledge level about social and environmental problems was adapted from Bohlen et al. (1993). The scale was modified to account for the current social and environmental issues identified in the United Nations' report on sustainable development challenges (United Nations, 2013). Fourth, several demographic factors were measured in the thesis, including age, gender, education level, work experience, entrepreneurial experience, entrepreneurial background and nationality. These demographic factors were chosen based on the findings of prior entrepreneurship literature on entrepreneurial intentions, entrepreneurial opportunity perceptions and sustainable entrepreneurship.

*Entrepreneurial attitudes*

First, general attitude towards entrepreneurship was measured via PED and PEF, reflecting the economic side of sustainable entrepreneurship. A scale for PED was adopted from Liñán and Chen (2009), while PEF was measured via a scale adopted from Kruger (1993) and Peterman and Kennedy (2003). Second, opportunity-specific attitudes form seven attributes of EOTs. A measurement instrument for EOTs does not exist in the literature, and hence it was developed in this thesis based on a systematic literature review on cognitive models describing entrepreneurial opportunities. EOTs were measured by asking respondents about the perceived importance of seven attributes of entrepreneurial opportunities, which include economic value potential, social value potential, environmental value potential, innovativeness of the venture, impact of the venture, riskiness of the venture and the scope of the market. Hence, attitude towards sustainability, which is a particular type of opportunity-specific attitude, was measured by asking respondents' to rate the importance (between 1 and 7) of the social and environmental impact of a potential entrepreneurial venture.

*Entrepreneurial intentions*

Entrepreneurial intentions were measured via a scale from Liñán and Chen (2009) and an item from Autio et al. (2001) and Davidsson (1995). Opportunity-specific entrepreneurial intentions were measured by multiplying the entrepreneurial intention scale with the entrepreneurial goal scale. Entrepreneurial goals were measured via Osgood's semantic differential scale (Osgood et al., 1975, pp. 25–26) by asking respondents to describe their ideal venture by choosing opposite characteristics. In the case of sustainable entrepreneurial goals, these characteristics included the following items: environmental problems, impact on society's weakest members, sustainable development, the world's poverty problem, a goal that maximises social good rather than economic gain and the responsible use of natural resources. These six items reflect the United Nations' sustainable development goals (UNDP, 2015). Hence, sustainability-oriented entrepreneurial intentions, which are opportunity-specific entrepreneurial intentions in sustainable entrepreneurship, are measured by multiplying entrepreneurial intentions with sustainable entrepreneurial goals.

### 3.4 Sampling and data collection

The study consists of four data samples. The first three samples include quantitative data, while the fourth sample consists of qualitative data. The first sample includes Global Entrepreneurship Monitor (GEM) 2009 and World Value Survey 2005-2008 data. The second sample includes cross-sectional survey data, and the third sample consists of

repeated measures data. The fourth data set includes secondary data. Data collection and the data sources are summarised in Table 4 below.

**Table 4:** Summary of data samples

	Global Entrepreneurship Monitor data	World Value Survey data	Cross-sectional survey data	Repeated measures data	Secondary document data
Collection method	Survey/interviews	Survey/ interviews	Survey	Survey	-
Sample size	129,543 individuals	29 countries	393 university students	32 university students	18 documents
Sample	individuals between 18 and 100 years old	individuals between 15 and 98 years old	university students between 18 and 35 years old	university students	product idea descriptions and business plans
Country	Multiple countries	Multiple countries	Austria, Finland and Liechtenstein	Finland	Finland

#### *Publication I*

The data for publication I consists of 2009 Global Entrepreneurship Monitor (GEM) data and 2005-2008 World Value Survey (WVS) data. The GEM 2009 data set contains observations from 54 countries (Bosma and Levie, 2009), while the WVS 2005-2008 data set includes 58 countries (World Value Survey, 2017a). GEM data comes from an annually collected entrepreneurship survey that focuses on entrepreneurial behaviours and attitudes in different national contexts (GEM, 2017). The central measure for entrepreneurial activity is total early-stage entrepreneurial activity (TEA), which includes all nascent entrepreneurs engaged in starting a business and owner-managers in young firms that are less than 3.5 years old (Reynolds et al., 2005). The GEM 2009 data has a special focus on social entrepreneurship and hence contains specific questions related to the goals of firms an individual is involved in (Lepoutre et al., 2013). The WVS survey focuses instead on changing values and their influence on political and social life. It has been collected in three-to-five-year waves since 1981 (World Value Survey, 2017b). Both data sets are publicly available. The sample of the GEM data (N=129,543) includes individuals from 29 countries. The WVS 2005-2008 sample from 29 countries was

combined with GEM 2009 data to control for national culture. The GEM data sample includes all individuals in the data and is not limited to entrepreneurs or managers.

#### *Publications II, III and IV*

The data sample utilised in publications II, III and IV consists of 393 university students from Finland, Liechtenstein and Austria who are under 35 years old. For publication II, the sample size is 338 because the publication was written when data collection was still in progress. The data was collected in March 2015 in Austria and Liechtenstein, and in April-May 2015 in Finland.

These three countries were selected based on their similarity. All three countries have similar social situation and place high emphasis on the natural environment. It should be noted that the survey data was collected in spring 2015 before the refugee crisis in Europe escalated. The study context is young adults, and hence the respondents included were between 18 and 35 years old. As discussed in the introduction, young adults have been proposed to have the most potential as advocates and practitioners of sustainable entrepreneurship (Deloitte, 2017; Hewlett et al., 2009). Furthermore, higher education level has been found to strengthen the emphasis placed on social and environmental entrepreneurial goals and diminish the importance of economic entrepreneurial goals (Hechavarria et al., 2017). Similarly, entrepreneurial activity is connected to higher education (Levie and Autio, 2008), and the desire to become an entrepreneur is associated with the course of study (Kuckertz and Wagner, 2010).

#### *Publication V*

The data in publication V includes two data samples, one quantitative and the other qualitative. The quantitative data consist of 32 Finnish business and technology students who participated in a practical entrepreneurship course module during academic years of 2015-2016 and 2016-2017. Respondents are both bachelor's and master's students. The average age of respondents is 23, and the majority of them are male technology students. The qualitative data consists of 18 written documents produced during the course; these include product idea descriptions and business plans. These documents were produced in groups. The quantitative data was collected during the academic years 2015-2016 and 2016-2017 via a repeated measures survey. The first round of data collection was executed between October and November 2015, when the course began, while the second round occurred between March and May 2016, around the time of the last course meeting. Similarly, the third round of data collection occurred between October and November 2016 and the fourth between March and May 2017. The qualitative data was collected in the spring 2016 and 2017.



Both data samples were collected from an entrepreneurship course module lasting one academic year. The course module consists of three courses (two courses in mechanical engineering and one business course), although participants are enrolled in only one of these courses. The participants in these courses are divided into groups of 15 to 17 students. These groups form virtual firms that have to come up with a product idea that has a mechanical component and a prototype that can be produced with 300 Euros. The course provides an interesting setting to study entrepreneurship because the participants in the course module go through the entire entrepreneurial process. First, they have to recognise an entrepreneurial opportunity and evaluate its viability in terms of economic potential. Second, the participants have to exploit that opportunity by building the prototype of their product idea.

### 3.5 Analysis methods

The thesis utilises both quantitative and qualitative analysis methods. The quantitative analysis methods used in this study include multiple linear regression, binomial logistic regression and clustering. The study incorporates two qualitative research methods, crisp-set qualitative comparative analysis (csQCA) and categorisation.

#### 3.5.1 Quantitative methods

Two types of regression analyses were used in the study, namely multiple linear regression and binomial logistic regression. Multiple regression is a regression analysis, through which the value of a dependent variable is predicted using several independent variables (Hair et al., 1998, p. 148). Regression analysis enables the identification of factors that are connected to a particular dependent variable. Publications II and III aimed to examine the factors influencing opportunity-specific intentions and attitudes in sustainable entrepreneurship; hence, multiple linear regression models were used to examine the influence of multiple factors. Furthermore, the dependent variable of both publications is opportunity-specific entrepreneurial intention, which is formed by combining a measure for entrepreneurial intentions and entrepreneurial goals reflecting the type of entrepreneurship that an individual is aiming at. Hence, the chosen dependent variable restricts the choice of method to multiple linear regression analysis resulting from inability to calculate error term.

Binomial logistic regression is a particular form of regression, in which the dependent variable is in the form of a categorical variable (Hair et al., 1998, p. 244). The probability of an event's occurrence is directly predicted with binomial logistic regression using a maximum likelihood procedure. Through this procedure, the so-called most likely estimates for the coefficient can be found (p. 278). These most likely estimates (logistic

coefficients) are called odds ratio, which results from comparing the probability of an event's occurrence to the probability of its non-occurrence. The dependent variable for publication I is categorical (having a sustainable entrepreneurial goal vs. commercial entrepreneurial goal), hence binomial logistic regression was chosen. Furthermore, the aim of the publication I was to examine the preference of young adults towards sustainable entrepreneurship via attitudes towards sustainable value creation; thus, a categorical dependent variable was chosen.

A third quantitative analysis method utilised in the study is clustering. A meaningful subgroup of individuals or objects are formed through cluster analysis (Hair et al., 1998, p. 15). More precisely, similarities among a sample of entities form the basis for classifying them into a limited quantity of mutually exclusive group. Hence, these formed clusters should internally be homogenous, while externally showing high heterogeneity (p. 473). Publication IV aimed to examine combinations of opportunity-specific attitudes of young adults through the development of a typology for EOTs. Cluster analysis was chosen because it enables the revealing of different combinations between opportunity-specific attitudes and the connecting of these combinations to differences in work values, entrepreneurial intentions and general attitudes towards entrepreneurship.

### 3.5.2 Qualitative methods

Qualitative comparative analysis (QCA) is a specific type of configurational comparative method (Rihoux, 2006, p. 17). More specifically, it is an analysis method that focuses on explaining how a certain outcome is produced by combining generalisability and in-depth insights from the cases under investigation (Rihoux, 2006; Legewie, 2013). QCA enables the analysis of samples with a limited sample size, between 15 and 50 observations (Rihoux and Ragin, 2009, p. 18; Legewie, 2013). QCA builds on complex causality and combines cross-case comparisons with within-case analysis (Legewie, 2013). The results of the within-case analyses may result in defining and/or redefining the sets depicting the conditions and the outcome. It ought to be noted that QCA can only provide support that causal relationships exist by revealing association patterns across sets of observations (Schneider and Wagemann, 2010; Legewie, 2013). QCA progresses as follows: First, measures are dichotomised to achieve the absence or presence of conditions and outcome. Then possible necessity and sufficient conditions are identified. Next, a truth table is constructed, and any possible contradictions are solved. Last, utilising Boolean minimisation, condition combinations (paths) that are associated with the outcome are identified.

There are three distinct types of QCA: csQCA, multi-value QCA (mvQCA), and fuzzy-set QCA (fsQCA). These distinct QCA types differ in terms of the number of values the outcome can have, ranging between 0 and 1, and the number of cases required for analysis (Legewie, 2013). In this study, csQCA was utilised for its applicability to limited sample size. Furthermore, publication V aimed to examine changes in opportunity-specific

attitudes. Crisp-set QCA enables the identification of different changes in opportunity-specific attitudes connected to a particular outcome, namely the degree of new venture idea completeness (ranging between high and low). Hence csQCA was chosen for publication V.

In csQCA, Boolean algebra is utilised to perform the analysis, and hence outcomes and conditions are required to be either present or absent (Schneider and Wagemann, 2010). In other words, the dichotomisation of conditions and outcomes is needed for simplification (Rihoux and Ragin, 2009, p. 149). Simplification through dichotomisation enables the comparison of a limited number of cases forming complex combinations of conditions in a rigorous manner. The dichotomisation of outcomes and conditions is performed by determining membership threshold values for outcomes and conditions.

The second qualitative analysis method used is coding. Coding is used for data reduction through the development of categories and themes. A code is a short phrase or word describing an attribute of the phenomenon of interest that is salient, summative and captures the essence of the attribute (Saldaña, 2009, p. 3). Coding, as an analysis method, usually consists of several rounds of analysis, which result in categories, themes, concepts and theories (p. 8). For this thesis, attribute coding was utilised. Codes were based on the developed typology for EOTs (publication IV). During the first round of coding, all representations of the different opportunity-specific attitudes of which EOTs consist were coded. In the second round, these coded attributes were categorised to present different themes related to each opportunity-specific attitude.

### 3.6 Validity and reliability

The validity and reliability of this doctoral thesis were evaluated according to the two types of analysis, quantitative and qualitative. In the case of summated scales, reliability refers to the internal consistency of variables, although other viewpoints of reliability exist in quantitative research (Hair et al., 1998, p. 118). In other words, each item in a summated scale should be highly correlated with the other items in the same scale, and hence they should measure the same construct. Scholars have proposed that internal consistency can be achieved via three measures: item-to-total correlations, inter-item correlations, and Cronbach's alpha. However, assessing the validity and reliability of qualitative research is not as straightforward. Qualitative research is evaluated in terms of credibility, transferability, dependability and confirmability (Schwandt et al., 2007).

Additionally, the internal and external validity of the results of the thesis were evaluated. Internal validity refers to the degree to which the causal effects studied are valid for the population studied, while external validity is connected to the generalisability of the results. Internal and external validity are at good level in the thesis. For publications I, II, III and IV, the cross-sectional data utilised in these studies influences the internal validity of the results, and hence causality is not possible to establish. For publication I, the

internal validity is evaluated through the specificity and sensitivity of the models proposed. The models can correctly predict between 67.8 and 82.7 percent of individuals with sustainable entrepreneurial goals; however, there are some differences between the two groups tested in each model, which limits the internal validity. For publications II and III, the underlying assumptions for linear regression were tested, and after detecting violations of these assumptions (heteroscedasticity, autocorrelation in errors and non-normally distributed residuals), heteroscedasticity and auto-correlation were corrected to provide internal validity. Moreover, no misspecification in the models was detected, and several control variables were included based on the findings of prior literature. For publication IV, the sample is randomly split into two, and the identified cluster structure holds for both samples. Regarding external validity, the sample in publication I consisted of individuals who are between 18 and 100 years old from 29 countries. Hence, the external validity of the publication is good. For publications II, III and IV a random sample of university students studying in three European countries was included. Furthermore, gender, age, discipline and entrepreneurial experience are among the variables controlled in the thesis (publications II and III). Although this may to some degree compromise the external validity, it also shows that discipline, country, gender and entrepreneurial parents seem to be significant control variables. Hence, the external validity remains at an acceptable level.

#### *Quantitative publications*

The assessment of the reliability and validity of the study regarding the survey data is presented in Appendix C. Reliability of the measurement scales used in publications II, III and IV is evaluated via Cronbach's alphas. All the Cronbach's alphas, except for perceived level of knowledge about social issues, for the sample utilised in publication II are above the recommended cut-off value of 0.7, and the Cronbach's alpha for perceived knowledge about social issues is above 0.6. Similarly, only PEF has a Cronbach's alpha between 0.6 and 0.7 in the data used in publication III and IV. Hence, it can be concluded that the measures utilised in this thesis are deemed reliable.

Construct validity is evaluated via convergent and discriminant validity. Average variance extracted and composite reliability enable the assessment of convergent validity. Average variance extracted reflects how much variance is caught by a construct compared to due to measurement error. Values above 0.5 are acceptable, while values above 0.7 are very good. For the measures utilised in publications III and IV, the average variance extracted is above the cut-off value of 0.5 for all the measures, except for extrinsic reward. Composite reliability is also above the cut-off value for all the measures, except for perceived entrepreneurial desirability. Discriminant validity is evaluated by comparing the intra-correlation of a construct to inter-correlation between constructs. This is done by comparing the square root of average variance extracted to inter-correlation between constructs. For the measures utilised in publication II, III and IV, there is discriminant

validity. Because there is both convergent and discriminant validity, construct validity is established. Hence, the measures utilised in this thesis are considered valid.

#### *Qualitative publication*

The rigour of qualitative research is evaluated through its trustworthiness that has been proposed to correspond to those measures utilised to analyse validity and reliability of quantitative research (Schwandt et al., 2007). The trustworthiness of qualitative research is evaluated through four criteria originally introduced by Lincoln and Guba (1985); these include credibility, transferability, dependability and confirmability. Each criterion is discussed separately below to demonstrate the contribution to the trustworthiness of the study.

*Credibility* refers to the degree to which the findings and conclusions of a study are recognised and accepted by the study participants (Krefting, 1991). Credibility can be achieved through such techniques as prolonged engagement, persistent observation, triangulation, member checking and peer debriefing. The credibility of the findings was enhanced in three ways. First, the results of the study were presented and discussed among relevant parties. Publication V was presented and discussed at an academic conference. Second, the findings of the study are based on two data sources, repeated measures survey data and written documents generated by the participants; these were collected through two methods. This further enhanced the credibility of the findings. Third, the coding of the data obtained through documents was checked with another researcher, further improving the credibility of the findings.

*Transferability* refers to the extent that findings can be generalised for a larger population by applying the findings to another context and/or population (Krefting, 1991). The results of publication V and the context, in which the study was conducted, are clearly described. Because the results are clearly reported, any perspective entrepreneur or individual involved in entrepreneurship education can learn how EOTs change and are connected to the realisation of new venture ideas. Furthermore, the results are presented via graphical representations, supported by illustrative quotes and critical analysis, based on which the findings and the conclusions of the research were formed. Hence, there is clear record of transferability. The population of the study were young, nascent entrepreneurs participating in a practical entrepreneurship training course, hence these results are applicable to different contexts with nascent entrepreneurs.

*Dependability* refers to the stability of the results and whether replicating the study would provide the same results (Krefting, 1991). Replication of the study was not possible in this research. All the product idea descriptions and business plans were stored together with the repeated measure data to enable checking of the data at a later stage. Dependability was further increased through the data sample collected, since the results of the categorisation and csQCA are align.

*Confirmability* refers to the degree to which the findings are solely based on the gathered data and not subject to a researcher's biases, motivations or perspectives (Krefting, 1991). Confirmability is established through credibility and transferability, and it is connected to dependability. The data was collected in a systematic way from two sources (18 documents and a repeated measures data sample). The analysis was conducted in a systematic manner, and the coding of the data was documented, including the original quotations from the written documents. Confirmability can be checked by comparing the findings of present study with those of studies on the same topic. Prior research results supported the findings of the study, hence providing confirmability for the findings. For example, prior research has described initial venture ideas as rudimentary, which was also the case in the present study.

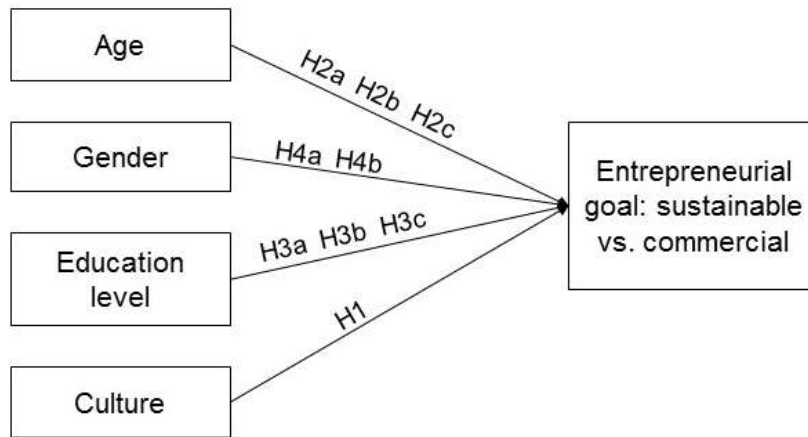
## 4 Results

This chapter presents the overall objectives of each publication and summarises its main findings. The empirical portion of the research comprises five publications. The first publication acts as a background study for the research context. The second and third publications focus on entrepreneurial intentions in the context of sustainable entrepreneurship, while the fourth and fifth publications focus on entrepreneurial opportunity templates in a more general manner. A summary of the publications is presented at the end of this chapter.

### 4.1 Publication I: Young adults and sustainable entrepreneurship: the role of culture and demographic factors

#### *Overall objectives*

The publication lays the foundation for the present study and the context of the research, young adults and sustainable entrepreneurship. The literature has proposed two alternative theories, the generation subculture theory and life stage theory, to explain why young adults may be more prone to sustainable entrepreneurship than older adults. The publication aims to examine whether young adults perceive sustainable entrepreneurship to be more attractive than older adults through two objectives. The first objective is to examine the role of individual-level factors, namely age, gender and education level, in holding a sustainable entrepreneurial goal over a commercial entrepreneurial goal. This publication utilises the concept of entrepreneurial goal, which focuses on the type of value created and hence reflects an individual's opportunity-specific attitude towards a particular value potential or a combination of value potentials. The second objective is to examine national cultural values and whether being in a country with postmaterialist values influence the likelihood of holding a sustainable entrepreneurial goal over a commercial entrepreneurial goal. The concept of sustainable entrepreneurial goal reflects an individual's emphasis on three types of value creation and hence reflects opportunity-specific attitude focusing on triple value creation. The theoretical model for the publication is presented below (Figure 5).



**Figure 5:** Theoretical model of publication 1

#### *Main findings*

The results of the publication show that the likelihood of having a sustainable entrepreneurial goal over commercial entrepreneurial goal is influenced by age, education level and culture. First, young adults are more likely to hold sustainable entrepreneurial goals over commercial entrepreneurial goals than older adults, suggesting that young adults perceive sustainable entrepreneurship to be more attractive than older adults. This provides support for the generation subculture theory, which proposes that individuals born during a particular time period in a specific geographic area tend to hold similar values. Generation Y (born between 1979 and 1994) are said to be more entrepreneurial and hold more environmentally and socially conscious values than previous generations. This is supported by the study results. However, results of the publication also show that when compared to older adults, young adults tend to hold economically and socially focused sustainable entrepreneurial goals rather commercial entrepreneurial goals. This provides partial support for the life stage theory, which proposes that young adults tend to highlight extrinsic reward, while older adults tend to hold more altruistic values.

Second, the results provide support for the role of education in enhancing sustainable entrepreneurship. Regardless of the type of sustainable goal, individuals with a higher education level are more likely to hold a sustainable entrepreneurial goal than a commercial entrepreneurial goal.



#### **4.2 Publication II: Socially-oriented entrepreneurial goals and intentions: the role of values and knowledge**

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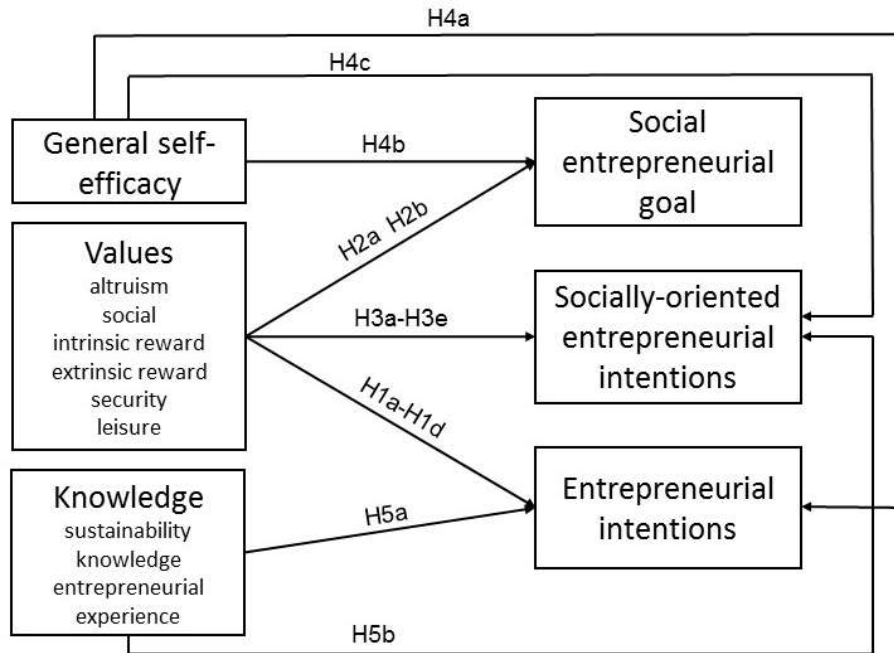
Third, individuals in countries with more postmaterialist values are more likely to hold sustainable entrepreneurial goals over commercial entrepreneurial goals compared to those in countries with more materialist values. These results are supported by the findings of Hechavarria et al. (2017) who showed that social and sustainable goals are enhanced by postmaterialist culture, while economic goals are hindered by it. To conclude, young adults with higher education levels in countries with postmaterialist values are most likely to have sustainable entrepreneurial goals over commercial entrepreneurial goals.

The results of the publication contribute to sustainable entrepreneurship literature in three ways. First, the results provide evidence of the connection between age and sustainable entrepreneurial goals using the generation subculture and life stage theories. The results show that the generation subculture theory is applicable for explaining the preference for sustainable entrepreneurial goals over commercial entrepreneurial goals, while the life stage theory partially explains preferences between different types of sustainable entrepreneurial goals compared to commercial entrepreneurial goals. Second, prior literature examining different entrepreneurial goals has examined each element of sustainable entrepreneurship separately (Hechavarria et al., 2017), while this publication examines all three value creation elements simultaneously. Third, the results show that university students in Western countries are an appropriate context for studying sustainable entrepreneurship.

#### **4.2 Publication II: Socially-oriented entrepreneurial goals and intentions: the role of values and knowledge**

##### *Overall objectives*

The publication focuses on social entrepreneurial goals and socially-oriented entrepreneurial intentions. As discussed in the introduction, in this doctoral thesis the concepts of socially-oriented entrepreneurial intentions and social entrepreneurial goals are used interchangeably with sustainability-oriented entrepreneurial intentions and sustainable entrepreneurial goals. As a result, contributions are discussed in relation to both social and sustainable entrepreneurship. The theoretical model of the publication is presented below in Figure 6.



Notes: Country (Finland=0, other=1), age, gender (male=0, female=1), field of study (business=0, other=1) and entrepreneurial parents (No=0, Yes=1) were controlled for.

**Figure 6:** Theoretical model of publication II

The aim of the publication was to examine the factors impacting social entrepreneurial goals and socially-oriented entrepreneurial intentions. More specifically, the publication aimed to show how work values and general self-efficacy influence social entrepreneurial goals. Additionally, the publication aimed to provide evidence of the differences between drivers of general entrepreneurial intentions and drivers of socially-oriented entrepreneurial intentions. This aim was realised by examining differences in the roles of work values, specific knowledge and general self-efficacy as drivers of general and socially-oriented entrepreneurial intentions.

## 4.2 Publication II: Socially-oriented entrepreneurial goals and intentions: the role of values and knowledge 67

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### *Main findings*

The results of the publication show that work values influence general entrepreneurial intentions differently than socially-oriented entrepreneurial intentions. First, altruism plays an important role in social entrepreneurial goals and socially-oriented entrepreneurial intentions, while it does not have a significant impact on general entrepreneurial intentions. This result is supported by the findings of prior literature showing the importance of altruism and empathy in social and sustainable entrepreneurship (London, 2010; Smith et al., 2010; Patzelt and Shepherd, 2011; Dees, 2012). Second, intrinsic reward has a negative, partially significant effect on social entrepreneurial goals and does not have any connection to socially-oriented entrepreneurial intentions, although it enhances general entrepreneurial intentions. This contradicts the suggestion that sustainable entrepreneurs are drivers of change (Cohen and Winn, 2008; Hockerts and Wüstenhagen, 2010) but aligns with the findings of entrepreneurship literature regarding the drivers of entrepreneurial intentions (Berings et al., 2004; Hirschi and Fischer, 2013). Third, security has a negative influence on both general and socially-oriented entrepreneurial intentions. These results follow the findings of prior literature regarding the role of security in entrepreneurial intentions (Brenner et al., 1991; Berings et al., 2004; Hirschi and Fischer, 2013). However, it ought to be noted that during data collection, economic distress in Europe may have heightened the role of security.

Surprisingly, general self-efficacy is not connected to social entrepreneurial goals or general or socially-oriented entrepreneurial intentions. Contrary to the publication results, prior literature has suggested that self-efficacy has a positive influence on entrepreneurial intentions across contexts (e.g., Boyd and Vozikis, 1994; Judge et al., 1998; Smith and Woodworthy, 2012). This may be due to the nature of general self-efficacy, and hence its influence is mediated by other factors, for example, intrinsic and extrinsic reward. Moreover, specific knowledge plays a role in entrepreneurial intentions. Entrepreneurial experience has a positive influence on general entrepreneurial intentions, while environmental knowledge has a positive impact on socially-oriented entrepreneurial intentions. These results are supported by the entrepreneurship literature that has proposed that knowledge plays an important role in recognising entrepreneurial opportunities, regardless of the context (Venkataraman, 1997; Shepherd and Patzelt, 2011; Shepherd et al., 2015). However, it seems that entrepreneurial experience cancels out the positive impact of environmental knowledge by making it insignificant. These results are in line with the findings of Kuckertz and Wagner (2010), which show that business experience weakens the influence of sustainability orientation on entrepreneurial intentions.

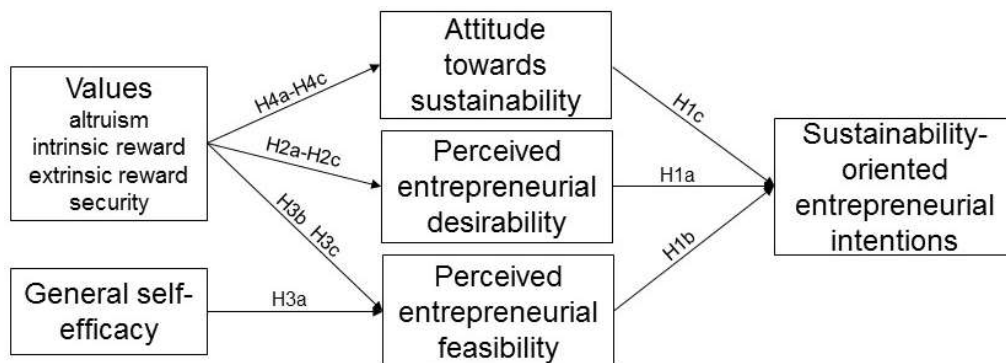
The publication's contribution to the entrepreneurship literature is threefold. First, the results show that general entrepreneurial and socially-oriented entrepreneurial intentions are driven by different work values. Comparing the drivers of general entrepreneurial intentions with those of socially-oriented entrepreneurial intentions provides new information about entrepreneurial intentions. Second, the results of the study shed more

light on the role of perceived knowledge level in intention formation. The entrepreneurship literature is extended to show the effect that entrepreneurial experience has on socially-oriented entrepreneurial intentions and how it seems to influence the environmental knowledge-socially-oriented entrepreneurial intention relationship. Third, the results provide evidence about the role of general self-efficacy in entrepreneurial intention formation. The results show that general self-efficacy is not directly connected to general or socially-oriented entrepreneurial intentions; however, it seems that its influence is mediated through other factors.

### 4.3 Publication III: Drivers of Entrepreneurial Intentions in Sustainable Entrepreneurship

#### *Overall objectives*

The publication focuses on the TPB in sustainable entrepreneurship. The objective of the paper was to extend and adapt the existing intentions model for sustainable entrepreneurship by including attitude towards sustainability and entrepreneurship-type-specific intentions into the model. This objective may be reached through two aims. First, the publication aimed to account for values and general-self efficacy as antecedents of drivers of entrepreneurial intentions. Second, the publication aimed to examine the role of PED and PEF, as well as attitude towards sustainability, in influencing sustainability-oriented entrepreneurial intentions. Figure 7 presents the theoretical model of the study.



**Figure 7:** Theoretical model of publication III

*Main findings*

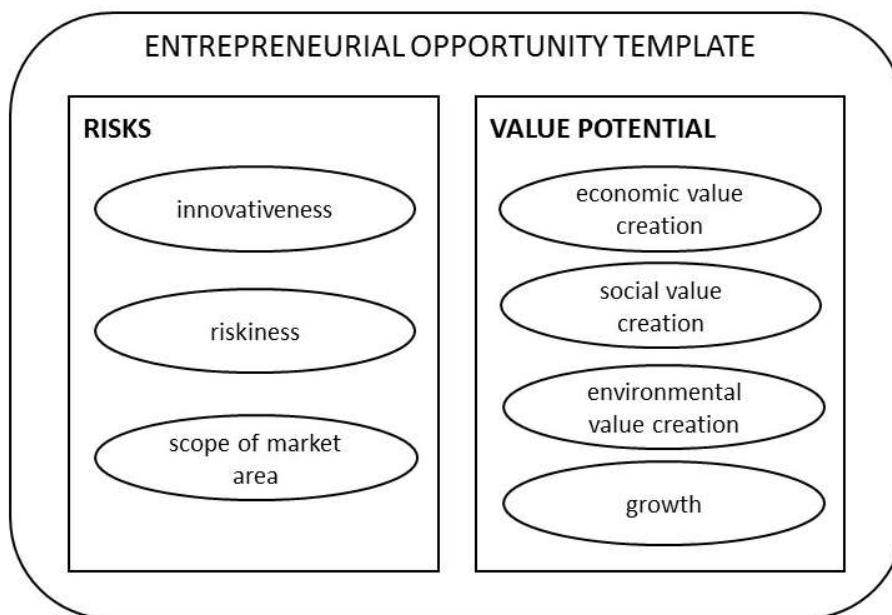
The results of the publication show that the intentions model needs to be context-specific. First, the variance explained is higher when attitude towards sustainability is included as a driver of sustainability-oriented entrepreneurial intentions. Second, sustainability-oriented entrepreneurial intentions are driven by attitude towards sustainability and PED. This is in line with prior entrepreneurship literature (Hockerts, 2017; Urban and Kujinga, 2017). However, PEF is not connected to sustainability-oriented entrepreneurial intentions. This result is supported by the findings of prior social entrepreneurship literature, which has found that PEF is not connected to entrepreneurial intentions (Ayob et al., 2013). Moreover, the effect of PEF on entrepreneurial intentions is proposed to be mediated through PED and it moderates the relationship between PED and entrepreneurial intentions (Fitzsimmons and Douglas, 2011; Schlaegel and Koenig, 2014). Additionally, the results show that general self-efficacy has a positive impact on PEF, hence providing support for the findings of prior literature (Kruger and Brazeal, 1994; Schlaegel and Koenig, 2014). The results also provide evidence about the connection between values, attitudes and entrepreneurial intentions by showing how work values impact the drivers of sustainability-oriented entrepreneurial intentions. First, there is a connection between altruism, attitude towards sustainability and sustainability-oriented entrepreneurial intentions. Altruism's influence on attitude towards sustainability is supported by the findings of the social and sustainable entrepreneurship literature (Schultz and Zelezny, 1999; Mair and Noboa, 2006; Smith et al. 2010; Patzelt and Shepherd, 2011). Second, extrinsic reward has a positive impact on PED, which, in turn, has a positive effect on sustainability-oriented entrepreneurial intentions. The role of extrinsic reward in driving PED is supported in the entrepreneurship literature (Brenner et al., 1991; Douglas and Shepherd, 2002; Kirkley, 2016). However, extrinsic reward has a negative impact on sustainability-oriented entrepreneurial intentions. This is supported by the findings of Schultz and Zelezny (1999). As a result, it seems that prospective sustainable entrepreneurs are faced with balancing values internally.

The publication contributes to the entrepreneurship literature in three ways. First, the publication extends the entrepreneurial intentions model to sustainable entrepreneurship by introducing attitude towards sustainability as a driver of entrepreneurial intentions. Moreover, the findings of the study provide evidence about sustainability-oriented entrepreneurial intentions. Second, the results of the publication include work values as drivers of PED, PEF and attitude towards sustainability. The results highlight the need to balance the effect of work values on different drivers of entrepreneurial intentions. From one perspective individuals aim to support themselves and possibly others by succeeding in entrepreneurship; but by contrast, they are willing to settle for smaller personal economic profits to generate positive impact on society and the natural environment. Hence, new insights about the connection between different work values and drivers of entrepreneurial intentions are provided. Third, the results contribute to the entrepreneurship literature by providing evidence about the connection between values, attitudes and intentions. All in all, the results highlight the need to adapt entrepreneurial intentions models to include the variance in entrepreneurial opportunities.

#### 4.4 Publication IV: A Typology for Entrepreneurial Opportunity Templates

##### *Overall objectives*

The publication focuses on entrepreneurial opportunity templates and as a result, extends the doctoral thesis beyond sustainable entrepreneurship and takes a broader perspective on entrepreneurial opportunities. The publication had two objectives. First, it aimed to develop a novel typology for entrepreneurial opportunity templates by reviewing the existing entrepreneurial cognition literature regarding entrepreneurial opportunity recognition and evaluation. Second, the publication provides empirical evidence about how entrepreneurial opportunity templates differ by gender, discipline, work values, and entrepreneurial attitudes and intentions. Figure 8 below presents the typology for an EOT.



**Figure 8:** A typology for an entrepreneurial opportunity template

*Main findings*

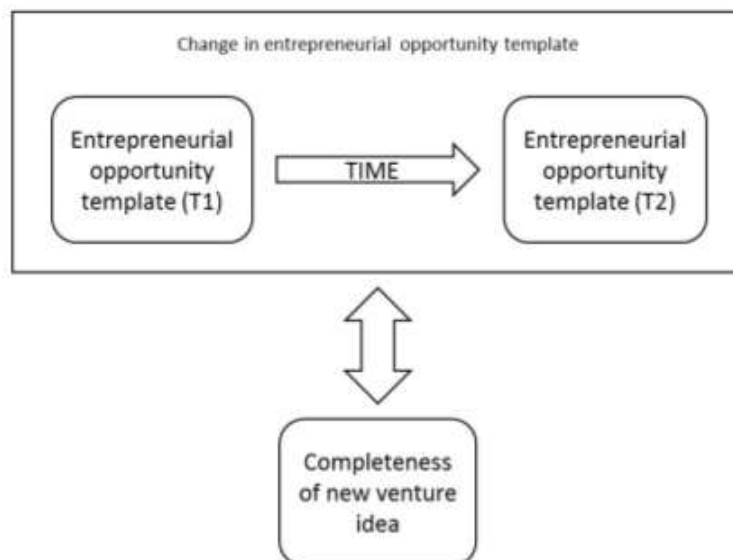
A novel typology for EOTs consisting of seven attributes was created. The literature review shows that existing literature has used the more traditional aspects of entrepreneurship when describing entrepreneurial opportunities, namely economic value creation, risks and novelty, while less attention has been paid to other types of value creation and the scope of the market. The results of the publication show that there are four distinct types of EOTs, namely global sustainable EOT, wealth-oriented EOT, local sustainable EOT, and international EOT. The comparison between EOT types shows that individuals with international EOT tend to have higher entrepreneurial attitudes and intentions than individuals with other EOT types. Conversely, individuals with wealth-oriented EOT perceive entrepreneurship as a less desirable career option than individuals with other types of EOT, while individuals with global sustainable EOT perceive entrepreneurial careers to be less feasible than individuals with other EOTs. Furthermore, individuals with global sustainable EOT tend to also value altruism more than individuals with other types of EOT, while extrinsic and intrinsic reward are more valued by individuals with international EOT. These results provide support for Patzelt and Shepherd (2011), who proposed that altruism influences recognition of sustainable development opportunities. Surprisingly, EOT types differ only by gender and discipline, while age, entrepreneurial background, as well as work and entrepreneurial experience, do not seem to matter. As expected, males tend to have wealth-oriented and international EOTs, while females have EOT types with a softer focus. Similarly, individuals with international and wealth-oriented EOTs tend to study business, while individuals with global and local sustainable EOTs tend to study other fields. These results are supported by the findings of the sustainable entrepreneurship literature (Kuckertz and Wagner, 2010; Hockerts, 2017; Hechavarria et al., 2017) that has found evidence of the difference between females and males regarding altruistic values, and between business and other students regarding sustainability orientation and entrepreneurial intentions.

The publication contributes to the entrepreneurship literature in three ways. First, a novel typology for EOTs is created that includes three types of value creation potentials, namely economic, social and environmental. Second, the publication examines the connection between work values, entrepreneurial attitudes and intentions and EOTs. This provides empirical evidence about the prominent association between deep beliefs, knowledge structures, and entrepreneurial attitudes and intentions proposed by Krueger (2007). Third, the publication contributes to the entrepreneurship literature by providing evidence about the difference in demographic factors between individuals with different EOTs.

#### 4.5 Publication V: Change in Entrepreneurial Opportunity Templates and New Venture Ideas

##### *Overall objectives*

The publication focuses on change in entrepreneurial opportunity templates and new venture ideas. New venture ideas are more detailed descriptions of recognised entrepreneurial opportunities and range from rudimentary to detailed idea. The objective of the publication was to examine change in EOTs and the development of new venture ideas. More precisely, the publication focused on which type of change in EOTs is connected to a high degree of new venture idea completeness. New venture idea completeness refers to the descriptive richness of a new venture idea. Hence, a more complete idea is one in which the attributes of EOT are described from multiple perspectives. For example, the riskiness of a new venture idea is described through competitive risk, financial risk and speed of technological change. This objective was reached through two aims. First, through csQCA the publication aimed to examine the type of changes that are associated with a high degree of new venture idea completeness. Second, the publication aimed to compare the initial new venture idea and its contents to the developed new venture idea. The context of the paper is an academic-year-long practical entrepreneurship course, which provides an interesting setting to study these changes and developments. The theoretical framework for the publication is presented in Figure 9 below.



**Figure 9:** Theoretical framework for publication V



#### **4.5 Publication V: Change in Entrepreneurial Opportunity Templates and New Venture Ideas**

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##### *Main findings*

The results show that a high degree of new venture idea completeness is associated with three distinct change combinations in EOTs. Economic value potential and novelty are only present in one change combination. This contradicts the entrepreneurship literature, which has shown that novice entrepreneurs tend to highlight innovativeness in their perceptions of entrepreneurial opportunities (Baron and Ensley, 2006). Moreover, the results of the publication show that new venture ideas tend to be initially rudimentary, but as learning occurs and new information regarding the new venture idea is discovered, the venture idea is developed further. Initial new venture ideas tend to place a heavy focus on technology, economic value potential and risk of competition, while developed ideas include wider views on value creation potential and account for different risk aspects. The findings of Sanz-Velasco (2006) provide support for results of the publication regarding the nature of initial venture ideas and the developed dimensions of these ideas. Although all the new venture ideas in the publication were developed, the degree of completeness varies. However, the results show that changes in EOTs and the developed dimensions of new venture ideas are in line. Hence, these results imply that new venture ideas may be influenced by individuals' EOTs, which may be influenced by entrepreneurial experience in a university setting.

The publication's contribution to the entrepreneurship literature is threefold. First, the results of the publication provide evidence about opportunity development, which is a step in the entrepreneurship process that has gained only limited attention (e.g., Ardichivili et al., 2003; Sanz-Valesco, 2006). Second, the results contribute to the entrepreneurship literature by examining changes in EOTs and new venture ideas. Cognition has tended to be viewed as stable in the entrepreneurship literature, although there is evidence that it changes over time (Baron and Ensley, 2006; Krueger, 2007). The results of prior research show that novice and experienced entrepreneurs have different perceptions of entrepreneurial opportunities (Baron and Ensley, 2006). Third, the publication shows a connection between EOTs and new venture ideas and provides evidence of how changes in individuals may influence group-level new venture ideas. EOTs are personal views about the nature of entrepreneurial opportunities, while new venture ideas in the studied cases were group efforts.

Table 5: Summary of the original publications

	Publication I	Publication II	Publication III	Publication IV	Publication 5
<b>Title</b>	Young adults and sustainable entrepreneurship: the role of culture and demographic factors	Socially-oriented entrepreneurial goals and intentions: the role of values and knowledge	Drivers of Entrepreneurial Intentions in Sustainable Entrepreneurship	A Typology for Entrepreneurial Opportunity Templates	Change in Entrepreneurial Opportunity Templates and New Venture Ideas
<b>Objective</b>	The aim is to examine the drivers of sustainable entrepreneurship in different cultures by examining sustainable and commercial entrepreneurial goals.	The aim is to identify those factors that shape social entrepreneurial goals and socially-oriented entrepreneurial intentions.	The purpose is to bring existing intentions models into the context of sustainable entrepreneurship by extending and adapting the models to include work values and attitudes towards sustainability	The purpose is to develop a typology for entrepreneurial opportunity templates of perspective young entrepreneurs based on a literature review.	The aim is to examine how individuals' EOTs and new venture ideas can be influenced through education.
<b>Results</b>	<ul style="list-style-type: none"> <li>- Young adults are more likely to hold sustainably-oriented entrepreneurial goals than older adults</li> <li>- Young adults are more prone to hold economically-oriented sustainable entrepreneurial goal</li> </ul>	<ul style="list-style-type: none"> <li>- Altruism has a positive impact on social entrepreneurial goals, socially-oriented entrepreneurial intentions</li> <li>- Environmental knowledge has a positive impact on socially-oriented entrepreneurial intentions but becomes insignificant as a result of entrepreneurial experience</li> </ul>	<ul style="list-style-type: none"> <li>- Altruism has a positive impact on attitude towards sustainability</li> <li>- Extrinsic reward has a negative influence on attitude towards sustainability and a positive influence on PED</li> <li>- PED and attitude towards sustainability enhance sustainability-oriented entrepreneurial intentions, while PEF is insignificant</li> </ul>	<ul style="list-style-type: none"> <li>- Four distinct entrepreneurial opportunity templates were identified</li> <li>- Individuals with particular EOT types tend to differ on intentions, entrepreneurial attitudes, work values, gender and discipline</li> </ul>	<ul style="list-style-type: none"> <li>- Three distinct change combinations were identified that are associated with a high degree of new venture idea completeness</li> <li>- New venture ideas tend to be rudimentary, but they are developed over time</li> <li>- The changes in EOT attributes correspond to new venture idea development</li> </ul>
<b>Main contribution</b>	The publication provides empirical evidence that young adults are more prone to have sustainable entrepreneurial goals.	The publication provides empirical evidence about the drivers of sustainable entrepreneurial goals and sustainability-oriented entrepreneurial intentions.	The publication introduces a context-specific intentions model, and shows that drivers of sustainability-oriented entrepreneurial intentions are impacted by different values.	The publication introduces a novel typology for entrepreneurial opportunity templates.	The publication provides empirical evidence about the change in EOTs and their association with the degree of new venture idea completeness
<b>Research question</b>	1 & 2	2	2	1 & 2	3

## 5 Conclusions

The main objective of this doctoral thesis was to examine the connection between perceptions of entrepreneurial opportunities and entrepreneurial intentions. Regardless of the shift in the role of entrepreneurship in society and increasing demands for sustainability, this shift seems to have only recently shaped entrepreneurship research. Moreover, despite the recognition of different types of purpose-driven entrepreneurship, the research has remained mostly at the conceptual level, focusing on definitions. This research has progressed only recently, mainly in the field of social entrepreneurship, by moving to examine entrepreneurial intentions in social entrepreneurship. Sustainable entrepreneurship, however, has gained less attention. Due to the shortcomings of TPB, entrepreneurial opportunities and motivational factors have remained underlying assumptions in this research field. As a result, attention should be paid to the connection between perceptions of entrepreneurial opportunities and entrepreneurial intentions.

The thesis is based mainly on three literature streams, namely entrepreneurial intentions, the cognitive view on entrepreneurial opportunities and sustainable entrepreneurship. The thesis builds on TPB, signal detection theory and pattern recognition theory. This doctoral thesis focuses on the research gap at the intersection of perceptions of entrepreneurial opportunities, entrepreneurial intentions and sustainable entrepreneurship. Hence, the objective of this thesis was to examine opportunity-specific entrepreneurial attitudes and intentions in sustainable entrepreneurship. Furthermore, the aim was to provide evidence of the importance of including the variability of entrepreneurial opportunities in entrepreneurship research. To achieve this aim, a model for opportunity-specific entrepreneurial intentions was proposed and tested in the context of sustainable entrepreneurship. Through a multiple method approach, the results of the study provide evidence of young adults' opportunity-specific attitudes, drivers of opportunity-specific attitudes and intentions toward sustainable entrepreneurship, as well as changes in opportunity-specific attitudes. These results are based on five original publications, which are presented in the second part of the thesis.

### 5.1 Results

The main research question for the thesis focused on the connection between perceptions of entrepreneurial opportunities and entrepreneurial intentions. As a result, an opportunity-specific entrepreneurial intentions model was proposed and tested in the context of sustainable entrepreneurship. Furthermore, in order to answer the main research question, three sub-questions were derived from the entrepreneurship literature. Through these sub-questions, new insights about the connection between perceptions of entrepreneurial opportunities and entrepreneurial intentions were generated. Answers to each sub-question and the main research question are provided below.

### 5.1.1 What kind of opportunity-specific attitudes do young adults hold?

Publication I examined the connection between age and entrepreneurial goals. The findings of the publication provide evidence that young adults seem to focus more on sustainable entrepreneurial goals than purely commercial goals. The results of the study show that the likelihood of having a sustainable entrepreneurial goal over a commercial entrepreneurial goal decreases as age increases. Additionally, the findings of the publication reveal what kind of sustainable entrepreneurial goals young adults seem to prefer. The results suggest that young adults tend to have economically- and socially-oriented sustainable entrepreneurial goals over purely commercial goals. The likelihood of having economically- or socially-oriented sustainable entrepreneurial goals rather than commercial entrepreneurial goals decreases with age. However, focusing only on age does not paint the whole picture. Both education level and national culture matter in entrepreneurial goal preference. Individuals with a higher education level are more likely to have any type of sustainable entrepreneurial goal rather than a commercial entrepreneurial goal. Similarly, individuals in countries with more postmaterialist values are more likely to have any type of sustainable entrepreneurial goal over commercial entrepreneurial goals. Taking these results together suggests that young adults with higher education in countries with postmaterialist values seem most likely to have sustainable entrepreneurial goals.

Moreover, the findings of the literature review in publication IV show that knowledge structures describing entrepreneurial opportunities have been described in prior literature through conventional characteristics of entrepreneurship, namely novelty, risks and economic value potential. Less attention has been paid to the attributes of newer forms of entrepreneurship such as international, sustainable and high-impact or growth-oriented entrepreneurship. Hence, the thesis proposes that EOTs comprise the following seven attributes: social value potential, environmental value potential, economic value potential, novelty, riskiness, the scope of the market and growth orientation. Moreover, the findings of publication IV generated four distinct types of EOTs, local sustainable, wealth-oriented, global sustainable and international.

### 5.1.2 What are the drivers of entrepreneurial attitudes and intentions in sustainable entrepreneurship?

Publications II and III focused on the drivers of entrepreneurial attitudes and intentions in sustainable entrepreneurship. The results show that work values and knowledge are connected to both sustainability-oriented entrepreneurial goals and intentions, while PED and attitude towards sustainability are merely associated with sustainability-oriented entrepreneurial intentions. First, altruistic values play an important role in sustainable entrepreneurship. Altruism is connected both directly and indirectly to sustainability-oriented entrepreneurial intentions. Surprisingly, intrinsic reward is connected to the traditional components of entrepreneurship, while it does not seem to be associated with

the sustainability aspect of sustainable entrepreneurship. Moreover, extrinsic reward weakens attitudes towards sustainability, while it increases PED. Security has a negative effect on general and sustainability-oriented entrepreneurial intentions. These results reflect the complex nature of motivational influences affecting sustainability-oriented entrepreneurial intentions, which demonstrates the triple value creation goals of sustainable entrepreneurship.

Second, perceived level of environmental knowledge has a positive influence on socially-oriented entrepreneurial intentions, while perceived level of social knowledge is not connected to these intentions. Moreover, entrepreneurial experience has a positive effect on general entrepreneurial intentions; however, it seems to cancel out the positive impact of environmental knowledge. Third, the findings of publications II and III show that general self-efficacy influences PEF, but is not directly connected to either socially-oriented or general entrepreneurial intentions. Fourth, following TPB, sustainability-oriented entrepreneurial intentions are driven by PED and attitude towards sustainability. In contrast to TPB, PEF is not connected to sustainability-oriented entrepreneurial intentions. Furthermore, the results of the publication IV show that individuals with a particular type of EOT tend to differ in terms of PED, PEF, entrepreneurial intentions, work values, gender and field of study from individuals with other types of EOT.

### 5.1.3 How do opportunity-specific attitudes change?

The findings of the thesis show that opportunity-specific attitudes change through distinct change combinations. Publication V focuses on changes in opportunity-specific attitudes via EOTs, and the results show that there are three distinct change combinations in opportunity-specific attitudes that are connected to high degree of completeness in a new venture idea. Hence, it seems that opportunity-specific attitudes tend to form combination patterns. The results of thesis show that the following changes in opportunity-specific entrepreneurial intentions need to occur for a high degree of new venture completeness: 1) attitude towards risks and sustainability strengthen or remain unchanged, while attitude towards novelty weakens 2) attitudes towards scope of the market and sustainability strengthen or remain unchanged, while attitudes towards risks decreases or 3) attitudes towards the scope of the market and risk strengthens or remain unchanged, while attitudes towards economic value creation and sustainability weaken.

The results of thesis suggest three issues. First, when less attention is paid to the novelty aspects of a potential entrepreneurial opportunity, and the importance of risks and sustainable value creation remains unchanged or becomes more important, the new venture idea tends to be more developed. Second, when individual focus on risks weakens, while the importance of scope of the market and sustainable value creation remains unchanged or increases, new venture ideas tend to be developed further. Lastly, when perceptions of entrepreneurial opportunities change in a way that attention paid to information regarding the scope of the market and risks increases or remains unchanged,

and the importance of value creation potentials decreases, the new venture idea tends to be more developed.

#### 5.1.4 **How are perceptions of entrepreneurial opportunities and entrepreneurial intentions connected?**

Entrepreneurial opportunities and entrepreneurial intentions are connected through opportunity-specific attitudes and opportunity-specific entrepreneurial intentions. Opportunity-specific entrepreneurial intentions reflect two things: 1) intentions towards entrepreneurship and 2) opportunity-specific entrepreneurial goals, which are connected to the type of entrepreneur an individual desires to be.

The thesis provides evidence of the opportunity-intention connection in the context of sustainable entrepreneurship. The findings of the thesis show that attitudes towards sustainability are important drivers of sustainability-oriented entrepreneurial intentions. Furthermore, the results suggest that individuals with different combination of opportunity-specific attitudes (EOTs) tend to also differ in their attitudes towards entrepreneurship and their level of entrepreneurial intentions. For example, individuals with international EOT tend to perceive entrepreneurship as more feasible and desirable, as well as have a higher level of entrepreneurial intentions.

## 5.2 **Discussion and theoretical contribution**

The doctoral thesis contributes to entrepreneurship research by extending the findings of entrepreneurial intention research, entrepreneurial cognition research on entrepreneurial opportunities and sustainable entrepreneurship research.

First, the thesis extends findings of entrepreneurial intention research by developing an entrepreneurial intentions model that overcomes the shortcomings of the TPB, which has been criticised for only implicitly including entrepreneurial opportunities and motivation factors (Brännback et al., 2007). By proposing an opportunity-specific intentions model that includes general attitudes towards entrepreneurship, opportunity-specific attitudes and work values, entrepreneurial opportunities and motivational factors are explicitly brought into intention formation. As a result, the findings of the thesis extend and adapt TPB to account for the variability in entrepreneurial opportunities using perceptions of entrepreneurial opportunities and an opportunity-specific entrepreneurial intention model. Moreover, through the introduction of the individual-opportunity nexus to entrepreneurial intention formation, the research provides new insights about the connection between perceptions of entrepreneurial opportunities and entrepreneurial intentions, and hence responds to a call by Fayolle and Liñan (2014) regarding the future directions of entrepreneurial intention research.

Moreover, the thesis contributes to entrepreneurial recognition research by proposing an opportunity-specific entrepreneurial intentions model, which proposes that individuals' prior knowledge and values shape their attitudes towards entrepreneurship and preferences in entrepreneurial opportunities, which, in turn, have impact on opportunity-specific entrepreneurial intentions. Hence, the model assumes that an individual has a preference in terms of entrepreneurial opportunities, which is reflected in that individual's attitude towards that preferred opportunity. However, a recognition of an entrepreneurial opportunity is not a necessary condition for an opportunity-specific attitude to be formed. This is in line with Vogel's (2017) notion of opportunity concept that is a stage, during which a nascent entrepreneur has only a vaguely defined the components of his or her venture. This step is preceded by entrepreneurial opportunity recognition; however, the type of entrepreneurial opportunity recognition, whether serendipity or systematic search (e.g. Chandler et al., 2002; Murphy, 2011; Vogel, 2017), does not seem to impact the opportunity concept itself. Hence, this further highlights the contribution of the doctoral thesis to the entrepreneurship literature by overcoming the shortcomings of TPB, which has not explicitly incorporated motivational factors and entrepreneurial opportunities into intention formation (Brännback et al., 2007; Jarvis, 2016).

Second, the contribution of the doctoral thesis to entrepreneurship cognition research on entrepreneurial opportunities is threefold. First, a novel typology for EOTs, which reflects different entrepreneurship types and variation in entrepreneurial opportunities, is developed and tested among young adults. Entrepreneurial opportunity template (Barreto, 2012) is a novel concept in entrepreneurial cognition research that refers to a knowledge structure depicting an entrepreneurial opportunity. As a result, new insights about this concept are provided by first showing connections between EOTs and other related concepts through a literature review and then operationalising the concept in a manner that is deeply rooted in the prior literature. The typology was developed based on entrepreneurship literature focusing on the cognitive view of entrepreneurial opportunities and different forms of entrepreneurship. Hence, the findings of prior entrepreneurial cognition literature are extended to include different value potentials and the scope of the market area as attributes of an entrepreneurial opportunity and by providing new insight by proposing and testing a novel typology for EOTs.

Second, prior research on knowledge structures describing entrepreneurial opportunities has not found conceptual agreement and has tended to focus on conventional attributes of entrepreneurial opportunities. By introducing a typology for EOTs that takes into account different value creation potentials, namely social, environmental and economic, among other attributes of potential entrepreneurial opportunity, the results of prior entrepreneurial cognition research are extended by strongly connecting EOT attributes to different types of entrepreneurship. Hence, the thesis contributes to entrepreneurship research by extending attributes of entrepreneurial opportunity perceptions beyond conventional characteristics of entrepreneurship. Third, prior entrepreneurship literature has tended to treat entrepreneurial cognition as stable (Gregoire et al., 2015), although the results of prior research regarding perceptions of entrepreneurial opportunities have shown that perceptions develop over time (Baron and Ensley, 2006; Krueger, 2007;

Gregoire et al., 2015). The thesis contributes to the entrepreneurship literature by answering a call for research about changes in entrepreneurial cognition (Gregoire et al., 2015) and potential entrepreneurial opportunities (Shepherd, 2015) by providing new insights about changes in EOTs and their connection to new venture ideas. Changes in new venture ideas occur through entrepreneurial opportunity development that remains an unexplored area in the entrepreneurial opportunity literature, and has been recently proposed as a separate step in entrepreneurial process (Bakker and Shepherd, 2017). Hence, the findings of the thesis also provide new understanding about entrepreneurial opportunity development.

Third, the thesis extends the findings of sustainable entrepreneurship research in four ways. First, applying the opportunity-specific intentions model to sustainable entrepreneurship provides new insights about the drivers of sustainability-oriented entrepreneurial intentions and sustainable entrepreneurial cognition. The thesis proposes the addition of two opportunity-specific variables to TPB, namely attitude towards sustainability and sustainability-oriented entrepreneurial intentions. As a result, TPB is applied in the context of sustainable entrepreneurship through a model for sustainability-oriented entrepreneurial intentions. However, the proposed sustainability-oriented intention model also contains general attitudes towards entrepreneurship through PED and PEF, and hence it contains all three aspects of sustainable entrepreneurship, which are social, environmental and economic value creation. Furthermore, the results show that drivers of sustainability-oriented entrepreneurial intentions differ from drivers of general entrepreneurial intentions. The theory of planned behaviour proposes that general entrepreneurial intentions are affected by PED and PEF. However, sustainability-oriented entrepreneurial intentions are influenced by PED and attitude towards sustainability. In contrast to TPB, PEF is not connected to sustainability-oriented entrepreneurial intentions. However, similar results regarding PEF have been found in social entrepreneurship research (Ayob et al., 2013). Similarly, general entrepreneurial intentions research has found that PEF influences entrepreneurial intentions through PED (Schlaegel ad Koenig, 2014) and that the relationship between PED and entrepreneurial intentions is negatively impacted by PEF. Hence, this implies that PEF may not have a direct effect on sustainability-oriented entrepreneurial intentions.

Second, the findings of the thesis highlight the connection between values, attitudes and intentions, as proposed by Krueger (2007). The findings suggest a relationship between altruistic values, attitude towards sustainability and sustainability-oriented entrepreneurial intentions. Similarly, extrinsic reward increases PED, which in turn enhances the level of sustainability-oriented entrepreneurial intentions. Furthermore, the findings imply a connection between intrinsic reward, PED and sustainability-oriented entrepreneurial intentions. However, the role of altruism in sustainable entrepreneurship is re-enforced in this thesis. Altruistic values are higher among individuals with sustainability-oriented EOTs, and altruistic values impact opportunity-specific entrepreneurial goals, attitudes and intentions. Prior social and sustainable entrepreneurship research has mainly focused on the role of altruistic values as influencing different aspects of sustainable entrepreneurship (e.g., Mort et al., 2003;



Shepherd et al., 2009; London, 2010; Smith et al., 2010; Dees, 2012; Gagnon, 2012; Hockerts, 2017). Hence, the thesis provides new insight about the role of values and their connection to general attitudes towards entrepreneurship, opportunity-specific attitudes and opportunity-specific entrepreneurial intentions in the context of sustainable entrepreneurship.

Furthermore, the findings of the thesis enhance understanding of the complexity of balancing value creation aims in sustainable entrepreneurship, which reflects triple goal setting in this area. The findings of the thesis show that extrinsic reward has opposite impacts on different sides of attitudes driving sustainability-oriented entrepreneurial intentions: extrinsic reward increases PEF, but it hinders attitude towards sustainability. Additionally, intrinsic reward increases PED and PEF, while it is not connected to attitude towards sustainability or sustainability-oriented entrepreneurial intentions. However, it is partially negatively connected to sustainable entrepreneurial goals. This, to some degree, contradicts the role of sustainable entrepreneurs as industry game changers through sustainable innovations (e.g., Cohen and Winn, 2008; Hockerts and Wüstenhagen, 2010). All in all, the findings of thesis provide support for the proposition of Shepherd et al. (2013) regarding the internal complexity of sustainable entrepreneurship, which involves balancing perceived capabilities, values and motives. This means that from one perspective, individuals aim at earning a living by creating a successful business, but they are also willing, to some degree, to sacrifice personal economic gain to create a positive environmental and societal impact.

Third, the findings regarding EOTs extend sustainable entrepreneurship research by showing how sustainable value creation is positioned in relation to other attributes of entrepreneurial opportunities and entrepreneurial cognitive aspects related to sustainability. This responds to the call for research on sustainability and entrepreneurial cognition put forward by Muñoz (2017). Specifically, the findings of this doctoral thesis contribute to entrepreneurial cognition research by including social, environmental and economic value potential as entrepreneurial opportunity attributes and sustainability-oriented attitudes and intentions in its focus. Furthermore, the findings of the study provide new insights about the differences in mental models related to sustainable entrepreneurship, a call also put forward by Muñoz (2017). The findings of the study show two EOT types that focus on sustainable value creation. These two templates differ in terms of the scope of the market, one being local and the other international. These findings reflect the nature of environmental issues: some of the issues are local such as the state of a stream or the nearby factory polluting a local lake, while others issues are in global scale, for example global warming. Moreover, the findings of the thesis provide new insights about the association between particular EOTs, entrepreneurial attitudes and entrepreneurial intentions.

Fourth, the findings of the thesis contribute to sustainable entrepreneurship research by demonstrating the role of age and gender in attitudes towards different aspects of sustainable value creation and EOT types. First, the findings follow the generation subculture theory regarding the connection between age and likelihood of having

sustainable entrepreneurial goals showing that young adults are more prone towards sustainable entrepreneurship than older adults. When examining value dominance within sustainable entrepreneurial goals, the results suggest that young adults are more likely to have economically- or socially-oriented entrepreneurial goals than older adults. These results are partially in line with life stage theory, which suggests that young adults are more prone to economic gain and independence than older adults. Additionally, gender seems to play a role in EOT types, as females tend to be more sustainability-oriented and males are more wealth-oriented when it comes to perceptions of entrepreneurial opportunities.

### 5.3 Implications for practitioners

The findings of the doctoral thesis have implications for both policy development and entrepreneurship education. The policy-level implications relate to encouraging and supporting growth in entrepreneurial activity, and supporting sustainable entrepreneurship to enable its influence on the development of societies. The implications for entrepreneurship education relate to education program design with the aim of increasing entrepreneurial intentions, both generally and for sustainable entrepreneurship.

#### *Policy level*

At the policy level, the thesis findings highlight the need to adapt policies and incentives to respond to the variety in perceptions of entrepreneurial opportunities in an attempt to increase entrepreneurial activity. The findings show that young adults are more prone towards sustainable entrepreneurship than older adults, and that sustainability-oriented entrepreneurial intentions are driven by PED and attitude towards sustainability. Hence, youth entrepreneurial activity could be encouraged by promoting forms of entrepreneurship aimed at social and environmental value creation. However, this is merely an example in a particular context, demonstrating the specifics associated with opportunity-specific entrepreneurial intentions and opportunity-specific attitudes. As the results regarding EOT types show, there are different combinations of opportunity-specific attitudes that form patterns reflecting different perceptions of entrepreneurial opportunities. Furthermore, these different perceptions are associated with varying levels of entrepreneurial intention and varying attitudes. Hence, flexibility in incentives and policies is needed. Simultaneously, attention should be paid to removing barriers to entrepreneurship and promoting entrepreneurial activity via public policies.

Moreover, the findings of the study imply that policies and incentives should be designed in a way that supports the founding and survival of sustainable enterprises as a result of their role in contributing to sustainable development. Conventionally, economic-oriented entrepreneurship has been seen to contribute to social inequality and environmental degradation, while sustainable entrepreneurship, focusing on the triple bottom line

(creating social, environmental and economic value) is perceived as a solution to these problems (Dean and McMullen, 2008). This is because sustainable entrepreneurship accounts for external operation costs and is even able to transfer them into external gains (Cohen and Winn, 2007). Hence, instead of merely exploiting natural and social resources, sustainable enterprises are able to contribute to community development and the natural environment through their operations and by changing industries towards operating in a sustainable manner. Thus, entrepreneurial opportunities unfold as a result of internalising externalities. Through these emerging entrepreneurial opportunities, sustainable entrepreneurs are able to indirectly contribute to societal development.

#### *Entrepreneurship education*

The findings of the thesis imply five issues for entrepreneurship education. First, entrepreneurship education programs should account for the diversity in entrepreneurial opportunities and how this is reflected in entrepreneurial intention formation. The results of the study (publication IV) show that young adults have four different EOTs reflecting their perceptions of entrepreneurial opportunities. Individuals with a particular type of an EOT require different treatment in order to encourage them towards becoming an entrepreneur, because individuals with a particular type of EOT tend to differ from individuals with another type of EOT in terms of work values, attitudes towards entrepreneurship and level of entrepreneurial intentions. For example, individuals with sustainability-oriented EOTs perceive social and environmental value creation as essential characteristics of entrepreneurial opportunities and are more motivated to help others, while individuals with economic-oriented EOTs strive for economic gains and are motivated by the chance to generate monetary rewards and power. Recognising these differences enables more accurate targeting of entrepreneurship education to match individual needs and values. Furthermore, different perceptions of entrepreneurial opportunities can be utilised to identify those individuals who seem most likely to be potential future entrepreneurs. For example, individuals with international EOTs tend to also have more positive attitudes towards entrepreneurship and higher entrepreneurial intentions; hence, these individuals seem to possess the most potential as prospective entrepreneurs. All in all, these differences need to be addressed in entrepreneurship education to better encourage individuals towards entrepreneurship.

Second, the results of the study (publication V) provide evidence of the impact entrepreneurship education may have on perceptions of entrepreneurial opportunities. It seems that entrepreneurship education may play a role in changing individuals' perceptions of entrepreneurial opportunities and as a result, shape new venture idea development. The findings show that changes in EOTs are in line with the developed characteristics of new venture ideas, although the latter is a group effort. Moreover, entrepreneurship education programs and courses need to provide sufficient time for learning. New venture ideas start out as rudimentary descriptions of product ideas. To understand the potential of a new venture idea, time is needed. Hence, when designing

entrepreneurship education, caution has to be taken when developing the desired learning goals in a way that reflects the different attributes of entrepreneurial opportunities. Simultaneously, entrepreneurship education needs to be planned in a way that leaves sufficient time for learning and development of one's ideas.

Third, entrepreneurial intentions and their drivers, together with other entrepreneurship-related factors, are perceived as indicators for learning (Fayolle & Gailly, 2015). The findings of the thesis (publication II and III) show that general entrepreneurial intentions and opportunity-specific entrepreneurial intentions seems to be driven by different factors. The results of prior entrepreneurship research show that entrepreneurial intentions are increased through PEF and PED, while opportunity-specific entrepreneurial intentions are connected to general attitude towards entrepreneurship (PED and PEF) and opportunity-specific attitude. The findings (publication III) show that when including attitude towards sustainability as a driver of entrepreneurial intention, variance explained in sustainability-oriented entrepreneurial intentions increases. This suggests that in order to examine opportunity-specific entrepreneurial intentions an additional attitudinal variable is needed. Moreover, in the context of sustainable entrepreneurship, PEF is not connected to the formation of entrepreneurial intentions, suggesting that perceived level of capabilities, know-how and skills required to become an entrepreneur does not seem to play as important a role in sustainable entrepreneurship as in conventional entrepreneurship.

Furthermore, increasing opportunity-specific entrepreneurial intentions is not simple, and several issues need to be taken into consideration. The findings of the thesis (publication III) show that if entrepreneurship education aims to increase the level of sustainability-oriented entrepreneurial intention, two attitudinal components are key. Hence, entrepreneurship education ought to enhance the perceived desirability of entrepreneurship and attitudes towards sustainability. The results of the study show that discipline and gender differences influence the level of PED and attitudes towards sustainability. It seems that PED is higher among males, while females tend to have more positive attitudes towards sustainability. In order to address the gender differences in entrepreneurship education, female students ought to be educated about entrepreneurship in general to increase their desire to engage in entrepreneurship, whereas sustainability-related issues should be highlighted in entrepreneurship education for males. Regarding discipline, the results of the thesis show that non-business students tend to have higher sustainability-oriented entrepreneurial intentions and perceive entrepreneurship to be more desirable than business students. Hence, non-business students should be targeted by entrepreneurship education if the goal is to enhance sustainability-oriented entrepreneurial intentions.

Although attitude towards sustainability is an important driver of sustainability-oriented entrepreneurial intentions, PED influences sustainability-oriented entrepreneurial intentions the most. This suggests that the level of sustainability-oriented entrepreneurial intention may be enhanced by making entrepreneurship look more attractive as a career option; this can be done by introducing positive images about entrepreneurship and

utilising role models. All in all, attitudes play an important role in driving sustainability-oriented entrepreneurial intentions, suggesting that both general attitude towards entrepreneurship and opportunity-specific attitude are key to enhancing opportunity-specific entrepreneurial intentions. Hence, entrepreneurship education ought to consider different drivers of opportunity-specific entrepreneurial intentions in order to influence them and generate positive results.

Fourth, attitudinal drivers of opportunity-specific entrepreneurial intentions are shaped by work values and general-self efficacy. The results of the thesis (publication III) show that altruism is key in enhancing attitude towards sustainability, while extrinsic and intrinsic reward increase PED. However, extrinsic reward tends to negatively affect attitude towards sustainability. The conflicting role of extrinsic reward merits special attention and suggests that prospective sustainable entrepreneurs need be supported in their search for ways to balance the value struggle between altruism and extrinsic reward. In entrepreneurship education, learning goals need to be carefully defined. If entrepreneurship education aims at increasing PED, highlighting innovations and ways to generate economic gains will be beneficial. However, if entrepreneurship education attempts to improve attitudes towards sustainability, highlighting softer aspects of entrepreneurship and alternative means of value creation could provide the desired benefits. Hence, different motivations need to be addressed when aiming to increase PED compared to enhancing attitude towards sustainability. Additionally, the role of intrinsic reward in enhancing PED and altruism in increasing attitude towards sustainability highlight the need to include soft skills such as compassion and creativity as a part of the entrepreneurship education agenda. Similarly, the findings show that university students have a higher appreciation for extrinsic reward than for altruism; hence, in order to increase attitudes towards sustainability, altruistic values need to be leveraged in entrepreneurship education. Conversely, general self-efficacy and gender are the key drivers of PEF, and hence, it seems that work values do not play a role in enhancing PEF. Rather, entrepreneurship education ought to focus on building students' confidence in their abilities in order to increase PEF.

Ultimately, the entrepreneurship education needs to find ways to address the fundamental values influencing opportunity-specific entrepreneurial intentions formation in order to promote sustainable entrepreneurship through entrepreneurship education. Additionally, sustainable entrepreneurship seems to provide a purposeful work option for young adults. Entrepreneurial, sustainability-conscious and meaning-seeking are adjectives used to describe "Millennials", or "Generation Y"—those born between 1979 and 1994 (Hewlett et al., 2009; Ng et al., 2010). This suggests that sustainable entrepreneurship would enable young adults to actualise their values.

Lastly, knowledge has an important role in enhancing purpose-driven entrepreneurship. The results of the thesis (publications I and II) show that individuals with a high education level are more likely to have sustainable entrepreneurial goals. However, the type of knowledge matters in the formation of opportunity-specific entrepreneurial intentions. For example, sustainability-oriented entrepreneurial intentions are enhanced by perceived

knowledge about environmental problems, while general entrepreneurial intentions are increased by entrepreneurial experience. This suggests that education programs should be built in a way that enables students to take courses from different disciplines and encourage elective minors in another discipline. Moreover, in the case of sustainability-oriented entrepreneurial intentions, incorporating sustainability-focused elements into education programs across disciplines could increase sustainability-oriented entrepreneurial intentions. It seems, however, that the role of knowledge in enhancing opportunity-specific entrepreneurial intentions is not straightforward. The findings of the study (publication II) show that entrepreneurial experience seems to make the impact of perceived knowledge on environmental issues insignificant. This implies that entrepreneurship education and other education programs need to balance the types of information taught to students at the university level.

#### 5.4 Research limitations

Like any research, this doctoral thesis has limitations. First, this thesis is limited to the context of university students in European developed countries. Young adults attending universities in these particular countries may see sustainable entrepreneurship in a different light than students in developing countries. Furthermore, it ought to be noted that the data was collected before the refugee crises in Europe (and all related events), which may have affected participants' views on sustainable entrepreneurship to some degree and the focus on environmental aspects of sustainable entrepreneurship. Although the selection of this context is supported by the findings of publication I, it is recognised that the context may influence the results and limit their generalisability. Furthermore, this thesis is limited to entrepreneurial intention as an outcome, and does not include action and actual behaviours, although Kautonen et al. (2015) have pointed out the lack of intention-behaviour link as a shortcoming of intention research. Webb and Sheeran (2006) showed that intentions are good predictors of subsequent behaviour. According to their results, small to medium change in intentions was generated by medium to large change in intentions. Similarly, entrepreneurial intentions have been found to positively influence entrepreneurial behaviour (Kautonen et al., 2015). Hence, suggesting that entrepreneurial intentions are good indicators for future entrepreneurial behaviours.

Moreover, the thesis focuses on a particular type of entrepreneurship, namely sustainable entrepreneurship, which confines the results regarding opportunity-specific entrepreneurial intentions to the context of sustainable entrepreneurship. Sustainable entrepreneurship is characterised by three value creation goals, and as a result, the peculiarities of sustainable entrepreneurship influence the role of values and attitudes. Hence, the relationships proposed in this study are limited to the context of sustainable entrepreneurship and sustainable value creation. Additionally, the opportunity-specific entrepreneurial intention model assumes that individuals' hold preferences in terms of entrepreneurial opportunities. As a result, the model has limited applicability in a

situation, in which an individual has high entrepreneurial intentions and no opportunity-specific attitudes. The findings of the publication IV show that individuals with wealth-oriented EOTs, which focus on economic value potential, risks and impact of the venture, tend to perceive entrepreneurship less desirable career option than those with sustainable or international EOTs. Furthermore, individuals with wealth-oriented EOTs tend to also have weaker entrepreneurial intentions than those with both types of international EOTs. Hence, suggesting that individuals without particular opportunity-specific attitude may be less likely to become entrepreneurs in the first place.

Second, the data utilised in publication I imposes some limitations on the research and possible relationships for examination. This is due to the structure and design of the original survey utilised to collect the data. For example, opportunity-specific attitude is measured via entrepreneurial goals, which can be social, environmental and economic, or any combination of them. Similarly, because respondents may be involved in more than one venture and have different goals for each of the ventures, an average goal had to be calculated when a respondent reported goals for more than one company, reflecting one's disposition in value creation rather than a goal of a venture that the respondent was involved in.

Third, the thesis focuses on the individual-opportunity nexus and opportunity-specific entrepreneurial intentions, and as a result, subjective norms are only implicitly included in the study. The findings of prior entrepreneurial intention research have been mixed about the role of subjective norms in entrepreneurial intentions. The lack of a direct relationship has been found in several studies in the entrepreneurship literature (Liñan, 2008), although some studies show that subjective norms are positively connected to entrepreneurial intentions (e.g., Souitaris et al., 2007). This focus on the individual is also perceived as a limitation regarding the findings on EOTs. EOTs are personal views about the composition of entrepreneurial opportunities, while new venture ideas in the chosen context were group efforts. Hence, the results do not show what particular changes in attributes of EOTs were connected with a particular development in a particular new venture idea.

Fourth, the methodological choices made in this thesis also impose some limitations. Although this study applies multiple methods, the majority of the findings were generated via quantitative methods. Hence, this limits our ability to explain the results more thoroughly, which can be achieved when utilising qualitative analysis methods. Conversely, the qualitative study provides a rich description of changes in EOTs; however, due to the use of qualitative methods and limited sample size, the findings cannot be extended beyond the context of the study.

Fifth, the thesis mainly examined direct connections between opportunity-specific entrepreneurial intentions, opportunity-specific attitudes and their antecedents. Both the findings of the study (publication III) and the findings of prior literature regarding general entrepreneurial opportunities support the interpretation that the connection between PEF,

PED and opportunity-specific entrepreneurial intentions may be more complex than a simple linear relationship.

### 5.5 Suggestions for future research

The suggestions for future research are derived from the limitations of the thesis, as well as recent developments in the entrepreneurship literature. First, the proposed model for opportunity-specific entrepreneurial intentions was only tested in a particular research setting, namely sustainable entrepreneurship and young adults in universities. To provide more validity for the proposed model and relationships between opportunity-specific entrepreneurial intentions and their antecedents, future research needs to test the opportunity-specific entrepreneurial intention model in different contexts and with different data samples. For example, applying the opportunity-specific entrepreneurial intentions model across different age categories, amongst non-students and those who already have entrepreneurial experience, would provide more support for the model. Moreover, future research could also utilise the opportunity-specific entrepreneurial intention model to compare the antecedents of entrepreneurial intentions in different contexts and hence generate more understanding about the variety of drivers of entrepreneurial intentions resulting from differences in perceptions of entrepreneurial opportunities. For example, by focusing on different types of entrepreneurship, more insights about the influence of work values on attitudinal components of the model could be generated.

Similarly, in this thesis, a novel typology developed for EOTs was tested among young adults studying in a university. In order to provide more evidence of how entrepreneurial opportunities are perceived, future research could test the typology for EOTs in different contexts. Furthermore, the research for change in EOTs was even more restricted; hence, more research on change in opportunity-specific attitudes is needed in order to enhance entrepreneurship research regarding opportunity development and change in entrepreneurial cognition. Furthermore, Vogul (2016) proposed that the entrepreneurial process starts with the recognition of venture ideas, which are developed into venture concepts and finally evaluated for desirability and feasibility. Future research could combine this proposed model with the EOT concept to provide new understanding about the different phases of the entrepreneurial process through for example the following question: are particular EOTs connected to particular way of recognising potential entrepreneurial opportunities, namely systematic search or serendipity.

Second, due to the limitations related to the research context and the sample size, EOTs and their association with new venture ideas were only examined at the general level. Based on the results of publication V, several questions arise for future research. What kind of individual changes are associated with a particular change in a new venture idea? What kind of combination of EOTs are connected to particular ideas? Is it enough for a certain dimension in a new venture idea to be developed if the EOT of a single person



changes or does the change have to occur in several individuals' EOTs? In a group setting, do EOTs of group members develop similarly, and is there a difference between disciplines? Will business students' EOTs change differently than engineering students' EOTs? Answers to these questions would provide more insights about the influence of team composition on venture idea formation and the dynamics related to new venture teams.

Third, the thesis proposed linear relationships between opportunity-specific entrepreneurial intentions and their antecedents. Future research could extend the opportunity-specific entrepreneurial intention model by including moderating and mediating effects. Prior literature on entrepreneurial intentions has provided evidence that PEF moderates and mediates the relationship between PED and entrepreneurial intentions (Fitzsimmons and Douglas, 2011; Schlaegel and Koenig, 2014). Hence, this may also be the case in opportunity-specific entrepreneurial intention formation in the context of sustainable entrepreneurship. Similarly, by considering mediating effect, future research could shed more light on the connection between values, opportunity-specific and general entrepreneurial attitudes and opportunity-specific entrepreneurial intentions.

Fourth, due to limitations related to the research context, the thesis focused only on entrepreneurial intentions, and did not include action as an outcome of entrepreneurial intentions. This limitation has been pointed out in the entrepreneurial intention literature (e.g. Schlaegel and Koenig, 2014; Kautonen et al., 2015). Future research could test the proposed model for opportunity-specific entrepreneurial intentions by examining whether or not opportunity-specific intentions actualise in practice through actions and behaviours. In case of general entrepreneurial intentions, the connection between entrepreneurial intentions and behaviour has been detected (Kautonen et al., 2015). On one hand, opportunity-specific entrepreneurial intentions may better explain behaviour, since they are more behaviour-specific and reflect an individual's values. On the other hand, it may be difficult to find an individual's ideal entrepreneurial opportunity, and as a result, even strong opportunity-specific intentions may not lead to behaviour.

Fifth, the thesis utilised cross-sectional and repeated measures survey data. Future research could use experimental research design to provide more evidence of the applicability of the proposed typology for EOTs. Moreover, through experimental research design, trade-offs between attributes of EOTs could be examined. Hence, future research may provide more understanding about the complexity and inter-relationships between different opportunity-specific attitudes and as a result, generate insights about the underlying process behind how EOTs work.

Lastly, future research could incorporate concepts such as entrepreneurial passion (Cardon et al., 2013) and opportunity belief (McMullen and Shepherd, 2006; Shepherd and Patzelt, 2017) into the opportunity-specific entrepreneurial intention model. Passion has been connected to antecedents of entrepreneurial intentions, both directly (Brännback et al., 2006) and indirectly (De Clerq et al., 2011). For example, the results of De Clerq et al. (2011) show that high passion for work strengthens the relationship between

perceived ability and entrepreneurial intentions, while low passion for work weakens this relationship. The same applies to the connection between passion for work, perceived attractiveness and entrepreneurial intentions. Hence, future research could examine the role of different types of passion in opportunity-specific intention formation (Cardon et al. 2017). Second, opportunity belief has been proposed to play an important role in the entrepreneurial process (Shepherd and Patzelt, 2017). Opportunity belief refers to an individual's vision of the potential outcome of any action taken regarding a potential opportunity (McMullen and Shepherd, 2006). Hence, including opportunity belief into the opportunity-specific entrepreneurial intention model would reveal new insights about intention formation.

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## Appendix A: Survey

### Survey about Attributes of Entrepreneurial Opportunity, Intentions and Sustainability Knowledge

This survey is aimed at collecting data about attributes of entrepreneurial opportunities, intentions and level of sustainability knowledge. The information obtained through this survey will be anonymous, and the personal information collected will be used for controlling purposes and cannot be connected to specific answers in the survey. Answering the survey will take approximately 15 minutes. Should you need further information or have questions about this survey, please contact me directly. Thank you for taking the time and answering the survey.

#### 1. ENTREPRENEURIAL OPPORTUNITY ATTRIBUTES:

Evaluate following claims the about different aspects of setting up a firm. **If I would set up a firm, it probably would...** (1=completely agree, 7=completely disagree)

require a large financial investment in the beginning	1	2	3	4	5	6	7	not require any large investment in the beginning
be something completely new	1	2	3	4	5	6	7	not be anything new to the world
be a new business model	1	2	3	4	5	6	7	apply a business model used elsewhere
impact on society's weakest members	1	2	3	4	5	6	7	not have any impact on society's weakest members
soon have global customers	1	2	3	4	5	6	7	have only local customers
remain small	1	2	3	4	5	6	7	become a large corporation

<b>apply completely new technology</b>	1	2	3	4	5	6	7	<b>apply technology that has been previously used in other applications</b>
<b>generate large profits</b>	1	2	3	4	5	6	7	<b>generate just enough living for me</b>
<b>reduce environmental problems</b>	1	2	3	4	5	6	7	<b>not create any environmental value</b>
<b>be something copied from other markets/ industries</b>	1	2	3	4	5	6	7	<b>be something new and original</b>
<b>generate enough income to quit my day job</b>	1	2	3	4	5	6	7	<b>be so small scale that I could simultaneously work elsewhere</b>
<b>help the World's poverty problem</b>	1	2	3	4	5	6	7	<b>not have any impact on World's poverty</b>
<b>have a high risk of failure</b>	1	2	3	4	5	6	7	<b>have a low risk of failure</b>
<b>have overseas operations</b>	1	2	3	4	5	6	7	<b>operate locally</b>
<b>enhance sustainable development</b>	1	2	3	4	5	6	7	<b>not impact sustainable development</b>
<b>create several new jobs</b>	1	2	3	4	5	6	7	<b>not create any new jobs</b>

<b>minimize risks related to markets</b>	1	2	3	4	5	6	7	<b>operate in markets with high risks</b>
<b>maximize societal good rather than economic profit</b>	1	2	3	4	5	6	7	<b>maximize economic profit rather than societal good</b>
<b>use natural resources responsibly</b>	1	2	3	4	5	6	7	<b>be sourced through the most cost- effective way</b>
<b>help our economy to recover/grow</b>	1	2	3	4	5	6	7	<b>have no impact on the economy</b>
<b>expand beyond home country</b>	1	2	3	4	5	6	7	<b>not expand beyond home country</b>
<b>be aimed at making profits</b>	1	2	3	4	5	6	7	<b>have other goals rather than profit-making</b>

## **2. SUSTAINABILITY KNOWLEDGE**

**Evaluate** the level of your knowledge regarding the following environmental and societal issues (1=know nothing about, 5= know a great deal about)

<b>1. Sea/river pollution</b>	1	2	3	4	5
<b>2. Air pollution</b>	1	2	3	4	5
<b>3. Global warming</b>	1	2	3	4	5
<b>4. Pollution of drinking water</b>	1	2	3	4	5

5. Pollution from chemicals	1	2	3	4	5
6. Destruction of the rain forests	1	2	3	4	5
7. Extreme poverty and hunger	1	2	3	4	5
8. Distinction of ethnic minorities	1	2	3	4	5
9. Decline in biodiversity	1	2	3	4	5
10. Risks of nuclear power	1	2	3	4	5
11. World population explosion	1	2	3	4	5
12. Increase in inequality	1	2	3	4	5

### **3. WORK VALUES**

“Different people may look for different things in their work. Below is a list of some of these things. **Please read each statement, and indicate how important each characteristic of work is for you (1=not very important, 5=extremely important.)**”

1. A job where you have enough vacation	1	2	3	4	5
2. A job that provides you with a chance to earn a good deal of money	1	2	3	4	5
3. A job that offers a reasonably predictable, secure future	1	2	3	4	5
4. A job that provides enough challenges	1	2	3	4	5

5. A job that gives you an opportunity to be directly helpful to others	1	2	3	4	5
6. A job that gives you a chance to build relations with coworkers	1	2	3	4	5
7. A job that has high status and prestige	1	2	3	4	5
8. A job where you get a chance to participate in decision-making	1	2	3	4	5
9. A job that provides an opportunity for preserving nature	1	2	3	4	5
10. A job that leaves a lot of time for other things in your life	1	2	3	4	5
11. A job well paid for	1	2	3	4	5
12. A job that secures employment for me	1	2	3	4	5
13. A job where you can learn new things, learn new skills	1	2	3	4	5
14. A job that is worthwhile to society	1	2	3	4	5
15. A job that permits contact with a lot of people	1	2	3	4	5
16. A job that most people look up to and respect	1	2	3	4	5
17. A job where I can work in my own way	1	2	3	4	5
18. A job where you can respect the environment	1	2	3	4	5
19. A job where you have the chance to be creative	1	2	3	4	5

20. A job which makes the world a better place	1	2	3	4	5
21. A job that involves a lot of cooperation with other	1	2	3	4	5
22. A job where the chances for advancement and promotion are good	1	2	3	4	5
23. A job where I can make my own decisions	1	2	3	4	5
24. A job where I can be close to the nature	1	2	3	4	5
25. A job with an easy pace that lets you work slowly	1	2	3	4	5
26. A job that provides a generous total compensation.	1	2	3	4	5
27. A job that will exist also in the future.	1	2	3	4	5

#### **4. PERCEIVED ENTREPRENEURIAL DESIRABILITY**

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

1. Being an entrepreneur implies more advantages than disadvantages to me	1	2	3	4	5	6	7
2. A career as entrepreneur is attractive for me	1	2	3	4	5	6	7
3. If I had the opportunity and resources, I'd like to start a firm	1	2	3	4	5	6	7
4. Being an entrepreneur would entail great satisfactions for me	1	2	3	4	5	6	7



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5. Among various options, I would rather be an entrepreneur	1	2	3	4	5	6	7
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### **5. PERCEIVED ENTREPRENEURIAL FEASIBILITY**

Evaluate the following questions regarding starting your own business.

1. How sure of yourself would you be if you would start your own business?
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Very sure of myself	1	2	3	4	5	6	7	Very unsure of myself
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2. How hard do you think it would be to start your own business?
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Very hard	1	2	3	4	5	6	7	Very Easy
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3. If you started your own business, how overworked would you be?
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Very overworked	1	2	3	4	5	6	7	Not overworked at all
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4. If you started your own business, how certain of success are you?
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Very certain of failing	1	2	3	4	5	6	7	Very certain of success
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5. Do you know enough to start your own business?
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Know absolutely nothing	1	2	3	4	5	6	7	Know enough
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**6. SELF-EFFICACY**

General self-efficacy relates to “one’s estimate of one’s overall ability to perform successfully in a wide variety of achievement situations, or to how *confident* one is that she or he can perform effectively across different tasks and situations (Chen et al., 2001). **Evaluate** the following statements regarding self-efficacy (1=strongly disagree, 5=strongly agree).

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

**7. ENTREPRENEURIAL INTENTIONS**

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

1. I’m ready to make anything to be an entrepreneur.	1	2	3	4	5	6	7
2. I will make every effort to start and run my own business.	1	2	3	4	5	6	7

3. I'm determined to create a firm in the future	1	2	3	4	5	6	7
4. I have very seriously thought in starting a business.	1	2	3	4	5	6	7
5. I've got the firm intention to start a firm someday.	1	2	3	4	5	6	7
6. I'm going to start my own business within one years of graduation.	1	2	3	4	5	6	7

#### **8. IMPORTANCE OF ATTRIBUTES OF ENTREPRENEURIAL OPPORTUNITIES**

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

1. Novelty and innovativeness of the venture (new technology, business model or other aspect).	1	2	3	4	5	6	7
2. Risks (e.g. financial risk, market risks, failure, and political risk) related to the entrepreneurial opportunity.	1	2	3	4	5	6	7
3. Social impact (poverty reduction, employment, and increasing equality) that the venture would have.	1	2	3	4	5	6	7
4. Environmental impact (e.g. use of natural resources, protecting biodiversity, and energy type) that the venture could have.	1	2	3	4	5	6	7
5. The degree of impact that the venture could have on national economic recovery through job creation and growth.	1	2	3	4	5	6	7
6. Whether or not the venture would generate enough profits for me.	1	2	3	4	5	6	7

<b>7. Possibility to expand the venture internationally (abroad customers and production/operations, market size).</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
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## **9. BACKGROUND**

<b>1. Age</b>					
<b>2. Nationality</b>					
<b>3. Field of study</b>					
<b>4. Gender</b>	<b>Male</b>				<b>Female</b>
<b>5. Family background</b>	<b>Parent(s) is entrepreneur</b>	<b>Other family member</b>	<b>Friend is entrepreneur</b>		
	<b>Well below average</b>	<b>Average</b>		<b>Well above average</b>	
<b>6. How have you performed in studies compared to others?</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
	<b>No experience</b>	<b>Some experience</b>		<b>Active for several years</b>	
<b>7. Work experience</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>8. Entrepreneurial experience</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>9. Student organization experience</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>10. Voluntary work experience (clubs, voluntary organizations (WWF etc.), associations (4H club))</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

## Appendix B: Survey 2 measure for attribute importance

Please put the following attributes in order from **most important (1)** to **least important (7)** by dragging the number to the attribute of your choice.

**Novelty and innovativeness** of the venture (new technology, business model or other aspect)

1

**Risks** (e.g. financial risk, market risks, failure, and political risk) related to the venture

2

**Social/societal impact** (poverty reduction, employment, and increasing equality) that the venture would have.

3

**The degree of impact** that the venture could have on **national economic recovery** through job creation and growth.

4

Whether or not the venture would generate enough **profits** for me.

5

Possibility to **expand the venture internationally** (abroad customers and production/operations, market size)

6

**Environmental impact** (e.g. use of natural resources, protecting biodiversity, and energy type) that the venture could have.

7



## Appendix C: Reliability and Construct validity

Table 6: Reliability and construct validity for publication II

Shared variance among constructs														
	CA	CR	AVE	INT	SG	ALT	SR	INTR	EXT	SEC	LE	GSE	EK	SK
INT	0.91	0.94	0.75	<b>0.87</b>										
SG	0.72	0.83	0.55	0.01	<b>0.74</b>									
ALT	0.83	0.87	0.58	0.01	0.35*	<b>0.76</b>								
SR	0.79	0.88	0.71	0.10	0.07	0.35*	<b>0.84</b>							
INTR	0.80	0.86	0.55	0.21*	-0.03	0.21*	0.47*	<b>0.74</b>						
EXT	0.74	0.83	0.50	0.08	-0.06	0.10	0.38*	0.38*	<b>0.71</b>					
SEC	0.77	0.87	0.69	-0.16*	0.02	0.23*	0.08	0.07	0.24*	<b>0.83</b>				
LE	0.71	0.87	0.77	-0.13*	0.01	0.13*	0.03	-0.08	0.10	0.23*	<b>0.88</b>			
GSE	0.85	0.89	0.57	0.16*	0.01	0.07	0.15*	0.48*	0.35*	0.05	0.05	<b>0.75</b>		
EK	0.80	0.86	0.55	0.16*	0.11	0.32*	0.10	0.10	0.08	0.14*	-0.03	0.09	<b>0.74</b>	
SK	0.67	0.80	0.51	0.04	0.09	0.25*	0.14*	0.17*	0.06	-0.01	-0.03	0.17*	0.49*	<b>0.71</b>

\*Notes: CA = Cronbach's alpha, CR = composite reliability, AVE = average variance extracted, SG = social entrepreneurial goal, INT = entrepreneurial intentions, ALT = altruism, SR = social relations, INTR = intrinsic reward, EXT = extrinsic reward, SEC = security, LE = leisure, GSE = general self-efficacy, EK = perceived environmental knowledge level, SK = perceived social knowledge level

**Table 7:** Reliability and construct validity for publication III and IV (adopted)

Shared variance among constructs													
	CA	CR	AVE	SG	INT	ATS	PEF	PED	GSE	ALT	INTR	EXT	SEC
SG	0.73	0.83	0.56	<b>0.75</b>									
INT	0.91	0.94	0.75	0.06	<b>0.87</b>								
ATS	0.76	0.90	0.81	0.47*	-0.07	<b>0.90</b>							
PEF	0.62	0.80	0.57	-0.03	0.39*	-0.11	<b>0.75</b>						
PED	0.94	0.60	0.85	-0.01	0.60*	-0.09	0.51*	<b>0.92</b>					
GSE	0.85	0.89	0.57	0.02	0.16*	-0.07	0.37*	0.35*	<b>0.75</b>				
ALT	0.83	0.88	0.60	0.41*	0.01	0.58*	-0.05	0.06	0.09	<b>0.77</b>			
INTR	0.75	0.85	0.60	-0.02	0.18*	-0.03	0.30*	0.43*	0.46*	0.16*	<b>0.76</b>		
EXT	0.74	0.80	0.45	-0.04	0.05	-0.11	0.17*	0.23*	0.37*	0.13	0.33*	<b>0.67</b>	
SEC	0.77	0.85	0.66	-0.02	-0.21*	0.09	-0.15*	-0.18*	0.07	0.18*	0.09	0.27*	<b>0.81</b>

\*Notes: CA = Cronbach's alpha, CR = composite reliability, AVE = average variance extracted, SG = sustainable entrepreneurial goal, INT = entrepreneurial intentions, ATS = attitude towards sustainability, PEF = perceived entrepreneurial feasibility, PED = perceived entrepreneurial desirability, GSE = general self-efficacy, ALT = altruism, INTR = intrinsic reward, EXT = extrinsic reward, SEC = security, SOC = social relations, LES = leisure, ENK = perceived environmental knowledge level, SOK = perceived social knowledge level



## **Publication I**

Vuorio, A.

**Young Adults and Sustainable Entrepreneurship: The Role of Culture and Demographic Factors**

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## **Publication II**

Kunttu, A., Puumalainen, K. and Fellnhofer, K.

**Socially-oriented entrepreneurial goals and intentions – the role of values and knowledge**

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## **Publication III**

Vuorio, A., Puumalainen, K. and Fellnhofer, K.

### **Drivers of Entrepreneurial Intentions in Sustainable Entrepreneurship**

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*International Journal of Entrepreneurship Behaviour & Research*

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## **Publication IV**

Kunttu, A. and Puumalainen, K.

### **A Typology for Entrepreneurial Opportunity Templates**

Proceedings of the RENT 2017 Conference, 16th – 20th November, Antwerp, Belgium.





## **Publication V**

Vuorio, A., and Puumalainen, K.

### **Change in Entrepreneurial Opportunity Templates and New Venture Idea**

Proceedings of the ECIE 2017 Conference, 20th – 22nd September, Paris, France.



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