Opportunity recognition in sustainable entrepreneurship: an exploratory study

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Abstract
Purpose – The recognition of opportunities for sustainable development is considered to be an essential part of sustainable entrepreneurship, but studies that address this phenomenon are scarce. A conceptual model which aims to explain the factors that lead to the recognition of sustainable opportunities was proposed by Patzelt and Shepherd (2011), but published research that tests this model empirically is limited. The purpose of this paper is to contribute to the sustainable entrepreneurship literature by empirically exploring Patzelt and Shepherd’s conceptual model in order to shed light on how sustainable entrepreneurs recognize opportunities for sustainable businesses in practice.

Design/methodology/approach – This paper adopts a qualitative research approach to address the aims of the study. In-depth semi-structured interviews were carried out with eight sustainable entrepreneurs based in Berlin. The data were analyzed by means of thematic analysis.

Findings – The findings indicate that sustainable entrepreneurs are influenced in their identification of sustainable opportunities by their knowledge of natural and communal environments, by their motivation to develop gains for themselves and others, and by entrepreneurial knowledge. These findings largely support the model proposed by Patzelt and Shepherd (2011). Furthermore, they extend this model by shedding light on some of the factors that comprise its components, as this study found that spending time abroad and socialization enhance entrepreneurs’ knowledge of natural and communal environments; a desire to be self-employed, aspects of one’s personality and one’s personal circumstances are sources of motivation, while prior jobs and prior projects create entrepreneurial knowledge.

Originality/value – Only two other studies have empirically tested Patzelt and Shepherd’s (2011) model, and these have led to disparate results. The first was conducted by Choongo et al. (2016), who did not find any evidence to support this model. The second was carried out by Muñoz and Dimov (2017), who addressed the model partially. This paper therefore makes four major contributions. First, it is the first to offer preliminary empirical support for each component of Patzelt and Shepherd’s (2011) conceptual model. Second, it extends their model by identifying some of the factors comprising its components. Third, it reflects on possible reasons why extant research has led to disparate findings. Fourth, it proposes avenues of research to resolve the unanswered questions arising from these studies. This paper therefore makes a contribution to the literature on sustainable entrepreneurship and serves as a stepping stone for further theory development and empirical research on sustainable opportunity recognition.

Keywords Motivation, Sustainable entrepreneurship, Opportunity recognition, Prior knowledge, Entrepreneurial knowledge

Paper type Research paper

Introduction
“Meet(ing) the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987, para. 1) has become an important task for politicians, businesses, and consumers. Sustainable entrepreneurs are considered to play a crucial role in this regard (Brown, 2006; Hall et al., 2010; Homer-Dixon, 2006; Lovins et al., 2004; Vaitheeswaran, 2003), as their companies “contribute to sustainable development by doing business in a sustainable way” (Crals and Vereeck, 2005, p. 2). Sustainable entrepreneurs are not only concerned with making financial profits, but also with creating social and environmental value. They are therefore said to
address the three Ps ("People", "Planet," and "Profit"), or the triple bottom line (TBL), which are the axioms for businesses to equally consider financial, environmental, and social aspects of their business decisions and performance (Elkington, 1997).

Opportunity recognition is considered to be an essential part of entrepreneurship – including sustainable entrepreneurship – since by definition entrepreneurship is “the discovery and exploitation of profitable opportunities” (Shane and Venkataraman, 2000, p. 217), while sustainable entrepreneurship is “the discovery, creation, and exploitation of opportunities to create future goods and services that sustain the natural and/or communal environment and provide development gain for others” (Patzelt and Shepherd, 2011, p. 632). A great deal of research has been carried out on opportunity recognition in entrepreneurship (e.g. Baron, 2006; Baron and Shane, 2007; Granovetter, 1973; Hills and Shrader, 1998; Kaish and Gilad, 1991; Shane and Venkataraman, 2000; Tang et al., 2010; Venkataraman, 1997), but opportunity recognition in sustainable entrepreneurship, which differs in focus from traditional entrepreneurship as explained above, has received much less attention. Literature in this area is scarce and largely conceptual in nature, consisting mainly of propositions which are yet to be empirically tested (e.g. Cohen and Winn, 2007; Patzelt and Shepherd, 2011), with a few exceptions.

Patzelt and Shepherd (2011) argue that perspectives taken in the context of traditional entrepreneurship research are insufficient for explaining opportunity recognition in sustainable entrepreneurship, since they consider only economic aspects. They propose a conceptual model and a set of propositions that provide possible explanations of how sustainable entrepreneurs recognize opportunities. According to this model, the recognition of sustainable opportunities is influenced by four elements, namely prior knowledge of natural and communal environments; motivation for personal gain (perception of threat); motivation to develop gains for others (altruism); and entrepreneurial knowledge, which is conceptualized by these authors as a moderating factor.

A search of the literature revealed only two published studies that have tested this model empirically, and they did so with disparate results. In the first study, Choongo et al. (2016) gathered questionnaire data from 220 owner-managers or managing directors of SMEs operating in the mining industry in Zambia. These researchers found no evidence to support Patzelt and Shepherd’s (2011) model, as outlined below. In another study, Muñoz and Dimov (2017) adopted an experimental quantitative approach using 87 business school students as their participants. They partially addressed Patzelt and Shepherd’s (2011) model by focusing on the effect of prior knowledge on sustainable opportunity intention, and extended it by exploring whether moral intensity (defined as the degree to which one feels a necessity to act due to moral standards and values) moderates this relationship. They found that prior knowledge has only a marginally significant direct effect on sustainable opportunity intention, however, they found that prior knowledge is effective in activating sustainable opportunity intentions when moral intensity is high.

Thus, although entrepreneurship scholars increasingly acknowledge that entrepreneurs can make important contributions to sustainable development, there is still a high level of uncertainty about how sustainable entrepreneurship unfolds in practice (Hall et al., 2010). This paper aims to address this gap in the literature through the following research question:

RQ1. How do sustainable entrepreneurs recognize opportunities for sustainable businesses in practice?

This paper contributes to sustainable entrepreneurship research by taking a different approach to empirically exploring Patzelt and Shepherd’s (2011) conceptual model in a different setting. It adopts a qualitative approach with the use of in-depth semi-structured interviews with sustainable entrepreneurs in Berlin to dig deeper into each component of the model and shed light on how they recognized opportunities for sustainable businesses in practice.
This paper makes four main contributions to the literature on sustainable entrepreneurship. First, it is the first to offer preliminary empirical support for each component of Patzelt and Shepherd’s (2011) conceptual model. Second, it extends their model by identifying some of the factors that make up its components. Third, it reflects on possible reasons why previous research led to disparate findings. Fourth, it proposes avenues of research to resolve the unanswered questions arising from these studies. This paper thus serves as a stepping stone for further theory development and empirical research on sustainable opportunity recognition.

Conceptual model and literature review
As outlined above, Patzelt and Shepherd (2011) propose a conceptual model and a set of propositions that suggest how sustainable entrepreneurs recognize opportunities in practice. According to this model, the recognition of sustainable opportunities is affected by prior knowledge of natural and communal environments; motivation for personal gain (perception of threat); motivation to develop gains for others (altruism); and moderated by entrepreneurial knowledge. This model is presented in Figure 1 and explained in further detail below.

Prior knowledge of natural and communal environments
Prior knowledge has been found to play a key role in opportunity identification in traditional entrepreneurship (Baron, 2006; Shane, 2000; Venkataraman, 1997). It is argued that all people develop an individual stock of knowledge throughout their lives, and therefore some people are more likely to recognize opportunities than others (Shane, 2000).

While knowledge related to customer needs, markets and industries is considered to be especially relevant in traditional entrepreneurship (Baron, 2006; Shane, 2000; Shepherd and DeTienne, 2005), the prior knowledge focused on by Patzelt and Shepherd (2011) is of natural and communal environments. These scholars argue that unlike opportunities for traditional entrepreneurship, which result from changes related to business (i.e. changes in supply and demand), opportunities for sustainable entrepreneurship are a result of changes in natural and communal environments. Therefore, those who attend to natural and communal environments are more likely to identify opportunities for sustainable entrepreneurship. Individuals who possess prior knowledge of natural and communal environments are argued to be more attentive to changes in these areas and would therefore be more likely to recognize opportunities for sustainable entrepreneurship. Furthermore, Patzelt and Shepherd (2011)
emphasize that individuals pay special attention to those areas in which they possess prior knowledge, and would therefore be more likely to recognize opportunities for sustainable entrepreneurship in those areas. For instance, chemists are more likely to concentrate on opportunities that involve chemical processes of water detoxification, while biologists may focus on developing fish farms in order to decrease overfishing.

In contrast to the above assertions, Choongo et al. (2016) found no evidence in their empirical testing of Patzelt and Shepherd’s (2011) model that prior knowledge of the natural and communal environments is positively related to sustainable opportunity identification. Their regression analyses revealed no significant relationships between these two forms of prior knowledge and the identification of sustainable opportunities.

On the other hand, Muñoz and Dimov (2017) found a marginal significant direct effect of prior knowledge on sustainable opportunity intention. Furthermore, they found that the relationship between prior knowledge and opportunity intention is moderated by perceived moral intensity. In other words, they found that the prior knowledge of natural and communal environments has a positive effect on sustainable opportunity intention when individuals perceive high moral significance but not when they perceive low moral significance in a given situation.

Motivation

Motivation has received considerable attention from scholars due to its effects on entrepreneurship including opportunity identification and new venture creation. Some authors support the “push-pull” theories of motivation, which suggest that negative factors – such as unemployment or poor working conditions – push individuals away from undesirable conditions and into entrepreneurship, while positive factors – such as desire for autonomy and self-fulfillment – pull individuals towards entrepreneurship (Segal et al., 2005).

Other authors propose various factors to explain what motivates individuals to recognize opportunities. Notably, Shane et al. (2012) argue that opportunity recognition is influenced by various entrepreneurial motivations, including need for achievement, locus of control, desire for independence, passion, drive, goal setting, and self-efficacy.

Patzelt and Shepherd (2011) argue that sustainable entrepreneurs are motivated by economic gain, environmental gain, and social gain. They differentiate between two forms of motivation in their model, namely motivation for personal gains (perception of threat) and motivation to develop gains for others (altruism), and they argue that both of these forms of motivation play a crucial role in the process of recognizing opportunities for sustainable entrepreneurship. These are discussed further below.

Motivation for personal gains (perception of threat). According to Patzelt and Shepherd (2011), motivation to create benefits for oneself increases the level of attention paid to sustainability opportunities and, as a result, also the likelihood that one recognizes an opportunity for sustainable entrepreneurship. They highlight the role of perception of threat of physical and psychological well-being in this regard, stating that it motivates individuals to “direct attention toward sustaining the natural and communal environment” (p. 638). As an example, these authors argue that individuals living in polluted areas may perceive pollution as a threat to their well-being, and hence are motivated to find opportunities to decrease pollution. According to Patzelt and Shepherd (2011), individuals’ psychological well-being can be threatened by unsustainable development in the following three ways.

First, individuals might have a need to “appear competent to themselves and others” (Patzelt and Shepherd, 2011, p. 638), and due to unsustainable development in natural and communal environments, this need for competence can be perceived to be threatened. According to these authors, individuals are then more likely to recognize opportunities for sustainable entrepreneurship, since they are motivated to increase their own (perceived) levels of competence.
Second, individuals might have a need to “entertain social relationships with others” (Patzelt and Shepherd, 2011, p. 638). These authors maintain that this need for relatedness can be perceived to be threatened by unsustainable development, as it harms future generations, who in turn might accuse prior generations for being responsible for social and environmental damage. Anticipations of being accused by others (e.g. future generations or third world countries) can result in entrepreneurs perceiving their possibilities to build relationships to be threatened, which in turn leads them to pay more attention to opportunities for sustainable entrepreneurship in order to put a stop to threats to relatedness (Patzelt and Shepherd, 2011).

Third, individuals’ need for autonomy might be threatened by unsustainable development (Patzelt and Shepherd, 2011). The reason for this is that unsustainable development leads to long-term consequences which limit one’s options (Ryan and Deci, 2000). Therefore, threats to needs for autonomy might motivate individuals to direct their attention towards opportunities for sustainable entrepreneurship in order to sustain a variety of options and alternatives.

Choongo et al. (2016) tested the relationship between entrepreneurs’ perception of threat to the natural and communal environments, and the identification of sustainable opportunities but no significant positive effects were detected. This suggests that, contrary to what Patzelt and Shepherd (2011) proposed, entrepreneurs’ perception of threats to their natural and social environment does not influence their sustainable opportunity identification.

Although Muñoz and Dimov (2017) do not deal with perception of threat directly, the factor they investigate as a moderator, i.e., moral intensity, consists of components which bear some similarity to perception of threat. For example, the moral intensity one feels in a situation depends on the magnitude of the consequences, as well as how soon they will take place, how close one feels to them, and how likely they are to happen (Jones, 1991). One could argue that when consequences are felt to be of a negative nature they are perceived as threats. Muñoz and Dimov (2017) did not find a direct effect of moral intensity on sustainable opportunity intention. However, they did find that when moral intensity is high, individuals are more likely to use their prior knowledge to pursue sustainable opportunities. Therefore, one can argue that their study offers partial support for Patzelt and Shepherd’s (2011) model as far as the effect of perception of threat is concerned, but not in the manner conceptualized in the said model.

Motivation to develop gains for others (altruism). According to Patzelt and Shepherd (2011), individuals differ regarding their motivation to develop “economic, environmental, and social gains for others” (p. 640), depending on their levels of altruism, which increase the likelihood that individuals recognize opportunities for sustainable entrepreneurship. Altruism can be defined as “individual motivation to improve the welfare of another person” (Penner et al., 2006, p. 368). Patzelt and Shepherd (2011) describe how empathy and sympathy for others are the building blocks for altruistic motivation. According to Decety and Ickes (2009), empathy can be described as the ability “to feel as another person feels” (p. 5), whereas sympathy is characterized by the feelings of compassion rather than experiencing the same feelings as another person. According to Patzelt and Shepherd (2011), altruism leads to paying attention to opportunities for sustainable development by focusing on aspects that threaten others.

These authors argue that altruistic behavior might be influenced by self-interest, but clarify that altruistic behavior always includes self-sacrifice combined with an intention to generate benefits for others. In light of this, it is worth mentioning that altruism can be divided into pure altruism and impure altruism (Heck et al., 2006). The former is characterized by a person’s actions that affect only other people positively, while the
latter is characterized by a person’s actions affecting themselves as well as others positively. As an example of pure altruism, Heck et al. (2006) mention a business owner who makes donations in favor of people in need, resulting in a benefit for these people but not for the business owner. In contrast to this, Patzelt and Shepherd (2011) describe how the founders of Ben and Jerry’s built a business on the belief “that using organic ingredients for food production could help improve the health of others and sustain a healthy natural environment” (p. 641). As this was the basis of their business, it also affected themselves positively and therefore can be considered as impure altruism.

The relationship between altruism and sustainable opportunity identification was empirically investigated by Choongo et al. (2016). They found that the inclination to donate to charity, which was one of three factors comprising altruism in their regression analysis, was positively related to the identification of sustainable opportunities. However, no significant effects were found for the other two factors which made up the altruism variable in Choongo et al.’s study, namely the inclination to help strangers and the inclination to make an effort for others. These authors argue that their study provides partial support for Patzelt and Shepherd’s (2011) proposition that “the greater entrepreneurs’ altruism towards others, the more likely they will recognize an opportunity for sustainable development” (p. 641), but this support is limited.

Similar to the way moral intensity can be compared to perception of threat as suggested above, it also bears some similarity to altruism, when the consequences are perceived to be of a positive nature. Since Muñoz and Dimov (2017) found no direct effect of moral intensity on sustainable opportunity intention but found that it moderates the relationship between prior knowledge and opportunity intention, one can further argue that their results offer partial support for Patzelt and Shepherd’s (2011) model as far as the effect of altruism is concerned.

Entrepreneurial knowledge

Entrepreneurial knowledge can be defined as “prior knowledge of markets, prior knowledge of ways to serve markets, and prior knowledge of customer problems” (Shane, 2000, p. 452). Patzelt and Shepherd (2011) use this definition in context of their propositions related to sustainable opportunity identification, but it should be noted that entrepreneurial knowledge can also be defined differently, for instance, as “the concepts, skills, and mentality which entrepreneurs use or should use” (Jack and Anderson, 1999, p. 118).

Patzelt and Shepherd (2011) argue that entrepreneurial knowledge takes on a moderating role by strengthening the effects of the three factors prior knowledge of natural and communal environments, motivation for personal gains (perception of threat), and motivation to develop gains for others (altruism) on the process of opportunity recognition for sustainable entrepreneurship.

Choongo et al. (2016) did not find any significant positive moderation effects for entrepreneurial knowledge on sustainable opportunity identification. They did find, however, significant direct effects for entrepreneurial knowledge. This suggests that conventional prior knowledge plays a role in the identification of sustainable opportunities, but this role is not a moderating one as proposed by Patzelt and Shepherd (2011).

The moderating effects of entrepreneurial knowledge will not be investigated in this study, as a qualitative methodology is employed which is unsuitable to test for moderating effects. However, this study shall explore the elements of entrepreneurial knowledge and their role in influencing the recognition of sustainable opportunities.

Method

This study adopted a qualitative research approach consisting of semi-structured interviews with sustainable entrepreneurs. The reason for this choice was linked to the...
exploratory nature of this research and in consideration of the previously published research by Choongo et al. (2016) and Muñoz and Dimov (2017), who empirically tested the conceptual model proposed by Patzelt and Shepherd (2011) using quantitative methods with disparate results.

Although Choongo et al. (2016) “found only limited empirical support” (p. 1), they conclude that “there is still much work to do to explore the validity and predictive power of this model” (p. 19). Since these scholars used a quantitative research approach based on questionnaires, research participants were limited to express themselves by choosing from a list of pre-defined answers. Due to the fact that research in this area is still in its early stages and that these scholars were the first to empirically test the model, many relevant factors might still be unknown and may therefore have been overlooked in their quantitative study. Muñoz and Dimov (2017) used an experimental design consisting of a scenario-based approach and quantitative measures. They acknowledge that no generalizations can be made from their research, as their “main contribution is to theory of opportunity recognition and intention, which can in turn be applied to understand particular cases in real settings” (p. 21).

Employing a qualitative approach was therefore deemed appropriate to gain new in-depth insights from real cases. Qualitative approaches allow researchers to discover “the meanings seen by those who are being researched” and to understand “their view of the world” (Jones, 1995, p. 2), because they enable researchers to see events through the eyes of their participants. In this study, the in-depth interviews that were conducted provided rich and detailed information about sustainable entrepreneurs’ experiences and perceptions related to opportunity recognition, and enabled the researchers to consider the meanings that the respondents attributed to the aspects that led them to recognize opportunities for sustainable entrepreneurship.

Furthermore, results from different research approaches, i.e., qualitative and quantitative approaches, “provide a bigger or better picture of what is really happening” (Sullivan and Ebrahim, 1995, p. 196) and “generate a richness of understanding and interpretation” (p. 196). According to Davidsson (2004), qualitative approaches are advantageous in entrepreneurship research when it comes to capturing processes, as this can be hard to achieve by using quantitative approaches. Since the topic of opportunity recognition involves complex processes and perceptions, it lends itself well to a qualitative method of research. Moreover, using a qualitative approach is a common choice in fields where research is scarce, such as opportunity recognition for sustainable entrepreneurship, since it allows insights to be gained on which quantitative methods can then build upon (Srška and Koeszegi, 2007). This means that contrasting this study’s results to those of Choongo et al. (2016) and Muñoz and Dimov (2017) can create a better understanding of the extent to which the model of Patzelt and Shepherd (2011) describes the process of opportunity recognition for sustainable entrepreneurship in practice.

Research participants
The research participants were eight sustainable entrepreneurs who were selected using purposive sampling. This entails establishing relevant selection criteria and searching for suitable respondents who meet these criteria (Bernard, 2002). This sampling technique leads to the generation of theoretically relevant samples which are considered most suitable for entrepreneurship research (Davidsson, 2004). For inclusion in the sample, participants were required to be owners of successful businesses that abide by the TBL concept by considering all the three Ps (financial, environmental, and social: Elkington, 1997). They were identified through different online business networks (Umwelthauptstadt, Dasselse in Gruen, Faires Berlin) and personal contacts. The fact that the selected entrepreneurs were running successful sustainable businesses implies that they had successfully identified opportunities for sustainable entrepreneurship and could therefore
share their experiences in this regard. For the purpose of this study and the interviews that were carried out, sustainable entrepreneurship was defined as “the discovery, creation, and exploitation of opportunities to create future goods and services that sustain the natural and/or communal environment and provide development gain for others” (Patzelt and Shepherd, 2011, p. 632).

The entrepreneurs who took part in the study were active across five different sectors, namely tableware, finance, food, clothing, and accessories (see Table I), and were all based in Berlin. This city was selected as the location for this study as it is currently a hub of entrepreneurship and sustainability, with over 40,000 new business startups being registered every year (Berlin.de, 2012), and with Berlin being described as the capital of the green economy due to the large number of people working in the green sector and the abundance of companies voluntarily supporting environment-friendly practices (Chamber of Commerce and Industry of Berlin, 2010).

Seven of the eight respondents were male and one was female. For six respondents, their current business was their first venture, whereas two respondents had prior experience with other business ventures. The current businesses of all the respondents were founded within the last five years before the research was conducted. Six of the respondents stated that they have a degree from a university, one gave up his studies in order to become an entrepreneur and one had received vocational training.

Data collection
Prior to conducting the interviews, a list of pre-defined questions (see the Appendix) was formulated to address each of the components in Patzelt and Shepherd’s (2011) model, in order to ensure that the interviews followed a similar structure and to facilitate the comparison of data gathered from different interviewees. Although this pre-defined list was used in each interview to guide the interview process, there was still room to digress in case that any unforeseen relevant topics would emerge during an interview. The interviews were therefore semi-structured in nature (Merriam, 2009). The pre-defined list consisted of the following questions.

First, some introductory questions were asked, which functioned as ice-breakers and to establish rapport between the researcher and respondent (Brennen, 2013). These questions included the respondents’ personal, educational and professional backgrounds, their personal views of the meaning of sustainability and a question about whether or not they consider themselves to be sustainable entrepreneurs.

After this, questions directly concerned with the topic of opportunity recognition were asked. This part started with a non-leading question, asking the respondents for their opinion about the circumstances and factors which contributed to them becoming sustainable entrepreneurs. This allowed the respondents to express what they personally perceived as the reasons why they identified sustainable business opportunities.

<table>
<thead>
<tr>
<th>Respondent code</th>
<th>Line of business</th>
<th>Sector</th>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>Bio-degradable single-use plates</td>
<td>Tableware</td>
</tr>
<tr>
<td>B</td>
<td>Sustainable investments</td>
<td>Finance</td>
</tr>
<tr>
<td>C</td>
<td>Sustainable snacks</td>
<td>Food</td>
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<tr>
<td>D</td>
<td>Sustainable textile printing</td>
<td>Clothing</td>
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<td>E</td>
<td>Sustainable fast food</td>
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<tr>
<td>F</td>
<td>Sustainable accessories</td>
<td>Accessories</td>
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<tr>
<td>G</td>
<td>Sustainable clothes</td>
<td>Clothing</td>
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<tr>
<td>H</td>
<td>Upcycled products</td>
<td>Accessories</td>
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</tbody>
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Table I. Research participants
The next set of questions examined the role of the relevant factors for opportunity recognition in the field of sustainable entrepreneurship according to Patzelt and Shepherd’s (2011) model. These included questions about prior environmental and communal knowledge, motivation for personal gains (perceptions of threat), motivation to develop gains for others (altruism), and entrepreneurial knowledge.

The length of the interviews was approximately 30 minutes. All interviews were audio-recorded with the written consent of the participants and later transcribed and analyzed using thematic analysis.

Data analysis
The data gathered in the interviews were analyzed using the approach of thematic analysis, based on the six-step approach formulated by Braun and Clarke (2006):

1. The transcripts were read repeatedly in order to become acquainted with the data. During this process notes were taken.
2. Initial codes were generated to conceptualize the different data extracts.
3. Themes were constructed. Braun and Clarke (2006) define a theme as a patterned response, which “captures something important about the data in relation to the research question” (p. 10). One of the ways in which themes were recognized in this study was related to the close connection between respondents’ answers and the literature review. Since the interview questions were guided by the literature review, the respondents’ answers were often in some way or another related to the topics identified in the literature review. For instance, asking the respondents about their prior knowledge of natural and communal environments was likely to reflect the importance of this prior knowledge by showing the role it played in the respondents’ individual cases. This led to the recognition that, for example, the respondents had prior knowledge of negative trends, changes, and conditions, which were therefore declared a theme. Furthermore, themes were recognized when different respondents gave similar answers to certain topics. In this case these answers were grouped and identified as a theme. One example of this was the way most of the respondents described that spending time abroad played an important role in their process of recognizing an opportunity for sustainable entrepreneurship. This aspect had not been found in the literature review, however, the large number of times that it was mentioned by this study’s respondents indicated it to be an important theme.
4. The initially generated codes were connected to the recognized themes. This was done by printing the coded data extracts and connecting them on a poster. By doing this, a thematic map was physically visualized, which helped in arranging the codes under the right theme and recognizing interconnectivity (Boyatzis, 1998).
5. A refinement of these themes was conducted, before the themes were finally determined and named concretely. This was again done physically, by first constructing a refined list of themes and then gluing the printed data extracts to the theme they belonged to.
6. The last step was the writing up of the results and discussion.

In order to ensure confidentiality and anonymity, each of the eight entrepreneurs is referred to by a respondent code ranging from A to H in the sections that follow.

Results
As described in the previous sections, Patzelt and Shepherd (2011) suggest that recognizing opportunities for sustainable entrepreneurship is influenced by prior knowledge of natural
and communal environments; motivation for personal gain (perception of threat); motivation to develop gains for others (altruism); and entrepreneurial knowledge. The interviews addressed each of these factors, and the results are presented in the following sections.

Prior knowledge of natural and communal environments

The interviews revealed that the entrepreneurs in this study were influenced by knowledge about negative and positive trends, changes, and conditions in natural and communal environments as they recognized opportunities for sustainable entrepreneurship.

Negative trends, changes, and conditions. Some of the challenges and problems described by the respondents as influential on their process of opportunity recognition were directly linked to the recognized opportunities. For example, Respondent A, who identified the opportunity to adapt an Indian custom and produce sustainable single-use plates for the German market, described the following recognition:

It’s unnecessary that we produce so much waste […] Throwaway mentality is here to stay; people will always eat on the go using one way products. This won’t change. But these products don’t have to be made of plastic.

Respondent C, who sells sustainable vegetable and chocolate snacks, recognized problems in the economy as such and in the development of agriculture in Ecuador, where this respondent is originally from. The first negative condition described was the role of Ecuador in the global market, which was a concerned for this respondent since an early age:

I come from a country which sells mostly commodities. I believe this to be very wrong. Ecuador is only exporting cocoa and other commodities like bananas for example. So I always wanted to understand what differentiates us from a highly developed country like Germany. Why can the best chocolate in the world only be produced in Europe and the countries where the cocoa grows aren’t able to do it? Who says this? I didn’t come to Germany to sell commodities but regional products made from commodities that don’t grow here.

This respondent then continued to explain how agriculture and nature were traditionally deeply connected in Ecuador, but that this has changed since the 1970s when the market demanded to increase efficiency and included the use of ecologically harmful chemicals. To fight this negative development, this respondent decided to support farmers who still work in traditional, sustainable ways. Moreover, this respondent recognized the disinformation of consumers regarding nutrition especially in cities, linked this to the recognized opportunity of selling sustainable vegetable and chocolate snacks, and emphasized the importance of customers understanding sustainable business concepts:

The people don’t recognize the correlation between what they eat and how they feel. People treat their bodies very badly although it’s the most important thing we have. It’s like putting the wrong fuel in your car – it will break very fast […] Our job is also to inform customers about what is going on […] That’s the only way a sustainable concept can work. If the customer doesn’t understand the concept the whole chain cannot work.

Respondent F recognized general problems in Kyrgyzstan, and described this recognition as “the main reason […] to found a company.” For instance, this respondent recognized that producers in Kyrgyzstan lacked access to international markets and produced mainly the same products.

Unlike Respondents A, C, E and F, who first recognized negative trends, changes, and conditions and then started entrepreneurial projects to counteract these problems and their effects, Respondent G explained how the relevant problems only came to light after starting
the entrepreneurial project, namely upon engaging in production and material related topics. This respondent described this development as follows:

Environment was always important to us. So the question what kind of shirts we were printing on came up relatively fast. Only in the beginning we used the “normal” shirts but we began to inquire under which circumstances these shirts are produced. And then we started to look around for producers with better working conditions. This led us to increase our own standards and, for example, also to pay attention which colors we used – that they are certified [...] Our first priority was to improve working conditions, but once you start thinking about it, you also find out about how resources are grown and about pesticide usage – the general agricultural conditions. In the end all these factors affect humans.

Also in the context of textile production, Respondent D criticized production processes outsourced by international companies to third world countries and considered these acts to be “unfair.”

In addition to the above, the respondents identified many other negative trends, changes, and conditions which could not be directly linked to the specific opportunity they identified but still played a role in their opportunity identification by raising their awareness that sustainable development is needed. For example, Respondent B stated that the process of opportunity recognition was influenced by:

The awareness that we are living in a limited system. I was sensitized by a study about our planet’s future. For me the systematical relationships were so evident, that it was clear to me that we need to steer the development of the economy in another direction.

While not mentioning any specific negative trends, changes, or conditions, Respondent H simply declared that “there are so many problems,” which eventually led to the recognition of an opportunity for sustainable entrepreneurship based on upcycled products (i.e. products made from waste).

Positive trends, changes, and conditions. Knowledge about positive trends and developments also influenced the process of opportunity recognition of the sustainable entrepreneurs interviewed in this study. Five respondents outlined how sustainability has developed and influenced society. For example:

Lifestyles are changing right now. People start to see their lives and the way they consume differently [...]. Right now you can see – mainly in large cities – an increasing variety of sustainable products and services. This trend hasn’t really arrived in smaller cities yet (Respondent A).

You can see that society is changing. The whole LOHAS-movement (LOHAS = Lifestyle of Health and Sustainability), that’s the reason why our concept works so well – because it’s trendy. But it’s not only a trend which is going to disappear again. It’s a development and it is rather going to increase in the future (Respondent H).

Respondents D and G described how staying open to new trends and developments influenced their processes of opportunity recognition for sustainable entrepreneurship by enabling them to adapt to the new sustainable possibilities that emerged:

In the beginning it was more politically motivated, e.g., anti-nuclear power. Sustainability became an important aspect of our work much later. Back then there simply were no sustainable textiles, no explicitly sustainably produced textiles, no organic cotton or any fair trade products [...]. Sustainable development always has been an important topic for me. International processes of production seemed very unfair to me. And in the last decades the textile industry went exactly to those places in the world where the least amount of money had to be spent, which of course affected society and environment negatively but meant higher profits for the industry [...]. The thought of doing something differently was there since day one. But we could only really start implementing sustainable aspects once the respective suppliers for our products were available [...]. The problem was there was no market where we could have obtained our goods, although there was already a market of potential customers (Respondent D).
We visited trade shows and exhibitions and we saw an increasing amount of sustainable clothes. And we also saw that these clothes no longer were these classical hippie garments, but of a more fashionable design. So we thought it’s worth a shot (Respondent G).

The above results demonstrate that knowing what is going on in one’s natural and communal environments can increase one’s ability to recognize opportunities for sustainable entrepreneurship. The interviews conducted in this study further revealed that the sustainable entrepreneurs obtained their prior knowledge of natural and communal environments from different sources, which are outlined in the next section.

Sources of prior knowledge of natural and communal environments

The respondents obtained prior knowledge of natural and communal environments that were most relevant to the process of opportunity recognition through two different sources, namely spending time abroad, and socialization.

Spending time abroad. All the respondents made some reference to international experience or knowledge, and spending time abroad played a role in this regard: five of the respondents had lived or worked in foreign countries for extended periods and therefore gained experience and knowledge of international contexts. Two of these respondents mentioned their foreign experience and knowledge as direct sources of the opportunities they identified:

I organized a one-way ticket to China, flew to Hong Kong and started working in a product design company there […]. While travelling India with a friend, we discovered a local custom of using dried leaves as plates, which completely amazed me […]. I thought it is a super cool product, so I looked around for different producers in India and picked one who was ideationally on the same page as me […]. All of this was also motivated against the backdrop of Hong Kong, where everyone is using these disgusting polystyrene plates (Respondent A).

A lot simply developed. The basis of the idea evolved when I went to Kyrgyzstan for personal reasons. My girlfriend is from there (Respondent F).

Three other respondents mentioned that they had plenty of international experience and knowledge in the form of studying abroad, working abroad, and/or traveling, and although this was not linked directly to their opportunity identification, it still played a role in their interest in sustainability. For example, Respondent H described the impact that “getting around a lot” had on attitudes towards sustainability as follows:

Let me put it like this. I’d say that people who see a lot and travel a lot and really live somewhere else for a while, not just backpacking from one hostel to another – you start to take things away from it and for me this is the best school that exists because it broadens your horizon. You start to see the relation between the reality we are living in here in Germany and other places in the world – when you think about how bad we all feel with ourselves and how we complain, because we take many things for granted. What we take for granted is not comparable to other places in the world.

This respondent traveled extensively, spent a semester abroad in Bali and two in Colombia, and did community service in Peru. Likewise, Respondent E spent several semesters abroad, which included Paris, Sydney, and Tokyo, as well as reading for an MBA degree in Italy and working in Poland for several years. This respondent believed that traveling contributed to the process of opportunity recognition, but at the same time emphasized that it was not the case of seeing a business model abroad and implementing it in Germany.

Unlike the other respondents, Respondent C did not grow up in Germany but in Ecuador and came to Germany to find out if it would be a good place to sell sustainable products.

Besides being abroad, all respondents, including those who did not mention being abroad as a factor that influenced their process of opportunity recognition, expressed knowledge about international connections and circumstances, which they obtained from other sources, e.g., as part of their socialization, which is outlined in the next section.
Socialization. Five of the respondents named experience and knowledge gained through socialization as a factor that contributed to the recognition of opportunities for sustainable entrepreneurship. Such socialization included the family background, engagement in sustainability movements, i.e., groups with the sole concern of improving society and/or environment, and being confronted with the outcomes of unsustainable practices, e.g., through the media. According to Respondent H, this leads to developing “so much awareness that you realize you need to change the ways you think, live and act.”

Respondent D’s family was engaged in the anti-nuclear power movement, which led to an interest in sustainable development from an early age. Respondent A “always read a lot of newspapers” and explained that this leads to certain realizations:

You are constantly confronted with issues like plastic, oceans, glaciers and so on. So you pick up on these things. It’s omnipresent. Also the climate debate is on the news all the time.

Respondents B and G pointed out that growing up in Germany during the 1970s or 1980s was “growing up with the environmental movement” (Respondent B) and that sustainability was therefore part of their “general socialization” (Respondent G).

Respondents A and H referred to the role of knowledge they obtained through networking. Respondent A highlighted how the exchange with other market participants can support entrepreneurs:

You have possibilities to question your ideas, e.g., you can find people to ask if they have knowledge about certain markets or just to ask how they like certain aspects of your ideas, like the name, logo or slogan [...]. There are a lot of different people who can help you. For me it was important to have a lot of professionals around me who I can consult or who direct me to other people.

Along similar lines, Respondent H stated that having access to knowledge about international markets enhances the process of opportunity recognition for sustainable entrepreneurship. This respondent had friends who imported from Asia, and this helped ensure that fair wages were paid to manufacturers (“I know how much they pay and I pay three to four times as much”).

Motivation for personal gains
As explained earlier in this paper, Patzelt and Shepherd (2011) consider two forms of motivation as crucial with regards to the process of recognizing opportunities for sustainable entrepreneurship, the first of which is motivation for personal gains (perception of threats of the natural and communal environment). The sustainable entrepreneurs in this study’s sample did not make any reference to being influenced by perception of threat in the way suggested by Patzelt and Shepherd. However, they described other personal motives that played a role for them in the process of becoming sustainable entrepreneurs, such as a desire to be self-employed, other aspects of their personality and their personal circumstances.

Desire to be self-employed. Some respondents made reference to an inner desire to become self-employed. Two of the respondents described early conscious decisions to become self-employed. When starting university, “it already was more or less clear” for Respondent H that being one’s own boss is a desirable career path. Similarly, Respondent E “always had the idea to start something” alone in order to be able to act autonomously.

Furthermore, being self-employed was considered by two respondents in connection with creativity. Respondent F described it as appealing to “start your own project because it gives you creative scope” and likewise Respondent B described seeing the chance to gain creative scope by choosing to be self-employed over being employed in someone else’s company.
Respondents E and F were influenced by role models around them. Both of them referred to a contagious “founders’ mentality” which motivated them, and mentioned the role of socializing with other entrepreneurs as a motivating factor:

Here are a lot of entrepreneurs and if you see them all the time you start to develop the desire to become one too (Respondent E).

You see a lot of people who have some kind of project – actually almost everyone has a project. This is inspirational and encouraging, because it’s omnipresent, you see it everywhere (Respondent F).

Other aspects of personality. Two respondents described other aspects of their personality as influential on the process of opportunity recognition. Respondent H claimed to be a determined individual and argued that:

It also depends on your character […] I’ve always been like that, a go-getter, an organizer. If you really want something and you set your mind on doing it, then you usually achieve it – if you really want it.

According to Respondent A, being an idealistic individual can lead to unhappiness in situations that are not in line with one’s beliefs. This respondent described, for instance, that this led to quitting several jobs which involved unsustainable practices.

Personal circumstances. The personal situations and circumstances the respondents had to face also contributed to their process of opportunity recognition. For two respondents, their personal circumstances and situations were directly linked to the opportunity they then identified.

Respondent B became involved in the finance sector after inheriting an amount of money which the respondent wanted to invest. To this respondent, it was important not only to invest the money profitably but also in consistence with one’s beliefs. This led the respondent to engage in the green finance sector, first as a customer, then as an agent, and finally as a sustainable entrepreneur.

Respondent F, who went to Kyrgyzstan to be with his girlfriend “was confronted with the question of what (he) could actually do there,” which eventually led the respondent to becoming a sustainable entrepreneur in Berlin, with products being produced in a sustainable manner in Kyrgyzstan and sold on the German market.

Motivation to develop gains for others (altruism)
As explained earlier, the second form of motivation that enhances sustainable opportunity identification according to Patzelt and Shepherd (2011) is the motivation to develop gains for others, or altruism. This study’s findings regarding the role of altruism in the identification of sustainable opportunities are presented below.

Striving for fairness. Five respondents referred to the desire to earn money in a fair way as a key driver in the process of recognizing an opportunity for sustainable entrepreneurship. They emphasized that fulfilling this desire was important for them personally to be happy with themselves, their work, and the way they earn money. For example:

Well, on one hand you have to earn money, because it’s a company. But I wanted to earn money in a way that would still allow me to look in the mirror (Respondent E).

We simply prefer to do things in the right way. It’s about fairness. If people do their job they should receive reasonable wages for it instead of being exploited. We wanted to create fairness (Respondent G).

I consider myself a businessman; I don’t want to be an accommodator. It’s just about fairness really – to have a good conscience and be able to sleep at night. They profit from us and we profit from them […] Our main thought was that if we import from third world countries it has to be fair. That’s a prerequisite for us (Respondent H).
Two of these respondents explained how their emphasis on fairness should not be confused with pure altruism, by stating:

It’s not a charity project – especially in gastronomy you can’t afford to give away money, competition is fierce (Respondent E).

We’re not starry-eyed idealists. We’re not Jesus. We have a cool concept, a good idea – and we want to be sustainable (Respondent H).

While being fair inevitably leads to improved conditions, improvements can also take place independently of the notion of fairness. This aspect also influenced some of the respondents as described in the next section.

**Striving for improvements.** Three respondents were intrigued by the possibility to improve the world in general by generating advantages for others. Respondent C emphasized that “this is not about welfare” but about selling high quality products. At the same time, this respondent explained that striving for improvements in the world can create positive feelings for oneself:

I criticize unsustainable practices. Everything I do is a search for how to do things in a better way, believing that there may be alternatives. Actually I don’t feel negative about it – it’s rather positive, it’s a good feeling […] a feeling of “I want to do something to improve the world”. This may sound super idealistic, but that’s exactly how I have always felt.

For Respondent F, the possibility to improve conditions for others was the principal reason to be interested in becoming a sustainable entrepreneur:

My motivation was dependent on being sustainable. I didn’t have any connection to economy before. It wouldn’t have been tempting for me to just sell a product. That’s not my thing. I would have never thought about it. That was the basis of the motivation. Without sustainability I wouldn’t have started, there would be no motivation […]. Generating advantages for others was the goal, the reason we came up with the idea to start our own company. One of the main reasons we wanted to do it, was that it would support the people we’re working with. We could generate additional income and create new markets for them. And of course also improve the working conditions […]. The motivation and vision was to create a sustainable value chain.

Along similar lines, Respondent A was influenced by the difficult conditions experienced while living in Hong Kong when thinking about becoming a sustainable entrepreneur. This respondent was amazed by the thought of “what you could reach in one city alone” by implementing such an idea, and was interested in “starting a little worldwide (product name) revolution.”

**Entrepreneurial knowledge**

As outlined above, Patzelt and Shepherd (2011) consider entrepreneurial knowledge as a moderating factor that enhances the impact that prior knowledge of natural and communal environments and motivation have on the process of opportunity recognition for sustainable entrepreneurship. Although this study’s qualitative research approach is not appropriate to test moderating effects, the interviews revealed that this study’s respondents had entrepreneurial knowledge prior to their opportunity recognition, either through prior jobs and/or prior projects, and that this can be in some way (directly or indirectly) influential on the process of opportunity recognition.

**Prior jobs.** Experience and knowledge gathered through prior jobs played a role for three of the respondents in their identification of opportunities for sustainable entrepreneurship. Respondent C worked in the agricultural sector in Ecuador “with regional products, such as vegetables and citrus fruits”, which are related to some of the products this respondent is selling now. Respondent B was formerly involved in the green finance sector as an agent for
a company, thereby gaining experience for a period of ten years before taking the decision to look for other “perspectives.” This respondent later started to develop a concept together with some colleagues based on how they personally believed is the best way to consult their clients regarding sustainable investments.

Besides gaining knowledge that influenced the process of opportunity recognition, Respondents A and B made reference to how the experience of being employed as such had influenced them. Respondent A did not derive self-fulfillment from prior employment, which included an “ideationally difficult” job in the graphic design sector which conflicted with the respondent’s beliefs, and another job in the product design sector which resulted in equally disappointing experiences:

It was very frustrating because it was all about low price products, and the concept always was: the faster it breaks, the better. It was only important that it would survive the first weeks.

Similarly, Respondent B recalled how the experience of a prior job contributed to the desire to become an entrepreneur:

I was working for a large social institute in Berlin, it was well paid. But it wasn’t my fulfillment in life. Well, it was how being employed usually is: not many possibilities to influence anything, zero creativity […] Everything very mindless and bogged down with bureaucracy.

The rest of the respondents did not refer to any relevant prior jobs and their prior jobs were completely unrelated. For example, Respondent G worked “mostly in bars,” Respondent E worked for a bus company, and Respondent D only had side-jobs while being a student and then directly became an entrepreneur.

Prior projects. Two of the respondents made reference to being involved in prior foundations of commercial and non-commercial projects. Respondent A’s personal experience shows how this can be an influence in relation to entrepreneurship:

I always had projects, not only sustainable ones but also political ones, a bit conscious of what’s going on on this planet […] And this definitely helped me: Implementing projects, motivating people to participate, and learning what happens if things don’t work out as planned, how to deal with it, how to restructure […] having the courage to fail, that’s elementary, because always when you start something new you automatically make mistakes because you lack knowledge […] I also have liked to act as a host all my life, a party is actually a small project too; I think if you never planned a party you shouldn’t try to found a company. You learn how to organize your to-do lists, set timelines for yourself and to really stick to them.

This respondent then went on to describe an involvement in various business foundations by naming and describing four of the “essential ones,” and added that there were some more.

Likewise, Respondent B talked about being involved in founding various projects and businesses, such as being involved in the foundation of the largest environment-friendly political party in Germany, some agricultural projects, a vegetarian restaurant, and some foundations in the finance sector.

The rest of the respondents were only involved in one business venture, which was the business they were running at the time of the interview and they did not mention any other projects to be relevant on their way to becoming a sustainable entrepreneur.

Discussion
As stated in the introduction, the research question addressed in this study is:

RQ1. How do sustainable entrepreneurs recognize opportunities for sustainable businesses in practice?
The results described in the sections above depict the process of opportunity recognition for sustainable entrepreneurship as an interplay between all the factors proposed by Patzelt and Shepherd’s (2011) model, namely prior knowledge of natural and communal environments, motivation for personal gains, motivation to develop gains for others (altruism), and entrepreneurial knowledge. In other words, the results of this study offer support for each of the components in Patzelt and Shepherd’s (2011) model. As outlined earlier in this paper, only two other studies (Choongo et al., 2016; Muñoz and Dimov, 2017) had empirically tested Patzelt and Shepherd’s (2011) model prior to the present study, and these led to disparate results. Choongo et al. (2016) did not find any evidence to support the model, while Muñoz and Dimov (2017) offered partial supporting evidence as they did not explore the entire model. Therefore, this study’s first contribution to the literature is in being the only one to date that offers empirical support for the full model of Patzelt and Shepherd (2011).

The second contribution of this study is in extending Patzelt and Shepherd’s (2011) model by identifying a number of factors that make up these components, including spending time abroad and socializing as sources of prior knowledge of natural and communal environments; the desire to be self-employed, other aspects of one’s personality as well as one’s personal circumstances as sources of motivation; and prior jobs and projects as sources of entrepreneurial knowledge, as illustrated in Figure 2.

In the following sections, the results of this study are discussed and interpreted not only in view of Patzelt and Shepherd’s (2011) model, but also in comparison with the findings of Choongo et al. (2016) and Muñoz and Dimov (2017). This discussion shall highlight which of this study’s findings are supporting past research and which are challenging it. Reflections on the possible reasons for the inconsistent findings that have emerged from the
limited extant research shall then be provided to highlight that there are still unanswered questions, thus making a third contribution. The fourth contribution lies in this study’s suggestions for future research which may resolve some of the unanswered questions arising from these studies. These suggestions are presented in the Conclusion section following an outline of implications for policy and practice and the study’s limitations.

Prior knowledge of natural and communal environments
The first major factor highlighted in the Results section is prior knowledge of natural and communal environments. This study found that prior knowledge of both negative and positive trends, changes, and conditions can be influential on sustainable entrepreneurs’ abilities to identify opportunities, thus supporting Patzelt and Shepherd’s (2011) model and Muñoz and Dimov’s (2017) research, but contradicting Choongo et al.’s (2016) findings.

In support of Patzelt and Shepherd’s (2011) notion that prior knowledge of natural and communal environments is positively related with sustainable opportunity identification, one could argue that without such prior knowledge, this study’s respondents would not have recognized many of the opportunities that they spoke about during the interviews. This is especially so in cases where these trends, changes, or conditions were directly linked to the recognized opportunity, such as Respondent A who recognized the harm of plastic products as a negative condition and introduced an ecofriendly alternative to the market to counteract this condition and its negative effects.

In addition to supporting Patzelt and Shepherd’s model regarding prior knowledge of natural and communal environments, this study extends this model by shedding light on some of the sources through which sustainable entrepreneurs may create such prior knowledge. The sources identified in this study are spending time abroad and socialization. Although one has to bear in mind that the small sample size and qualitative approach of this study does not allow any generalizations to be made, it is noteworthy that all the respondents had similar backgrounds, i.e., they were all open minded travelers and their relevant prior knowledge derived at least in part from the above mentioned sources.

Since the relevant prior knowledge of the sustainable entrepreneurs seems to include a moral judgment related to trends, changes, or conditions that are perceived to be negative or positive, the results also support the study of Muñoz and Dimov (2017) which found that prior knowledge of natural and communal environments and moral thoughts are interconnected. There are various examples of this interconnection in this study’s results. For example, Respondent G’s first priority was to improve working conditions in the clothing industry, but when other unsustainable practices in this industry – such as the usage of pesticides – came to light, this respondent quickly came to the conclusion that this too has a negative effect in the long term and reacted accordingly.

In contrast to the above, this study does not support Choongo et al.’s (2016) study which found no significant relationship between prior knowledge of natural and communal environments and sustainable opportunity identification. These scholars suggest that the entrepreneurs in their sample “may not seek knowledge on sustainability issues” (p. 17), which might explain why such knowledge was not found to be a significant predictor of sustainable opportunity identification in their study.

Motivation for personal gains
As outlined in the literature review, Patzelt and Shepherd (2011) proposed that there are two types of motivation which play a role in the process of opportunity recognition for sustainable entrepreneurship, the first being motivation for personal gains. These authors consider this type of motivation to be triggered by a perception that the natural and communal environments are under threat. However, this study’s findings do not support this notion and are thus in line with the results of Choongo et al. (2016), who found no
significant positive relationship between perception of threat and sustainable opportunity identification. As argued earlier in this paper, the concept of moral intensity shows similarities to perception of threat. Therefore, this study also partially supports the results of Muñoz and Dimov (2017) in this aspect since these scholars found that moral intensity has a moderating effect but not a direct effect on the likelihood to recognize opportunities for sustainable entrepreneurship, and on the intention to pursue such opportunities.

Although perceptions of threats to the natural and communal environment were not found to motivate entrepreneurs to identify sustainable opportunities, this study’s findings indicate that there are other personal motives that play a role in the process of becoming a sustainable entrepreneur. The results show that the personal gains that motivate individuals to become sustainable entrepreneurs are their desire to be self-employed, aspects of their personalities, and personal circumstances that require such a role. This implies that factors that motivate individuals to engage in traditional entrepreneurship also motivate individuals who engage in sustainable entrepreneurship. Thus, a link between traditional and sustainable entrepreneurship is created, suggesting that the view of scholars such as Segal et al. (2005), who maintain that need for autonomy and self-fulfillment pulls individuals towards becoming entrepreneurs, is also applicable in the field of sustainable entrepreneurship. The results do not oppose the suggestions of Patzelt and Shepherd (2011) that a personal motive for pursuing an opportunity for sustainable entrepreneurship can be based on need for competence or need for relatedness, but neither do they support them. Furthermore, the results show that not all motives to become a sustainable entrepreneur are necessarily strictly connected to sustainability motives, and they could also be fulfilled by pursuing an opportunity for traditional entrepreneurship.

Motivation to develop gains for others (altruism)
The second type of motivation which was suggested by Patzelt and Shepherd (2011) to play a role in the process of sustainable opportunity recognition is the motivation to develop gains for others (altruism). The results of this study suggest that sustainable entrepreneurs can be influenced by altruistic motives. They therefore support Patzelt and Shepherd’s (2011) model but largely contradict Choongo et al. (2016), who found that only an inclination to donate to charity was positively related to sustainable opportunity identification, while an inclination to help strangers and to make efforts for others were not. These scholars mention their limited sample size and the high levels of altruism among their sample as possible explanations for why their results do not support the model of Patzelt and Shepherd (2011) in this regard. As explained earlier, moral intensity can be linked to altruism when an action is considered to create positive consequences. In contrast to this study’s results, Muñoz and Dimov (2017) did not find the direct effects of moral intensity on the process of opportunity recognition for sustainable entrepreneurship, but found that it moderates the process. This study’s findings contradict this notion and suggest that altruism directly influences the process of opportunity recognition. Due to the design of this study, its results cannot be used for measuring moderating effects.

As some of the respondents put their altruistic motivation into perspective by contrasting it to their more egoistic aspects, the findings of this study imply that at least some sustainable entrepreneurs are influenced by impure altruism rather than pure altruism (Heck et al., 2006). Despite the fact that not all respondents explicitly stated how their altruistic motivation also has egoistic aspects, the businesses of all respondents followed the TBL, meaning that they generated benefits for the entrepreneurs themselves in the form of profit as well as for (other) people and the environment (Elkington, 1997). Therefore, all the respondents in this study (and possibly all sustainable entrepreneurs) could be argued to possess impure forms of altruism according to Heck et al.’s (2006) definition. While the findings of this study imply that the main form of altruism that influences the process of
opportunity recognition is that of impure altruism, it is nevertheless conceivable that sustainable entrepreneurs also employ aspects of pure altruism in their businesses. This can currently only be speculated as it was not explicitly studied in this research.

Entrepreneurial knowledge
The fourth major factor that plays a role in sustainable opportunity recognition according to this study’s results is entrepreneurial knowledge. Patzelt and Shepherd (2011) attribute a moderating role to this factor. Due to the qualitative design of this study, it is not possible to address whether the role of entrepreneurial knowledge is of a moderating nature or not, however, the results indicate that entrepreneurial knowledge can in some way (directly or indirectly) be influential on the process of opportunity recognition. This is at least partly in line with Choongo et al.’s study which found no moderating effects for entrepreneurial knowledge but found significant positive direct effect on sustainable opportunity identification.

The respondents in this study reported having obtained entrepreneurial knowledge through two sources of knowledge, namely prior jobs and prior projects. These findings add depth to the model of Patzelt and Shepherd (2011), since they present possible sources for obtaining relevant entrepreneurial knowledge for those interested in identifying opportunities for sustainable entrepreneurship. Although the results cannot shed light on the moderating effect of entrepreneurial knowledge, they do indicate that entrepreneurial knowledge can facilitate the process of opportunity recognition, and they suggest prior jobs and prior projects as possible sources to obtain this kind of knowledge.

Reflections on the disparate findings of extant research
The findings of this study which, as discussed above, largely support Patzelt and Shepherd’s (2011) model are in stark contrast with one of the other empirical papers that has tested Patzelt and Shepherd’s (2011) model (Choongo et al., 2016), while offering partial support for the other (Muñoz and Dimov, 2017). Choongo et al. (2016) found no evidence that supports any of the relationships proposed by Patzelt and Shepherd (2011). This could be due to several reasons, some of which are identified by the authors in their paper. First, Choongo et al.’s study was carried out in Zambia, which is a developing African country. These authors suggest that western theories might not be appropriate for explaining sustainable entrepreneurship in developing countries. On the other hand, this study was conducted in Berlin, which is recognized as a hub of sustainable entrepreneurship, therefore, western theories may be more applicable to this study. Second, Choongo et al.’s study was carried out in the mining industry, and their sample was made up of owner-managers or managing directors of SMEs that are suppliers of the four major mining companies in Zambia. Unlike this study’s respondents, who hailed from a variety of industries and who were all identified as sustainable entrepreneurs due to their focus on serving customers with sustainable products and services, Choongo et al.’s respondents offered business-to-business services, not necessarily in a sustainable manner. Another important difference that may have led to this divergence in findings is the research approach adopted. Choongo et al. employed a quantitative approach by carrying out a survey and conducting statistical analyses, while this study adopted a qualitative approach by conducting in-depth semi-structured interviews which were analyzed using thematic analysis. It is possible that since this study’s approach was more exploratory, in that it allowed respondents to come up with their own answers rather than having to select from a limited number of pre-defined responses, they were able to identify the factors that were truly of relevance to them personally. Conversely, Choongo et al.’s survey might not have included the factors that their respondents found most relevant in their sustainable opportunity identification.
Perhaps the most important difference, however, is the way that sustainable opportunity identification was operationalized and measured in the two studies. In this study, sustainable opportunity identification was understood to involve starting up a company, or introducing new products or services, in a sustainable way, i.e., in accordance and with due consideration of all the three Ps (Elkington, 1997). However, Choongo et al. (2016) took a much broader view of sustainable opportunity identification. They operationalized it as the number of opportunities identified for making one’s business more sustainable and/or starting a sustainable business within the last five years. The latter part of this definition is in line with the conceptualization adopted in this study, but the former encompasses many more activities than what sustainable opportunity identification is considered to be in this study. Some examples of sustainable opportunities identified by Choongo et al.’s (2016) respondents are using high-pressure machines to avoid using cleaning chemicals, energy saving, recycling, and increasing care and health benefits for their employees. While these measures may certainly lead to the enterprise becoming more sustainable, it may be argued that they do not strictly constitute opportunity identification as they did not lead to new enterprises, products, or services.

As mentioned above, this study shows support for the study of Muñoz and Dimov (2017) in some parts and contradicts it in others. Considering the similarity of moral intensity to both perception of threat and altruism (dependent on whether consequences are perceived to be of negative or positive nature), it can be argued that the results of both studies are to some degree comparable. Muñoz and Dimov’s (2017) results indicate that moral intensity, and therefore perception of threat and altruism, has no direct effects on the process of opportunity recognition for sustainable entrepreneurship but instead takes on a moderating role in this process. Considering these results regarding perception of threat and altruism, this study’s findings are in line with Muñoz and Dimov’s (2017) conclusions regarding perception of threat, but not with those regarding altruism. Both studies contradict Patzelt and Shepherd’s (2011) view that perception of threat increases the likelihood that opportunity recognition for sustainable entrepreneurship takes place. However, the results of Muñoz and Dimov (2017) contradict the results of this study with regards to the role of altruism, as only this study found it to be directly beneficial for the process of opportunity recognition for sustainable entrepreneurship. In comparison to this, the results of Muñoz and Dimov (2017) suggest that perception of threat and altruism, which can both be considered as forms of moral intensity, affects the process of opportunity recognition for sustainable entrepreneurship solely as a moderating factor.

Although this study can to some degree be considered comparable to the study of Muñoz and Dimov (2017), it is important to emphasize that comparability is limited by some major differences between the two studies. First, the research designs differ. While Muñoz and Dimov (2017) employ a quantitative approach consisting of experiments, the researchers of this study carried out a qualitative research consisting of in-depth semi-structured interviews. Second, the studies focused on different outcome variables. Muñoz and Dimov (2017) studied opportunity intention, while this study explored opportunity recognition and exploitation. Third, the research samples were fundamentally different, since Muñoz and Dimov (2017) chose business school students for their study while the researchers of this paper studied sustainable entrepreneurs.

Considering that the studies which empirically tested the model proposed by Patzelt and Shepherd (2011) have come to disparate results, further research is required to address persisting unanswered questions. These are outlined below, following the implications for policy and practice and the limitations of the present study.
Conclusion
All in all, this study found substantial support for the model of Patzelt and Shepherd (2011) and furthermore identified some relevant details such as possible sources of prior knowledge of natural and communal environments and entrepreneurial knowledge. The findings lead to the following implications for policy and practice.

Since this study found that the recognition of social, economic, and ecological aspects is an important element of recognizing opportunities for sustainable entrepreneurship, it is recommended that sustainable entrepreneurs deliberately pay attention to what is going on in society, nature, and economy, in order to recognize trends and changes in these areas and hereby increase their abilities to recognize opportunities.

Given the importance of knowledge of natural and communal environments in this regard, sustainable entrepreneurs should make use of the sources which this study found to increase these kinds of knowledge. For instance, sustainable entrepreneurs could spend time abroad to get first-hand experience and knowledge, or on a national level they could make use of publicly offered information, e.g., by reading newspapers or using the internet. Furthermore, sustainable entrepreneurs could join movements which pursue sustainability goals. These movements are likely to possess extensive knowledge about natural and communal environments and could therefore function as excellent sources for knowledge of this kind. Gaining knowledge from the sources mentioned above could then help to recognize trends and changes which in turn might lead to the recognition of opportunities for sustainable entrepreneurship.

This study found that the existence of entrepreneurial knowledge facilitates the process of opportunity recognition. Therefore, it is recommended that sustainable entrepreneurs work on their entrepreneurial knowledge and skills. This study found that valuable sources in this regard are working in the relevant field one wants to start an entrepreneurial project and taking part in founding and organizing projects of any kind. Sustainable entrepreneurs should engage in these sources in order to develop their entrepreneurial knowledge and skills and, by doing so, increase their abilities to recognize opportunities for sustainable entrepreneurship.

This research was concerned with learning about processes, and therefore a qualitative approach was arguably the most appropriate choice as close-up information was needed (Davidsson, 2004). This approach was effective in providing a rich and detailed picture about the specific respondents who were interviewed, but certain limitations arose that are inherent to such a research design and that were beyond the researchers’ control.

First, this study did not aim at producing generalizable results, and the findings cannot be considered to be generally true for the majority of sustainable entrepreneurs. Second, due to time restrictions, a relatively small sample of eight sustainable entrepreneurs was interviewed in this study. Although this was initially felt as a set-back, the researchers felt that saturation of information was reached when all eight interviews were carried out and therefore it can be argued that sufficient data were collected (Seidman, 2013).

Another limitation of this study is the possibility of memory bias having come into play, which could have led the sustainable entrepreneurs to “edit or entirely rewrite (their) previous experiences – unknowingly and unconsciously – in light of what (they) now know or believe” (Schacter, 2001, p. 5). Since some time has passed between the opportunity detection and the interviews of the sustainable entrepreneurs, it is possible that their perception has changed and that they therefore answered questions in a biased manner.

In light of the above described limitations it becomes clear that further research is required to test the model proposed by Patzelt and Shepherd (2011) in practice. First, further research is required to explore in which contexts and under which conditions the model would be appropriate for explaining the process of opportunity recognition for sustainable
entrepreneurship. Choongo et al. (2016) argue that their lack of significant findings could be due to contextual differences between developing countries and western countries, and this is at least partly supported by this study which found the model to be applicable in Berlin. However, further research should be carried out in different countries and in different sectors to address this question.

Adopting a quantitative approach in future research would enhance the generalizability of findings, but researchers should think carefully about the measures they use. They could consider incorporating the findings of this study into their quantitative measures, for example by including spending time abroad and socialization as facets of prior knowledge, and adding prior jobs and prior projects as aspects of entrepreneurial knowledge. They could also carry out qualitative research to further explore the components of the model in their particular settings, and then incorporating their findings into a followup quantitative study. Notably, researchers need to pay particular attention to the way they operationalize sustainable opportunity identification. To do so, it is advisable that they draw upon both traditional entrepreneurship literature and sustainable entrepreneurship literature.

To conclude, this study supports and extends the model proposed by Patzelt and Shepherd (2011) to explain how sustainable entrepreneurs identify opportunities by being the first to offer empirical support for all the components of the model and identifying some of the factors that make up these components. Furthermore, this study reflects upon why previous studies have led to disparate results and proposes avenues of research to resolve the unanswered questions arising from these studies. This paper therefore contributes to knowledge in the field of sustainable entrepreneurship by creating a more wholesome picture of how sustainable entrepreneurs identify opportunities in practice, while serving as a stepping stone for further theory development and empirical research on sustainable opportunity recognition.

References
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Appendix. Interview guide

(1) Can you tell me about yourself and your background? (e.g. business sector and experience, educational background, etc.).

(2) What do sustainability and sustainable entrepreneurship mean to you?

(3) Do you consider yourself to be a sustainable entrepreneur? Why?

(4) Which circumstances contributed to you becoming a sustainable entrepreneur?

(5) Did awareness of any of the following aspects lead you to recognizing an opportunity for sustainable entrepreneurship?
   - Resources being wasted due to poor allocation.
   - Negative impacts that business activities in Berlin have on its social and/or natural environment.
   - Consumers paying prices that do not equal the value of what they purchase
   - Misinformed buying decisions.

(6) Were there any other issues that led you to recognizing an opportunity for sustainable entrepreneurship?

(7) Before you became a sustainable entrepreneur, were you in any way connected to the specific field in which you identified an opportunity for sustainable entrepreneurship? If yes, how?

(8) Did you feel personally threatened by the unsustainable issues that you decided to act against? If yes, how?
Did you feel responsible to act in order to create benefits for other people than yourself?
If yes, how?

What type of knowledge about the relevant markets did you hold before becoming a sustainable entrepreneur?

What role did networking plays in regard to identifying the opportunity?

Do you think networking in large cities differs in any way from networking in other areas?

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