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Opportunity Recognition: Conversational Foundations and Pathways Ahead

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Abstract: This paper provides an overview of the ever-increasing literature on opportunity recognition, with a focus on its antecedents and determinants. With a two-step research approach, a bibliometric analysis and a systematic literature review, we structure the current research in this field. By using bibliometric techniques, we analyzed 161 publications and, consequently, clustered the 30 most influential references. Apart from economic theories and the role of opportunity recognition in entrepreneurship, a strong research focus is on antecedents of opportunity recognition. Therefore, in our subsequent literature review, we focus on determinants which influence opportunity recognition. We find that the opportunity recognition process is influenced by various personal, organizational and environmental factors. We conclude with a research outlook for future research opportunities on opportunity recognition.

Keywords: opportunity recognition, bibliometric analysis, systematic literature review

1 Introduction

Against the backdrop of the increasing globalization and competition in business environments, the capability to recognize entrepreneurial opportunities is a major prerequisite for innovativeness (Jones and Barnir 2019) and entrepreneurial performance (Shane and Venkataraman 2000; Short et al. 2010). In fact, the

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identification of opportunities is the first step in the entrepreneurial process (Bhave 1994). Therefore, the importance of opportunity recognition is paramount as, without spotting opportunities, no entrepreneurial action can take place (Harms et al. 2009). Incumbent firms and entrepreneurs need an in-depth understanding of how opportunities considered to be valuable by the market (Ding 2019) can be identified and what factors influence the opportunity recognition process. With a clear understanding of the factors that influence the opportunity recognition process, entrepreneurs can increase the likelihood that profitable opportunities can indeed be found (Ferreira et al. 2019).

Regarding the ontology of entrepreneurial opportunities, two views can be distinguished (Shane 2003). The opportunity recognition school, which is the perspective focused on in this paper, goes back to the works of Kirzner (1973, 1979, 1997). In this view, opportunities objectively exist in the market, irrespective of the entrepreneur. Rather, the entrepreneur's task is to find these opportunities and exploit them. In contrast, the opportunity creation school, which is based on Schumpeter's (1934, 1942) conceptualization, sees opportunities as subjective constructions enacted by the entrepreneur. Opportunities do not already exist but rather are made. These views do not necessarily have to be seen as opposing. Rather they address two different market situations and, correspondingly, two different types of entrepreneurs. While Kirzner's entrepreneur is an arbitrageur who balances resource misallocations and price differences, Schumpeter's entrepreneur is a radical innovator bringing a disequilibrium or disruption to the market (Shane 2003). In other words, while both conceptualizations have their merits and Schumpeter's hero-like entrepreneur is probably more appealing to both founders and researchers, Kirzner's entrepreneur is much more common in practice. This is why we focus on the opportunity recognition school in this paper.

Due to its practical relevance, research on opportunity recognition has strongly grown over the last 20 years, leading to a complex and confusing research landscape, which involves the risk of an "information overload" (Castillo-Vergara, Alvarez-Marin, and Placencio-Hidalgo 2018). Entrepreneurs and researchers who want to understand how the opportunity recognition process works and how it can be fostered, are confronted with a myriad of publications which are difficult to grasp. To deal with this problem, the aim of this paper is to structure the scattered research field on opportunity recognition by conducting both a bibliometric analysis and a systematic literature review. While literature reviews are a traditional, qualitative way to organize complex research fields (Kraus, Breier, and Dasi-Rodríguez 2020; Tranfield, Denyer, and Smart 2003), bibliometric analyses represent a quantitative mapping method based on citations (Devos 2011; Zupic and Čater 2015; Mas-Tur et al. 2020) which has just recently become increasingly popular in business, entrepreneurship, and

management (Filser et al. 2020; Gundolf and Filser, 2013; Kruggel et al. 2020; Luther, Tiberius, and Brem 2020; Xi et al. 2015). More specifically, our bibliometric analysis identifies the 30 most cited and therefore most influential publications within the opportunity recognition field. We analyze these publications by conducting a qualitative content-analysis to generate a thematic clustering of research topics from a statistical perspective, consisting of the following clusters: economic theories of entrepreneurship, the role of opportunities in entrepreneurship, and antecedents of opportunity recognition. As the cluster focusing on antecedents is of highest importance for incumbent firms and entrepreneurs, within our systematic literature review, we focus on publications in top-tier management and business journals which deal with the personal, organizational, and environmental determinants that influence the process of opportunity recognition. Our findings contribute to opportunity research in entrepreneurship by providing a systematic, two-fold analysis based on a quantitative and qualitative procedure which gives researchers an overview of the prior research and helps identify research gaps. Entrepreneurs can reflect on their individual, social, and environmental prerequisites and assess if they represent a solid foundation for entrepreneurial success or need further investments.

2 Bibliometric Analysis

2.1 Dataset

In the first step, a bibliometric analysis was conducted by analyzing all articles with the word combinations of opportunity + recognition, discovery, identification or creation in the title and published before 2019. We decided to conduct a title rather than a topic search (which also screens abstracts and keywords) because we wanted to collect a core data set of publications which clearly focus on these topics rather than deal with them as a side aspect. We also included the creation term because often both conceptualizations are examined in one article. To obtain high-quality articles from scholarly journals, the databases *Science Direct*, *EBSCOhost*, *Emerald Insight*, *ISI Web of Science*, *ResearchGate*, *SpringerLink*, *SAGE Journals*, and *Google Scholar* have been used for the search, leading to a dataset of 161 articles with 10,404 references. In the following, the nature of the cited literature is highlighted. Figure 1 shows the distribution of document types that have been cited by the 161 publications. Three quarters of the cited literature were peer-reviewed journal articles.

Figure 2 shows the top 25 most cited journals. The most cited journal in the field of opportunity recognition is the *Journal of Business Venturing*, followed by

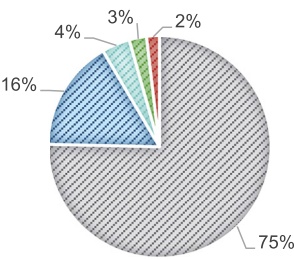
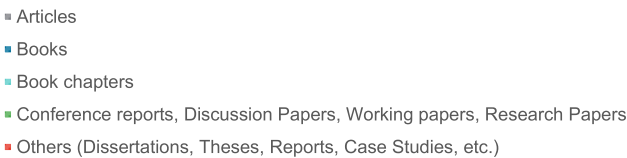


Figure 1: Most cited types of publications.

Entrepreneurship Theory and Practice and the *Academy of Management Review*. Due to the fact, that many articles are published in high-quality journals, it can be concluded that the topic “Opportunity Recognition” is an important and established field of research.

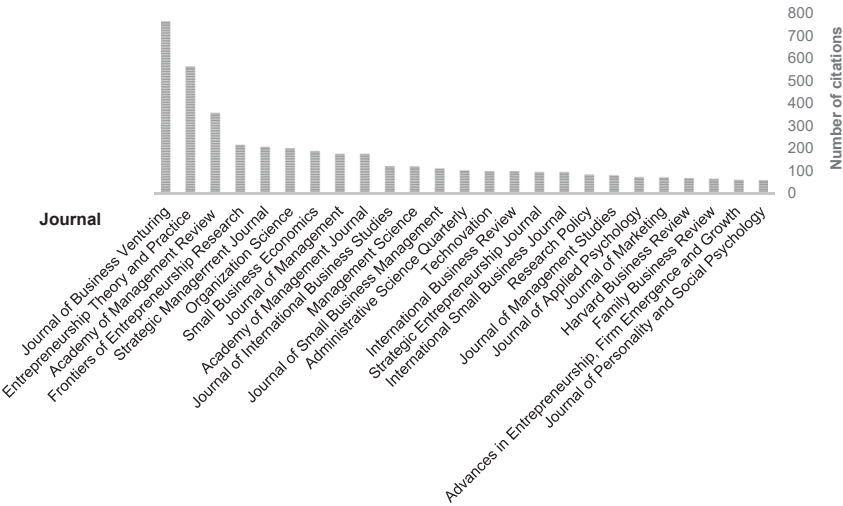


Figure 2: Top 25 most cited journals.

2.2 Clustering of the Top 30 Publications

Based on the citations of all 161 publications, the 30 most cited and therefore most influential publications were identified, analyzed, and attributed to different clusters. The clustering was based on reading the abstracts or jacket blurbs and categorizing the publications according to common themes that could be found in the reduced data set.

Table 1 provides an overview of the four identified clusters.

In Figure 3, the citation network matrix is illustrated, which shows the different publications attributed to the clusters. In the middle of the matrix, the references with the most citations are depicted. The publications at the periphery show the 161 articles that represent the basis of the bibliometric analysis.

2.2.1 Cluster A: Economic Theories of Entrepreneurship

This cluster covers economic theories of entrepreneurial opportunities. The books by Schumpeter (1934, 1942) provide general theories of economic development driven by the entrepreneur and innovator as the central driving force creating opportunities. In contrast, Kirzner (1973; 1979; 1997), as a proponent of the Austrian school, argues that opportunities are recognized by alert entrepreneurs rather than being created. The younger publications in this cluster determine the research field of entrepreneurship by providing a frequently cited definition (Venkataraman 1997), suggesting a research agenda (Shane and Venkataraman 2000), and explaining the entrepreneurial process (Shane 2003; Timmons 1994). Sarasvathy (2001) questions the objective existence of firms and markets and introduces the concept of effectuation as a process opposed to planned causation.

2.2.2 Cluster B: The Role of Opportunities in the Entrepreneurial Process

The publications attributed to this cluster B, illustrate the role of opportunities in the entrepreneurial process in greater detail. Alvarez and Barney (2007) take up the Schumpeter-Kirzner discussion of whether opportunities are created or have to be discovered and conclude that both conceptualizations are justified and their validity depends on the market context. Bhawe (1994) develops a three-stage entrepreneurial process model consisting of opportunity recognition, organization-creation, and exchange. The realization of an entrepreneurial opportunity is attributed to a market disequilibrium (Eckhardt and Shane 2003). The entrepreneur overcomes the barrier between an opportunity and its realization based on knowledge and motivation (McMullen and Shepherd 2006).

Table 1: Clustering top 30 of bibliometric analysis.

Cluster	Citations	Authors/Year	Publication type
Cluster A: Economic theories of entrepreneurship	96	Shane and Venkataraman 2000	Article
	45	Venkataraman 1997	Book chapter
	42	Kirzner 1997	Article
	38	Kirzner 1973	Book
	33	Shane 2003	Book
	31	Schumpeter 1934	Book
	30	Kirzner 1979	Book
	21	Timmons 1994	Book
	20	Schumpeter 1942	Book
	20	Sarasvathy 2001	Article
Cluster B: The role of opportunities in the entrepreneurial process	30	Eckhardt and Shane 2003	Article
	22	McMullen and Shepherd 2006	Article
	21	Bhave 1994	Article
	20	Alvarez and Barney 2007	Article
Cluster C: Antecedents of opportunity recognition			
Cluster C1: Individual antecedents	89	Shane 2000	Article
	48	Baron 2006	Article
	37	Baron and Ensley 2006	Article
	37	Gaglio and Katz 2001	Article
	33	Kaish and Gilad 1991	Article
	29	Shepherd and DeTienne 2005	Article
	20	Zahra, Korri, and Yu 2005	Article
	20	Corbett 2005	Article
Cluster C2: Social antecedents	42	Ozgen and Baron 2007	Article
	27	Singh 2000	Book
	25	Davidsson and Honig 2003	Article
	23	Singh et al. 1999	Article
	20	Dimov 2007	Article
Cluster C3: Hybrid approaches	73	Ardichvili, Cardozo, and Ray 2003	Article
	26	Lumpkin and Lichtenstein 2005	Article
	22	Hills, Lumpkin, and Singh 1997	Article

2.2.3 Cluster C: Antecedents of Opportunity Recognition

This cluster is separated into three subclusters which examine the antecedents of opportunity recognition on the individual, social, and a hybrid level. The individual antecedents (C1) refer to cognitive frameworks and processes and include experiential learning (Corbett 2005), knowledge (Shane 2000; Shepherd and DeTienne 2005) alertness (Baron 2006; Gaglio and Katz 2001), active information search (Kaish and Gilad 1991), pattern recognition (Baron and Ensley 2006; Zahra, Korri, and Yu 2005), whereas social antecedents (C2) include social networks

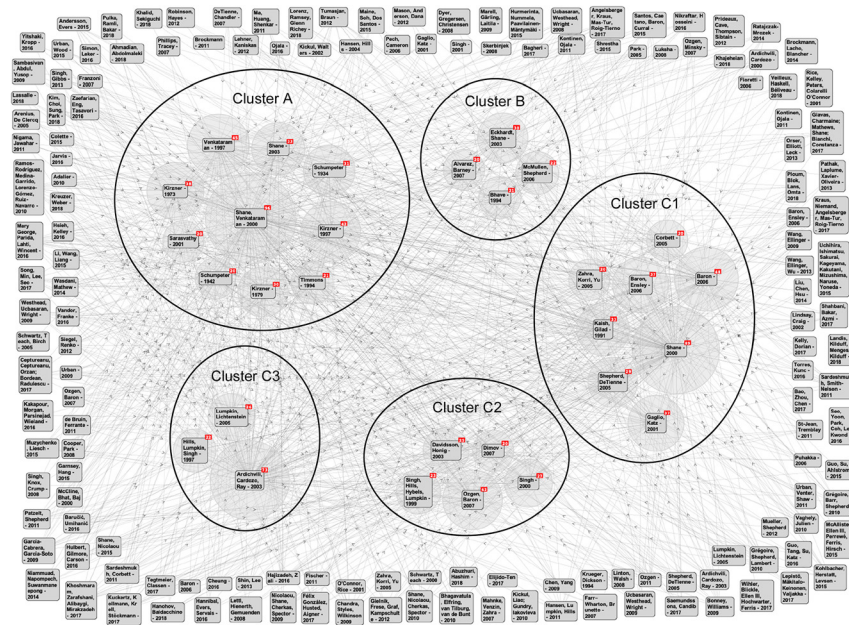


Figure 3: Citation network matrix.

(Dimov 2007; Ozgen and Baron 2007; Singh 2000; Singh et al. 1999) and especially the social capital derived from them (Davidsson and Honig 2003). Some articles focus on both individual and social antecedents (C3) such as prior knowledge, personality traits, and social networks (Ardichvili, Cardozo, and Ray 2003) or organizational learning (Lumpkin and Lichtenstein 2005). Hills, Lumpkin, and Singh (1997) study whether entrepreneurs who develop business ideas independently or who are embedded in social networks are more successful in identifying opportunities. Their findings show that the latter pursue more opportunities and have more sophisticated ideas than those who develop them on their own.

3 Literature Review

In the second step, we carry out a systematic review of journal articles in order to get a more detailed understanding of the current research on the concept and determinants of opportunity recognition. This approach is also frequently used to confirm the outcomes of the bibliometric analysis (Filser et al. 2016; Gast et al. 2015; Vallaster et al. 2019; Xi et al. 2015).

We used the data bases Science Direct, EBSCOhost, Emerald Insight, Web of Science, ResearchGate, SpringerLink, SAGE Journals, and Google Scholar. Within the search process, the keywords “opportunity recognition”, “opportunity identification”, and “opportunity creation” in the title or abstract were used. We only used papers in English. To focus on highly relevant literature alone, we applied a quality threshold as we only included articles from journals ranking two* or higher in ABS, C or higher in the VHB Jourqual, or journals with a JCR Impact Factor of 0.7 or higher. Additionally, the papers had to be cited at least five times according to Web of Science. As a consequence, our data set consisted of 48 papers.

3.1 Definitions and Conceptualizations

Before going into a more detailed analysis of opportunity recognition, the following table shows different definitions of the term opportunity (Table 2).

Table 2: Definitions of the term opportunity.

Article	Definition
Shane and Venkataraman 2000, p. 220	“situations in which new goods, services, raw materials and organizing methods can be introduced and sold at greater than their cost of production”
Ardichvili, Cardozo, and Ray 2003, p. 108	“a range of phenomena that begin unformed and become more developed through time”
Eckhardt and Shane 2003, p. 336	“situations in which new goods, services, raw materials, markets and organizing methods can be introduced through the formation of new means, ends, or means-ends relationships”
Gaglio 2004, p. 534	“the chance to introduce innovative (rather than imitative) goods, services, or processes to an industry or economic marketplace”
Sarason, Dean, and Dillard 2006, p. 287	“sources of opportunities are extant features that provide the context for creating entrepreneurial ventures”
Alvarez and Barney 2007, p. 11	“competitive imperfections in markets were created by the actions of entrepreneurs”
Short et al. 2010, p. 55	“idea or dream that is discovered or created by an entrepreneurial entity and that is revealed through analysis over time to be potentially lucrative”
Wood and McKinley 2010, p. 67	“opportunities are the outcome of social construction, not preexisting entities subject to detection by the entrepreneur”
Ramoglou and Tsang 2016, p. 4	“the propensity of market demand to be actualized into profits through the introduction of novel products or services”
Ding 2019, p. 6	“neutral entities that emerge from an agent’s ability to develop a course of action that converts an existing situation into a desired one”

The definitions differ with regard to their specifics. Most of them are seen as abstract categories such as entities, features, phenomena, or situations. One definition provides chances as a mere synonym for opportunities. Other definitions are more specific as they state that opportunities are competitive imperfections, ideas or dreams, the outcome of social construction, or the propensity of market demand. A common feature of almost all definitions is that they relate opportunities to something that currently does not exist in a market yet but could exist.

Against this backdrop, we suggest the following definition: “*An entrepreneurial opportunity is the potential of a profitable market offer recognized by an entrepreneur or by an entrepreneurial venture.*” We believe that this definition captures the core of what entrepreneurial opportunities mean. Especially, it sees an opportunity as something that is not yet but could be realized, i.e., a potential. It also addresses the requirement of profitability as suggested by Shane and Venkataraman (2000). Without this prospect, the entrepreneur would not be interested in realizing the potential. We deliberately do not include novelty in our definition. In this regard, we disagree with Eckhardt and Shane (2003) who state that the product or service has to be new as it is sufficient to offer them in a new way. For example, the sharing economy usually provides products and services which have already been around for a long time. However, firms provide access to rather than ownership of products. The same is true for many digitized products such as video streaming which replaces DVDs, Blu-Rays, or going to the cinema. The product, the movie, is the same, but the way it is delivered is different. However, it is not necessary to stress this novelty, as it would be redundant to the characterization as a potential. Besides its conciseness, an additional advantage of our definition is that it is not committed to either the opportunity discovery or opportunity creation school but can be applied to both.

Some authors such as Shane and Venkataraman (2000), Eckhardt and Shane (2003) or Gaglio (2004) rather support the discovery view, in which the opportunities already exist and need to be discovered. Other scholars like Ardichvili, Cardozo, and Ray (2003), Sarason, Dean, and Dillard (2006), Alvarez and Barney (2007), or Wood and McKinley (2010) claim that opportunities are subjective and must be created by individuals. Other researchers such as Short et al. (2010), Ramoglou and Tsang (2016) or Ding (2019) suggest that some of the opportunities are discovered and some of them are created. Similarly, researchers agree that there are two different types of opportunities, innovative and arbitrage. Innovative opportunities can be identified through the creation of new means or ends, whereas arbitrage opportunities emerge due to market inefficiencies (Shin and Lee 2013). This controversial issue created some difficulties in researching the field of opportunity recognition (Grégoire, Shepherd, and Schurer Lambert 2010). Therefore, in this study, we act on the assumption that opportunities can be either

discovered or created, based on the circumstances, but focus on opportunity recognition.

The process of recognizing an opportunity starts with an idea, and proceeds with the evaluation of this idea. Therefore, an idea is the precondition for opportunity recognition but not yet an opportunity (Khalid and Sekiguchi 2018). Grégoire, Barr, and Shepherd (2010) define opportunity recognition as a process in which individuals seek to make sense of indications for change and make decisions about whether to take actions or not to address this change. The main objective of an opportunity recognition process is to determine whether an opportunity exists and should be exploited or not.

3.2 Clustering of Opportunity Recognition Determinants

The research on determinants of opportunity recognition is characterized by high diversity. Many different approaches are used to study this topic. In our literature review, three main clusters emerged based on reading the papers and categorizing the publications according to common themes that could be found in the data set: the role of personal, organizational, and environmental determinants. The first and third cluster are then subdivided into further sub-clusters. Table 3 provides an overview of the identified thematic clusters.

3.2.1 Cluster 1: The role of personal factors in opportunity recognition

The emphasis of Cluster 1 is on the role of personal factors in opportunity recognition. In the literature, prior knowledge, experience, cognitive processes,

Table 3: Publications assigned to thematic clusters.

Thematic clusters
Cluster 1: The role of personal factors in opportunity recognition
Cluster 1a: Prior knowledge
Cluster 1b: Experience
Cluster 1c: Cognitive processes
Cluster 1d: Personality traits
Cluster 1e: Genetics
Cluster 2: The role of organizational aspects in opportunity recognition
Cluster 3: The role of environmental factors in opportunity recognition
Cluster 3a: Networks
Cluster 3b: Technology
Cluster 3c: Other environmental conditions

personality traits, and genetics are discussed with regard to opportunity recognition.

3.2.1.1 Cluster 1a: Prior Knowledge

The entrepreneur's prior knowledge is a crucial aspect in opportunity recognition. For example, Hajizadeh and Zali (2016) argue that entrepreneurial alertness and learning, as the key cognitive characteristics in entrepreneurship, are mediating affects between previous knowledge and the identification of opportunities. The prerequisite of identifying opportunities is prior knowledge. The more diverse the knowledge of an individual, the higher the probability that opportunities are discovered. Moreover, individuals who are aware of environmental change and employ various styles of learning are more likely to identify profitable opportunities. Moreover, linguistic knowledge can be an important factor in the identification of new opportunities, especially internationally (Hurmerinta, Nummela, and Paavilainen-Mäntymäki 2015). Apart from the language skills of the individual entrepreneur, also the skills of co-workers, partners, and family members influence the process of recognizing opportunities. The authors introduced the concept of the so called "knowledge corridor" that indicates that on the one hand, language skills foster opportunity recognition in areas with shared linguistic heritages, but on the other hand, it may lead to a blindness for identifying opportunities in other regions. Additionally, the authors argue that apart from language skills also cultural knowledge is helpful for recognizing international opportunities. Chandra, Styles, and Wilkinson (2009) argue that individuals with little internationalization knowledge discover opportunities rather coincidentally, whereas entrepreneurs with more experience actively search for new business opportunities globally. Regarding innovation in the service sector, prior knowledge, active search, and alertness are considered to be the basis for recognizing opportunities. Fischer (2011) states that knowledge management plays an important role because it increases the individuals' alertness and active search for ideas.

3.2.1.2 Cluster 1b: Experience

In different studies, Ucbasaran, Westhead, and Wright (2008; 2009) highlight the importance of personal experience in opportunity recognition. Ucbasaran, Westhead, and Wright (2009) find that entrepreneurs with experience in starting a business do not only recognize more but also more lucrative opportunities with higher profits. Also, Westhead, Ucbasaran, and Wright (2009) show that portfolio entrepreneurs with prior business ownership recognize more business opportunities than serial and prospective entrepreneurs. Serial entrepreneurs have already closed their business or sold their company shares, whereas portfolio entrepreneurs operate two or more businesses at the same time. However, experienced

entrepreneurs do not participate less in information search processes than novice entrepreneurs. Generally, high information search intensity and high entrepreneurial capabilities are positively linked to the number of identified opportunities. Ucbasaran, Westhead, and Wright (2008) outline that entrepreneurship-specific human capital, such as business ownership experience as well as entrepreneurial, technical, and managerial capabilities explain why some individuals identify and pursue opportunities and others not. Regarding general human capital, such as education or work experience, only the educational background of an individual influences the number of identified opportunities. Regarding human capital, Bhagavatula et al. (2010) argue that the entrepreneur's experience has a positive impact on the acquisition of resources but negatively influences the recognition of new opportunities. This contradicts the findings by Ucbasaran, Westhead, and Wright (2008; 2009), who state that the more experience the entrepreneur has, the higher the probability that opportunities are identified. In contrast to the entrepreneur's experience, the language capabilities are positively related to opportunity recognition. Vandro and Franke (2016) point out that individuals with cross-cultural experience show a higher entrepreneurial activity and recognize profitable opportunities more easily than those without such experience. With the help of cross-cultural experience internationally mobile individuals are more capable to identify arbitrage opportunities.

3.2.1.3 Cluster 1c: Cognitive Processes

The role of cognitive processes in opportunity recognition is frequently mentioned in the literature. According to Baron (2006), opportunities are identified by using cognitive frameworks. Individuals who are capable of perceiving trends or connections between events which, on first sight have nothing in common, are more likely to recognize business opportunities. Baron (2006) also discusses the importance of prior knowledge of the market, searching, and alertness. He argues that high alertness can compensate low motivation for an active search for opportunities. Entrepreneurial alertness is mentioned numerous times in the literature when it comes to the success factors of opportunity recognition. Gaglio and Katz (2001, p. 95) define entrepreneurial alertness as "a distinctive set of perceptual and information-processing skills". Similarly, Baron and Ensley (2006) suggest that opportunity recognition involves the identification of patterns through cognitive processes. Experienced entrepreneurs' prototypes are set up more detailed and with more meaningful content than the ones from prospective entrepreneurs. This underlines the authors' suggestion that pattern recognition is crucial in the opportunity recognition process. Entrepreneurs with more experience in founding new ventures have acquired a cognitive framework through continuous learning and, thus, are more capable to identify successful

opportunities again. Grégoire, Barr, and Shepherd (2010) also argue that cognitive processes of structural alignment are crucial to identify a new business opportunity. However, the authors demonstrate that entrepreneurs do not relate to other prototypes in the opportunity recognition process. Dyer, Gregersen, and Christensen (2008) describe four behavioral patterns of innovative entrepreneurs that are also connected to cognitive processes, namely idea networking with diverse people, observing the environment, questioning the status quo, and experimenting. Adopting these behavioral patterns increases the likelihood of identifying an innovative idea for a new opportunity. Zahra, Korri, and Yu (2005) illustrate implications for further research on the recognition and exploitation of international opportunities. They state that the application of a cognitive perspective is advantageous to identify why and how individuals identify international opportunities.

3.2.1.4 Cluster 1d: Personality Traits

An individuals' traits and management skills positively influence the opportunity recognition that has a positive impact on the company's sales volume, sales growth, and the stability in profit (Sambasivan, Abdul, and Yusop 2009). Ardichvili, Cardozo, and Ray (2003) highlight that an individual's personality traits influence the alertness for recognizing opportunities that may lead to the formation of a new business venture. Creativity, self-efficacy, and optimism are considered to be the most important personality traits in the development of opportunities. Krueger and Dickson (1994) argue that self-efficacy is crucial in opportunity recognition. Positive feedback increases the individuals' self-competence and risk taking and, consequently, they recognize more opportunities. In contrast, individuals who received negative feedbacks do not perceive themselves very self-confident and, therefore, take fewer risks. Tumasjan and Braun (2012) deal with two theories of self-regulation in the opportunity recognition process: the regulatory focus theory and the self-efficacy theory. They argue that promotion focus or focusing on maximal goals positively influences the opportunity recognition process. Moreover, the higher the promotion focus, the higher is the innovativeness of an opportunity. Additionally, the authors demonstrate that low creativeness and entrepreneurial self-efficacy can be compensated by high promotion focus. In contrast, prevention focus, or focusing on minimal goals and restrictions, does not have a significant impact on the identification of opportunities. Creativity is also mentioned several times in the literature on opportunity recognition. For example, Gielnik et al. (2012) found that divergent thinking has a significant impact on the generation of new business ideas. Whereas diverse information in this case is moderating the influence of divergent thinking on opportunity identification, constrained information has a

negative effect on divergent thinking and the generation of new ideas. Hansen, Lumpkin, and Hills (2011) examine a multidimensional model of opportunity recognition that focuses on the aspect of creativity, involving the five phases of opportunity recognition: preparation, incubation, insight, evaluation, and elaboration. Whereas incubation and elaboration are strongly linked to creativity, the study showed no significant relationship between creativity and the stages of preparation, evaluation and insight. Furthermore, the authors argue that creativity is not only an influencing factor on the identification of opportunities, but opportunity recognition itself is an inherently creative process. Muzychenko and Liesch (2015) deal with personality traits in international opportunity recognition. Perceived behavioral control and having an attitude towards international opportunity recognition improve the identification of international opportunities. Thus, on the one hand, having self-efficacy in opportunity identification in combination with cross-cultural interpersonal relationships will have a positive effect on the intention to identify international opportunities. On the other hand, the desire to build a world-class enterprise and having a passion for cross-cultural encounters will influence the intention positively.

3.2.1.5 Cluster 1e: Genetics

In their study, Nicolaou et al. (2009) examined the role of genetic factors in recognizing opportunities. Although the study only found substantial heritability for opportunity recognition, the authors state that not only environmental factors, but also biological factors must be considered in researching the field of opportunity recognition. They argue that both learning and genetics have an impact on the individual's capability to identify entrepreneurial opportunities. The authors argue that interventions to enhance opportunity recognition such as incentives or special trainings should not be given too much attention due to their lack of influence. Similarly, Shane and Nicolaou (2015) deal with genetic predispositions and focus on creative individuals and their capability to recognize business opportunities. The findings show that creativity influences the process of recognizing opportunities and starting a business positively. According to DeTienne and Chandler (2007) there is a relationship between gender and opportunity recognition. Men and women have different approaches to the process of opportunities and use their gender-specific characteristics to generate new ideas. Nevertheless, the gender of an entrepreneur has no influence on the innovativeness of an opportunity.

3.2.2 Cluster 2: The Role of Organizational Aspects in Opportunity Recognition

Cluster 2 focuses on the organizational aspects in opportunity recognition. Different researchers explore what organizations can do in order to enhance the

process of identifying opportunities. In the literature, aspects like potential financial reward, entrepreneurial culture, decision-making processes, organizational learning, and information sourcing, are studied. Shepherd and DeTienne (2005) show that potential financial rewards have a positive impact on identifying opportunities. They point out that for those individuals with little prior knowledge about markets and customer needs, potential financial rewards are a motivational aspect to search for new business opportunities, whereas for those individuals with plenty knowledge, potential financial reward is only a minor motivation. Jarvis (2016) points out that if an individual sees himself or herself as an entrepreneur, the likelihood to explore entrepreneurial intentions increases. Therefore, if a company struggles to identify new opportunities, establishing an entrepreneurial culture and providing adequate resources and special education programs or incentives for previous entrepreneurial behavior may help individuals to identify themselves as entrepreneurs and consequently enhance the opportunity recognition process. Maine, Soh, and Dos Santos (2015) explore the role of entrepreneurial decision-making, namely effectuation and causation, in the opportunity recognition process. Whereas in the effectuation mode, the overall goal is not determined at the beginning and the opportunity creation process is experimental, the causation mode is goal-driven and aims at avoiding mistakes. The outcome of the study is that, in environments with high uncertainty, a combination of effectuation and causation in the entrepreneurial process is recommended. On the one hand, effectuation permits higher resiliency that fosters decision-making in an uncertain environment. On the other hand, causation helps to assess risks more appropriately. Lumpkin and Lichtenstein (2005) demonstrate that organizational learning can foster the opportunity recognition process within a company, especially cognitive, behavioral, and action learning. In their study, Vaghely and Julien (2010) demonstrate that the information sourcing process for opportunity recognition and creation is a combination of algorithmic and heuristic characteristics. The study of Seo et al. (2016) deals with the question how opportunities for new feasible products can be identified based on the internal capabilities of the company, using the present product portfolio of a firm as a basis. They argue that, with the aid of text mining in the patent analysis and association rule mining techniques, new product opportunities can be identified. In large established enterprises, recognizing new opportunities is considered to be a difficult challenge. In their article, O'Connor and Rice (2001) suggest different methods how large corporations can solve this problem. First, the need for new ideas has to be communicated by the managers. Second, established companies should invest in activities such as providing information sources that enable individuals to identify new opportunities more easily. Third, promoting informal networks fosters multidimensionality and therefore also enhances opportunity recognition. If an

opportunity is recognized, it is important that companies provide mechanisms that make it easier to pursue the opportunity. Rice et al. (2001) demonstrate that in established firms, the initiation gap between the generation of an idea and the opportunity recognition by the management is a major problem. The authors propose a framework to determine if a generated idea can be commercialized and if the idea is worth to be proposed to the management. The framework involves three aspects that should be determined by making decisions: technology related issues, market related issues, and corporate strategy issues. Philips and Tracey (2007) deal with opportunity recognition in institutional entrepreneurship. They argue that previous knowledge and experience, social networks and creativity are crucial in the opportunity recognition process.

3.2.3 Cluster 3: The Role of Environmental Factors in Opportunity Recognition

Cluster 3 deals with the role of environmental factors, such as networks, technology, and other environmental conditions, in opportunity recognition.

3.2.3.1 Cluster 3a: Networks

The role of networks in opportunity recognition is frequently discussed in the current literature. Song et al. (2017) outline that entrepreneurs rely on social networks to gain knowledge and other strategic resources. The findings show that network reliance has a positive impact on opportunity recognition. Whereas individuals with a low entrepreneurial orientation appreciate the acquisition of knowledge through social networks and consequently are able to recognize opportunities better, the individuals with high entrepreneurial orientation are not dependent on knowledge from social networks in the opportunity recognition process. The outcome of the study of Song et al. (2017) is in line with the findings of Kontinen and Ojala (2011). They argue that network ties are important in the opportunity recognition process. With the absence of network ties, companies will have difficulties to recognize international opportunities and expand to foreign markets. Bhagavatula et al. (2010) explore the role of social capital (networks) and human capital in the opportunity recognition process. Their proposition is consistent with the suggestion of Kontinen and Ojala (2011). To recognize opportunities, structural holes or weak ties in the network are advantageous. Nevertheless, such weak ties have a negative effect on the acquisition of resources. To acquire resources, strong ties are considered to be more beneficial. Therefore, in order to recognize and subsequently exploit opportunities both forms of network ties are needed. Arenius and Clercq (2005) demonstrate that the reason why some people perceive opportunities differently than others, is that they are embedded in different network settings. People living in urban areas are

more likely to identify new opportunities than individuals in rural regions. The researchers argue that when starting a new business, prospective entrepreneurs should include a variety of sources to look for new information. Therefore, the information sourcing process is considered to be easier in big agglomerates. Ozgen and Baron (2007) investigate the role of mentors, professional forums, and industry networks in the information sourcing for opportunity recognition. The authors show that there is a positive relationship between these factors of information sourcing and identifying opportunities. Whereas the role of networks in the opportunity recognition process has been investigated by many other researchers, the impact of professional forums such as workshops or conventions and mentors is a new finding by Ozgen and Baron (2007). The higher the frequency of individuals participating in professional forums, adopting support from mentors, and taking part in industry networks, the higher is the chance that opportunities are recognized. The study of Zaefarian, Eng, and Tasavori (2016) deals with the recognition of international opportunities in family firms that are characterized as risk-averse, i.e., not proactive in terms of looking for new international opportunities. The authors illustrate that in this case not only prior knowledge, but also social and business networks outside the company are highly relevant for internationalization.

3.2.3.2 Cluster 3b: Technology

New technologies influence opportunity recognition, as technological changes provide possibilities for new products and services. Park (2005) argues that identifying new technological opportunities requires a combination of entrepreneurial, managerial, and technical experience. In a continuously changing technological industry with high uncertainty, using stakeholder feedback to develop the product further is crucial for opportunity development (Ojala 2016). According to Siegel and Renko (2012), both market knowledge and technological knowledge are positively influencing the recognition of entrepreneurial opportunities in a technology-based industry. Companies are more successful in identifying profitable opportunities when they have solid technological and market knowledge. The main objective of the study of Shin and Lee (2013) was to figure out how low-risk technological arbitrage opportunities can be identified in mature technologies for small and medium-sized enterprises (SMEs). To identify low-risk technological arbitrage opportunities, they proposed a procedure for recognizing opportunities, involving the analysis of technological complexity, market appropriateness, technology maturity, and organizational fit. By applying these measures, SMEs may overcome the disadvantages compared to large companies and might be able to recognize opportunities from mature technologies effectively.

3.2.3.3 Cluster 3c: Other Environmental Conditions

In the study of Kohlbacher, Herstatt, and Levsen (2015), the role of demographic changes regarding opportunity recognition and exploitation is discussed. Demographic change, as a global trend, gives new inputs for the identification of opportunities. First, the companies need to allocate resources to address the needs of the silver generation and, second, the employees need the capability to deal with the older generation's needs. By identifying profitable opportunities that increase the competitive position of a company, it is important that prospective entrepreneurs believe in their ideas. Opportunity recognition beliefs are characterized mainly by two different indicators. First, the degree to which the opportunity's means of supply is aligned to the target market is a sign of believing in the opportunity. Second, the higher the perception of the general feasibility of the opportunity, the higher is the entrepreneur's belief that the idea presents a profitable opportunity (Grégoire, Shepherd, and Schurer Lambert 2010). Lehner and Kansikas (2012) as well as Félix González, Husted, and Aigner (2017) focus on opportunity recognition in social entrepreneurship. The main aim of social entrepreneurship is to enhance the living conditions of human beings worldwide. Lehner and Kansikas (2012) argue that social entrepreneurs try to create social value rather than profit. Additionally, the opportunity recognition process more often takes place collectively rather than individually. Lehner and Kansikas (2012) as well as Félix González, Husted, and Aigner (2017) argue that, in social entrepreneurship, both approaches opportunity discovery and opportunity creation are needed to identify opportunities. Additionally, the scholars point out that only some of the influencing factors that are relevant for commercial opportunity identification are valid for social opportunities as well. Information search and innovation radicalness are relevant for both business and social opportunities, whereas the perception of the environment is only relevant for the identification of commercial opportunities. Luksha (2008) argues that niche construction through environmental transformation is a possible mechanism for creating opportunities. A change in the environment is seen as a source for new opportunities. As the emergence of opportunities may occur through ungoverned niche construction, the creation of a new opportunity is not always teleological. This means that individual entrepreneurs or organizations are not necessarily responsible for the creation of new opportunities. However, as these aspects of opportunity recognition cannot be controlled, most of the research is done on governed niche construction where opportunities are created through the influence of entrepreneurs.

In summary, various factors and aspects influencing opportunity recognition are identified and discussed in the literature. Figure 4 illustrates the highlighted factors and aspects.

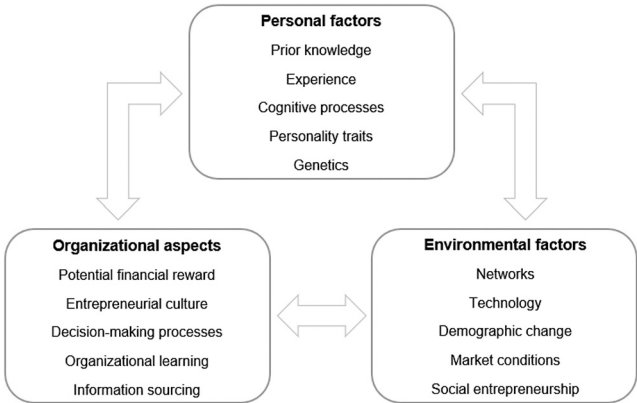


Figure 4: Factors influencing opportunity recognition.

4 Discussion

The bibliometric analysis and the literature review resulted in two different clusterings (see Table 4) as the approaches by which the literature was analyzed differed. After identifying the antecedents of opportunity recognition by the means of a bibliometric analysis, a systematic literature review was conducted that identified determinants of opportunity recognition.

Table 4: Cluster overview.

Clusters based on the bibliometric approach	Clusters based on the systematic literature review
A Economic theories of entrepreneurship	1 The role of personal factors in opportunity recognition
B The role of opportunities in the entrepreneurial process	1a Prior knowledge
C Antecedents of opportunity recognition	1b Experience
C1 Individual antecedents	1c Cognitive processes
C2 Social antecedents	1d Personality traits
C3 Hybrid	1e Genetics
	2 The role of organizational aspects in opportunity recognition
	3 The role of environmental factors in opportunity recognition
	3a Networks
	3b Technology
	3c Other environmental conditions

The comparison of the different clusters leads to the result that drivers influencing opportunity recognition are the most researched topic within this field of research. Whereas in Cluster C, the drivers are subdivided in individual antecedents, social antecedents and hybrid, the clusters emerging from the literature review refer to personal, organizational and environmental factors. Cluster C1 is similar to Cluster 1 regarding the content and Cluster C2 can be compared to Clusters 2 and 3 in regards to their topics. Cluster C3 contains papers which could not be attributed exclusively to either C1 or C2 as they examine both individual and social antecedents. Therefore, C3 papers can also not assigned to exclusively to Clusters 1, 2, or 3, but address aspects from more than one cluster. As the systematic literature review immersed deeper into the determinants of opportunity recognition, more subclusters emerged.

The content of Cluster C1 “Individual Antecedents” is highly interrelated with Cluster 1 “The role of personal factors in opportunity recognition”. There is a multitude of different researchers that highlight the importance of individual aspects, especially prior knowledge, in opportunity recognition (e.g. Ardichvili, Cardozo, and Ray 2003; Baron 2006; Chandra, Styles, and Wilkinson 2009; Fischer 2011; Hajizadeh and Zali 2016; Hurmerinta, Nummela, and Paavilainen-Mäntymäki 2015; Kohlbacher, Herstatt, and Levsen 2015; Shepherd and DeTienne 2005; Zaefarian, Eng, and Tasavori 2016). In addition to prior knowledge, other factors influence the opportunity recognition process. Chandra, Styles, and Wilkinson (2009) argue that prior knowledge in combination with entrepreneurial orientation is crucial for succeeding in recognizing beneficial opportunities. Individuals can have much prior knowledge, but if they do not see themselves as entrepreneurs and are not motivated to identify new business opportunities, the chance that new opportunities are recognized is low. Therefore, prior knowledge alone does not automatically lead to a higher number of identified opportunities. Hajizadeh and Zali (2016) and Fischer (2011) demonstrate that alertness in combination with prior knowledge is very important to identify opportunities. The former researchers indicate that entrepreneurial alertness is a mediator between prior knowledge and opportunity recognition. Both Fischer (2011) and Baron (2006) outline that following three factors are essential in opportunity recognition: prior knowledge, searching and alertness. The term alertness is mentioned frequently in combination with cognitive processes. Baron (2006) and Fischer (2011) refer to cognitive frameworks in their studies, and also Gaglio and Katz (2001), Dyer, Gregersen, and Christensen (2008), Grégoire, Barr, and Shepherd (2010), Zahra, Korri, and Yu (2005) and Baron and Ensley (2006) show that cognitive processes are important in opportunity recognition.

In their studies, Ucbasaran, Westhead, and Wright (2008; 2009) argue that experience plays a crucial role in the opportunity recognition process. Also,

Bhagavatula et al. (2010) examine the role of experience in this context but found out that whereas experience positively influences the acquisition of resources, it has a negative impact on opportunity recognition. Another term that is mentioned quite often with reference to opportunity recognition is self-efficacy. Various researchers, like Ardichvili, Cardozo, and Ray (2003), Krueger and Dickson (1994) as well as Tumasjan and Braun (2012) argue that self-efficacy, as a personality trait, fosters the phenomenon of opportunity recognition. Self-efficacy is on the other hand influenced by the received feedback as shown in the study from Krueger and Dickson (1994). Also, Ojala (2016) demonstrates that feedback from stakeholders is crucial in an environment with high uncertainty.

The role of genetics in opportunity recognition is discussed by Nicolaou et al. (2009), Shane and Nicolaou (2015) and DeTienne and Chandler (2007). The authors share the opinion that not only environmental factors but also the genetic predispositions influence the identification of opportunities. For example, Nicolaou et al. (2009) demonstrate that environmental conditions like the upbringing of an individual does not have an impact on opportunity recognition, whereas having a creative personality that can be inherited, indeed influences the innovativeness of opportunity identification, as shown in the study of Shane and Nicolaou (2015). In addition, DeTienne and Chandler (2007) argue that although the gender does not influence the innovativeness of the recognized opportunity, men and women have different characteristics and therefore, a different approach to discover new business opportunities.

All the personal factors influencing opportunity recognition that are mentioned above are strongly related to each other. However, Fischer (2011) and Shepherd and DeTienne (2005) argue that the personal factors are also related to organizational aspects. Entrepreneurial orientation or alertness can be influenced by leadership, corporate governance or the organizational structure of the firm. Additionally, according to Shepherd and DeTienne (2005) potential financial reward can have a positive impact on the personal motivation of the individual to identify opportunities. There is also a strong connection between personal factors and environmental factors in opportunity recognition. By the emergence of new trends in the environment, new skills are required. For example, with the increasing trend of globalization, cross-cultural experience and linguistic knowledge are required, to recognize international opportunities (Hurmerinta, Nummela, and Paavilainen-Mäntymäki 2015; Vandor and Franke 2016). Moreover, with the continuous digitalization, the importance of technological skills is rising in identifying opportunities, like it is mentioned in the studies of Park (2005) and Siegel and Renko (2012).

In Cluster C2 and 2, social and organizational aspects are discussed that influence the opportunity recognition process. Therefore, organizations should take

measures that enhance this process. Potential organizational measures that are mentioned in the literature are to provide financial reward (Shepherd and DeTienne 2005), to establish an entrepreneurial culture of decision-making (Jarvis 2016; Maine, Soh, and Dos Santos 2015), organizational learning (Lumpkin and Lichtenstein 2005), to communicate the need for new ideas, to provide different sources of information and to promote informal networks (O'Connor and Rice 2001). On the one hand, organizations can enhance the entrepreneur's motivation to search for new business opportunities and on the other hand, with their measures, firms can increase the probability that discovered opportunities are pursued and exploited successfully.

Eventually, environmental factors have to be considered in the opportunity recognition process. Cluster 3 has no completely corresponding Cluster in the bibliometric analysis. Only social networks could be found as a common topic. Specifically, these networks play an important role in opportunity recognition research. Individuals acquire new knowledge more easily through the participation in networks (Ozgen and Baron 2007; Zaefarian, Eng, and Tasavori 2016). Especially for individuals with low entrepreneurial orientation, the knowledge acquisition through networks fosters opportunity recognition (Song et al. 2017). Researchers agree that in the opportunity recognition process, weak ties are more important than strong ones (Bhagavatula et al. 2010; Kontinen and Ojala 2011). Kontinen and Ojala (2011) indicate that weak ties can be formed for example through attending international exhibitions. Nevertheless, in the acquisition of resources, weak ties are rather hindering, and in this case, strong ties are needed (Bhagavatula et al. 2010). Additionally, Arenius and Clercq (2005) demonstrate that the likelihood that individuals in urban regions identify opportunities is higher than in rural areas due to the existence of networks. However, the study of Ucbasaran, Westhead, and Wright (2008) is contradicting to the propositions of the above-mentioned authors as they state that there is no significant relationship between the information gathered through personal and business networks and opportunity recognition.

Technological changes provide possibilities for new opportunities and therefore highly influence the recognition of new opportunities (Park 2005; Siegel and Renko 2012). Another environmental condition that may influence the recognition of opportunities is demographic change, as demonstrated in the study of Kohlbacher, Herstatt, and Levsen (2015). In general, the personal and organizational requirements that are needed to recognize an opportunity depend on the business environment. For example, the skills needed for identifying sustainable opportunities is different than for technological opportunities. Additionally, recognizing normal business opportunities requires different skills than the recognition of social opportunities (Félix González, Husted, and Aigner 2017).

Cluster C2 “Social Antecedents” is similar to Cluster 2 “The role of organizational aspects in opportunity recognition” and Cluster 3 “The role of environmental factors in opportunity recognition”. Cluster C2 includes both organizational aspects and environmental factors. The fact that there are publications emphasizing that both, individual and social antecedents have an impact on opportunity recognition likewise indicates that all the factors influencing the process are strongly interrelated.

5 Future Research Opportunities

Overall, there is already a multitude of articles published in the field of opportunity recognition. Nevertheless, there are some recommendations for future research to obtain a more complete understanding of the opportunity recognition process. First, we see a still largely unused potential to connect opportunity recognition with strategic foresight (Iden, Methlie, and Christensen 2017). Future opportunities can be sensed through foresight (Semke and Tiberius 2020). Specifically, apart from past and present, also future customer wants and needs could provide a valuable source of insights into entrepreneurial opportunities. Especially the scenario technique could enable entrepreneurs to explore alternate future developments (Tiberius 2019) which contain novel opportunities. Dealing with divergent future scenarios can also enhance creativity (Rohrbeck and Gemünden 2011) beneficial for the opportunity recognition and especially creation process.

Second, an investigation of which combinations of individual and social drivers are most effective for opportunity recognition in practice, would be a valuable input for prospective entrepreneurs. Further studies could review articles in the field of research on opportunity recognition on the fuzzy-set qualitative comparative analysis (fsQCA), as it is increasingly used in entrepreneurship research (Kraus, Ribeiro-Soriano, and Schüssler 2018).

Third, the investigation of the outcomes of the process of opportunity recognition are rather neglected in the literature. Therefore, it would be interesting to study how opportunities should be deployed to result in a long-term, sustainable growth.

Forth, in relation to the current trends of sustainability and globalization, some further research on opportunity recognition regarding these trends would be interesting. Due to the fact, that the importance of sustainable development increases, it should be further investigated what factors influence the identification of sustainable opportunities. In addition, the research about international opportunity recognition is limited. An improved understanding would be helpful for businesses to follow the trend of globalization. Therefore, some more research on

the identification of international opportunities should be done, so that firms can derive some measures for their internationalization process. Generally, further research has to be done to broaden the knowledge about this diverse field of research. Due to the consistently changing environment, it is important to look for new methods to recognize opportunities and investigate which factors influence the process.

Fifth, we see research opportunities regarding crisis-induced opportunity recognition. For example, the current COVID-19 crisis has shown that some firms predominantly perceived the lockdown consequences as a major threat, whereas other firms saw opportunities emerging from it (Kraus et al. 2020). Crises address a specific contextual situation which is under-explored in regard to opportunities. Apart from individual, also organizational properties might influence not only if opportunities are recognized but also how well they can be realized under unfavorable circumstances.

6 Conclusion

The aim of this study was to provide an overview of the literature on opportunity recognition, with a specific focus on opportunity recognition determinants. The topic is widely discussed in the literature and the publications on opportunity recognition have increased over the last years. Our review of previous literature revealed 48 articles from high-quality journals. The findings of the literature review show that many different factors influence the opportunity recognition process and the aspects are highly interrelated. The main focus in the current research is on personal factors. Aspects like prior knowledge, experience, and alertness were mentioned several times. Additionally, the importance of social antecedents (especially social networks) in opportunity recognition was frequently outlined in the literature. The phenomenon of opportunity recognition cannot be explained through personal factors alone, but it is influenced by a combination of individual and social aspects.

Our research has both theoretical and practical implications. The clusterings derived in this paper, especially the second, more detailed one, provides a collection of already explored factors influencing opportunity recognition and clear structure of the research field. This grid can help researchers to get a better overview of the prior research and help identify research gaps. Also, assumptions about relations between determinants can be formulated. This research also has implications for entrepreneurs. They can reflect on their individual prerequisites and assess if they place a solid foundation for entrepreneurial success or need further investments in their human capital. Similarly, they can examine the

identified social and environmental factors relevant to increase opportunity recognition performance.

The outcomes of this paper should be interpreted with some limitations. The citation analysis is past-oriented and therefore, in the future the outcome of the bibliometric approach would probably be a different one as citations habits change over the years. Furthermore, as it is a quantitative analysis, the citations cannot be rated positively or negatively. In contrast, the qualitative clustering of the publications in categories within the literature review is not objective. It is a rather subjective approach and probably could have been interpreted in another way by different researchers. Additionally, the clusters can of course never form a complete list of topics related to opportunity recognition, especially also since not all extant articles on this topic could be considered.

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