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The Opportunity Recognition Process of Discoveries and Social Creations in Entrepreneurial Teams

A Structurationist Approach to the Opportunity Recognition Process

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Abstract

Opportunity recognition characterizes the development process from initial business idea, which derives from either discovery or social creation, to a viable business model. Previous research has investigated opportunity recognition largely in either cognitive-individualist or in social-constructionist dimensions with input-output approaches, leading to inconsistent results through differing assumptions. Therefore, this study aims at examining opportunity recognition as a process in the lens of Structuration Theory, enabling an interdisciplinary analysis between cognitive realms of agency and the social construction of opportunities. The study is designed as an abductive, multi-case study based on a proposed Structurationist Model of Opportunity Recognition (SMOR). The results show that entrepreneurial teams recognize discoveries in separate business and product development streams and socially created opportunities in interdisciplinary teams. Entrepreneurial teams recognizing discoveries are ineffective in reconciling product and business development to create product-market fits, but more effective in innovating. In contrast, entrepreneurial teams creating opportunities socially are ineffective in innovating, but effective in reconciling product and business development. Furthermore, the study finds that (i) prior knowledge supports the opportunity recognition process but only when the entrepreneurial team is aware of its knowledge-related assumptions, (ii) that the team members shall unify empathetic, hard-working, extroverted, and cooperative personalities, and (iii) that the engagement with the opportunity-related external environment, interdisciplinary collaborations, and in-depth projects foster the effectiveness of opportunity recognition process.

Keywords: Entrepreneurship; Entrepreneurial Process; Opportunity Recognition; Opportunity Research; Structuration Theory; Innovation

Introduction

The ability to turn an idea into a business to generate various kinds of value characterizes an entrepreneur (Dimov, 2003; Shane & Venkataraman, 2000). The goal of an entrepreneur is to build a product or service matching the market demands, thereby achieving a product-market fit (Fisher, Kotha, & Lahiri, 2016; Ries, 2011). Scholars speak about ideas as opportunities that the entrepreneur recognizes and shapes to business concepts (Ardichvili & Cardozo, 2000; Eckhardt & Shane, 2003; Renko, Shrader, & Simon, 2012). These entrepreneurs aim not only at creating financial value and achieving self-fulfillment (Mathews, 2008; Sarasvathy, 2001; Shaver & Scott, 1991), but also at delivering value to their customers (Trimi & Berbegal-Mirabent, 2012; Volkmann, Tokarski, & Ernst, 2012). Opportunity recognition has been seen as the dawn of the entrepreneurial process, representing the development process of an initial business idea to a viable business model (Shane & Venkataraman, 2000). Two analytical perspectives are prevalent in opportunity recognition research, an individualist-cognitive perspective (R. A. Baron, 2004; Gaglio & Katz, 2001; Grégoire, Barr, & Shepherd, 2010), and a constructionist-social perspective (Fletcher, 2006; Mole & Mole, 2010; Ramoglou & Tsang, 2016). These two research streams frequently produce inconsistent results, because the streams build on different assumptions and, thus, examine contrasting subjects (Herron, Sapienza, & Smith-Cook, 1991; Murphy, 2011). Therefore, Herron and colleagues (1991) call for more interdisciplinary studies on opportunity recognition across psychology, sociology, and anthropology. Although some scholars have already analyzed a socio-cognitive perspective of opportunity recognition(e.g. De Koning, 2003; De Koning & Muzyka, 1999; Mathews, 2008; McMullen, Wood, & Kier, 2016; Sarason, Dean, & Dillard, 2006), the scholars could neither generate a shared understanding of the opportunity recognition process nor attain validity through quantitative and qualitative studies on the theoretical frameworks. In addition, the vast majority of studies on opportunity recognition is based on an input-output perspective, thereby determining influencing factors of the opportunity recognition but disregarding a processual view on opportunity recognition (Klotz, Hmieleski, Bradley, & Busenitz, 2014). Finally, studies on opportunity recognition suffer from an overemphasis of the entrepreneurial hero, instead of focusing on underlying processes and factors, which drive effectiveness within the opportunity recognition process (Herron et al., 1991; Murphy, 2011). Hence, research needs to address these gaps on the phenomenon of opportunity recognition in a team-related, processual, and interdisciplinary perspective.

Based on this, the purpose of this study is to examine the processes of opportunity recognition by reconciling socio-behavioral elements of team interactions and cognitive analyses. This study is based on an abductive multi-case approach, thereby building on existing theory but exploring new theoretical boundaries (Visconti, 2010). Theoretically, the study draws on Giddens' (1984) Structuration Theory and *duality of structure* to integrate the process of opportunity recognition in a socio-cognitive perspective. This perspective accounts for both social perspective of opportunity recognition represented in opportunities as socially-created structures and the cognitive perspective of the individual embedded in the concept of agency (den Hond, Boersma, Heres, Kroes, & van Oirschot, 2012). Thus, applying Structuration Theory helps overcome the analytical discrepancy between cognitive and behavioral perspectives (Herron et al., 1991). Furthermore, it allows analyzing the interplay and influence between cognitive drivers and behavioral outcomes in the opportunity recognition process. In the following, I will review the existing literature on opportunity recognition along with its antecedents and its moderators.

Then, I will introduce Giddens' (1984) Structuration Theory and build on it to create a theoretical model for opportunity recognition, which I refer to as the Structurationist Model of Opportunity Recognition (SMOR). Subsequently, I will introduce the methodology of the study. Afterwards, I will present the empirical data along with an analysis within the SMOR. I conclude with the discussion and presentation of general propositions derived from the empirical findings.

Literature review

Opportunity and opportunity recognition

An opportunity refers to an objective phenomenon, which individual entrepreneurs socially perceive and construct (De Koning & Muzyka, 1999; Renko et al., 2012). An opportunity inherits a degree of newness (R. A. Baron, 2006), and potentially yields financial returns for the entrepreneurs or other positive value for the entrepreneur or the society (Murphy, 2011; Volkmann et al., 2012). In the context of entrepreneurship, entrepreneurs seek for opportunities, which are not already being exploited by others (R. A. Baron, 2006) to create value by shaping opportunities to market offerings (Murphy, 2011). Opportunities in entrepreneurship turn, ultimately, to new product or service offerings (Eckhardt & Shane, 2003). As the developers of the opportunities, entrepreneurs have the ability to develop and shape opportunities to business concepts through entrepreneurial endeavors (Renko et al., 2012).

From this static definition of opportunities, research has conceptualized opportunity recognition as the initial process of entrepreneurship (Shane & Venkataraman, 2000). The process of opportunity recognition is generically defined as the social construction of an opportunity over time, to which value-creating meanings are attached through actions and interactions (Pryor, Webb, Ireland, & Ketchen, Jr., 2016). Dutta, Gwebu, and Wang (2015) and Alvarez and Barney (2007) acknowledge two sources of opportunity recognition; the *discovery* of a potential opportunity through scientific findings or experiments, also referred to as the causation view, and the *creation* of a potential opportunity through the purposeful search of entrepreneurs for opportunities, also referred to as the effectuation view. Discoveries inherit natural opportunities to be discovered through experiments and research, such as the nuclear fission or the chemical creation of plastics. In contrast, the creation of opportunities is a social construction, which only exists as the entrepreneurs' endogenous creation based on their explicit recognition of resources. An example for a social creation is an artist who wants to open a gallery with her sample of artworks (Dutta et al., 2015; Ramoglou & Tsang, 2016). These discovery-driven or socially created opportunities inherit a financial lucrativeness in the entrepreneurs' perspective (Short, Ketchen, Shook, & Ireland, 2010) and should result in a viable business model (Ardichvili & Cardozo, 2000) with product-market fit; the product or service propensities satisfy market needs (Fisher et al., 2016; Ries, 2011). Principally, the teams recognize opportunities through two general sets of actions, market-related actions and product-related actions. Market-related actions include the validation of market insights, such as the revelation of customer needs or the product pricing. Product-related actions comprehend the reformulation of the product offering or of components of the product (Fisher et al., 2016).

The term opportunity recognition is interchangeably used with the terms opportunity perception, opportunity identification, opportunity discovery, and opportunity notice (Renko et al., 2012). Since opportunity perception supposes a cognitive notion of perceiving an opportunity

on the process of opportunity recognition, opportunity notice supposes a static view as a moment of recognition on the process of opportunity recognition, and opportunity discovery supposes an exclusion of socially-constructed creation of opportunities, I prefer to use the term opportunity recognition. Opportunity recognition, hence, shall inherit both a cognitive perspective of perceiving an opportunity considering a socio-historical context of the entrepreneur as well as a social perspective of acknowledging social interactions as constructing processes of opportunities (De Koning & Muzyka, 1999; Pryor et al., 2016; Ramoglou & Tsang, 2016). Given the theoretical foundation, I will proceed with the definition of opportunity recognition as the initial step of the entrepreneurial process, in which opportunities originating from discoveries or social creations are socially constructed to value-creating businesses.

Antecedents and mediators of the opportunity recognition process

The antecedents for the process of opportunities recognition stem from cognitive setups and environmental and social factors. Opportunity recognition presupposes an entrepreneur's or an entrepreneurial team's intent and confidence in the ability to create a new venture (Park, 2005). The individual's personality and cognitive setting establish the entrepreneur's ability to initiate the opportunity recognition process based on certain sets of beliefs, values, attitudes, and traits (Shook, Priem, & McGee, 2003). For example, Van Ness and Seifert (2016) identify work-centrality, self-reliance, and the delay of gratification as personality characteristics corresponding with the characteristics of a successful entrepreneur. Knowledge and creativity are also identified as antecedents of the entrepreneurial process, since both concepts support the entrepreneur's cognitive processes for conceptual combination, analogical reasoning, and abstractive thinking to construct opportunities (Ward, 2004). Shane (2000), for example, notes that prior knowledge of markets helps identify new markets for products and services and prior knowledge of customer problems helps tailor products and services to the market demands. According to Ardichvili, Cardozo, and Ray (2003), entrepreneurs require knowledge about customer needs, industries, and markets. The authors also suggest that entrepreneurs need a creative and optimistic personality in the cognitive domain, but must also engage in the networking activities in a social domain to foster the effectiveness of the opportunity recognition process. Ward (2004), however, suggests that not only knowledge itself helps recognize opportunities but the mental structure of the entrepreneur to process knowledge, which he defines as creativity. Rarely scholars draw on both social and cognitive antecedents of opportunity recognition like Pryor and colleagues (2016) who identify the entrepreneurs' abilities to perceive, understand, and interpret from social interactions, along with abilities to acquire and control resources through social interactions as driver of the opportunity process.

In addition, the process of opportunity recognition underlies various moderators. In their review on opportunity recognition, Short and colleagues (2010) identify the subjective, low perception of risk and uncertainty as key moderators in the opportunity recognition process. Furthermore, the abilities of an entrepreneur to simplify complexities (R. M. Baron & Kenny, 1986), to recognize patterns in complexities (R. A. Baron, 2006), and to interpret external stimuli (Renko et al., 2012) moderate the opportunity recognition process.

Moreover, one prominent moderator of the opportunity recognition process is learning (Corbett, 2005). While other scholars (e.g. Ardichvili & Cardozo, 2000) draw on knowledge as antecedent of opportunity recognition, the learning perspective constitutes a processual approach

to the static concept of knowledge (Corbett, 2005). Learning involves the simplification of ambiguities and complexities (Levinthal & March, 1993), which create knowledge, routines (Lumpkin & Lichtenstein, 2005), behavioral scripts (Pryor et al., 2016), and cognitive patterns (R. A. Baron & Ensley, 2006). Learning within the opportunity recognition process helps the actors reduce uncertainties and complexities of an opportunity in terms of the potential target market or technical composition and feasibility of a product (Martins, Rindova, & Greenbaum, 2015). Through learning, entrepreneurs develop social skills and overcome biases and heuristics to recognize opportunities more effectively (Lichtenstein, Lumpkin, & Shrader, 2003). Entrepreneurial teams recognize opportunities through action learning by constantly contesting the organizational assumptions through active involvement in organizational processes (Lumpkin & Lichtenstein, 2005). Hence, comprehensive knowledge and perceived rationality do not drive opportunity recognition process. Rather, the composition of cognitive settings and socio-historical context determine the effectiveness of the opportunity recognition mediated by entrepreneurial learning.

Theoretical framework

As demonstrated above, the research on opportunity recognition partially produces inconsistent results (Shook et al., 2003; Short et al., 2010). Herron and colleagues (1991) suggest that the reason is that the studies on opportunity recognition are based on the differing assumption from various fields, such as psychology or sociology, and call for more interdisciplinary studies on opportunities and opportunity recognition. Various scholars (e.g. Chiasson & Saunders, 2005; Sarason et al., 2006) have already applied Structuration Theory to assess interdisciplinary, opportunity-related issues. Despite this fact, the chance has not been taken yet to analyze the opportunity recognition as process within Structuration, enabling to take a cross-disciplinary viewpoint overcoming disciplinary frictions. I will outline now the key concepts of Structuration Theory as theoretical foundation of this study and then introduce an interpretive framework of the opportunity recognition process within Structuration Theory.

Structuration Theory

Based on Giddens' (1984) pioneering work "The Constitution of Society", management research has largely integrated Structuration Theory in variety of studies across various fields (den Hond et al., 2012; Englund, Gerdin, & Burns, 2011). Structuration Theory explains the world through structures. The key principle of Structuration Theory is the *duality of structure*, which states that structure guides agency, defined as the ability of human actors to decide and act, and agency reversely shapes structure (Giddens, 1984). Structures consist of rules and resources, which are recursively reproduced through social interactions empowered by agency (Schatzki, 1997). Rules embed the meanings of how things work in three dimension: Signification rules determine the interpretation of events within the structure through an interpretive scheme. Legitimization rules inherit, as consequences of the signification, the normative meanings of structures, which are embodied in the cultural, legal, and normative constraints of the structure (Whittington, 2010). Lastly, domination rules determine the means to execute the legitimized actions (Giddens, 1984). These means are epitomized in authoritative and allocative resources (Orlikowski, 1992). Authoritative resources build the power relationships between the structure and the actors (Berends, Boersma, & Weggeman, 2003) by

socially granting the agent power to act (Chiasson & Saunders, 2005). Allocative resources, on the other hand, constitute material features and means of material production and reproduction of structure (Giddens, 1984).

Structuration Theory builds on the assumption of an existing, unbreakable duality of structure; agency creates the structure and the structure reversely enables and limits future actions. As secondarily implied assumption, Giddens' (1984) suggests that all human actors are knowledgeable, reflexive, and purposive. Thus, human actors act with the purpose to influence structural elements and act upon certain consciousness of the existence of structures, which is constantly influenced by the structural feedback (Gurd, 2015). Knowledgeability, however, does not include the actor's full consciousness about the conditions, motives, and consequences of their actions (Berends et al., 2003). Instead, Giddens (1984) acknowledges three dimensions of knowledgeability: discursive knowledgeability, through which the actor is fully conscious about her actions and able to discuss why she does what she does; practical knowledgeability, through which the actor is fully aware of her actions, but is not able to articulate choices and actions until asked for it; and unconscious knowledgeability, through which the actor is not conscious why she is doing what she is doing.

In conclusion, building a model of opportunity recognition based on Structuration Theory can establish a structuration process between the agency of entrepreneurial teams and opportunities as structure determined by rules and resources to overcome the epistemological constraints of cognitive sciences, behavioral sciences, and management research (Herron et al., 1991). Further, a structuration model of opportunity recognition can enable a dynamic view on cognitive and social processes within the opportunity recognition process (Tsoukas & Chia, 2002).

Toward a Structurationist Model of Opportunity Recognition

Cognitive sciences have already examined the relationship between the opportunity recognition process and the entrepreneur's attitudes, characteristics, and propensities (Gaglio, 2004; Renko et al., 2012). While cognitive sciences focus on the inner-personal processes of the individual, behavioral sciences acknowledge the influence of the external world on the individual and the opportunity they recognize (Herron et al., 1991; Shaver & Scott, 1991). Through the duality of structure, Structuration Theory enables to reconcile the social construction of opportunity structures through social interactions and the cognitive and behavioral elements of individuals' agencies (Chiasson & Saunders, 2005).

Figure 1 shows a visualization of the SMOR. In the lens of a Structuration Theory approach, an opportunity constitutes a structure with rules and resources as structural components, which stand in a recursive relationship. The structuration process over time represents the underlying opportunity recognition process, which shapes both the entrepreneurial team's agency and the opportunity structure. The opportunity, thus, is structuralized through an ongoing interaction with the entrepreneurial team's agency. The agency modifies the rules and resources of the opportunity structure and is reversely redefined by the opportunity. The opportunity's rules represent codes how to use of the product or service (*Signification)* and interpretations why to use the product or service and which value is gained through the use (*Legitimization). Domination* refers to the concrete means how the product or service is put into action. For example, a painkiller drug, as opportunity structure, *signifies* the healing of pain, which the user *interprets* as reliever for pain. The *domination* of the painkiller drug occurs through oral intake.

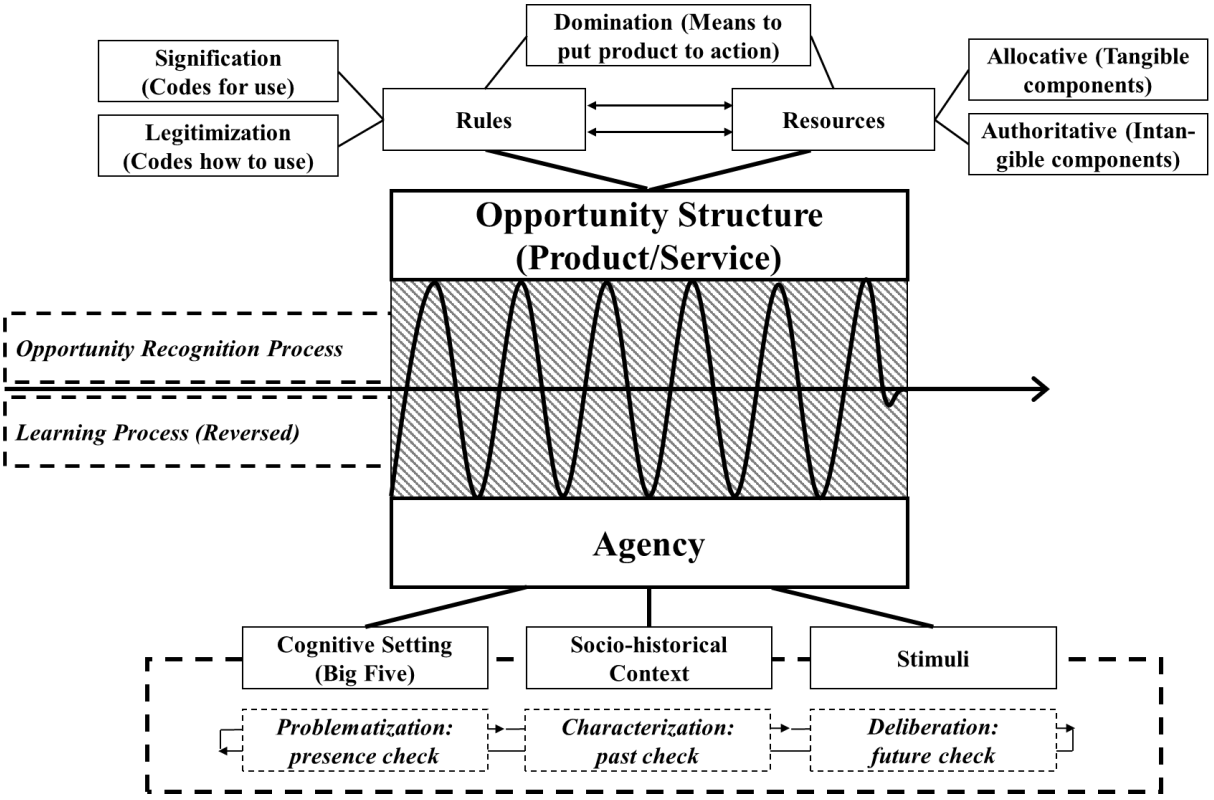

Figure 1: Structurationist Model of Opportunity Recognition

In addition, following Orlikowski (1992), opportunity structures have both a psychical and a social construction embedded in the structural resources. The resources are authoritative and allocative and stand in a recursive relation to the structural rules. Authoritative resources coordinate human activities triggered by other human agents and structures. Human agents will actively use and, thus, interact with an opportunity in its augmentation as product or service and thereby build authoritative resources to the product or service. Therefore, the authoritative resources represent users or customers of the product and service but also the entrepreneurial team as provider of the product or service. Allocative resources serve as tangible components of a product or service. Hence, the key challenge within the SMOR is to match the users' interpretation of rules of the opportunity structure with the intended utility of the product created by the entrepreneurs. This depends on the interpretation of the customers or users how to utilize the opportunity and how to extract value through the use of the opportunity. In other words, all authoritative resources have to agree that the opportunity structure creates values for everyone. Following up on the example of the painkiller drug, the allocative resources of the drug constitute the chemical, material components of the pill. The authoritative resources represent the drug's users and producers. The challenge is now that the structural rules convey that a benefit exists for the potential user by using the drug. The product has become market-ready when a growing user base for painkiller drug is establishing. Then, the components of the opportunity structure, such as the material composition within the allocative resources, are routinizing, thereby gaining stability. With the first signs of routinization of the opportunity as product or service in market, I consider the opportunity recognition process to be ended, since it merges with the opportunity exploitation process as the next step of the entrepreneurial development (Shook et al., 2003).

As second important element in the model, agency serves as interpretive framework of the entrepreneurial team members for the opportunity structure (Orlikowski, 1992). The agency

constantly shapes and modifies the opportunity structure while being modified by the response of the opportunity structure. The agency defines the entrepreneurial team's decisions and executions or non-executions of actions to shape the resources and rules of the opportunity. It is important to note that also not acting upon a chance to act can change the opportunity structure. Agency in the SMOR represents the aggregated team agency. Although the individual team members have agency, the entrepreneurial team acts in a common agency space, because if one team member deploys agency, the others either concurringly act with the team member or react on the team member's action (Emirbayer & Mische, 1998). Since the deployment of agency influences both the other team members' agencies and the opportunity structure, the focus of the model lies on rather how agency is deployed than who deploys agency to best analyze the effects on the opportunity structure. With every decision and actions of the entrepreneurial team to re-define the opportunity structure, the opportunity restrains and changes the entrepreneurial team's agency. If the entrepreneurial team changes one resource component of the opportunity, the change will influence the other rules and resources of the opportunity structure, on the one hand, and will influence the agency through new structural constrains and new decision and actions potentials, on the other hand. Therefore, the power of the actors to shape the opportunity to achieve a product-market fit depends on their control over the rules and resources of the opportunity. Control over rules depends first on the consciousness about their existence and second on the right interpretation of impacts of the resource modifications on the opportunity structure. Following Giddens' (1984) categories of knowledgeability, entrepreneurial teams can attain practical or recursive consciousness or be unconscious of the structural components. Practical consciousness means that the entrepreneurial team is conscious about the existence of certain rules and resources and can foresee possible impacts of modification of those. Recursive consciousness enables the team to understand that certain rules and resources exist, but they are unable to break them down into their elements to comprehend effects and possible consequences of structural modifications. By defining the product components and producing products or services within their firm, the entrepreneurial team largely controls the allocative resources. However, the authoritative resources in the form of the users and customers of the product or service are hardly to control and their decisions whether to use the product or service determines the viability of the opportunity structure in the future. Therefore, discursive or practical consciousness of structural components reduce potentially unintended consequence by changing the opportunity structure and help adapt to the demands and needs of the customers.

Paying more attention to the details of agency, the formation of agency occurs in three steps (Emirbayer & Mische, 1998). First, in the *problematization* phase, the actor receives a stimulus from the structure, through which the actor identifies an ambiguity in the structure *at present*. Second, in the *characterization* phase, the actor interprets the ambiguity through principles or typifications of the socio-historical context. Hence, a practical evolution of the ambiguity occurs through the application of learned skills and behaviors and the cognitive setting of the actor, which the actor learned *in the pas*t. Lastly, in the *deliberation* phase, the actor acknowledges potential options to modify the rules or resources of structure to solve the ambiguity *in the future*. The actors weigh the options according to the potential chances and backdrops. After the deliberation phase, the actors move on to decision-making and the execution or non-execution of the coherent action, which in return influence the opportunity structure.

Notwithstanding, the agency of the entrepreneurial team has several structural determinants, which entail the constitution of each team's agency and, hence, their ability to reach decisions and actions to influence structural properties. First, as discussed above, the agency is co-determined and constrained through the given opportunity structure and receives ongoing responses on its own activity. Second, the socio-historical context of the actor lets the actor rationalize retrospectively, referred to as sensemaking process, across all phases of the agency formation (Strike & Rerup, 2016). The actor has been gaining the history through the personal life experiences, professional experiences, or education throughout the life and the actor has been developing behavioral scripts for searching for, perceiving, and interpreting opportunities but also to mobilizing and controlling resources and rules of opportunities (Pryor et al., 2016). Third, the actor was given and has been acquiring a cognitive setting over time (Lumpkin & Lichtenstein, 2005), which determines his cognitive capabilities and constraints. The cognitive setting establishes focus areas of the actor, e.g. people-focus or technology-focus, and, thus, co-determines the extent of consciousness for structural rules and resources (Bandura, 1989).

While a process structuration represents the opportunity recognition process, *learning* constitutes a second structuration process. Learning unfolds through an interplay between the determinants of agency and the agency itself. Giddens' (1984) notes that the agency will be modified and constrained through any change of the structure. However, the modifications and constraints, additionally, embrace the gaining of consciousness about then-unconscious processes and inner-structural changes in rules and resources through modifications. Learning enables the actors to become more conscious about the components of the opportunity structure, since the execution of social practices enables fluid transitions between unconsciousness, discursive, and practical consciousness, triggered by ever-changing structural properties (Berends et al., 2003). Therefore, the reverse structuration process of the opportunity recognition process constitutes learning as a process of remodeling agency determinants.

Methodology

Setting and case selection

An abductive case study method inspired by ethnography was adopted to examine entrepreneurial teams. The setting of the study is within the city of Gothenburg, Sweden, a highly industrialized and technologically advanced city with major globally leading technology firms and with one of the leading technical universities of Sweden. By using a purposeful sampling strategy (Creswell, 1998) and an information-oriented selection of critical cases (Flyvbjerg, 2006), I selected six entrepreneurial firms, which provided access to their facilities and enabled interviews with the team members. The purposeful sampling required all case firms to have not more than eight employees, because teams tend to split up in two more focused teams with more than eight team members (Daspit, Justice Tillman, Boyd, & Mckee, 2013). Furthermore, all participating firms are at maximum four years old, three ventures were discovery-driven and three ventures were socially created (Alvarez & Barney, 2007), and all stand at three different development stages. The study encompasses one early stage (pre-market-launch), one formative stage (market testing), or one later stage firm (post-market-launch) for each of the both discovery-driven and socially-created ventures. The different stages in the sample enable to analyze the trajectory of the opportunity recognition process through in-depth analyses of the

respective stages as well as retrospective reflections upon the earlier phases. All companies are all involved in high-tech products. Services are not part of their core business. Overall, this sampling facilitates to draw comparisons between the companies (Flyvbjerg, 2006). Table 1 displays an overview of the participating firms including a short profile about their product. Out of ethical consideration, the companies and the team members were anonymized, because sensitive, internal issues and sensitive, private data of the individual team members are collected and discussed. Anonymity and confidentiality shall allow the interviewees to speak more openly and to make informed guesses without negative consequences (Walsham, 2006). In addition, the study comprises observations in the startup environment of Gothenburg, including participation at startup-related events, open days at local incubators and co-working spaces, and informal meetings. To achieve higher variability in the observation cases, I used the snowballing technique and asked related persons to introduce me to other relevant persons for my study.

Name	Description	Team members (interviewed)	Interviewed team members	Founded (stage)	Opportunity type
Firm A	Pharmaceutical treatment of herniated discs / Pharmaceuticals	4 (2)	Business Developer 1 (BD 1), Business Developer 2 (BD 2)	2015 (Formative stage)	Discovery
Firm B	Intelligent Building-Management-Systems	2 (1)	CEO	2015 (Formative stage)	Social creation
Firm C	Social Network for Handball with services for professionals / Social Media Networks for Sports	6 (4)	CEO, COO, CMO, Business Developer (BD)	2014 (Later stage)	Social creation
Firm D	Modular, wooden wind power towers / Construction Systems	3 (2)	Business Developer 1 (BD 1), Business Developer 2 (BD 2)	2015 (Early Stage)	Discovery
Firm E	Devices to turn marginal vibrations into energy / Energy production	4 (2)	CEO, COO	2013 (Later Stage)	Discovery
Firm F	Software Development Boutique / Software, Tools, and Application Development	3 (3)	Business Developer 1 (BD 1), Business Developer 2 (BD 2). Full-stack Developer (Dev)	2016 (Early Stage)	Social creation

Table 1: Selection of case firms

Design of the study

The aim of the study is to understand the opportunity recognition process in entrepreneurial teams using the SMOR. This allows analyzing both social interactions constructing the opportunity and the influences of corresponding cognitive propensities embedded in agency. The design was embedded in an abductive case study approach (Visconti, 2010). Abductive case studies refine theoretical models through both unanticipated empirical findings and theoretical insights of both inductively collected and deductively analyzed data in order to reduce ontologically and epistemologically naïve realism and relativism (Dubois & Gadde, 2002; Järvensivu & Törnroos, 2010). This study is based on a mainly qualitative approach inspired by ethnography (Van Maanen, 2011) and Grounded Theory (Glaser & Strauss, 1967) and supported quantitative data gathered through surveys. Ethnography helps understand the underlying processes through detailed observations and interviews (Watson, 2011).

The abductive, multi-case study approach allows a close-to-reality analysis of processes how the members of the entrepreneurial teams interact with each other and their external environment (Visconti, 2010). The multi-case study approach does not only enable to examine cross-patterns among the firms but also to observe the general context of opportunity recognition in different situations and fields (Eisenhardt, 1989). Multiple sources allow to examine a broader range of

historical and behavioral themes and a cross-case verification of the data (Yin, 1981). In terms of cognitive analyses, Watson (2011) states that the ethnographic research approach generally allows to interpret cognitive data, but does not fully cover all facets. Therefore, I included the Big Five personality domains and facets as reviewing element of my interpretations of the team members' cognitive domains to avoid a potential bias and misinterpretation of the data (Eisenhardt, 1989). The Big Five assess personalities in five domains (Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience) and in five facets of each domain (Johnson, n.d.; Soto & John, 2009) and have previously been qualified as tool to assess entrepreneurs' personalities (van Ness & Seifert, 2016).

The design of the study follows the suggested flow for an abductive, ethnographic case study by Visconti (2010) and comprises six phases. First, the identification and sampling of potential interview partners and accordingly the access to case firms were coordinated. Second, a literature review of relevant research about opportunity recognition, entrepreneurship, and Structuration Theory was conducted. The literature was gathered through online research search databases, such as EBSCOhost and through systematically reviewing prominent peer-reviewed journals. The literature review established the basis for the subsequent phase, the design of the interview guidelines and a potential design of the SMOR. The interview guidelines were designed for a semi-structured interview format, including the needed data points for SMOR. As fourth step, the interviews were carried out in individual sessions with the team members. Besides that, observations were conducted to complement and reassess the interview data. Fifth, the data was analyzed and conclusions were drawn. Eventually, the results were brought into paper form.

Data collection

As data collection method, I selected first semi-structured interviews for the formally arranged interviews with the case firms and second unstructured interviews and observations in informal settings at events, meetups and outside the interview settings at the case firms. The study comprises in total 14 semi-structured and audiotaped interviews with selected team members of the six case firms of approximately 20 hours and participative observations of approximately 24 hours at eight startup-related events, such as Lean-Startup seminars, networking events, technology events, or Startup pitching competition. On these events and through network contacts, 15 informal interviews with entrepreneurs were conducted to contest the prevalent hypotheses of the then-actual state of work. The data was collected over the course of three months from January to April 2017. As the study analyzes both environmental as well as individual factors, the collection of the data was carefully separated along the categories of interview guidelines, so that ambiguities in the data could be avoided (Van Maanen, 2011).

The semi-structured interviews lasted approximately 60 minutes; however, some interviews also exceeded the time, as additional insights could be won. The interview technique followed in the manner the Platonic Dialogue - seeking with arguments and counter-arguments an agreement, since this is promising to generate in-depth insights, as the questioning and counterargument can release unconscious knowledge (Kvale, 2006). All interviews were transcribed shortly after the conduction of the interview. The interview guide included a threefold division of the interview. First, the interviewee was asked to narrate the story from the idea of the business until today to assess the gradual development of the opportunity recognition process. The storytelling was supporting by a drawn timeline, which tried to separate the

opportunity recognition process in the inherent milestones of the entrepreneurial process. During the storytelling process, the interviewee was specifically asked to refer to the team interactions within the entrepreneurial team leading to the defined milestones. Specific attention was given to the description of the contributions, skills, and personality of other team members and the interviewee's own positioning among them. Second, the interviewee should describe the own personality, function in the team, education, skills, and motivation for the future in order to establish a basis for the cognitive account of agency. Third, the interviewee was asked to draw the own, individual learning curve in a time-learning graph along the defined milestones and in three dimension (low, medium, high) and explain the extension of the dimensions and the way of learning in the respective periods in a personal perspective and a team view. The learning narration should later account for the structuration of the team agency throughout the opportunity recognition process.

Notes for interviews and observations were taken with the Evernote application, since it allows writing, recording voice, taking pictures and videos, and structuring and easily editing notes at the same time. The note writing took place during the interview. The context was described in detail and editorial comments were avoided (Martin & Turner, 1986). As suggested by Eisenhardt (1989), structured summary sheets directly prepared after the interview or observations were prepared to support the subsequent analysis.

After the interview, all interviewees were asked to conduct the IPIP-NEO, a freely accessible version of the Big Five Personality Test developed by Johnson (n.d.) based on McCrae and Costa (2007). The IPIP-NEO is a reliable tool to assess the personalities, which categorizes personalities according to the domains (i) Extraversion, (ii) Agreeableness, (iii) Conscientiousness, (iv) Neuroticism, and (v) Openness to Experience (Johnson, n.d.). The domains and corresponding facets of the IPIP-NEO are displayed in detail in the Appendix.

Data analysis

The focus of the data analysis lies on anomalies and processual factors within the structuration, since changes and, thus, the chance to recognize opportunities, can be better evaluated (Glaser & Strauss, 1967; Renko et al., 2012). The collected data was used to develop codes, concepts, and categories in accordance with Grounded Theory (Corbin & Strauss, 1990), which is line with an abductive case study approach (Dubois & Gadde, 2002). First, the data of each firm was consolidated separately. Following the approach of process theory, the data was analyzed as a generic story *explaining* underlying processes within SMOR, instead of *describing* single stories of opportunity recognition (Langley, Smallman, Tsoukas, & Van De Ven, 2013). Applying the SMOR, the data analysis obtains a high level of abstraction to reveal the theoretical significance of the gathered data. Then, the narratives were compared to identify anomalies across socially-created and discovery-driven ventures. The existence of the two types and existing differences between the two types were immediately prevalent, despite applying a Grounded Theory approach. Second, in an inductive-interpretive approach, I horizontally separated the data analysis of the opportunity recognition process along social interactions and the evolvement of the agency through learning and structural influences and vertically separated the data according the phases: early stage, formative stage, and later stage. Thereby, the phases concentrate on the activities of the actors in the processes, allowing generating sequential patterns within the opportunity recognition process applying the SMOR (Pentland, 1999). For

each stream, the data across the firms was consolidated in figurative-textual summary sheets. Third, to enable a rigorously comparative analysis, I used a pattern recognition approach to perceive patterns in the opportunity recognition process and the evolvement of the agency in socially-created ventures, discovery-driven venture, and across both. Afterwards, the streams were reconciled again, which provided an abductive image of the data within the SMOR (Järvensivu & Törnroos, 2010). Eventually, the abductive image helps immerse into the structuration of opportunity recognition and the agency evolvement.

Empirical findings and analysis - The process of opportunity recognition

The presentation and analysis of the empirical data are structured in three parts. First, I analyze the origin of the opportunity and formation of the team as initial processes, because both processes establish the basis for the opportunity recognition process. Second, I present the process of opportunity recognition as structuration process in discovery-driven and socially-created teams. Every paragraph presents first the empirical data in a narrative and with indirect and direct quotes from the field data. Then, the presented data is analyzed within the SMOR. The quantitative evaluation of the Big Five is displayed in the Appendix and is applied occasionally as supporting evidence for the analysis of agency. I will present the empirical data of discovery-driven and socially-created teams separately and in that order, because the analysis has shown that both opportunity recognition processes develop differently. Three case firms comprise a discovery-related origin (Firm A, D, E), while the other three are socially created (Firm B, C, F).

The origin of the opportunity

In the three discovery-driven cases, all opportunities stem from a discovery in either an R&D context of an existing corporation or a laboratory setting in academia. The researchers or inventors discover new technical application areas and initiate the opportunity recognition process through imagining a business case for the discovery.

> *The idea came from <Researcher 1> who was a researcher within the research team of <Researcher 2> who was the head. <Researcher 2> owns a research team at <Institution>. And, in this research team was <Researcher 2>, and they found this. (BD 1, Firm A)*

The interviews showed that the researchers and inventors are aware of their lack of industry and market knowledge to develop the discovery to a business, because they see other firms developing discoveries in the mixed teams of product and business developers. Their fundamental understanding of business suggests that business capabilities are required besides product development. Inventors and academic researchers, thus, search for capabilities to analyze costumer needs and to develop and validate various business cases to achieve a product-market fit to launch their discovery as product on the market. Therefore, they start a purposeful search process for potential founding partners, who are able to run the business-related operations. Yet, there is a particular case for the internal R&D teams of corporations, who could collaborate with internal business-developing units. The inventors still decide to incubate the discovery with external business partners. They argue that the structural context would lock the discovery in the context of the corporation, which limits an application in other settings.

Within the SMOR, the discovery-driven origin of the opportunity suggests that every opportunity has already structural propensities pre-defined by the inventor or researcher, such as an intended legitimization for the application of the product or allocative resources in form of a prototype. The opportunity, however, has barely built authoritative resources, for example, identified, potential users of the product. Thus, the initial agency of the entrepreneurial team solely stems from the researchers or inventors, whose socio-historical context trigger the idea of founding a business.

On the other hand, the empirical analysis shows that socially-created firms fundamentally arise through a preexisting, mutual relationship of a group of people. The founders have known each other from professional experiences or have been friends before they intend to found a business. The soon-to-be founders have already exchanged ideas, have shared knowledge and experiences, and have become familiar with each other's personalities. At a certain point, a member of the group comes up with an "idea".

> *We won a couple of big deals together [in our previous firm]. Well, we liked each other. After having worked together for two years, he called me up to this summerhouse. 'I have this idea that I told only my wife about.' (COO, Firm C)*

Categorized in the Structurationist of Opportunity Recognition, the roots of the socially-created opportunity rather lie in the development of authoritative resources through social relationship of the team members over time than in the initial discovery of an allocative resource combination. Thus, the initiation moment of the opportunity recognition process is vague, because the business idea arises all of a sudden. The opportunity structure has only loosely defined resources and rules, because it was neither exposed to any potential customer nor tested in its technical feasibility. The team members are Cooperation- and Friendliness-driven personalities (Big Five) and seem aware of an existing agency within the group in terms of the capabilities, emotional setting, and personality because of their common work history and friendship-like relationships. Hence, the then-existing authoritative resources of the opportunity, the entrepreneurial team, drive the entire opportunity structure within its own horizons. This, consequently, limits the agency and the opportunity radically from the beginning of the process, because the team is caught within their own cognitive and socio-historical boundaries. Thus, existing capabilities, histories, and roles in the team are isolated and routinized.

Team formation

The team formation includes three elements: establishing contact between the team members, setting up the team structure, and initiating the collaboration. Discovery-driven teams have rarely established contact before the actual start of the opportunity recognition process. The team formation originates from the purposeful search to compensate lacking capabilities. The product development team, mostly researchers and inventors, initiates a search procedure for business development and financial expertise. The future business developers are sustaining a general alertness for opportunities, which seem worth developing to a business. The team members present themselves to their prospective colleagues as "experts" in the respective areas. This leads to a pre-definition of team roles from the first day of the collaboration.

> *The project was founded in 2015. Ah, I would say in June. And we joined the two researcher for the product development and we were three business developers. (BD 1, Firm A)*

Discovery-driven teams acknowledge that the business developers serve market-related activities and the product developers serve product-related activities. Instead of thoroughly discussing team roles, the team members affirm themselves skills with own background and skill checks, so that their own-perceived capabilities match the respective job. The team formation, thus, occurs in sequential steps of establishment of contact among team members, the setup of the team structure, and the initiation of the collaboration. The initiation of the collaboration involves meetings to explain the counterparts own expertise and plans. Consequently, both teams try to interpret the impacts the other team's plans on their own work.

Transferred into the SMOR, the authoritative resources of the whole team complement the initially established allocative resources. The agencies of the product developers and business developers, however, barely overlap, because signification and legitimization rules of the opportunity vary in each one's perspective and build individually different perception of the structural components. Therefore, the formation discovery-driven serves as new authoritative resources to the structure, but the understanding of signification and legitimization of the opportunity structure is ambiguous in the different teams.

Unlike discovery-driven teams, team members of socially-created ventures have established a relationship before the actual origin of the opportunity and have previously built, thereby, an emotional connection. The opportunity, then, emerges as a suggested business idea of one of the team members and the team starts to form immediately around the opportunity.

> *<Co-Founder> had some experience with <Consulting Firm>. And he told me about his vision: "okay, we can do something we were doing now". They were doing maintenance plans for their client basis. And he got the idea, maybe we can do this in some digital format. […] I said, yes. Then, I built a small program that <Consulting Firm> could use to deliver their work in a digital format, which then developed soon into our own business. (CEO, Firm B)*

Within the SMOR, the team formation occurs simultaneously to the origin of the opportunity. This sets up immediately an authoritative resource basis to the opportunity structure to initiate the collaboration of the venture team. At the moment of the opportunity emergence, the team members have to decide whether pursue or reject the business idea. Members of socially created firms decide to pursue the opportunity, since they seek for self-fulfillment and adventures, on the one hand. This reflects in high levels of Achievement-seeking and Adventurousness in their personality facets (Big Five). On the other hand, high levels of Trust (Big Five) among the team members facilitate the consent in the team to pursue the opportunity commonly. The formation of the team structuralizes through this decision for a collaboration. The team, thereby, establishes legitimization rules for the opportunity structure, which serve as a common purpose for the team. Yet, a translation of the idea into material respectively allocative resources has not happened.

The structuration of the opportunity – the opportunity recognition process

Discovery-driven teams

The empirical data shows that discovery-driven teams pursue business development and product in development in separate teams. They have only few touchpoints in their work streams, because they already separated tasks and responsibilities for business and product development during the team formation. Figure 2 shows a simplified, visual overview over the process.

> *[…] we did not any technical development at all, up until that point [8 months after starting the venture]. We had only a few PowerPoint slides, which meant that <COO> and me were working constantly with business development together. (CEO, Firm E)*

A "partnership of convenience", avoiding initial conflicts in the teams about skills, capabilities, and team dynamics and potential, is created. Collaborations between the separate teams are implied, but, generally, product and business development activities are separated.

> *I haven't been able to always explain what we are doing and I haven't been able to, on a broad scale, make people aware of what we are doing. [Not even] some personal circles that I am part of but my hands are tied. And, I'm not the expert of the technology. This combination sometimes made me not that motivated. (BD 2, Firm A)*

In regards to the SMOR, the team builds up authoritative resources to cover both business development (market-related activities) and the product development (product- or service-related activities). They attempt to avoid facing structural instability in the initial phase by revealing and discussing differently established interpretation in rules of the opportunity structure. At this moment, the pre-defined, structural separation becomes structural routine, which also restrains the agency. The routinized structure prevents thoughts in the agency whether interdisciplinary team roles make sense or a business developer has the skills to contribute to product development. As supportive factor, the Big Five of the team members show low levels of Cautiousness, restraining the consideration of consequences of important decisions, and low levels of Modesty, signaling high self-confidence in own capabilities.

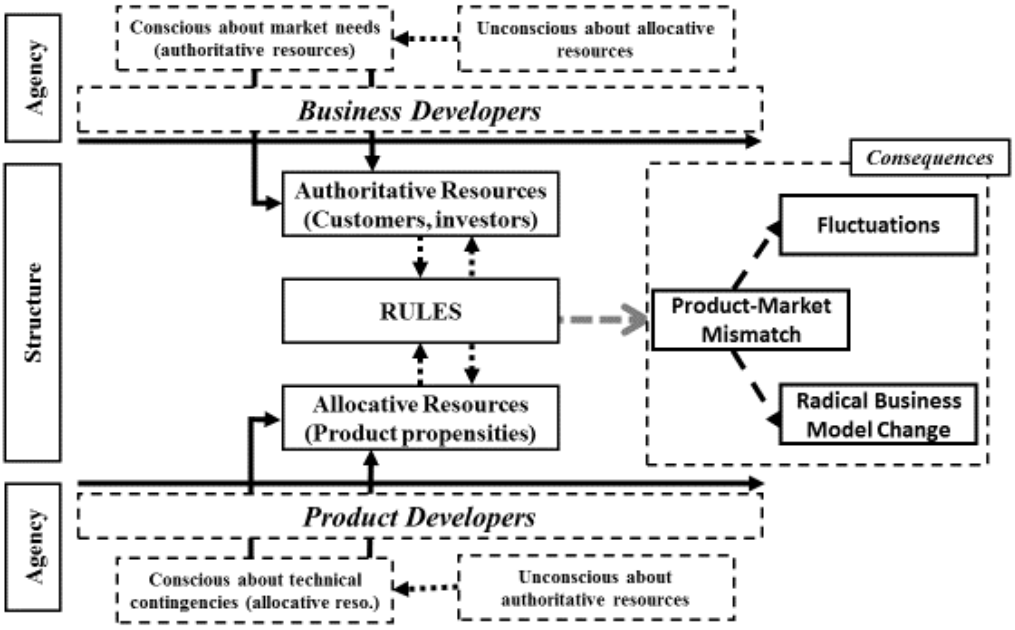

Figure 2: The opportunity recognition process and its consequences in discovery-driven teams (simplified).

Market validation and business development. The empirical data shows that the business development teams engage in three types of actions: testing and validating market hypotheses, ensuring the venture's financial resources, and building customer relationships. Testing and validating market hypotheses and ensuring financial resources, however, are the prioritized activities, while actual building of customer relationship is secondary to the teams. The business development team prioritizes these activities, because they argue that they want to ensure the

financial survival of the venture and build the foundation for the further business development. Although building customer relationships would be a basis for future sales, the business development team claims not to know enough about how the product looks and functions now and what it will be at the market launch.

> *Interviewer: "[…] how would you describe a normal workday for you? […]"*
> *BD 1 (Firm D): "A large part of it is to get access to funds, writing applications for different grants on the EU level or Swedish level, private ones, governmental ones."*
> *Interviewer: "So, it's first about ensuring survival and then going into business development?"*
> *BD 1 (Firm D): "Yes, a lot of time needs to be invested in survival at this stage."*

The separation of business development and product development has two major effects on the business development activities for the SMOR. The team tries to identify signification and legitimization rules of potential authoritative resources by testing and validating market hypotheses aiming at building a foundation for future customer relationships. However, the business developers lack practical and recursive consciousness of the actual signification and legitimization rules of the opportunity, since, as shown in the quote of *BD 2 (Firm A)* in the section above, the business development team is not fully knowledgeable about the technical propensities and potential of the opportunity. Hence, the given structure already impedes the market validation, because the business development team needs to correctly interpret and reconcile the understanding of both the product development team and potential user. Through the lack of consciousness, the business development team might identify unfavorable target groups. As second effect, the business development team prioritizes the validation of market hypotheses and ensuring the venture's funding over sales activities, because sales activities would require a more routinized opportunity structure with a clear set of structural rules and routinized allocative resources. Only then, the business development team could target an identified group of customers willing to the product. The structure would require at least recursive consciousness of the rules and the allocative resources, for example in the form of a functioning prototypes being able to go into production. Prototypes can already exist at this stage of the opportunity recognition process, but their full functionalities and potentials are exclusively conscious to the product development team because of the separation of the teams.

The business development team's agency, thus, determines, which of the three types of activities the team members prioritize *(Problematization)*. Through the education in business or entrepreneurship and professional experience *(Characterization)*, the business developers see a need in evaluating the market hypotheses to identify rules to attract authoritative resources, which can later constitute the customer base for the opportunity. As team-oriented personalities, the business developers also feel responsible for the financial survival of the venture. This reflects in medium to high levels of Altruism and Cooperation in their cognitive setting (Big Five). Therefore, the decisions to prioritize accordingly make sense to the business developers as activities, which both ensure the survival of the firm and create necessary knowledge about the market. In addition, building authoritative resources through customer relationships would result in a relatively instable authoritative resource structure through the diluted meanings of the rules. This makes the future structure uncertain and unforeseeable *(Deliberation)*.

As second step in business development process in discovery-driven teams, the empirical data shows that the business developers design business plans and do research in line with academic

principles like the lean startup (Ries, 2011). By creating a business plan, the business developers engage in learning about the technology and the products through interactions with both the product development team and externals like professors, consultants, and experts. However, the product developers do not actively participate in the business planning process; they only share knowledge and insights.

> *We [business developers] worked on the business model and business plan. We tried to contact several business contacts and partners to verify our hypotheses. <Researcher 1> met with us once a week to explain technical things. We also hired a consultant to do a patentability assessment whether we can patent this. (BD 1, Firm A)*

Within the SMOR, this disengagement of the product development team impedes the correct and conscious codification of allocative resources into signification and legitimization rules. The identified customers in the business plan could create authoritative resources to the opportunity, but the business development team still suffers from a lack of knowledge. The business plan, however, constitutes also an allocative resource to the opportunity. Thereby, the business plan can constrain the team's agency to act outside the plan. Albeit the teams consider a business plan as adaptable and not fixed, it provides a stable allocative resource, which recursively influences the rules of opportunity structure. The business plan provides stable interpretations of structural rules, e.g. which purpose the product serves or which customer groups shall be targeted. As long as the business plan is coherent to reality, the opportunity structure does not suffer. However, the short validity of plans (Orlikowski, 1992) can also result into distortions in the opportunity recognition process through reinforcing a misconstruction of structural rules.

Moreover, the empirical data shows that, while narrowing down the market and focusing on identification of potential customers, the business developers attempt to ensure the financial survival of the venture. The business developers stated that they potentially have two choices to generate financial income: to attract funding like venture capital or to sell products or services. The business developers prefer to attract external funding, because their education generally suggests the need for external investors and they follow a self-serving purpose to pay salaries to all members of the team quickly. Therefore, the team invests plenty of time into short-term acquisitions of funds instead of developing the business and sales. Investors, however, demand at least a business plan and prototype-like product from the venture prior to the investment. This requires the entrepreneurial teams to engage in market validation to match customer needs and product propensities. Nevertheless, the market validation serves rather the purpose to attain funding. The results are possibly deviations from the full business reality of the opportunity to please potential investors with potentially large, monetary outcomes. The channels for external funding can be, for example, business competitions or pitching events, which the business developers categorize not only as attracting funds but also as additional market validation. Thus, the business developers cannot achieve substantial progress in business development, because they are in a loop of fund attraction and market validation.

> *When we look at this area, I would say market research was important, funding was important, and also market validation. […]It does not always feel like that you make a step forward. We concluded this is a long-term project; there won't be a [product] up for sale for maybe three years. (BD 1, Firm D)*

In the context of the SMOR, sales would require activating authoritative resources as users through rules, which communicate a value-creating use of allocative resources. The attraction of funds, however, needs to define only authoritative resources for investors but not for real customers. As long as the investors believe in the entrepreneurial team and the opportunity, the investors contribute capital to the venture without the real activation of any authoritative resources as users. Moreover, the funding is issued based on a business plan and forces the entrepreneurial team to relative dependency on the initially flexibly designed plan. Thus, the entrance of an investor as authoritative resource to the opportunity and the investor's funds as allocative resources to the opportunity foster the routinization of the business plan as script for guiding other rules and resources and further restrict the application areas of the discovery, because the investors buy in based on the business plan. Thus, focus on funding slows down the opportunity recognition process in the business development and can restrain their agency.

Product reformulation. The product development occurs in a structurally separated stream from the business development. The product development team, who usually brought in the discovery to the venture, continues developing the product within their familiar environment and they spent only limited time with the business development team and their activities. The product development gradually improves product's functionality or extends the product features. As owner of the idea, the researchers or inventors feel knowing the path of the discovery and the application areas and want the business developers to "just bring it to the market" (BD 2, Firm A). Neither inventors from traditional corporation nor researchers are used to work in interdisciplinary teams and to consider business-related consequences.

> *<Inventor> had this modular construction, this way of building with modules, and he also had, <Inventor> thought it would be a great thing to apply it to wind power. So, we [the business developers] had to work with wind power. (BD 1, Firm D)*

The separation of product development from the business development implies in the SMOR that the product development team solely shapes the allocative resource basis of the opportunity. The product development team is conscious about the allocative resource basis of the opportunity, because they are knowledgeable about the material or technical composition of the product and underlying technologies. The product development team poses own legitimization and domination rules how to use the product by reflecting on how value can be created for an imaginary customer. However, the actual behavior of the customer in legitimizing the use and the subsequent value of the opportunity are unknown to the product developers. Therefore, the product development team is practically conscious about the existence of signification rules and authoritative resources, since customers are supposed to extract value from use of the developed product. The value interpretation of the product and activation of customer, however, remains a customer decision, which product developers only imagine but cannot know. Through the initially separated team structure and the separate product development, the product development team's agency is not able to activate authoritative resources to the opportunity as customers and to build the corresponding, embedded codes to the opportunity (signification) to interpret the use of the product. Therefore, the product developers find themselves in a product development silo, consciously influencing only allocative resources. This restricts their agency to create a product-market fit from the very start of the opportunity recognition process. Thus, the product development team's *problematization* concerns only the ambiguities in the technical

functionality of the product, but does not raise ambiguities from the potential users. Their experience and education in the technical field and the knowledge that traditional businesses separate product and business development reinforce a purely product-related agency *(Characterization).* The product development team's decisions involve the assessment of contingencies of changes in the allocative resource basis for the functionality of the opportunity. While the legitimization is considered in the decision process, the product development team unconsciously affects the customer activation potential of the opportunity (authoritative resources) and of the rules embedded in the opportunity. This yields unintended consequences for the opportunity and for the work of the business development team.

Process obstacles and consequences. The major obstacle that discovery-driven teams face is the separation of business and product development. The results are a product-market mismatch, team member fluctuations, and radical concept changes. As demonstrated above, discovery-driven teams create different realities through working in separate teams, because the product development team intended application areas and value for the potential users do not comply with the insights generated by the business development team. On the other hand, the business developers lack a full understanding of the product to address the market effectively. The separation inherits a conflict potential between the product and business developers.

> *Stepping up in a complicated situation, that was the first time, I really said to an old dude [from the product development team] that he should really look over his values. […]I always used to be polite. You never end up in these situations before, where real conflict arises, because they just don't listen and do the wrong things. Then somebody gets mad. And you have to get mad back. (BD 2, Firm A)*

Within the SMOR, at moments of market validation or sales activities, discovery-driven teams face the ambiguity between the allocative resources placed in the product and the authoritative resource, which shall activate the consumer. The structural rules define a mismatch between authoritative resources and allocative resources, because both business and product developers push and pull the rules through their resource modifications. This creates an opportunity with certain functionalities and propensities not matching the potential consumers' usage embedded in the transmitted domination codes. The team members start problematizing the mismatch through feedback from external actors, e.g. potential customers or business partners, and acknowledge that given rules and allocative resources do not reactivate authoritative resources. Thus, the teams become recursively conscious about their previous unconsciousness on the effects of the structural team separation. Consequently, gaining consciousness inherits the conflict potential, because the teams acknowledge the existence of an ambiguity and try to locate it within the opportunity structure. As a result, discovery-driven teams face substantial changes in their business model through the recently attained consciousness of the opportunity structure.

As second obstacle, the empirical data shows that discovery-driven teams undergo team member fluctuations throughout the opportunity recognition process. Team members leave the ventures for various reasons arguing with, for example, mismatching personalities or redundancies in competences.

> *<Previous Team Member> left us. We [BD 2 and previous team member] had a similar profile. We knew kind of the same things. So, it was all a question of personality and he used to be the*

> *one that was conservative. He would think twice. And I would be the one that would working for something that I hadn't really verified, but that sounded good. […] <BD 1> would do these tasks, but <Previous Team Member> and I had the same tasks. We would just do them differently. They were ours. Like the funding and finance and everything. (BD 2, Firm A)*

Although the reasons might differ, interestingly only team members leave with background, capabilities, or skills, which another team member already represents in the team. Subsequently, the other team members assume the tasks and roles of the previous team member or new members take more hybrid roles. This restructuration of the team setting establishes broader interdisciplinary work for the first time.

> *I do more business planning now, for example. My role is sort of on the business-technical aspect I would say. Because that's actually my background. (BD 1, Firm A)*
>
> *So, we brought on Marcus. He's been fantastic. […] He's so much more entrepreneurial. […]If you compare him to regular engineers at big companies, there is no comparison. Because now he can take decisions, lead projects, and so on. (CEO, Firm E)*

In the context of the SMOR, the member fluctuations lead to losses of both allocative resource in terms of human resources and of authoritative resources by the depletion of total agency, since contributions of the lost team member disappear. The remaining team members fill the authoritative resource void by redistributing tasks or by new hires. This results in overlaps of the technical and business field. Although the loss of a team member naturally slows the work progress and reduces available resources, the social interaction involved interdisciplinary work and the reformation elicit recursive and practical consciousness about opportunity properties, which have been previously insensible.

Moreover, the empirical data shows that new insights through changes in the team composition and conflict through the product-market mismatch prompt radical business model changes as a consequence.

> *Interviewer: "I understand the focus was on business development before and now you move more into the technical part. Is it about these first towers that you want to prototype and build or is it, because you got new team members here?"*
> *BD 2: "It's a combination of both. First, new people that can verify further the technology, but also we got pretty much a valuable input on the technology from different people. <Researcher> changed the concept and now we presented the second concept in November, which is more of the shelf, which was the big step so far. It's the new concept, not new people." (BD 2, Firm D)*

With the initiation of interdisciplinary collaboration in the teams, the teams unveil unconscious, structural properties by merging their previously separate agencies to redefine the opportunity. Through team fluctuations and conflicts, the teams, subsequently, retrieve agency on a higher consciousness level, which enable them to change the concept. The radical concept change allows changing the inviolable, allocative resource in the opportunity structure - besides incremental changes through the product development team – conjointly with attaining relatively higher consciousness about the effects on authoritative resources.

Socially-created teams

Other than discovery-driven teams, the empirical data on socially-created teams suggests that they structuralize the opportunity through a common interplay across the product and business development. Figure 3 summarizes a simplified opportunity recognition process of socially-

created teams. Socially-created teams function in a project-like manner. They define internal projects or milestones and work commonly across product and business development towards those milestone. When team members engage in business development activities, e.g. market research or customer interviews, they fully share the information with the rest of the team and the whole team discusses the implication for the product. As of their common history as friends or colleagues, the team members are aware of each other's skills, education, and personality and appreciate each other's thought and opinions.

> *It was <BD 2>, we are close friends. He talked about that he was going to start up a web development company together with <Dev>, who is an old classmate of his [sic!]. […]So, together, we met up at <Dev's> house and started developing our business plan and our own website. (BD 1, Firm F)*

Put in the context of the SMOR, the social interactions among the team members construct the opportunity. The team members shape the opportunity through the application of their knowledge and skills in contesting other team members' views and opinions. Throughout this recursive process of between their agencies and the opportunity, the actual product emerges as opportunity as consensus between the team members about structural components. At the same time, the individual agencies of the team members merge to a common team agency and the views and opinions of the team members become routinized within the agency.

> *No, no, but they should talk a little bit more with each other. Maybe have discussion so that they can bring something up and talk about. (BD, Firm C)*

The product and business development, hence, happens within the same structure. The closely intertwined development is reflected in vastly high levels of Cooperation, Trust, and Cheerfulness (Big Five) in the personalities of socially-created teams.

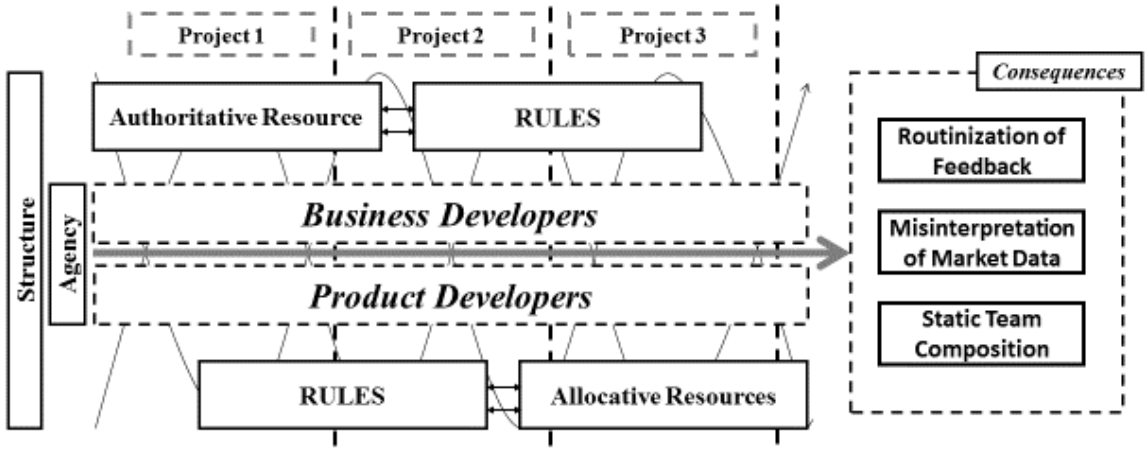

Figure 3: Opportunity recognition process and its consequences in socially-created teams (simplified).

Market validation and product reformulations. The socially-created teams begin with a commonly created opportunity, of which the starting point is undefined in the past. The product idea only exists as an oral narrative, but has defined functions and an intention to provide value to the user. The team, then, exposes this idea to feedback of friends or potential customers and start to change the idea gradually according to the received feedback.

> *We ask them [potential users] a lot of questions, like 'How would rate those functions?' Just recently, we started to develop other user functions, for teenagers as well as older people like me. [We have] various user groups that we can interact with and listen to what they want and what they need and what they like to see next. [...] [The goal is] [k]eeping a tight dialog with them. (COO, Firm C)*

> *We try to involve the customer in the development as much as possible. (CEO, Firm B)*

In terms of the SMOR, team has already established a certain set of rules and resources of the opportunity over time, because the team was formed out of people who have known each other before, which already determines the general, environmental setting of opportunity recognition process. Through social interactions with potential customers in the external environment of the venture, the team constantly defines new contingencies for the opportunity in resources and rules. The team and the customers commonly determine *verbally* the allocative resources as product properties, such as functionalities, design, and material, along with creating signification and legitimization rules. The inclusion of the customers as external influences also laterally serves as creating of authoritative resources as potential users of the opportunity. This initial opportunity structure is rather instable, since the structure is merely built in the minds of the team and the external influencers and allocative resources have not been realized in a prototype.

Concerning product development, the empirical data shows that socially-created teams develop the product in rather a project-based work mode. Interdisciplinary teams work towards commonly agreed short-term goals and milestones. The team defines the properties of product with increasingly more details over time, for example through the creation of a business plan. To identify a market or to test the product, the team repeatedly exposes the product to external influences, such as potential customers or business partners. The consequence is that the details of the product properties change quickly and business plans become outdated.

> *Interviewer: "Do you think you learned a lot in the first week of mainly reading documents [after you joined the venture team]?*
> *BD 1: "Yeah, I learned what they have written. The documents are maybe one or two years old sometimes, so I had to ask many things, because a lot of information sits in their heads and they say: 'Oh, yeah, I have written this, but that was a long time ago. I showed this [the product] to the customer and he wants us to change this in the product.'" (BD 1, Firm C)*

As apparent from the quote, taking step to build a first prototype enables the teams to discuss structural details of their product with the customers. With a first tangible or visual product, the socially-created teams structure their projects along different functions or versions, which they want to establish and test with their customers.

This implies within the SMOR that the defined allocative resources in business plan and in the narratives within the team enable the creation of a first product version, a prototype, which the team commonly examines commonly with externals like potential customers. Thereby, they unveil previously unconscious resources and rules of the opportunity structures. The inclusion of potential customers contests the signification and legitimization of the opportunity and discloses their interpretation of the opportunity. For example, the signification and legitimization rules of the opportunity structure embedded in product functions and service properties do not match the understanding of the customers how to put the product in use. This forestalls the establishment of wrong authoritative resources through the customers' misinterpretation. These feedback cycles do not only influence the agency of the team, but also the structural properties

of the opportunity. The agency of socially-created teams identifies ambiguities in the resource and rule composition of the opportunity through listening to customer feedback *(Problematization)*. Instead of trying to resolve the ambiguity with their own skills, the team interacts directly with the external influence, the prospective user, to resolve these ambiguities *(Characterization)*. Socially-created team members are highly extroverted (Big Five), which facilitates their direct communication with their environment. The decision-making process always involves the customers' views and opinions *(Deliberation)*, because the teams are discursively conscious of the customer as authoritative resources to the opportunity.

The empirical data also reveals that the teams recognize the opportunity from milestone to milestone, each of them defining more details of the product through customer feedback. Internally, the teams keep up a closely intertwined work mode between product and business development. Often, team member appear in hybrid roles between product and business development.

> *So, that would be in the beginning a lot of studies to learn. Then the business development and sales, because I wasn't so good at the technical stuff in the beginning. And I developed our business model and so and wrote the text on our website. And when we had the first bigger projects, I started with the technical stuff to help where I could contribute as much as the others on the front-end. And on the project right now, I'm working on the back-end skills as well. (BD 2, Firm F)*

In terms of the SMOR, after the completion of a project milestone, the not only team's agencies have been considerable reshaped through the project, but also the opportunity structure of the entire project has changed. The next project step will consequently proceed in a different structural setting and the given structure limits the team's agencies. Although the process helps building authoritative resources, the opportunity structure is constantly constrained and "out-of-the-structure" ideas are hardly possible. Hence, the team's agency moves gradually into a deadlock of a customer feedback silo through the routinization of feedback.

Process obstacles and consequences. Socially-created teams face three main process obstacles, which impede the opportunity recognition: the misinterpretation of market data, the routinization of feedback cycles, and static team compositions leading to agency constraints. Socially-created teams do not concentrate on the creation and execution of the formal business opportunities. Instead, they create an opportunity through social interactions with the external environment within project-like organizations. The teams, hence, make themselves dependent on the feedback of their identified, potential customers to develop the opportunity. The teams, however, are jeopardized to mix up different customer segments and gain incorrect data.

> *So, we interviewed about 300 players, both football and handball on the highest division and some coaches and some agents. And some ordinary sport fans. Just to hear their opinion on the whole idea. […] But <App> is about handball only at the moment. (COO, Firm C)*

Within the SMOR, socially-created teams attempt to overcome the structural gap between authoritative and allocative resources through the establishment of feedback cycles between the team and the external environment and the close cooperation of product and business development. Arising from a set of rules and resources within the team, the opportunity structure is restructured through gathering data with surveys and interviews with prospective customers, so that the authoritative resource base fits the activation potential of the customers to use the

product later. The feedback from the external environment, however, does not only develop authoritative resources to the opportunity, it also constrains the socially-created teams' agencies. Indeed, the socially-created teams require practical and recursive consciousness of the structural properties to interpret the agency the feedback correctly and to reshape the structural properties accordingly. If the team is unable to interpret the feedback correctly, because the team is not practically or recursively conscious of the structural properties, the opportunity structure will be designed with inappropriate signification or legitimization rules and ill-suited to allocative resources. These will deform, consequently, the authoritative resources and, thus, the opportunity. To gain consciousness, the teams, however, need appropriate feedback from the structure, which finally leads to a paradox: the structure determines the team's consciousness, but the structure might have been determined through an ill-defined agency based on misinterpreted feedback.

Albeit structural circumstances can impede the correct interpretation of the feedback, the empirical data also shows these feedback cycles can become routinized. Socially-created teams learn through feedback from customers. They, however, tend to enquire feedback constantly from similar persons through the same channels in the comparable contexts.

> *And then we have a very tight dialog with our "superusers", because that's what they actually sign when they sign a contract. It's not a really contract. At least, it is a paper that says that 'I will be using <App>]'. Then, it says that they should at least four times a year take part in surveys. (COO, Firm C)*

Within the SMOR, the team tailors the resource base of the opportunity according to the feedback. The subsequent problematizing of ambiguities, thus, occurs only within then-given structural set of rules and resources, which the initial feedback cycles have defined. In particular, when similar or the same individual customers are incorporated in the various feedback cycles as authoritative resources, the feedback cycles become routinized in the structure. Thereby, the team's agency becomes constrained, as the feedback from the same individuals allows neither driving new interpretations nor varying and weighing different viewpoints. Consequently, the teams rather unintentionally confirm than contest the given structural rules and resources of the feedback and build rules and resources that are suitable for this certain group of authoritative resources, who can or cannot be representative for wider group of customers. The agencies of socially-created teams are generally driven through Openness to Experience, Extroversion, and low Neuroticism (Big Five). The teams, thus, do not face difficulties in asking for feedback and openly engaging with the external environment of the opportunity structure embedded in authoritative resources. Through the above-described routinization of the feedback cycles with the external environment, the teams, however, objectively lose their Openness to Experience, since they dive deeper into the opportunity structuration of the specific feedback and start ignoring other rule and resource combinations outside the structure. Asking for feedback and acting upon are subject to Openness to Experience, Extroversion and low Neuroticism. The interpretation of feedback, however, underlies the understanding of human behavior and empathy to reverse the expressed problems and wants of the external environment to the satisfaction of needs through structural rules and resources of a product. Socially-created teams would need higher levels of Sympathy and Altruism (Big Five) to be able to interpret the feedback human-centrically. Despite medium to high values of average Agreeableness among

socially-created teams, the team member underperform in the facets of Sympathy and Altruism. This reflects that the purpose of socially-created venture is firstly well-working social relations among the team members, but not the genuine interest to solve an instant problem for the society. This is also confirmed through generally low levels of Morality with team members.

In addition, the empirical data shows that socially-created teams start as a team of friends and the team composition does not substantially change throughout the opportunity recognition process. The stability of the team composition facilitates internal teamwork and creates a favorable atmosphere.

> *It's important to make the girl at the reception or the other guys feel that they are important, too. That's the first things that the customer experiences when they go to the office. If they are not in a good mood or not at the right place, it's bad for the company and it costs you actually so little to show that person that they are important. You buy them flowers every now and then or a bottle of wine and say: 'Hey, you're doing a great job.' (COO, Firm C)*

Notwithstanding, socially-created teams also acknowledge needs for new team members at peak performance points during the opportunity recognition process. The teams, however, want to hire additional team members to rather reduce the overall workload of the core team than to add new skills sets or new viewpoints to the socially-created team.

> *I think the skill set what we need is what we have. At the moment at least. If we try to scale, then we would need to bring more people to the team. So, we are eventually going to have more designers, because that takes up a lot of time. And we want more developers. Also, photographer are something that we discuss from time to time, if we should hire one or try to become photographers. (Dev, Firm F)*

In the context of the SMOR, the relative stability in the team composition leads to a stable composition of the teams' agencies. Thus, the initial interpretation of feedback from the external environment determines the setup of the rules and resources of the opportunity structure, thereby closing the structure to wider applications of the opportunity structure. The agency is influenced predominantly through interactions with the opportunity structure, in particular the external customer feedback. When identifying ambiguities in the opportunity structure, the *characterization* process resorts to the same basis of common team agency, because the team works closely and transparently together so that disagreements are of minor effects for the agency. Since new members are hired to only reduce the workload, they do not considerably contribute to the team's agency composition, because their opinions are rather neglected. Through this stability in the teams' agency, the opportunity structure can only develop within the agency constraints of the socially-created teams. This narrows down the teams' chances to gain insights "outside-the-box" respectively leaving the given structural boundaries.

Discussions of findings and analysis – Underlying structuration processes

After formulating the opportunity recognition process within socially-created teams and discovery-driven teams, I will first discuss theoretical implications focusing on the interaction points within two structuration processes: first, the structuration of the opportunity structure through social interactions and, second, the structuration of the agency through an interplay with the opportunity structure, representing the learning processes of the team members. I will present generalizing propositions as inferences from the discussions.

Opportunity recognition as structuration between team agency and the opportunity

Both socially-created and discovery-driven teams shape the opportunity structure through modifying the resource or rule basis of the opportunity through their agency. The agency, however, enables the reshaping of only one component at a time. Through the modification of one component, the other structural components transform as well, because all stand in recursive relationships. While the team members assess future consequences of their actions within the deliberation phase, the ability to foresee the forthcoming opportunity structure in all its components depends on the actors' consciousness about the structural components. Thus, the modification of a component can yield unintended consequences for the opportunity structure through the changes in the other components. For example, a material change on the product, a modification of the allocative resources, matches the team members' assessment of customer needs (authoritative resources). However, the customer might reject the product through an inability to decode the value of the product correctly (signification) or to use the product correctly (legitimization). Through the recursive relationships, the newly shaped structure, consequently, bounces back on the agency, which is reshaped likewise; the actors, consequently, assess the structure from a new perspective, limiting and opening new *Problematization* chances. The new structure, however, also limits the agencies in its potential. As a logical consequence of unintended consequences in resource modifications and of the resulting agency constraint through the structure, the structure can never be reversed to its old previous state. Even if full consciousness over all structural components was theoretically be given, a reversely intended modification of a structural component would change all other components again and not necessarily in the reversely intended manner. Therefore, I propose:

Proposition 1: Once one component of the opportunity structure changes, the other components of the opportunity structure are inevitably changed as well, so that new opportunity structure becomes irreversible.

Gaining relative control over the opportunity recognition process to a certain extent, hence, requires attaining practical or recursive consciousness of the structural components of the opportunity structure and a principally correct assessment of the reciprocal influences.

Proposition 2: Entrepreneurial teams can gain control over the opportunity recognition process by attaining practical and recursive consciousness of the structural components of the opportunity.

Attaining practical or recursive consciousness depends on the learning and the cognitive setting of the actors, which are subsequently discussed.

Learning as structuration of the agency

The learning process constitutes the structuration process of reshaping the agents' agencies through structural changes over time and allows the agents to attain consciousness about structural properties. The learning process unfolds through new experiences of the agent within the structural boundaries, which allow the agent to reflect differently on the structure and provide new options to decide and act. On the other hand, the learning process also supersedes previous options to decide and act, because the actors can lose consciousness through the routinization of structural components, such as in the routinization of feedback cycles. Therefore, the learning process helps problematize and identify new ambiguities within the opportunity structure and reshapes the historical information available to the actor. The *deliberation* does not only open

up new theories and futures for the structure, upon which the actors make decisions and execute actions, but also limits previous decision possibilities.

The analysis of the learning curves of the entrepreneurial teams shows that the structuration of agency as learning in the opportunity recognition process depends on three prerequisites: stability of the interpersonal relation, engagement in explorative-progressive activities, and relatable history of team members. An involvement into opportunity-related learning requires set rules within the team, which provide relative stability to enable effective collaborations. Team members are already knowledgeable to a certain degree through previous experiences. This influences the assessment of arising ambiguity and the evaluations of possible consequences of actions. In its essence, the prerequisites of opportunity-related learning require an engagement with the opportunity structure. To develop the agency through learning, the actors receive stimuli by attaining consciousness through social interactions with internal team members and with external influencers, such as consultants, friends, or new stakeholders. In addition, team members with personalities shown in the Big Five with high Conscientiousness (e.g. BD 1, Firm A; COO, Firm C; BD 2, Firm D) tend to learn through interdisciplinary teamwork and the application of literature. Team members (e.g. BD 2, Firm A; Dev, Firm D) with comparably higher Immoderation (the tendency for engaging with short-term cravings) and comparably low Agreeableness (the tendency to be uncooperative and suspicious) do not learn from interdisciplinary teamwork and literature.

The learning process of the team members unfolds through four types of effects: an interdisciplinary aggregation of agencies in the team's agency, interactions with an external but related environment, in-depth project-like activities around the opportunity, and overcoming the gap between theoretical education and practice.

First, team members experience strong learning trajectories, when new team members join the team or interdisciplinary collaborations arise. The agencies of the individual team members merge to the team's total agency and thereby help reshaping the opportunity structure. The team members learn individually through the interaction of the new team agency with the opportunity structure and attain consciousness through the feedback of the opportunity structure. Second, the learning trajectory of the team members increases, when interactions with the external environment occur. New external influences help shaping the authoritative resource basis of the opportunity structure. This recursively affects the team's agency and enables the team members to attain consciousness over more structural components. Third, when team members engage deeply in projects, which can require both skills and experiences in their field and the ability to connect product and business development, the learning trajectories are strong, because the team members attain practical consciousness about details of the opportunity structure through granular modifications and learn to assess consequences of modifications more accurately. Fourth, the team members experience individually strong learning trajectories through transferring theoretical knowledge into practice. Through building cognitive bridges between theory and practice by receiving triggers from the structure, the team members apply the knowledge through their agency on the opportunity structure and experience how the rule and resource structure of the opportunity changes. In summary, I can infer two general propositions:

Proposition 3: Entrepreneurial team members can attain consciousness about properties of the opportunity structure through engaging in interactions with an external but related environment and in-depth project-like activities around the opportunity.

Proposition 4: Entrepreneurial team members with high Conscientiousness can attain consciousness about properties of the opportunity structure through engaging in interdisciplinary activities and study relevant theory.

Concluding discussions

The application of Structuration Theory over the opportunity recognition phenomenon has provided a processual, in-depth analysis of the social interactions in the entrepreneurial teams, the structural propensities of the opportunity, and the composition and effects of agency. Applying the SMOR, the analysis of the opportunity recognition process could provide an in-depth understanding of underlying processes and drivers of opportunity recognition. All these factors inherit several contributions to organizational studies and entrepreneurship studies, which I subsequently discuss and from which I infer general propositions.

First, the analysis has shown that discovery-driven teams drive opportunity recognition in separated, heterogeneous product and business related teams.

Proposition 5a: Discovery-driven teams recognize opportunities in separate business development teams and product development teams.

Discovery-driven teams are often practically or recursively conscious about the allocative resources of the opportunity and their effects on the functionality of the product, because the product development team is experienced and deeply engaged with technology and research. On the contrary, the teams fail achieving high consciousness of the signification and legitimization rules, because the interpretation of the allocative resources of the structure differs among the team members and their different interpretations diffuse the rules, which the potential customers interpret. Thus, one can say that the technology and the product push the structure and the actors.

Proposition 5b: Through structural separation of business and product development, discovery-driven teams are conscious about the structural composition of the allocative resources, but are ineffective to find a match with authoritative resources ("Technology Push").

Proposition 5c: Structural rules for discovery-driven teams are disguised through the separation of business development teams and product development teams.

In contrast, socially-created teams structuralize the opportunity commonly across product and business development and achieve, thereby, higher consciousness of the structural properties.

Proposition 6a: Socially-created teams recognize opportunities in interdisciplinary collaboration across business and product development.

In particular, the consciousness about authoritative resources and the signification and legitimization rules allow the socially-created teams to tailor the allocative resources to the customer interpretation of the opportunity. In line with Shane (2000), prior knowledge of markets and products of the socially-created teams can positively influence their opportunity recognition process. The market feedback, thus, pulls the team within the opportunity structure.

Proposition 6b: Socially-created teams are relatively conscious about the structural composition of the opportunity's rules and resources and structuralize the opportunity through collected customer feedback ("Market Pull").

On the other hand, the practical consciousness about authoritative resources constrains the agency of the socially-created teams, because the structure, which has been built through the specific sample of potential customers, limits the agency. This constructs allocative resources

precisely tailored to the sample of authoritative resources but not apart from those. For example, customer insights of a customer segment create a tailored product and thereby limit the product from the beginning to the specific customer group. On the contrary, the product development of discovery-driven groups is decoupled from the conscious reality of the authoritative resources. They are able to develop allocative resources through a more general, unconscious basis of authoritative resources, while the allocative resources and the agency of socially-created teams are immediately restrained. One could say that socially-created teams are "too conscious" to be innovative and think outside-the-box of the structure. In contrast, discovery-driven teams are more innovative due to their "blatant unconsciousness", which enables to construct variable structures through unconscious product-market mismatches, which one could refer to as failures.

Proposition 6c: Socially-created teams undermine innovativeness through their consciousness about the structural components, which restricts authoritative and allocative resource modifications outside the structural contingencies.

Proposition 5d: Discovery-driven teams' innovativeness is fostered through their unconsciousness about structural components, which provides more options to act.

Consolidating Propositions 5 and 6, both socially-created teams and discovery-driven teams behave paradoxically. On the one hand, the domination of allocative resources and the separation of product and business development distort signification and legitimization rules and the team has difficulties to build authoritative resources (discovery-driven teams). On the other hand, the authoritative resources as customer feedback solely drive the allocative resources of the opportunity structure (socially-created teams). Both team types, however, aim at achieving a product-market fit, an effective combination of authoritative and allocative resources with the corresponding rules. Ineffective and effective opportunity recognition diverge through both a lack of consciousness and a proliferation of consciousness, which can be mediated through learning. Learning, however, occurs only through the changes of the resources or rules of the opportunity. Thus, the team must presume an imperfection of the opportunity to be able to learn. Therefore, agency, which rigidifies the structure over time, can both impede and facilitate the opportunity recognition process. On the one hand, perceived imperfection of rules and resources is required to extract positive learning to achieve effectiveness for the opportunity; on the other hand, too timely discursive consciousness about the structural properties can cause a perpetuating spiral of opportunity recognition within the structural boundaries, unless the actors are practically conscious about their own assumptions (Lumpkin & Lichtenstein, 2005).

Proposition 7: The learning process impedes an effective opportunity recognition process, when prematurely discursive consciousness about structural properties is achieved ("Silo Thinking").

Furthermore, the SMOR analysis could contribute to the understanding of the antecedents of opportunity recognition. Many scholars have isolated prior knowledge of the market, the industry, technology, and customers as antecedent of opportunity recognition (Ardichvili & Cardozo, 2000; Shane, 2000). The analysis of the SMOR, however, suggests that prior experiences and knowledge can undermine the entrepreneurial teams' learning process and routinize structural properties of the opportunity structure in narratives about, for example, customer segments or technical feasibility. On the other hand, prior knowledge can be effective in terms of technical skills enabling the team's technical development or increasing their sales. Hence, in a team context, prior knowledge drives the opportunity recognition process, as long

as recursive or practical consciousness about the assumption of the established narratives is prevalent in the team's agency.

Proposition 8: Prior knowledge positively influences the effectiveness of the opportunity recognition process, as long as team members are able to contest the knowledge-related assumptions.

According to the SMOR, the team members' personalities partially determine the agency to shape the opportunity structure. As suggested by the previous propositions, interactions with the related, external environment, project-like activities, interdisciplinary activities, and theory studies about structural properties can help the entrepreneurial teams recognize opportunities. These propositions partially correspond with certain personality types. The Big Five analysis showed that, in particular, team members of the business development team have high Activity-Level and Friendliness and low values in Neuroticism. These attitudes drive them to engage with the external environment of their venture and help the team build social networks related to their opportunity through proactive, inclusive, and fearless behavior (Johnson, n.d.). In addition, high values in Gregariousness indicate that external networking stimulates the team's thoughts and unveil new insights. This is also strongly connected with showing empathy towards the potential customers (Johnson, n.d.). Overall, product developers often stand out with high values in the facets Self-discipline and Achievement-seeking within the Conscientiousness domain. This implies the ability to immerse themselves into project-like activities and theory studies and reflects with at least one hard-working, excellence-striving team member in all examined teams, who demonstrates the self-motivation to "get things done" and effectiveness and efficiency in their work. On the other hand, the entrepreneurial teams are partially disengaged in interdisciplinary activities through a lack of curiosity towards other fields and a rather self-oriented attitude, which is reflected in medium to low values in Openness to Experiences or low values in the facets of Altruism, Cooperation, and Modesty. These team members require a unifier with high values in the respective facets. The late stage firms in the study have already developed this role over time. As a conclusion, the influences of the personality traits allow inferences about the composition of entrepreneurial teams.

Proposition 9: To increase the effectiveness of the opportunity recognition process, the team members shall combine empathetic, hard-working, extroverted, and cooperative personalities.

Eventually, this study can contribute with several managerial implications. Through the analysis, I suggest that venture team in the team formation phase should focus on attracting both supplementary skills sets and compatible personalities, which encompass empathetic, hard-working, and extroverted personalities. Sufficiently broad samples of customer groups should generate rich data sets of customer insights. Then, customer-centricity should drive the business operations along with a product development aligned to these customer insights but sufficient space to test new ideas. This trade-off can serve as a dominant rationale in the management of ventures. Moreover, I suggest that the entrepreneurial team should focus on conscious learning processes across the product and business development domains and the corresponding implications for the structural rules, for example, by implementing knowledge sharing systems.

Notwithstanding, this study underlies several limitations. The SMOR is a theoretical model based on the evidence of this multi-case study. Therefore, it still lacks larger quantitative foundations, more detailed qualitative considerations of the included steps, and more precise categorizations of actors within the process. In addition, this study relies on only three main data

points (early stage, formative stage, and later stage) of each venture type. The study underlies time and resource constraints that did not allow following ventures along the entire opportunity recognition process. Despite a deeper insight into cognitive domains, the aggregation of agency to the team level still bears the risk that individual factors are undermined. In future research, potential personality developments of the team members should be taken into account and included, which would enable a further disentanglement of the agency component. Future research could test various components of the SMOR in more detail, for example the difference of considering agency on a team level or on an individual level, the influences of the education and experience of team members, the particular process of building authoritative resources, or the influence of financial resources in the opportunity recognition process. In addition, the entrepreneurial processes after opportunity recognition could be analyzed within the SMOR.

References

Alvarez, S. A., & Barney, J. B. (2007). Discovery and Creation: Alternative Theories of Entrepreneurial Action. *Strategic Entrepreneurship Journal*, *1*(1–2), 11–26.

Ardichvili, A., & Cardozo, R. N. (2000). A Model of the Entrepreneurial Opportunity Recognition Process. *Journal of Enterprising Culture*.

Bandura, A. (1989). Human Agency in Social Cognitive Theory. *American Psychologist*, *44*(9), 1175–1184.

Baron, R. A. (2004). Opportunity recognition: A cognitive perspective. In *Academy of Management Proceedings* (pp. A1–A6).

Baron, R. A. (2006). Opportunity Recognition as Pattern Recognition: How Entrepreneurs "Connect the Dots" to Identify New Business Opportunities. *Academy of Management Perspectives*, *20*(1), 104–120.

Baron, R. A., & Ensley, M. D. (2006). Opportunity Recognition as the Detection of Meaningful Patterns: Evidence from Comparisons of Novice and Experienced Entrepreneurs. *Management Science*, *52*(9), 1331–1344.

Baron, R. M., & Kenny, D. A. (1986). The Moderator-Mediator Variable Distinction in Social The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182.

Berends, H., Boersma, K., & Weggeman, M. (2003). The Structuration of Organizational Learning. *Human Relations*, *56*(9), 1035–1056.

Chiasson, M., & Saunders, C. (2005). Reconciling Diverse Approaches to Opportunity Research Using the Structuration Theory. *Journal of Business Venturing*, *20*(6), 747–767.

Corbett, A. C. (2005). Experiential Learning Within the Process of Opportunitiy Identification and Exploitation. *Entrepreneurship Theory and Practice*, *29*(4), 473–491.

Corbin, J. M., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology*, *13*(1), 3–21.

Creswell, J. W. (1998). *Qualitative Inquiry and Research Design: Choosing Among Five Traditions*. London: London : SAGE.

Daspit, J., Justice Tillman, C., Boyd, N. G., & Mckee, V. (2013). Cross-Functional Team Effectiveness. *Team Performance Management: An International Journal*, *19*(1/2), 34–56.

De Koning, A. J. (2003). Opportunity Development: A Socio-Cognitive Perspective. In *Advances in Entrepreneurship, Firm Emergence and Growth* (Vol. 6, pp. 265–314).

De Koning, A. J., & Muzyka, D. F. (1999). *Conceptualizing Opportunity Recognition as a Socio-Cognitive Process*. *SSE/EFI Working Paper Series in Business Administration No 1999:13*.

den Hond, F., Boersma, F. K., Heres, L., Kroes, E. H. J., & van Oirschot, E. (2012). Giddens à la Carte? Appraising Empirical Applications of Structuration Theory in Management and Organization Studies. *Journal of Political Power*, *5*(2), 239–264.

Dimov, D. (2003). The Nexus of Individual and Opportunity: Opportunity Recognition as a Learning Process. In *Frontiers of Entrepreneurship Research* (pp. 410–419).

Dubois, A., & Gadde, L.-E. (2002). Systematic Combining: An Abductive Approach to Case Research. *Journal of Business Research*, *55*(7), 553–560.

Dutta, D. K., Gwebu, K. L., & Wang, J. (2015). Personal Innovativeness in Technology, Related Knowledge and Experience, and Entrepreneurial Intentions in Emerging Technology Industries: A Process of Causation or Effectuation? *International Entrepreneurship and Management Journal*, *11*(3), 529–555.

Eckhardt, J. T., & Shane, S. A. (2003). Opportunities and Entrepreneurship. *Journal of Management*, *29*(3), 333–349.

Eisenhardt, K. M. (1989). Building Theories from Case Study Research. *The Academy of Management Review*, *14*(4), 532–550.

Emirbayer, M., & Mische, A. (1998). What Is Agency? *American Journal of Sociology*, *103*(4), 962–1023.

Englund, H., Gerdin, J., & Burns, J. (2011). 25 Years of Giddens in Accounting Research: Achievements, Limitations and the Future. *Accounting, Organizations and Society*, *36*(8), 494–513.

Fisher, G., Kotha, S., & Lahiri, A. (2016). Changing With the Times: An Integrated View of Identity, Legitimacy, and new Venture Life Cycles. *Academy of Management Review*, *41*(3), 383–409.

Fletcher, D. E. (2006). Entrepreneurial Processes and the Social Construction of Opportunity. *Entrepreneurship and Regional Development*, *18*(5), 421–440.

Flyvbjerg, B. (2006). Five Misunderstandings About Case-Study Research. *Qualitative Inquiry*, *12*(2), 219–245.

Gaglio, C. M. (2004). The Role of Mental Simulations and Counterfactual Thinking in the Opportunity Identification Process. *Entrepreneurship: Theory and Practice*, *28*(6), 533–552.

Gaglio, C. M., & Katz, J. A. (2001). The Psychological Basis of Opportunity Identification: Entrepreneurial Alertness. *Small Business Economics*, *16*(2), 95–111.

Giddens, A. (1984). *The Constitution of Society: Outline of the Theory of Structuration*. Polity Press.

Glaser, B. G., & Strauss, A. L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. *Observations* (Vol. 1).

Grégoire, D. A., Barr, P. S., & Shepherd, D. A. (2010). Cognitive Processes of Opportunity Recognition: The Role of Structural Alignment. *Organization Science*, *21*(2), 413–431.

Gurd, B. (2015). Giddens ' Structuration – Problems and Prognosis in Management Research. In *29th Annual Conference of the Australian and New Zealand Academy of Management* (pp. 1–11).

Herron, L., Sapienza, H. J., & Smith-Cook, D. (1991). Entrepreneurship Theory from an Interdisciplinary Perspective: Volume I. *Entrepreneurship: Theory & Practice*, *16*(2), 7–12.

Järvensivu, T., & Törnroos, J.-Å. (2010). Case Study Research with Moderate Constructionism: Conceptualization and Practical Illustration. *Industrial Marketing Management*, *39*(1), 100–108.

Johnson, J. A. (n.d.). Short Form for the IPIP-NEO (International Personality Item Pool Representation of the NEO PI-R^{TM}). Retrieved May 20, 2017, from http://www.personal.psu.edu/~j5j/IPIP/ipipneo120.htm

Klotz, A. C., Hmieleski, K. M., Bradley, B. H., & Busenitz, L. W. (2014). New Venture Teams: A Review of the Literature and Roadmap for Future Research. *Journal of Management*, *40*(1), 226–255.

Kvale, S. (2006). Dominance Through Interviews and Dialogues. *Qualitative Inquiry*, *12*(3), 480–500.

Langley, A., Smallman, C., Tsoukas, H., & Van De Ven, A. H. (2013). Process Studies of Change in Organization and Management: Unveiling Temporality, Activity, and Flow. *Academy of Management Journal*, *56*(1), 1–13.

Levinthal, D. A., & March, J. G. (1993). The Myopia of Learning. *Strategic Management Journal*, *14*(S2), 95–112.

Lichtenstein, B. B., Lumpkin, G. T., & Shrader, R. C. (2003). Organizational Learning By New Ventures: Concepts, Strategies, and Applications. In *Cognitive Approaches To Entrepreneurship Research* (Vol. 6, pp. 41–56).

Lumpkin, G. T., & Lichtenstein, B. B. (2005). The Role of Organizational Learning in the Opportunity-Recognition Process. *Entrepreneurship Theory and Practice*, *29*(4), 473–491.

Martin, P. Y., & Turner, B. A. (1986). Grounded Theory and Organizational Research. *The Journal of Applied Behavioral Science*, *22*(2), 141–157.

Martins, L. L., Rindova, V. P., & Greenbaum, B. E. (2015). Unlocking the Hidden Value of Concepts: A Cognitive Approach to Business Model Innovation. *Strategic Entrepreneurship Journal*, *9*(2), 99–117.

Mathews, J. (2008). Entrepreneurial Process: A Personalistic-Cognitive Platform Model. *Vikalpa: The Journal for Decision Makers*, *33*(3), 17–35.

McCrae, R. R., & Costa, P. T. (2007). Brief Versions of the NEO-PI-3. *Journal of Individual Differences*, *28*(3), 116–128.

McMullen, J. S., Wood, M. S., & Kier, A. S. (2016). An Embedded Agency Approach to Entrepreneurship Public Policy: Managerial Position and Politics in New Venture Location Decisions. *Academy of Management Perspectives*, *30*(3), 222–246.

Mole, K. F., & Mole, M. (2010). Entrepreneurship as the Structuration of Individual and Opportunity: A Response Using a Critical Realist Perspective. Comment on Sarason, Dean and Dillard. *Journal of Business Venturing*, *25*(2), 230–237.

Murphy, P. J. (2011). A 2 x 2 Conceptual Foundation for Entrepreneurial Discovery Theory. *Entrepreneurship: Theory and Practice*, *35*(2), 359–374.

Orlikowski, W. J. (1992). The Duality of Technology: Rethinking the Concept of Technology in Organizations. *Organization Science*, *3*(3), 398–427.

Park, J. S. (2005). Opportunity Recognition and Product Innovation in Entrepreneurial Hi-Tech Start-Ups: A New Perspective and Supporting Case Study. *Technovation*, *25*(7), 739–752.

Pentland, B. T. (1999). Building Process Theory with Narrative: From Description to Explanation. *Academy of Management Review*, *24*(4), 711–724.

Pryor, C., Webb, J. W., Ireland, R. D., & Ketchen, Jr., D. J. (2016). Toward an Integration of the Behavioral and Cognitive Influences on the Entrepreneurship Process. *Strategic Entrepreneurship Journal*, *10*(1), 21–42.

Ramoglou, S., & Tsang, E. W. K. (2016). A Realist Perspective of Entrepreneurship: Opportunities as Propensities. *Academy of Management Review*, *41*(3), 410–434.

Renko, M., Shrader, R. C., & Simon, M. (2012). Perception of Entrepreneurial Opportunity: A General Framework. *Management Decision*, *50*(7), 1233–1251.

Ries, E. (2011). *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. *Crown Business*.

Sarason, Y., Dean, T., & Dillard, J. F. (2006). Entrepreneurship as the Nexus of Individual and Opportunity: A Structuration View. *Journal of Business Venturing*, *21*(3), 286–305.

Sarasvathy, S. D. (2001). What Makes Entrepreneurs Entrepreneurial? *Harvard Business Review*, (206), 1–9.

Schatzki, T. R. (1997). Practices and Actions: A Wittgensteinian Critique of Bourdieu and Giddens. *Philosophy of The Social Sciences*, *27*(3), 283–308.

Shane, S. (2000). Prior Knowledge and the Discovery of Entrepreneurial Opportunities. *Organization Science*, *11*(4), 448–469.

Shane, S., & Venkataraman, S. (2000). The Promise of Entrepreneurship as a Field of Research. *Academy of Management Review*, *25*(1), 217–226.

Shaver, K. G., & Scott, L. R. (1991). Person, Process, Choice: The Psychology of New Venture Creation. *Entrepreneurship: Theory & Practice*, *16*(2), 23–45.

Shook, C. L., Priem, R. L., & McGee, J. E. (2003). Venture Creation and the Enterprising Individual: A Review and Synthesis. *Journal of Management*, *29*(3), 379–399.

Short, J. C., Ketchen, D. J., Shook, C. L., & Ireland, R. D. (2010). The Concept of "Opportunity" in Entrepreneurship Research: Past Accomplishments and Future Challenges. *Journal of Management*, *36*(1), 40–65.

Soto, C. J., & John, O. P. (2009). Ten Facet Scales for the Big Five Inventory: Convergence with NEO PI-R Facets, Self-Peer Agreement, and Discriminant Validity. *Journal of Research in Personality*, *43*(1), 84–90.

Strike, V. M., & Rerup, C. (2016). Mediated Sensemaking. *Academy of Management Journal*, *59*(3), 880–905.

Trimi, S., & Berbegal-Mirabent, J. (2012). Business Model Innovation in Entrepreneurship. *International Entrepreneurship and Management Journal*, *8*(4), 449–465.

Tsoukas, H., & Chia, R. (2002). On Organizational Becoming: Rethinking Organizational Change. *Organization Science*, *13*(5), 567–582.

Van Maanen, J. (2011). Ethnography as Work: Some Rules of Engagement. *Journal of Management Studies*, *48*(1), 218–234.

van Ness, R. K., & Seifert, C. F. (2016). A Theoretical Analysis of the Role of Characteristics in Entrepreneurial Propensity. *Strategic Entrepreneurship Journal*, *10*(1), 89–96.

Visconti, L. M. (2010). Ethnographic Case Study (ECS): Abductive Modeling of Ethnography and Improving the Relevance in Business Marketing Research. *Industrial Marketing Management*, *39*(1), 25–39.

Volkmann, C., Tokarski, K. O., & Ernst, K. (2012). *Social Entrepreneurship and Social Business - An Introduction and Discussion with Case Studies*. *Springler Gabler*. Wuppertal.

Walsham, G. (2006). Doing interpretive research. *European Journal of Information Systems*, *15*(3), 320–330.

Ward, T. B. (2004). Cognition, creativity, and entrepreneurship. *Journal of Business Venturing*, *19*(2), 173–188.

Watson, T. J. (2011). Ethnography, Reality, and Truth: The Vital Need for Studies of "How Things Work" in Organizations and Management. *Journal of Management Studies*, *48*(1), 202–217.

Whittington, R. (2010). Giddens, Structuration Theory and Strategy as Practice. In *Cambridge handbook of strategy as practice* (pp. 109–126).

Yin, R. K. (1981). The Case Study Crisis: Some Answers. *Administrative Science Quarterly*, *26*(1), 58–65.

Appendix

TOTAL RESULTS

Domain	Low%	Medium%	High%	Description of Low Levels	Description of High Levels
Extraversion	7,69%	15,38%	76,92%	Quite, passive, deliberate, unsocial	Engaged w/ external world, Energetic, Positive
Agreeableness	23,08%	61,54%	15,38%	Self-interested, Skeptic, Suspicious	Considerate, Helpful, Believe in others' honesty
Conscientiousness	15,38%	38,46%	46,15%	Low ambitions, short-lived pleasures	Cautious, Perceived as intelligent, Avoid Trouble, Stuffy
Neuroticism	76,92%	23,08%	0,00%	Hard to upset, Emotionally stable	Negative feelings (Anxiety, Anger), Emotionally reactive
Openness to Experience	15,38%	46,15%	38,46%	Straight-forward, Conservative, Skeptical	Intellectual, Curious, Artsy, Individualistic

DISCOVERY-DRIVEN TEAMS

Domain	Low%	Medium%	High%	Description of Low Levels	Description of High Levels
Extraversion	0,00%	16,67%	83,33%	Perceived as distant, Reserved	Like others, Easy finding friends, Intimate Relationships
Agreeableness	16,67%	83,33%	0,00%	Avoid large crowds, Like privacy	Stimulation and Rewards through others' company
Conscientiousness	16,67%	33,33%	58,06%	Not talkative, Led other's control	Speak out, Take charge, Leaders in groups
Neuroticism	66,67%	33,33%	0,00%	Slow-paced and relaxed life	Fast-paced life, Energetic, Vigorous
Openness to Experience	0,00%	66,67%	33,33%	Dislike noise, Not thrill-seeking	Easily bored, Risk-taking, Thrill-seeking

SOCIALLY-CREATED TEAMS

Domain	Low%	Medium%	High%	Description of Low Levels	Description of High Levels
Extraversion	14,29%	14,29%	81,40%	Prone to energetic, high spirits	Positive emotions (Happiness, Optimism, Enthusiasm)
Agreeableness	28,57%	42,86%	37,84%	See others' as selfish and devious	Believe in others' fairness, honesty, good intentions
Conscientiousness	14,29%	42,86%	48,84%	More guarded, Don't reveal whole truth	Candid, Frank, Sincere, Easy to relate to
Neuroticism	85,71%	14,29%	0,00%	Help as imposition, Feel no need to help	Rewarding to help others, Self-fulfilment in help
Openness to Experience	28,57%	28,57%	56,76%	Intimidating to get their way	Dislike confrontations, Willing to compromise

Facet	Low %	Medium %	High %	Description of Low Levels	Description of High Levels
Friendliness (E)	7,69%	23,08%	69,23%	Perceived as distant, Reserved	Like others, Easy finding friends, Intimate Relationships
Gregariousness (E)	7,69%	30,77%	61,54%	Avoid large crowds, Like privacy	Stimulation and Rewards through others' company
Assertiveness (E)	0,00%	53,85%	46,15%	Not talkative, Led other's control	Speak out, Take charge, Leaders in groups
Activity Level (E)	7,69%	15,38%	76,92%	Slow-paced and relaxed life	Fast-paced life, Energetic, Vigorous
Excitement-Seeking (E)	23,08%	53,85%	23,08%	Dislike noise, Not thrill-seeking	Easily bored, Risk-taking, Thrill-seeking
Cheerfulness (E)	7,69%	38,46%	53,85%	Prone to energetic, high spirits	Positive emotions (Happiness, Optimism, Enthusiasm)
Trust (A)	7,69%	38,46%	53,85%	See others' as selfish and devious	Believe in others' fairness, honesty, good intentions
Morality (A)	30,77%	53,85%	15,38%	More guarded, Don't reveal whole truth	Candid, Frank, Sincere, Easy to relate to
Altruism (A)	23,08%	38,46%	38,46%	Help as imposition, Feel no need to help	Rewarding to help others, Self-fulfilment in help
Cooperation (A)	7,69%	38,46%	53,85%	Intimidating to get their way	Dislike confrontations, Willing to compromise
Modesty (A)	53,85%	38,46%	7,69%	Feel better than others, Self-esteem	Feel not better than others, possibly low self-confidence
Sympathy (A)	30,77%	46,15%	23,08%	Justice-driven, Objectively judging	Tenderhearted, Compassionate
Self-Efficacy (C)	23,08%	38,46%	38,46%	Feel ineffective and uncontrolled	Intelligent, Driven, Self-controlled, Confidence in abilities
Orderliness (C)	23,08%	30,77%	46,15%	Disorganized, Scattered	Well-organized, Routinized life, Planning
Dutifulness (C)	46,15%	30,77%	23,08%	Dislike rules, Unreliable	Sense of duty and obligation
Achievement-Seeking (C)	0,00%	46,15%	53,85%	Optimizing work effort, Lazy	Excellence-striving, Single-minded, Workaholics
Self-Discipline (C)	7,69%	38,46%	53,85%	Procrastinate, Poor follow-through	Self-discipline, Persistence, Hard to distract
Cautiousness (C)	38,46%	15,38%	46,15%	Impulsive decisions, No long deliberation	Considerate, Take time for decisions
Anxiety (N)	53,85%	46,15%	0,00%	Calm, Fearless	Feel endangered, Fearful, Tense, Nervous
Anger (N)	53,85%	38,46%	7,69%	Don't get angry easily	Resentful and bitter when being cheated, Feeling angry
Depression (N)	69,23%	30,77%	0,00%	Free from depressive feelings	Feel sad, dejected, discouraged, Lack energy
Self-Consciousness (N)	76,92%	7,69%	15,38%	Don't feel observed, being judged	Feel Embarrassed, ashamed, Perceived as exaggerating
Immoderation (N)	38,46%	30,77%	30,77%	No strong cravings, Short-term pleasures, Overindulge	Strong cravings, Short-term pleasures, Overindulge
Vulnerability (N)	46,15%	38,46%	15,38%	Poised, Clear thinker in stress, confident	Panic, Confusion, Helplessness under pressure
Imagination (O)	30,77%	53,85%	15,38%	Facts-based	Using fantasy to create richer, more interesting world
Artistic Interest (O)	23,08%	61,54%	15,38%	Lack aesthetic sensitivity	Absorbed, interested in arts and nature
Emotionality (O)	30,77%	46,15%	23,08%	Low awareness of emotions, Closed	Awareness of own feelings, Express emotions
Adventurousness (O)	7,69%	23,08%	69,23%	Change uncomfortable, Familiar routines	Explorers, Up for new activities, Curious
Intellect (O)	15,38%	46,15%	38,46%	People-focused, Intellectually disengaged	Open-minded, Like intellectual issues
Liberalism (O)	7,69%	46,15%	46,15%	Conservative, Safety, Security	Like ambiguity, chaos, Rule-breaking, Challenge status

(E) Facets of Extraversion
(A) Facets of Agreeableness
(C) Facets of Conscientiousness
(N) Facets of Neuroticism
(O) Facets of Openness to Experience

Source: Internet-based, freely accessible test under
http://www.personal.psu.edu/~j5j/IPIP/ipipneo120.htm