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Opportunity Recognition Processes in Entrepreneurial Founder Teams: The Development of Originality and Business Value across Business Opportunities

Thomas Koch

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Vorsitzender: Prof. Dr. Dr. Holger Patzelt

Prüfer der Dissertation: 1. Prof. Dr. Nicola Breugst

2. Asst. Prof. Dr. Anne Domurath

Wilfrid Laurier University, Canada

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ABBREVIATIONS

BEST   Building Entrepreneurial Success Teams

BO   Number of business opportunities

BS   Boundary spanning

BV   Business value

cf.   Confer (compare)

COH   Cohesion

e.g.   Exempli gratia (for example)

ERI   Entrepreneurship Research Institute

et al.   Et alii (and others)

EXP   Entrepreneurial experience

FIML   Full information maximum likelihood estimation

HI   High-tech industry

HLM   Hierarchical linear modeling

ICC   Intraclass correlation coefficient

i.e.   Id est (that is)

OR   Originality

s.d.   Standard deviation

TS   Team size

TE   Technological experience

TUM   Technical University of Munich

VIF   Variance inflation factor

ABSTRACT

Understanding opportunity recognition is a core part of entrepreneurship research. However, research has not yet investigated how successively developed business opportunities by entrepreneurial founder teams unfold over time in terms of creativity. This thesis examines the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality as well as the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value. Additionally, the impacts of human and social capital components on these relationships are analyzed. Based on an experiment conducted with entrepreneurial founder teams, hierarchical linear modeling results indicate that team size, entrepreneurial experience, boundary spanning, and cohesion reinforce or attenuate the main effects. This dissertation contributes to research on opportunity recognition, creativity, human capital, and social capital.

Keywords: entrepreneurship; opportunity recognition; new venture idea; entrepreneurial founder team; creativity; human capital; social capital

ZUSAMMENFASSUNG

Das Verständnis von Opportunity Recognition ist ein zentraler Bestandteil der Forschung zu Unternehmertum. Jedoch hat die Forschung bisher nicht untersucht, wie sich nacheinander entwickelte Geschäftsideen von unternehmerischen Gründerteams über die Zeit mit Bezug auf Kreativität entfalten. Diese Studie untersucht die Beziehung zwischen der Originalität einer vorher entwickelten Geschäftsidee und einer nachfolgend entwickelten Geschäftsidee, sowie die Beziehung zwischen dem Business Value einer vorher entwickelten Geschäftsidee und einer nachfolgend entwickelten Geschäftsidee. Zudem werden die Auswirkungen von Human- und Sozialkapitalkomponenten auf diese Beziehungen analysiert. Basierend auf einem mit unternehmerischen Gründerteams durchgeführten Experiment zeigen Ergebnisse mit Hierarchisch Linearer Modellierung, dass Teamgröße, unternehmerische Erfahrung, Boundary Spanning und Zusammenhalt die Haupteffekte stärken oder schwächen. Diese Dissertation trägt zu Forschung in den Bereichen Opportunity Recognition, Kreativität, Humankapital und Sozialkapital bei.

Schlagwörter: Unternehmertum; Opportunity Recognition; New Venture Idea; Unternehmerische Gründerteams; Humankapital; Sozialkapital

1 INTRODUCTION

1.1 Setting the stage

Research on entrepreneurship has no long tradition as a field. Even if the concept of entrepreneurship, a corresponding economic meaning, and the importance of the entrepreneur for economic development were already brought up in the 18th century by Cantillon (2001)[1], a broader discussion did not evoke before the 19th century. The discussion on the importance of entrepreneurship expanded from Europe to the United States during the rising importance of the United States in various industry sectors in that period. Economists like Francis Walker, Frederick Hawley, and Frank Knight gave the topic a new dynamic (Cornelius, Landström, & Persson, 2006). It was then Schumpeter (1997) in his seminal work "Theorie der Wirtschaftlichen Entwicklung" in 1912 who argued that creative destruction induced through innovative entrepreneurs is a driver for economic change and development.

Nowadays, entrepreneurship plays a central role for economic growth (Baumol & Strom, 2007; Hessels & van Stel, 2011), since it increases competition, promotes diversity, and is a mechanism for knowledge spillovers (Audretsch & Keilbach, 2010). Especially innovative firms are crucial for economic prosperity as they contribute to productivity growth (Decker, Haltiwanger, Jarmin, & Miranda, 2014). Entrepreneurial teams are important for the foundation of innovative new ventures (Ripsas & Tröger, 2015; Ruef, Aldrich, & Carter, 2003), because individuals do not develop their opportunities isolated from other individuals, but want to discuss, refine, and exchange their thoughts with others (Dimov, 2007). However, the relevance of the entrepreneurial founder team did not come under particular scrutiny before the 1990s as mentioned by Cooney (2005). Kamm, Shuman, Seeger, and Nurick (1990) were one of the first highlighting the importance of teams in entrepreneurial research. The necessity for a shift from the analysis of the single entrepreneur to team dimensions of entrepreneurship were underpinned by the fact that "the vast majority of new ventures are founded and led by teams, rather than by individuals" (Klotz, Hmieleski, Bradley, & Busenitz, 2014, p. 227), also mentioned by West (2007) and supported by empirical studies in the context of German innovation-based ventures (Ripsas & Tröger, 2015). Taken together, "there is strong support for the conclusion that teams are more

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[1] Originally published by Cantillon in 1755

often involved in the creation of high growth potential entrepreneurial ventures, than the apocryphal sole entrepreneur" (Carland & Carland, 2012, p. 71).

In order to found a start-up, entrepreneurial teams first need to develop or recognize business opportunities (Baron, 2006; Shane & Venkataraman, 2000). Moreover, even after the foundation of a company, opportunity recognition may remain a key task for many entrepreneurial founder teams, because access to new information may induce the development of further business opportunities (Grégoire, Barr, & Shepherd, 2010). Creativity as a concept may play a significant role in this process (Amabile, 1988). In general, it describes ideas that are novel or original and useful (Amabile, 1988; Oldham & Cummings, 1996; Shalley, 1991; Zhou & George, 2001). Novel or original ideas are unique in comparison to existing ideas. Useful ideas generate some kind of value to the person, team, or organization in the short or long term who generated the idea (Shalley, Zhou, & Oldham, 2004).

Creativity is an important part of the entrepreneurial process in general (Perry-Smith & Coff, 2011), but it has been seen as particularly relevant for opportunity recognition (Hansen, Lumpkin, & Hills, 2011), since "one of the persisting and most intuitive notions in entrepreneurship is that the recognition of opportunities is, inherently, a creative process" (Dimov, 2007, p. 723). Business opportunities are a necessary building block to understand the entrepreneurial process, because by definition, entrepreneurs need to discover, evaluate, and exploit opportunities as part of the entrepreneurial process (Shane & Venkataraman, 2000).

A very well known entrepreneurial founder team offering music - rock, beat, pop (Hargadon, 2006) - as a product, needed to develop business opportunities repeatedly during their whole career: The Beatles, founded in 1960. John Lennon, Paul McCartney, George Harrison, Pete Best and Stuart Sutcliffe as founding team members lived on their creativity and song writing capabilities. For most of their songs, they complemented each other's musical ideas and challenged each other to adapt and improve song texts (Sobel, 2006). For instance, John Lennon described the development of the song "Michelle" the following way:

> *"I wrote the middle eight of Michelle, one of Paul's songs. [...] That's what made me think of the middle eight. My contribution to Paul's songs was to add a little bluesy edge to them. Otherwise "Michelle" is a straight ballad. He provided a lightness, an optimism while I would always go for sadness, the discords, the bluesy notes" ("The Beatles anthology," 2000, p. 197).*

Accordingly, the founding team members worked together on their opportunities, even if especially Lennon and McCartney were very dissimilar concerning their way of working (Sobel, 2006). The Beatles illustrated various features being relevant in the context of entrepreneurial teams, the process of opportunity recognition, and creativity. First, while playing in the clubs of Hamburg and Liverpool, they teamed up and laid the foundation of allowing each team member to be innovative in the environment of the group (Clydesdale, 2006; Sobel, 2006). Second, the creative act of composing a song was not a specific, static event, but "their creative improvements were a process of gradual continuous improvement over time" (Clydesdale, 2006, p. 137). Thus, the process-related development played an important role for The Beatles' creative output. This is in accordance with Dimov's (2007) description of opportunity recognition as a creative process. Third, their music is in line with the definition of creativity. They initially followed different music styles by looking out for other artists (Clydesdale, 2006), but then quickly left their mark on the advancement of Rock and Roll and created their own, distinctive, new sound (Hargadon, 2006), affirming the aspect of originality. For instance, the song "A Day in the Life" was based on two complete separate songs initiated by Lennon and McCartney (Shenk, 2014). Additionally, the songs generated value to The Beatles by making them successful (Clydesdale, 2006) in a similar way how the development of entrepreneurial opportunities can contribute to the success of entrepreneurial ventures.

Despite the importance of creativity for the recognition of business opportunities, the topic and the interplay between creativity and opportunity recognition have not been sufficiently researched by scholars (Gielnik, Frese, Graf, & Kampschulte, 2012). So far, empirical results for the influence of creativity on opportunity recognition are mixed. For instance, DeTienne and Chandler (2004) find a positive relationship between creativity and opportunity recognition, whereas Hansen, Lumpkin et al. (2011) only detect a relationship between creativity and opportunity recognition for incubation and elaboration based on a five-dimensional model consisting of preparation, incubation, insight, evaluation, and elaboration.

The purpose of this thesis is to contribute to research on entrepreneurial founder teams' opportunity recognition processes and the role of creativity within these processes. It examines the relationships between successively developed business opportunities of entrepreneurial founder teams in terms of creativity and factors that might impact these relationships. I thereby focus on bringing together the role of entrepreneurial founder teams and creativity in opportunity recognition addressing a call by Busenitz, Plummer, Klotz, Shahzad, and Rhoads (2014, p. 994) who encourage researchers to shed more light on the interplay between entrepreneurial founder

teams and business opportunities because "the role of individuals and teams seems critical to better understanding the discovery and development of new opportunities" and by Davidsson (2015, p. 688) who has asked for a clearer view on "Which Actors are most likely to identify New Venture Ideas?".

The remainder of this chapter is organized as follows. In section 1.2, I provide a brief description of the focus of this thesis and outline the research questions I intend to answer. In section 1.3, I present the data set and methodology applied. In section 1.4, I outline the structure of this thesis.

1.2 Focus of this thesis and research questions

Entrepreneurship and especially opportunity recognition is not conducted isolated from the social environment and is no static event, but is a social process incorporating several individuals and requiring time (Amabile, 1983; Dimov, 2007). More specifically, recognizing business opportunities is a process: different opportunities evolve over time. In the real world, this process might take a long time period and might even accompany a firm over its entire lifespan. But even in a specific opportunity recognition task, not only one but several business opportunities are likely to be developed. Research provides a *learning perspective* (Dimov, 2007) and a *componential perspective* (Amabile, 1983, 2012) theoretically illustrating how this process might take place, without indicating if later business opportunities are better or worse as compared to early business opportunities. First, from a learning perspective, entrepreneurs individually start generating a business opportunity (intuiting), then explain the opportunity to others (interpreting) and, finally, try to arrive at a shared understanding regarding the opportunity among the group (integrating). Second, the componential perspective is more concentrated on the individual. Entrepreneurs develop business opportunities with the help of their domain-relevant skills, creativity-relevant processes, task motivation, and the surrounding environment. Only the last component, surrounding environment, is outside the individual and describes the social environment which may either block or stimulate the development of business opportunities.

An acknowledged indicator to measure the quality of ideas[2] is creativity (Rietzschel, Nijstad, & Stroebe, 2007). In general, creative ideas "(1) […] are novel or original and (2) they are potentially relevant for, or useful to, an organization" (Oldham & Cummings, 1996, p. 608).

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[2] The notion *idea* is used here because the topic is creativity in general and there is no specific focus on entrepreneurial opportunity recognition

Since this thesis is concentrated on the entrepreneurial environment, it measures creativity by two distinct components being relevant for entrepreneurial founder teams, originality and business value. Originality determines the uniqueness of a business opportunity (Amabile, 1983), being of interest for the entrepreneur in order to exploit it. Business value determines the usefulness of the business opportunity to the entrepreneur. It describes the business opportunity's utility (Girotra, Terwiesch, & Ulrich, 2010), i.e., an adequate probability of profitability (Spörrle, Breugst, & Welpe, 2009; Welpe, Spörrle, Grichnik, Michl, & Audretsch, 2012) and its feasibility.

Reviewing the existing literature on creativity (Paulus & Dzindolet, 1993; Rietzschel, Nijstad, & Stroebe, 2006) shows that in many cases interactive groups are compared to nominal groups in terms of creativity. Interactive groups work together to generate ideas, whereas in nominal groups individuals work first alone and at the end of the process developed ideas are pooled (Rietzschel et al., 2006). Generally, interactive groups generate fewer original ideas as compared to nominal groups (Rietzschel et al., 2006). This creativity literature compares different idea generation possibilities, but disregards the development of the ideas' creativity across time. However, for an entrepreneurial founder team it is not only important why some individuals or groups recognize business opportunities whereas others do not (Shane & Venkataraman, 2000), but it should be important to understand if developed business opportunities are better in terms of originality and business value at the beginning of an opportunity recognition process or at its end. If the first developed business opportunities are associated with the highest assessment of originality and business value, such a process can be of short time. On the other side, if assessments become better for later business opportunities, the founder team members need to stay concentrated for a long time span and constantly aim at further developing their ideas. To represent the process of opportunity recognition, I specifically focus on the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality as well as on the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value.

As important as a better understanding how business opportunities develop in terms of originality and business value across time is a deeper comprehension regarding characteristics that may influence these developments. For the entrepreneurial founder team, it might be of interest to better understand which factors may influence the development of the business opportunities' creativity in opportunity recognition tasks (Zhou & Rosini, 2015) in order to better appreciate the influence of (team) characteristics on opportunity recognition in the own founder team.

Scholars have been advocated that human and social capital might be important influencers for opportunity recognition (Davidsson & Honig, 2003). Literature suggests various human and social capital components that may influence opportunity recognition (Bhagavatula, Elfring, van Tilburg, & van de Bunt, 2010; Burt, 2004; Davidsson & Honig, 2003; Ucbasaran, Westhead, & Wright, 2009; Zhou & Rosini, 2015). First, human capital, the stock of knowledge and skills incorporated in an individual (Becker, 1993), can be divided into a quantitative and a qualitative part (Ucbasaran, Lockett, Wright, & Westhead, 2003). As to the quantitative part, *team size* describes the number of individuals being part of an entrepreneurial founder team. Regarding the qualitative part, *entrepreneurial experience* is specifically relevant for an entrepreneurial founder team. It represents an essential human capital characteristic in the context of entrepreneurship (Delmar & Shane, 2006) as it provides the necessary information in order to recognize business opportunities (Shepherd, Douglas, & Shanley, 2000), assists in developing cognitive frameworks to recognize specific patterns (Baron & Ensley, 2006), and allows generating a distinct entrepreneurial mindset (McGrath & MacMillan, 2000). Second, social capital is the goodwill which is available to individuals or groups in their social relations (Adler & Kwon, 2002). It can be divided into external aspects, focusing on direct and indirect links teams or individuals have to other individuals in the external social network, and internal aspects, focusing on the relationships of individuals within their group (Adler & Kwon, 2002; Burt, 2004; Gittell & Vidal, 1998). As to the external aspect, *boundary spanning* describes the activities a team conducts to get support and resources from its environment (Faraj & Yan, 2009). For the entrepreneurial founder team, this environment might be investors, business networks, or other entrepreneurial founder teams. Regarding the internal aspect, *cohesion* describes the commitment entrepreneurial founder team members have to a specific group task (Goodman, Ravlin, & Schminke, 1987). For the entrepreneurial founder team, such a group task might be to develop business opportunities with respect to a specific topic.

Previous literature analyzed these team characteristics in the majority of cases with reference to some measure of venture performance. For team size, some academics found a positive impact on performance, others did not find any positive influence (Amason, Shrader, & Tompson, 2006; Sine, Mitsuhashi, & Kirsch, 2006). The same conclusion holds for the impact of entrepreneurial experience on performance (Delmar & Shane, 2006; Shane & Stuart, 2002). As to social capital, boundary spanning provides mixed evidence with reference to performance. Depending on the operationalization of the concept, boundary spanning has a positive or no impact on performance (Davidsson & Honig, 2003; Faraj & Yan, 2009). Most previous research has

found cohesion to be positively related to performance (Beal, Cohen, Burke, & McLendon, 2003; Mullen & Copper, 1994). As can be seen, while previous research has not unequivocally connected human and social capital to performance, it still has highlighted its importance for team processes (Adler & Kwon, 2002; Davidsson & Honig, 2003). Therefore, the impact of both components on the creative process of opportunity development by entrepreneurial founder teams will be in the focus of this study.

At the same time, from a more methodological perspective, the concentration on the development of business opportunities implies the possibility to analyze data on the *new venture idea level* (Davidsson, 2015), allowing "to make a unique and worthwhile contribution to entrepreneurship research" (Davidsson & Wiklund, 2001, p. 89). The advantage of the new venture idea level lies in its construct clarity and easy operability and my study benefits from the theoretical precision connected to this approach which was suggested as a "more fruitful design […] for empirical investigation" (Davidsson, 2015, p. 676).

To sum up, recent calls from scholars for research on the interplay between entrepreneurial teams and business opportunities (Busenitz et al., 2014) and a better understanding of the process of opportunity recognition (Davidsson, 2015) show that these topics are currently largely neglected in entrepreneurship research. Specifically, the development of business value and originality assessments across business opportunities in an opportunity recognition task is not adequately understood. A better understanding of these processes is a key insight for an entrepreneurial founder team to better appraise if earlier or later developed business opportunities are relevant. Besides, it might be of interest to get a more precise impression if originality and business value go into the same direction across opportunities or if they are opposing. Moreover, research does not understand which team characteristics might influence the process of opportunity recognition. In this regard, concentrating on the process of opportunity recognition and human as well as social capital components which might impact this process can increase the understanding of opportunity recognition in entrepreneurship. More specifically, team size, entrepreneurial experience, boundary spanning, and cohesion might impact the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality in a different way than the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value. Hence, they need to be considered separately (Perry-Smith & Coff, 2011). In an attempt to close these research gaps, I raise the following research questions in this thesis:

(1)   How does the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality develop in an entrepreneurial founder team's opportunity recognition task?

(2)   How does the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value develop in an entrepreneurial founder team's opportunity recognition task?

(3)   How do team size, entrepreneurial experience, boundary spanning, and cohesion impact the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality and the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value?

In addressing these research questions, I build on the associative theory of creativity (Mednick, 1962) as general theoretical framework which postulates that for any concept, there is a number of associations that can be ordered according to their associative strength. Furthermore, I draw on human and social capital literature in order to investigate the role of team size, entrepreneurial experience, boundary spanning, and cohesion on opportunity recognition processes. Doing so, my argumentation results in an elaborate model how creative ideas are generated across the development process (Benedek & Neubauer, 2013) in the entrepreneurial context.

The objective of this thesis is to enhance knowledge being simultaneously relevant for scholars and for practitioners. I contribute to research on opportunity recognition by providing a benchmark study design offering the possibility of longitudinal, multilevel analyses and the specific inspection of the venture idea level. Furthermore, the study design allows concentrating on the early stages of economic activity (Davidsson, 2003, 2015; Davidsson & Wiklund, 2001), where entrepreneurship may contribute most to the broader research fields of economics and organizations (Davidsson, 2015). I also contribute to the literature on opportunity recognition processes by motivating the introduction of originality and business value as the two creativity components to assess business opportunities and provide evidence for their negative relationship (Diehl & Stroebe, 1987; Girotra et al., 2010). Additionally, I add to research on human and social capital by offering insights with respect to the role of specific entrepreneurial founder team characteristics in the opportunity recognition process (Adler & Kwon, 2002; Ucbasaran

et al., 2003). From a practical perspective, this study helps entrepreneurial founder teams and (potential) investors to consider important facets of opportunity recognition processes.

1.3 Data set and methodology

This thesis is part of the *Building Entrepreneurial Success Teams (BEST)* study at the Entrepreneurship Research Institute at Technische Universität München (TUM). It is the third *BEST* research project, *BEST III*, and like the two previous projects, it also focuses on entrepreneurial founder teams. Under the leadership of Professor Dr. Dr. Holger Patzelt (TUM), Professor Dr. Nicola Breugst (TUM) and Prof. Dr. Marc Gruber (Ecole polytechnique fédérale de Lausanne (EPFL)), the operational research team - Inga vom Holtz, Manuel Braun, and myself – conducted an experiment with 116 entrepreneurial founder teams between January 2014 and February 2015. The objective of the *BEST III* study was to shed light on the opportunity recognition in entrepreneurial founder teams including several different topics and approaches. To understand intra-team processes, only entrepreneurial founder teams involving all founders participated in the study. As core part of the experiment, each entrepreneurial founder team was observed while developing business opportunities with respect to the implementation of a new technology. Hence, the research team was able to gradually analyze the entire process of opportunity recognition including the development of each individual business opportunity in the order in which the entrepreneurial teams came up with each of the opportunities.

My study on opportunity recognition processes is a quantitative study with the purpose to test theory (e.g., Mednick's (1962) associative theory of creativity), make predictions, and generalize findings based on the sample incorporated in the analyses at hand. The development of opportunity recognition processes as well as factors influencing those processes are a key component of the topic of opportunity recognition (Davidsson, 2003). Therefore, understanding the interplay between entrepreneurial teams and developed business opportunities is crucial for entrepreneurship research (Busenitz et al., 2014). Accordingly, I concentrate on subsequently developed business opportunities and team level characteristics which might influence the development of these business opportunities. Since this procedure comprises two levels of analysis – 1279 business opportunities nested in 116 entrepreneurial founder teams - I employ hierarchical linear modeling (Aguinis, Gottfredson, & Culpepper, 2013; Hox, 2010) in order to analyze the data. Chapter 3 of this thesis provides more detail on the research setting and methodology of this study. The next section gives an overview of this thesis' structure.

1.4   Structure of this thesis

Having described the focus and research questions of this thesis, I subsequently outline the structure and content of each chapter.

Chapter 2 illustrates the theoretical foundations of this thesis. First, I focus on opportunity recognition processes at the team level and describe the role of creativity and more specifically originality and business value in opportunity recognition. Moreover, I provide details on the role of human and social capital in opportunity recognition processes. Second, I derive my hypotheses on the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality and between a prior business opportunity's business value and a subsequent business opportunity's business value. Additionally, I derive hypotheses how the moderators impact the main effects.

Chapter 3 concentrates on describing the methodology of this thesis. I elaborate on the recruiting of the sample and describe the sample's characteristics. Furthermore, I provide details on the experiment and its procedure. Afterwards, I depict the coding and rating of the data, the variables and measures used, and specify the methodology applied to test the hypotheses.

Chapter 4 is dedicated to the results. After providing an overview of recognized business opportunities, results for the experimental manipulation check are presented. Then, individual hypotheses for originality and business value are tested. Moreover, I modify regression specifications and present two robustness checks.

Chapter 5 comprises a synthesis of the results, followed by theoretical and practical implications. Afterwards, I describe the limitations of this thesis, highlight avenues for future research and draw some conclusion.

2 THEORETICAL FOUNDATIONS

The theoretical context of this thesis lies in the topics of entrepreneurial founder teams, the development of creativity of business opportunities in an opportunity recognition task, and the impact of human and social capital aspects on the creativity of developed business opportunities. To begin with, I provide an introduction of the research on opportunity recognition processes at team level (section 2.1), followed by an overview of the role of originality and business value in opportunity recognition (section 2.2). The role of human and social capital in opportunity recognition processes is subsequently illustrated in section 2.3. Finally, in section 2.4, I develop hypotheses for the dependent variables originality and business value.

2.1 Opportunity recognition processes

In the recent literature on entrepreneurship, academics draw attention to the investigation of the entrepreneurial founder team in various dimensions (Schjoedt, Monsen, Pearson, Barnett, & Chrisman, 2013). An entrepreneurial founder team is defined in this thesis as "two or more individuals who have a significant financial interest and participate actively in the development of the enterprise" (Cooney, 2005, p. 229). All individuals participating in the experiment for this thesis were founding team members of their start-up[3]. This section first argues why a consideration of the entrepreneurial founder team is relevant and why this kind of team is different from corporate top management teams (TMTs). Second, the motivation to examine the field of opportunity recognition is provided. Lastly, the team level consideration of opportunity recognition is explained and a rationale for the process examination of opportunity recognition illustrated.

Entrepreneurial founder teams in entrepreneurship

Academic research on entrepreneurship traditionally focuses on individual founders in the context of opportunity recognition (Baron, 2007; Klotz et al., 2014) and their role as "heroes of successful ventures" (Lim, Busenitz, & Chidambaram, 2013, p. 47). For example, Shane (2000) concentrates on the individual entrepreneur's recognition of business opportunities based on a technological innovation. On a theoretical level, Bhave (1994) focuses on the individual in his model on internally and externally stimulated opportunity recognition. Ardichvili, Cardozo, and

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[3] See section 3.2.1 for a more detailed definition of the entrepreneurial founder team

Ray (2003) propose a theory for the opportunity development process focusing on the individual serial entrepreneur. They build on Dubin's (1978) theory and identify personality traits, social networks, and prior knowledge as relevant conditions for an entrepreneur's alertness to business opportunities. Experiential learning as an important part of the opportunity recognition process for the individual entrepreneur was mentioned by Corbett (2005).

Although Kamm et al.'s (1990) study on "Entrepreneurial Teams in New Venture Creation" attempted to shift the focus from the individual entrepreneur to the entrepreneurial founder team, the entrepreneurial literature remained focused on the individual entrepreneur until recently, as mentioned in the previous paragraph. The recent shift to the analysis of the entrepreneurial founder team has several reasons: First, the actual distribution of start-ups between entrepreneurial founder teams and single entrepreneurs confirms the relevance of entrepreneurial teams. For instance, the panel study of entrepreneurial dynamics sampled from the U.S. population by Ruef et al. (2003) includes a majority (421 out of 816) of entrepreneurial founder teams with at least two members. Even more pronounced is the finding of Beckman (2006). In her sample, nearly 90% of the ventures were started by entrepreneurial teams as opposed to individuals. In a recent study from 2015, 78% of 1,024 participating start-ups in Germany were founded by at least two individuals (Ripsas & Tröger, 2015). The study was conducted across different industries; most participating teams work in the fields of software as a service (15.3%), e-commerce (10.1%), and IT/software development (8.6%). Gartner, Shaver, Gatewood, and Katz (1994, p. 6) put it succinctly by arguing that "the "entrepreneur" in entrepreneurship is more likely to be plural, rather than singular". Second, start-ups founded by entrepreneurial teams are in many cases more successful than those founded by individuals (Chandler & Hanks, 1998). Lastly, on a more practical level, venture capitalists as major start-up financiers explain the importance of entrepreneurial teams in the start-up process and in the start-ups' potential (Cyr, Johnson, & Welbourne, 2000). Taken together, the abovementioned arguments and examples support the call for a thorough investigation of the entrepreneurial team (Klotz et al., 2014; Schjoedt et al., 2013), which has already been pursued by some academics (Beckman, Burton, & O'Reilly, 2007; Breugst, Patzelt, & Rathgeber, 2015; Breugst & Shepherd, 2015; Eisenhardt, 2013; Gartner et al., 1994; Lim et al., 2013; West, 2007). However, further research is required to better understand the role of the entrepreneurial team aspect in the founding process.

Research on corporate top management teams (TMTs) certainly exists. But the business contexts faced by entrepreneurial founder teams and corporate TMTs are different (Klotz et al.,

2014). Five arguments support this statement: First, unlike in TMTs, there is no organizational history nor organizational structures in a new start-up (Blatt, 2009). The entrepreneurial founder team itself needs to function as an organization and establish new structures (Blatt, 2009). Second, the start-up is founded in an environment with weak social structures (Klotz et al., 2014). Hence, the personalities, values, and beliefs of the founders significantly influence the culture of the company (Athanassiou, Crittenden, Kelly, & Marquez, 2002). Third, entrepreneurial founder teams and corporate TMTs work on different tasks and face different challenges. Work in a start-up is associated with a high risk of failure (Corbett, Covin, O'Connor, & Tucci, 2013) and with the venture's liability as a new player in a market dominated by incumbents (Singh, Tucker, & House, 1986; Stinchcome, 1965). In addition, the entrepreneurial founder team needs to manage and lead the company through the entire entrepreneurial process (Ensley, Hmieleski, & Pearce, 2006); there are no substitutes for leadership - "situational factors that enhance, neutralize, and/or totally substitute for leadership" (Avolio, Walumbwa, & Weber, 2009, p. 436) - like for TMTs in larger organizations (Kerr & Jermier, 1978). Fourth, compared to corporate TMTs, entrepreneurial founder teams bear a much higher financial risk, since they are faced with the idiosyncratic risk of their start-up (Hall & Woodward, 2010) and they own a substantial part of the equity in their firm (Huovinen & Pasanen, 2010). Fifth, as to the development of the start-up, entrepreneurial founder teams have more possibilities to move their company in a particular direction and determine its strategy (Blatt, 2009). If their product is differentiable, the demand for the product is unstable, and they do not work in an oligopolistic industry structure, their managerial discretion is high (Hambrick & Abrahamson, 1995). Given these points, the call for a separate consideration of the entrepreneurial founder team (Klotz et al., 2014; Schjoedt et al., 2013) is justified due to the exceptionally large influence of the founder team on the development of the start-up (Harper, 2008) and the clear externally driven differences between the entrepreneurial founder team and corporate TMTs.

Opportunity recognition in entrepreneurship

After arguing why entrepreneurial founder teams are central for entrepreneurship, I now focus on opportunity recognition as a core part of entrepreneurship (Shane & Venkataraman, 2000). The overall entrepreneurial process involves the recognition, evaluation, and exploitation of opportunities (Shane & Venkataraman, 2000). Academics agree on the importance of opportunity recognition for the overall entrepreneurial process, as is documented by Shane and Venkataraman (2000, p. 220), "To have entrepreneurship, you must first have entrepreneurial opportunities", or Baron (2006, p. 104), "Indeed, opportunity recognition is widely viewed as a

key step in the entrepreneurial process - one from which, in many cases, all else follows". Other influential papers position the topic of opportunity recognition as a central point of analysis (Alvarez & Barney, 2007; Kirzner, 1997; Shane, 2000), and it gained significance with the development of entrepreneurship research (cf. Short, Ketchen, Jr., David J., Shook, and Ireland (2010) for a review).

Since opportunity recognition describes only one part of the field of entrepreneurship, it is essential to differentiate it from the two remaining processes, evaluation and exploitation (Shane & Venkataraman, 2000). The focus of this study is on opportunity recognition, not on evaluation and exploitation. In general, evaluation involves the investigation of whether or not the business opportunity is viable for the entrepreneur (Hansen, Lumpkin et al., 2011). Furthermore, opportunity evaluation refers to considerations of whether the business opportunities developed in the recognition phase are workable and whether the entrepreneurial founder team has the necessary skills and knowledge to exploit them. Additionally, it needs to be decided whether the business opportunity is sufficiently attractive to balance the potential risks (Lumpkin & Lichtenstein, 2005). The entrepreneur might also perform preliminary market testing (Lumpkin, Hills, & Shrader, 2004). Exploitation refers to either the creation of new firms or the sale of the business opportunity to existing firms or markets (Shane & Venkataraman, 2000), whereas the common assumption is that entrepreneurs exploit the business opportunity themselves, building efficient operations for the product or service created through the business opportunity (Choi, Lévesque, & Shepherd, 2008). This is a necessary step to ultimately generate revenues (Schoonhoven, Eisenhardt, & Lyman, 1990).

After distinguishing the evaluation and exploitation of business opportunities from opportunity recognition, a definition of the latter is necessary. The literature offers various definitions for the concept of opportunity (recognition), but "if one were to select any conceptual or operational definition of entrepreneurial opportunity or opportunity recognition or opportunity identification, etc., then one would be hard pressed to find the same definition in another article. This makes it difficult to generalize about conceptual developments or empirical findings related to entrepreneurial opportunity and processes of opportunity recognition, identification, discovery, or creation (henceforth simply referred to as opportunity related processes)" (Hansen, Shrader, & Monllor, 2011, p. 284). Due to this lack of consistency in definitions and an absence of a definition in 80% of opportunity-related articles (based on Davidsson's (2015) review), an adequate definition of opportunity is difficult to identify. For instance, the description provided by Short et al. (2010) is sufficiently broad and allows for different approaches: "An opportunity

is an idea or dream that is discovered or created by an entrepreneurial entity and that is revealed through analysis over time to be potentially lucrative." But the second part of the definition, the requirement of being potentially lucrative, is associated with some kind of favorability or selection, which might be an unnecessary assumption. Moreover, this assumption is not suitable for the use of the term opportunity in this thesis. Thus, I rely on an even broader opportunity definition - the *new venture idea* - offered by Davidsson (2015):

> *"An 'imagined future venture'; i.e., an imaginary combination of product/service offering, markets, and means of bringing the offering into existence." (p. 683)*

The terms *new venture idea* and *imagined future venture* are conceptually identical. *New venture* describes a specific economic activity. The definition does not include any favorability or selection, only the substance of what is referred to in the existing literature opportunity as recognition, opportunity identification, or opportunity discovery. Hence, this definition clearly separates between recognition and evaluation (Davidsson, 2015). It is important to realize that, while a new venture idea must present something previously not offered by the entrepreneur, it does not need to be novel (Amason et al., 2006). Additionally, new venture ideas are not required to display a specific level of quality—they can be either good or bad. A further aspect that makes this definition appealing with regard to the approach in this thesis is the property of a new venture idea of being entirely cognitive (see section 3.3.3 for a description of the experimental setting). As soon as a new venture idea is identified, it exists. Moreover, Davidsson (2015) explicitly includes the thought that new venture ideas can be shared and developed in a team.

As mentioned in the aforementioned opportunity definition by Short et al. (2010), opportunity discovery and opportunity creation describe two influential theories of entrepreneurial action. Another theory describes a more idiosyncratic, path-dependent view (Sarason, Dean, & Dillard, 2006), referred to as the evolving idiosyncrasy view (Davidsson, 2015). These will be discussed in further detail in the next paragraphs in order to better understand how business opportunities might be recognized or developed.

Subsequently, I take a closer look at the three theories on how opportunity recognition might take place: *opportunity discovery theory*, *opportunity creation theory*, and *evolving idiosyncrasy theory.* The first two theories are oftentimes seen as opposing each other, whereas the third theory is distinct. In this regard, I first concentrate on opportunity discovery theory and opportunity creation theory as well as on their interrelationships before examining the evolving

idiosyncrasy theory. In order to understand the differences in the development of business op-
portunities, it is essential to first explain the underlying definition of an entrepreneur in the first
two theories. Schumpeter (1997) and Kirzner (1973; 1997) represent the two perspectives.
While in both theories business opportunities exist when there are market or industry imperfec-
tions (Alvarez & Barney, 2007), the origins of these imperfections differ. The Schumpeterian
entrepreneur acts in an environment where technology, political forces, regulation, or economic
and social factors change and create new information (Shane, 2003). The entrepreneur recom-
bines resources (he or she creates a technological innovation) and induces a disequilibrium be-
tween market demand and market supply, allowing him or her to generate short-term profits
(Schumpeter, 1997; Shane & Venkataraman, 2000). In contrast, Kirzner (1973; Kirzner, 1997)
criticizes the neoclassical assumption of perfect and universal information in the market. Ac-
cording to him, market imperfections arise exogenously and lead to information being asym-
metrically distributed across individuals. Based on the access to superior information, the en-
trepreneur discovers and exploits a business opportunity (Kirzner, 1997; Shane, 2003).

There is an ongoing debate in the literature regarding the correct understanding of the entrepre-
neur and its implications for the formation of business opportunities (Alvarez & Barney, 2007;
Eckhardt & Shane, 2012; Hmieleski, Carr, & Baron, 2015; Shane, 2003, 2012). Therefore, in
the following, I take a closer look at the development of business opportunities in a discovery
and a creation context. First, from a *discovery perspective*, a business opportunity arises when
"a set of resources is not put to its "best use" (i.e., the resources are priced "too low," given a
belief about the price at which the output from their combination could be sold in another loca-
tion, at another time, or in another form)" (Shane & Venkataraman, 2000, p. 220). In this view,
asymmetric information and the corresponding market inefficiencies (Eckhardt & Shane, 2003)
play a crucial role. Five factors might induce some individuals to discover a business oppor-
tunity while others do not. To begin with, access to asymmetric information is necessary (Sar-
asvathy, Dew, Velamuri, & Venkataraman, 2005). Asymmetric information arises through ex-
ogenous events, resulting from changes in technology, consumer preferences, or resource avail-
ability (Kirzner, 1973). Further, entrepreneurial alertness is a prerequisite. The entrepreneur's
accurate study of the environment is essential to discover business opportunities (Gaglio &
Katz, 2001). Moreover, the entrepreneur potentially needs access to further complementary re-
sources (Sarasvathy et al., 2005). The most important complementary resource is assumed to
be prior knowledge (Venkataraman, 2012). Additionally, adequate cognitive skills are neces-

sary to value the obtained asymmetric information. New means-ends relationships must be realized in order to use the available information (Shane & Venkataraman, 2000). Lastly, different expectation beliefs, stemming from intuition or heuristics, cause some individuals to discover market imperfections where others do not (Shane & Venkataraman, 2000). Thus, this availability of business opportunities due to exogenous market imperfections is closely related to Kirzner's entrepreneur searching for existing but not yet discovered business opportunities (Alvarez & Barney, 2007).

Second, from a *creation perspective*, business opportunities are created endogenously by the actions, reactions, and enactments of entrepreneurs exploring ways to produce new products or services (Baker and Nelson, 2005; Gartner, 1985; Sarasvathy, 2001; Weick, 1979) (Alvarez & Barney, 2007, p. 15). The development of a business opportunity is driven by the entrepreneur's actions (Gartner, Carter, & Hills, 2003). The opportunity does not exist in the market objectively and independently of the entrepreneur and cannot be simply discovered, but requires action. This view of the development of a business opportunity is closely related to Schumpeter's entrepreneur, who takes advantage of market imperfections and creates an innovation. This action is the true source of the business opportunity (Alvarez & Barney, 2007).

Various authors (Dyer, Gregersen, & Christensen, 2008; Hmieleski et al., 2015; Sarasvathy et al., 2005; Short et al., 2010) discuss the relationship between these two different theories and argue for a combination or coexistence of the two theories. Four approaches - demand or supply focused, exclusionary, temporal, and context dependent - will be presented briefly. First, a differentiation is possible according to demand and supply disequilibria. For opportunity discovery, demand and supply of products or services are known and have to be brought together. Opportunity discovery refers to a situation where either demand or supply does not exist and the missing side has to be discovered. For opportunity creation to happen, neither supply nor demand may exist and the entrepreneur has to create both (Dyer et al., 2008; Sarasvathy et al., 2005). Second, it can be argued that opportunity discovery and opportunity creation are equally valid but mutually exclusive. This view concentrates on the distinction between the concepts and ignores potential overlaps (Sarasvathy et al., 2005). Third, it can be specified that the creation view is a more general view and chronologically prior to the discovery theory: Business opportunities might have been created through actions of individuals before someone else is able to discover them. More specifically, if a creation process has illuminated specific goals or preferences, the entrepreneur can discover means to satisfy these goals or preferences (Sarasvathy et al., 2005). Fourth, a context-dependent view combines the two theories. Some business

opportunities might be discovered, while others might be created (Short et al., 2010). For instance, where there is a high level of uncertainty (e.g., neither demand nor supply in a specific industry or market are known), a creative approach might be the more useful one (Hmieleski et al., 2015). Hmieleski et al. (2015) concentrate on integrating both views in the context of business opportunity exploitation. Since exploitation is not in the scope of this thesis, these arguments are not laid out in more detail.

As a further step, the *evolving idiosyncrasy perspective* includes, as a main assumption, the inseparability of the entrepreneur from the business opportunity (Dimov, 2011; Sarason et al., 2006; Sarason, Dillard, & Dean, 2010). More specifically, based on structuration theory (Giddens, 1979, 1991), Sarason et al. (2006) argue that the entrepreneur and the opportunity form a duality. As the entrepreneur further conceptualizes, specifies, and acts upon the opportunity and interacts with the sources of the opportunity, it evolves over time. Dimov (2011, p. 64) calls this evolvement a "developing living organism", borrowing from biology. Hence, each entrepreneur-opportunity duality is unique and neither the entrepreneur nor the business opportunity can be understood without the other. Furthermore, the entrepreneur does not just discover a market gap, but needs to create and evolve the opportunity over time in line with the economic and social structure (Sarason et al., 2006).

The opportunity recognition theories introduced above - *discovery theory, creation theory,* and *evolving idiosyncrasy theory* - are the only perspectives that systematically describe how opportunity recognition might happen. All theories focus on the individual entrepreneur. Generally, a large share of entrepreneurship research and, more specifically, in opportunity recognition is related to the individual (Short et al., 2010). Nevertheless, as mentioned above, most start-ups are founded in teams (Beckman, 2006; Ripsas & Tröger, 2015). Moreover, a process view and closely linked temporal dynamics in the development of business opportunities might be a more relevant mode of analysis (Short et al., 2010) in order to understand the concept of opportunity recognition as compared to a static view. The reasons for the importance of teams in opportunity recognition as well as a tightly-knit rationale for a process view on the development of business opportunities are provided in the following.

Opportunity recognition processes at the team level

The study of the entrepreneurial process is prevalent in the entrepreneurship literature (Steyaert, 2007). Moroz and Hindle (2012) list a number of frameworks and concepts, each taking a process view: establishment and usage of social networks, cognitive processes and routines of successful entrepreneurs, environmental factors influencing entrepreneurs, and the concept of opportunity. The concept of opportunity, relevant for this study, comprises opportunity recognition but goes beyond that and also includes the evaluation and exploitation steps. For example, Bhave (1994) includes opportunity recognition, product creation (including setup of production technology), and the linkage to markets and customers in his process model. According to him, opportunity recognition might be either externally or internally stimulated. In the external case, the decision to start a venture precedes the opportunity recognition phase and is mainly influenced by personal and environmental circumstances. In the internal case, opportunity recognition precedes the decision to start a venture because the entrepreneur realizes that a specific need is not yet fulfilled. In further steps, a business opportunity is chosen and refined, and a business concept is prepared. Then, the physical creation takes place. In this thesis, only the process of opportunity recognition is considered, while further steps are ignored.

Shane and Venkataraman (2000) argue that individuals recognize business opportunities because they possess necessary information and have the cognitive ability to process it while others do not. This is only one of many examples focusing on opportunity recognition at the individual level of analysis (Ardichvili et al., 2003; Bhave, 1994; Corbett, 2005; Shane, 2003). But, as highlighted by Dimov (2007, p. 714), entrepreneurs do not develop business opportunities in isolation: "The socially embedded aspect pertains to the fact that potential entrepreneurs, rather than thinking and acting alone, are actively engaged in information and value exchange with a surrounding community". Hence, the role of the entrepreneurial team in the process of opportunity recognition (without the subprocesses of evaluation and exploitation) are discussed in the following. More explicitly, two lines of reasoning emphasize that entrepreneurs might develop business opportunities while being actively engaged with others - one perspective describing a *learning perspective* and a second perspective describing a *componential perspective.*

First, from a *learning perspective*, Dimov (2007) suggests the 4I organizational learning framework (Crossan, Lane, & White, 1999), which links individual, group, and organizational levels, as the starting point for studying the process of opportunity recognition. In general, the framework describes the process of organizational learning to achieve the strategic renewal of a company, whereby organizational learning involves a tension between exploration and exploitation of learning. The framework describes feed-forward processes for learning across levels relating

to exploration (transfer of learning from individuals and groups to institutionalized structures and systems) and feedback processes relating to exploitation (influence of institutionalized learning on individuals and groups) (Crossan et al., 1999; Shrivastava, 1983). The 4I framework's four elements are intuiting, interpreting, integrating, and institutionalizing. This framework is useful in order to better understand the development of business opportunities for the following reasons: First, the model can be rearranged away from the environment of an existing and established organization to the setting of a developing opportunity without compromising the model's validity. Second, the four elements cause the learning process to be interpreted and fed in various ways and allow for diverse inputs from individuals. Third, the model not only covers the individual level but enables collective levels of action (Crossan et al., 1999; Dimov, 2007; Dutta & Crossan, 2005). Intuiting, interpreting, and integrating are relevant to understand opportunity recognition. Intuiting and interpreting appear at the individual level, while interpreting and integrating occur at the team level. Intuiting refers to the generation of an opportunity. Interpreting, which occurs at the individual and team level, describes the explanation through words or actions of the opportunity to oneself or to others. This serves as a clarification of the opportunity content. Integrating includes the process of a shared understanding among the group. This requires a dialogue between individuals in order to arrive at a common understanding, which is generally informal. Institutionalizing ensures that lessons learned by individuals and groups are integrated into the organization. It includes systems, structures, procedures, and strategy (Crossan et al., 1999).

With this in mind, a more detailed examination of the learning subprocesses interpreting and integrating is possible. I concentrate on those subprocesses because they are relevant for the team level and establish the link to social influences[4]. In terms of the subprocess interpreting, the entrepreneur gets in touch for the first time with his environment - potential co-founders, other entrepreneurs, friends, family, colleagues, investors, customers, suppliers, and employees - to explain, refine, and defend his or her opportunity (Dimov, 2007; Greve & Salaff, 2003). In discussions and conversations, the opportunity might be either refined and adjusted or abandoned. The social environment allows the entrepreneur to get a different view of the opportunity and further coordination "clarifies images, and creates shared meaning and understanding" (Crossan et al., 1999, p. 528). More specifically, social influences might impact the interpreting and integrating part of the learning process through different characteristics of new information.

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[4] Contextual influences play a role in the individual learning subprocess intuiting. Influences might stem from experience, information gathered, emotions, or the task environment (Dimov (2007); Amabile (1988); Baron (2012)). They might affect the generation or assessment of opportunities.

The social network might provide new, previously unknown information (Burt, 2004); it might give access to relevant information earlier than official channels (Adler & Kwon, 2002; Gargiulo & Benassi, 2010); and members of the social environment might share different experiences (Van Der Vegt, Gerben S. & Bunderson, 2005) or challenge the validity of assumptions or the opportunity itself. Furthermore, potential access to financial or technological resources that the social environment might offer can influence the shaping of the opportunity (Shane & Cable, 2002). Likewise, cultural norms or social roles adopted by the social network might influence the decision to pursue or abandon an opportunity by shaping the entrepreneur's consciousness (De Carolis & Saparito, 2006; Moscovici, 1984). The reason is that opinions and information of others influence the entrepreneur's attitude and behavior regarding specific decisions (Burt, 1992; Salancik & Pfeffer, 1978). In summary, the team level is important because founder team members might help to develop a fuzzy idea into a business opportunity; they might add specific knowledge and information from their educational background or field of interest; they might act as sounding boards and complement further suggestions from other industries or business environments; they might give access to different resources (e.g., financial, technical); and they might form their opinions based on specific cultural or social norms. Thus, opportunity recognition depends not only on individual characteristics and skills, but also on the co-founding members and the individuals with whom the team or the entrepreneur maintain contact.

Second, from a *componential perspective*, opportunity recognition is in part a social process because of the "inclusion of social-environmental variables and their interaction with personality characteristics and cognitive skills in producing creative responses" (Amabile, 1983, pp. 369–370). The componential perspective is understood as the relevant elements necessary to produce creative ideas (Amabile, 1983). The components are divided into within-individual components - domain-relevant skills (expertise), creativity-relevant processes (cognitive processes), and task motivation (intrinsic motivation) - and a component outside the individual, which is the surrounding environment (Amabile, 2012; Hirst, van Knippenberg, & Zhou, 2009). The model will be illustrated only briefly because it is less appropriate to understand opportunity recognition in entrepreneurial teams compared to the learning perspective for two reasons: First, Amabile (2012) concentrates on creativity in general and does not focus explicitly on the role of creativity in the recognition of business opportunities. Second, not all model steps are dedicated to the team - some focus exclusively on the individual. More explicitly, the only component outside the individual is that of the surrounding environment. It is able to influence

each part of the within-individual components, but has the largest impact on task motivation (based on empirical research results, e.g., Amabile (1988)) (Amabile & Pillemer, 2012). The surrounding environment comprises mainly the social environment, which is divided into factors that block creativity and those that stimulate creativity. Blocking factors might be heavy criticism of the idea by others (since Amabile talks solely about creativity and not about opportunity recognition, the term *ideas* is used instead of *opportunities*) or other individuals lacking risk appetite who do not support or discuss an individual's creative thoughts. Stimulating factors are collaborative: others willing to discuss ideas and share their ideas, thoughts, and experiences, as well as diversely skilled teams (Amabile, 2012). Hirst et al. (2009) considered the team aspect as part of the surrounding environment and argued that the team might support individual learning and thus improve individual creativity. Taggar (2002) argues, based on the componential perspective, that in a team setting "team creativity-relevant processes" (Taggar, 2002, p. 317) - i.e., inspirational motivation, organization, and coordination, as well as individualized consideration - are important for all members of the team. Inspirational motivation and individualized consideration are based on Bass and Avolio's (1994) transformational leadership concept. The processes establish a supporting social environment for each team member, thus increasing individual creative performance. In Taggar's study with 94 teams, these processes moderated the relationship between individual creativity and team creativity.

Opportunity recognition is not only relevant for new ventures, it is just as important for other company types. However, scholars analyze opportunity recognition in the entrepreneurial team differently from opportunity recognition in the corporate environment, i.e., in large and well-established companies. Research on opportunity recognition in entrepreneurial teams essentially concentrates on team/individual characteristics and external enablers (e.g., technology, regulatory frameworks) (Davidsson, 2015). In comparison, research on opportunity recognition in corporate entrepreneurship is scarce (Short et al., 2010) and focuses mainly on the company itself instead of the individuals. For instance, analyzed factors that might influence opportunity recognition in the corporate entrepreneurship context are willingness to take risks (Pérez-Luño, Wiklund, & Cabrera, 2011), industry characteristics (Eddleston, Kellermanns, & Sarathy, 2008), geographical location of the company (Mahnke, Venzin, & Zahra, 2007), and spending on R&D and technological innovation (Zahra, 1996). These firm-level analyses are only starting to be accompanied by studies concentrating on employee characteristics (Marvel, Griffin, Hebda, & Vojak, 2007).

In summary, the insights are fourfold: First, academics in entrepreneurship have long concentrated on the individual, despite the fact that start-ups founded by teams are prevalent in reality. Only with the study by Kamm et al. (1990) has a new stream of research opened up that concentrates on the role of entrepreneurial teams. Second, opportunity recognition is admittedly a key step in the entrepreneurial process. While there is no clear and distinct definition of opportunity recognition, three main theories describe how opportunity recognition might occur: discovery theory, creation theory, and evolving idiosyncrasy theory. Recently, some scholars have argued how these theories might be interrelated. Third, few studies concentrate on the opportunity recognition process (without evaluation and exploitation) at the team level. The learning and componential perspectives are two theories on how this process might happen. Lastly, the research on opportunity recognition in large and well-established companies (corporate entrepreneurship) concentrates mainly on the company itself and should therefore be considered separately from opportunity recognition in entrepreneurial founder teams.

2.2 Creativity: The role of originality and business value in opportunity recognition processes

In section 2.1, I elaborated on the importance of opportunity recognition in the field of entrepreneurship and the relevance of the entrepreneurial founder team. However, to assess whether an opportunity recognition process is successful, some measure for the outcome of the process is necessary. In the following, I provide a short overview of potential measures for the quality of business opportunities and argue why this thesis concentrates on originality and business value as indicators of the quality of business opportunities.

Quantitative and qualitative indicators of creativity

In the first place, the success of business opportunity recognition tasks can be measured with *quantitative* or *qualitative* indicators. First, the *quantitative* measure is the number of recognized business opportunities (DeTienne & Chandler, 2004; Diehl & Stroebe, 1987; Rietzschel et al., 2006). One advocate of the number of recognized business opportunities as a performance measure is the group brainstorming literature (Osborn, 1979), which argues that more developed ideas (the brainstorming literature uses the term *ideas* instead of *opportunities*) are desirable because this increases the probability that at least one idea is of extremely high quality (Rietzschel, Nijstad, & Stroebe, 2010). As the brainstorming technique in groups is theoretically motivated to be an effective technique for generating many ideas, the research compares the number of generated ideas between group brainstorming and individual brainstorming

(Diehl & Stroebe, 1987; Rietzschel et al., 2006; Taylor, Berry, & Block, 1958). For instance, Rietzschel et al. (2006) show that nominal groups (in which each group member brainstorms individually and ideas are pooled at the end) develop 2.2 ideas per minute in an experimental task and thus significantly more than interactive groups (in which the group brainstorms together), which only yielded .78 ideas per minute. But the brainstorming literature is subject to criticism. As noted by Perry-Smith and Coff (2011, p. 249), "with respect to group creativity, the brainstorming literature may raise more questions than it answers." It is not instrumental in understanding why some teams recognize more ideas than others. For instance, empirical studies do not confirm the assumption that interactive teams might recognize more ideas than nominal teams. This phenomenon is referred to as the "illusion of group productivity" (Paulus, Dzindolet, Poletes, & Camacho, 1993; Paulus & Yang, 2000), meaning that individuals working alone develop more ideas than individuals working in groups, thus arriving at the same result as Rietzschel et al. (2006). Nevertheless, independent of groups or individuals, there are a number of factors fostering the number of recognized business opportunities. For example, more diverse industry experience and external knowledge sourcing relationships (Gruber, MacMillan, & Thompson, 2013), serial entrepreneurs' prior start-up experience (Gruber, MacMillan, & Thompson, 2008), prior knowledge of customer problems (Shepherd & DeTienne, 2005), network size, number of weak ties in the network, and self-perceptions of alertness (Singh, Hills, Lumpkin, & Hybels, 1999), as well as learning asymmetries (Corbett, 2007) all positively impact the number of recognized business opportunities.

However, this quantitative approach focuses only on the number of business opportunities. It does not take into account how successful the opportunity recognition task is in terms of quality and is not a sufficient indicator of the value of an opportunity (Shepherd & DeTienne, 2005). Moreover, it does not integrate the development of different business opportunities over time. The second way to evaluate the success of a business opportunity recognition task is different in nature and measures some form of *quality* or value. The predominant quality measure in the literature on ideas in general as well as for business opportunities is creativity (Amabile, 1983, 1988; Oldham & Cummings, 1996; Shalley, 1991; Zhou & George, 2001). Before relating creativity directly to business opportunities, the following paragraphs briefly introduce the concept more generally.

Some preceding notions might help to understand the concept of creativity in this thesis as compared to alternative approaches. Besides different definitions, an overview of its origin, the

level of analysis, and the differentiation from innovation simplify the application of creativity to the field of entrepreneurship.

First, various definitions are available. Guilford (1967) proposes the categories fluency (number of developed ideas), flexibility (development of different ideas), originality (development of unusual ideas), and elaboration (building on the ideas of others and organizing the details of an idea in order to talk about it) to describe creativity. In contrast, Baer (1993) does not concentrate on different categories but equates creativity with the ability of divergent thinking. More specifically, he defines individuals as being creative if they are capable of developing manifold ideas associated with a specific problem. For Mednick (1962), creativity is mainly dependent on the associational skills an individual has to generate many remote ideas regarding a specific topic. This consideration is described in more detail in section 2.4.2. Lastly, Amabile (1983) describes creativity as the development of novel and useful ideas.

A further differentiation can be made according to the point of view on creativity definitions. They may be based on the person, the process, or the product/idea (Amabile, 1988). For example, in their person-oriented view, Findlay and Lumsden (1988) concentrate on the constellation of personality and intellectual traits of individuals in a creative process. In contrast, Rogers (1954) has a process of creativity in mind and focuses on the actions arising from the interplay of individuals with material, events, and other individuals. Product- or idea-oriented creativity analyzes whether the product or the idea itself is creative (Rietzschel et al., 2010).

Second, as to the origin of creativity, five different possible theoretical perspectives exist: grace, accident, personality, association, and cognition (DeTienne & Chandler, 2004; Henry, 1991). From a grace perspective, creativity itself and where it comes from is not explainable. The source and formation of creativity is unclear (DeTienne & Chandler, 2004). The accident view of creativity assumes that creativity originates by chance. Individuals might have a completely different goal, but may make a creative discovery by chance (DeTienne & Chandler, 2004). The personality perspective suggests that creativity might originate from an individual's personality. Some individuals have the personality to develop original ideas, while others do not. People are either innovators who have radically new ideas, or they are conformists who adapt to the thinking of the majority (Kirton & McCarthy, 1988). The associative perspective argues that creative individuals are able to apply ideas from one industry, situation, or discussion and adapt them to a novel task, thereby evolving a creative solution (Mednick, 1962). Finally, advocates of the cognitive perspective mention the existence of cognitive processes that help some

individuals to identify creative ideas. Prerequisites are cognitive flexibility and cognitive restructuring, meaning the ability to use broad and inclusive cognitive categories (Amabile, 1988; DeDreu, Baas, & Nijstad, 2008).

Third, the level at which creativity is analyzed is not consistent across academic publications. Instead of the group level, most creativity research has focused on the individual level, as shown in a review by Anderson, Potočnik, and Zhou (2014). Academics focusing on the individual level mainly analyze different creativity antecedents – job complexity, relationship with supervisors and coworkers, rewards, individuals' evaluation, or deadlines and goals - and their impact on an individual's creativity (Shalley et al., 2004). Most research on group creativity is based on the input-process-outcome models dominant in general research on teams (Gilson & Shalley, 2004; Nemiro, 2002; Taggar, 2002). Most research defines creativity as an outcome (Amabile, 1996; Ford, 1996; Oldham & Cummings, 1996), but to better understand the drivers behind creativity, some research focuses on creativity as a process (Gilson & Shalley, 2004). For instance, Gilson and Shalley (2004) understand the creativity process as "members working together in such a manner that they link ideas from multiple sources, delve into unknown areas to find better or unique approaches to a problem, or seek out novel ways of performing a task (Amabile, 1996; Drazin et al., 1999; Torrance, 1988; Woodman, Sawyer & Griffin, 1993)" (Gilson & Shalley, 2004, p. 454). They study attitudes towards team activities, team characteristics, and team interactions, as well as their impact on creativity. They find that members of more creative teams spend more time socializing with each other, share the same goals, and are perceived as working in jobs with high task interdependence. Shalley et al. (2004) call for a stronger concentration on antecedents and conditions for group creativity as compared to individual creativity, mainly due to the higher practical relevance.

Lastly, it is important to differentiate between creativity and innovation. Creativity refers to the development of ideas which might be shared between individuals. But only a successfully implemented idea is considered to be an innovation. In the literature, creativity is frequently conceptualized as being the first step necessary for a subsequent innovation (Amabile, 1988; West, 1990; West & Farr, 1990).

In this thesis, a creative idea is defined as being novel or original and useful (Amabile, 1988; Oldham & Cummings, 1996; Shalley, 1991; Zhou & George, 2001). Creativity is product- or idea-oriented, and entrepreneurial founder teams are responsible for the development of creative ideas. The product- or idea-oriented view is chosen for this thesis because of the complexity

associated with observations and assessments of person or process measures. The measure of a product or idea is clearer and more straightforward. Thus, the *production* of novel and useful ideas is central to my consideration of creativity (Amabile, 1988). Ideas are considered to be novel if they are unique compared to other available ideas. Inherent in this view of creativity is the fact that there are different degrees of creativity. Creative ideas can range from incremental to divergent. Incremental creativity describes novel solutions which differ from older versions in a predictable way through modification of something that already exists. Divergent ideas are ideas that ideally are as different as possible from a current solution (Audia & Goncalo, 2007; Zhou & George, 2003). In the context of creativity in the working environment, novelty or originality are not enough for being creative. Ideas must also be useful. Ideas are considered to be useful if they generate some kind of value in the short or long term to the person, team, or organization that generated the idea (Shalley et al., 2004). An original idea that has no value is unusual, but it is not creative (Zhou & George, 2003).

As mentioned in the previous paragraphs, creativity research is concentrated primarily on the individual (Anderson et al., 2014), but the relevant level of analysis should be the team level (Shalley et al., 2004) because the importance of creativity for organizations in general is becoming more and more prevalent. This is the case because the adaption to changing environments and innovative ideas are basic requirements for remaining successful (George, 2007). Moreover, tasks and issues in organizations are complex, and handling them requires specialized knowledge and work roles. Hence, creative work is often executed in teams (Hoever, van Knippenberg, van Ginkel, & Barkema, 2012). All characteristics of creative ideas mentioned in the previous paragraph also apply to the team view of creativity. In this thesis, team creativity is defined as the joint generation of novel and useful ideas by a group of individuals (Hoever et al., 2012) and, thus, in accordance with Oldham and Cummings's (1996) definition.

Originality and business value as core creativity components in opportunity recognition
After specifying how creativity is generally defined and conceptualized in this thesis, a closer look at creativity in the field of entrepreneurship is a necessary next step. The recognition of entrepreneurial business opportunities is closely linked to creativity. For example, entrepreneurs with similar experience might not recognize the same business opportunities (Perry-Smith & Coff, 2011). Hence, creativity might play a role in recognizing business opportunities, and Perry-Smith and Coff (2011, p. 248) see entrepreneurial creativity as a special case of creativity. They define it as "the capacity to identify novel and useful solutions to problems in the form of new products or services."

As mentioned above, creative ideas "(1) […] are novel or original and (2) they are potentially relevant for, or useful to, an organization" (Oldham & Cummings, 1996, p. 608). First, originality is an important component of creativity, because business opportunities need to have some unique feature in order to be interesting for the entrepreneur. Hence, the opportunity must be unusual, uncommon, or rare (Amabile, 1983; DeDreu et al., 2008; Guilford, 1967). Because of its importance, novelty, or originality, is directly measured in this thesis.

Second, usefulness describes the business opportunity as being beneficial to the organization itself. Girotra et al. (2010, p. 597) do not mention the word usefulness directly, but they define the concept of business value to be "the utility of the ideas to a commercial organization that might develop and sell the products." If the business opportunity is useful, it has to deliver some kind of utility. From the point of view of an entrepreneurial founder team, the opportunity needs to be feasible and, at the same time, associated with an adequate likelihood of profitability (Rietzschel et al., 2010; Welpe et al., 2012). If the business opportunity is not feasible (no innovation possible), it is irrelevant for the entrepreneurial founder team. Additionally, if the opportunity is not associated with a minimum level of profitability, potential entrepreneurs will not be compensated for their opportunity cost and will not engage in entrepreneurship (Welpe et al., 2012). Taken together, the business value of a business opportunity for an entrepreneurial founder team is composed of its feasibility and its profitability.

In this thesis, the two aspects of creativity – novelty, i.e. originality, and usefulness, i.e. business value – are looked at separately. The reason is that the factors causing originality and business value to arise might be different. More specifically, business opportunities might be optimized for either originality or business value, but not for both aspects at the same time. If one does not treat these two aspects discretely, the differences between originality and business value might not be identified (Perry-Smith & Coff, 2011). For entrepreneurial founder teams, both originality and business value are relevant parameters in order to decide whether a business opportunity is promising. If the business opportunity is too original, the market might not accept it. But many business opportunities associated with a high business value are already exploited by other entrepreneurs.

In summary, quantitative and qualitative indicators exist to describe the outcomes of a business opportunity recognition task. One central qualitative measure is creativity. Creativity is defined in various versions in the literature, but two predominant aspects of creativity are originality/novelty and business value/usefulness. In this thesis, the creativity of entrepreneurial

founder teams is analyzed at the team level; more specifically, in the dimensions originality (representing novelty) and business value (representing usefulness).

2.3   The role of human and social capital in opportunity recognition processes

As stated in section 2.1, the entrepreneurial founder team plays a pivotal role in entrepreneurship (Kamm et al., 1990). But the process of opportunity recognition is frequently still a black box, and the phenomenon is still scarcely understood (Corbett, 2007; Vaghely & Julien, 2010), leading Davidsson and Honig (2003) to the following questions: "Many people who begin the process of starting a new business fail to achieve their goal, while others are quite successful. Do individuals who attempt to start businesses begin with different levels of human or social capital? Do these endowments affect their rate of success?" (Davidsson & Honig, 2003, pp. 301–302). Building on these questions, I focus on the entrepreneurial team and aim to understand which human or social capital factors impact the opportunity recognition process at the team level. Three reasons suggest that a better understanding of human and social capital endowments might be helpful in order to better comprehend opportunity recognition processes. First, human and social capital factors are advocated by various authors as important influencing factors for opportunity recognition (Burt, 2004; Davidsson & Honig, 2003; Ucbasaran et al., 2009; Zhou & Rosini, 2015). For instance, Bosma, van Praag, Thurik, and Wit (2004) mention that it is not only talent or good luck that determine success in opportunity recognition, but that human and social capital play a decisive role as well. Second, human and social capital factors and their influence on opportunity recognition are still not adequately (empirically) researched and decoded for a comprehensive and complete picture (Davidsson & Honig, 2003). Third, the analysis of human and social capital factors might still further enrich the theoretical understanding of relevant processes in opportunity recognition (Han, Han, & Brass, 2014). In the following, I briefly summarize the research on human and social capital and their impact on opportunity recognition. Together with this broad view, I highlight the relevance of specific characteristics of human and social capital – team size, experience, boundary spanning, and cohesion – and how they might be categorized.

Human capital

A clear and generally accepted definition of *human capital* does not exist. Broadly speaking, human capital includes the stock of knowledge and skills possessed by an individual (Becker, 1993). It can be developed over time, and a transfer between individuals is possible (Wright,

Hmieleski, Siegel, & Ensley, 2007). The literature tends to differentiate between general and specific forms of human capital (Hmieleski et al., 2015). For instance, general human capital is associated with overall education and life experience (Dimov, 2010). In contrast, specific human capital relates to the education and experience particularly necessary in a specific context (Becker, 1993). For example, Ucbasaran, Westhead, and Wright (2008) relate entrepreneurs' business ownership experience and their managerial, entrepreneurial, and technical capabilities to business opportunity recognition and find that these specific human capital aspects explain more of the dependent variable number of recognized business opportunities than general human capital aspects (education and work experience). In a meta-analytical review, Unger, Rauch, Frese, and Rosenbusch (2011) show that the relationship between specific human capital and entrepreneurial performance is significantly stronger than that between general human capital and entrepreneurial performance, because specific human capital better satisfies the particular task. Generally speaking, more human capital is assumed to result in better performance in a specific task (Becker, 1993), and it is thought to influence opportunity recognition (Dimov & Shepherd, 2005). But there is no consistent empirical evidence that human capital positively influences entrepreneurial performance (Unger et al., 2011).

In view of the abovementioned arguments, it seems appropriate to distinguish between different types of human capital (Dimov & Shepherd, 2005) and to concentrate on general human capital aspects as well as on the human capital aspects specifically relevant for opportunity recognition in the field of entrepreneurship (Fiet, 2007; Marvel, 2013). The overall level of human capital of an entrepreneurial founder team might be divided into a quantitative and a qualitative part (Ucbasaran et al., 2003). More specifically, the more individuals the entrepreneurial founder team consists of, the larger its quantity and, accordingly, the greater the absolute level of human capital in the entrepreneurial team. But the total number of individuals in the entrepreneurial founder team does not necessarily match the absolute quality of human capital in the team. The type of human capital – e.g., complementary or heterogeneous human capital - might reflect the quality of human capital (Ucbasaran et al., 2003). One proxy for the quantity of human capital is the *size* of the entrepreneurial founder team (Ucbasaran et al., 2003), while a proxy for the quality of human capital is the entrepreneurial founder team's *entrepreneurial experience* (Delmar & Shane, 2006).

The *size* of the entrepreneurial founder team as a quantitative aspect of human capital is defined by the number of individuals that are part of the entrepreneurial founder team (Ucbasaran et al., 2003). According to Forbes, Borchert, Zellmer-Bruhn, and Sapienza (2006), resource-seeking

is a primary reason for adding new team members and, hence, for a larger entrepreneurial founder team. They are mainly needed to pursue the specific goals and strategy of the start-up (Ucbasaran et al., 2003). Oftentimes, a larger entrepreneurial founder team is induced by the aim of reaching more relational trust and similarity of personal characteristics between team members (Forbes et al., 2006), leading to a duplication of already present qualities and an intensification of the existing atmosphere (Sapienza, Herron, & Menendez, 1991). The research indicates that there is no one optimal number for team size (Stewart, 2006), because it is dependent on the characteristics of the task being worked on and the team environment (Kozlowski & Bell, 2003).

The qualitative aspect of human capital – *entrepreneurial experience* – is defined as "the previous creation of new organizations" (Delmar & Shane, 2006, p. 220), providing information regarding experience in "such activities as opportunity identification and evaluation, resource acquisition and firm organizing" (Delmar & Shane, 2006, p. 220). It is a relevant and important aspect of human capital for an entrepreneurial team confronted with an opportunity recognition task for three reasons: First, it provides necessary information regarding tasks to be borne in mind for successful opportunity recognition. It provides routines and skills required to effectively recognize opportunities (Shepherd et al., 2000). This specific type of experience is difficult to acquire by other means and is closely tied to similar situations and challenges experienced in the past (Carroll & Mosakowski, 1987). It can be transferred from a previous opportunity recognition task to a current one (Shepherd et al., 2000), since entrepreneurial founder teams with entrepreneurial experience might have already worked on an opportunity recognition task in the creation of a previous start-up. Second, entrepreneurial experience assists in developing cognitive frameworks to recognize specific patterns (Baron & Ensley, 2006). Cognitive frameworks based on personal life experience serve as guides helping to recognize patterns in events that are independent at first glance (Baron & Ensley, 2006). In opportunity recognition, cognitive frameworks used by experienced entrepreneurs are suggested to be different compared to those used by novice entrepreneurs (Baron & Ensley, 2006), as these frameworks develop with more experience through the process of learning (Whittlesea, 1997). More specifically, experienced entrepreneurs think about business opportunities in a more sophisticated way than novice entrepreneurs (Baron & Ensley, 2006). Their cognitive frameworks are more clearly defined, richer in content, and they consider risks as well as chances when thinking about business opportunities. This leads experienced entrepreneurs to detect business opportunities that others overlook (Baron & Ensley, 2006) and to choose opportunities with a high

probability of success (Gruber et al., 2008; Thornhill & Amit, 2003). However, too strong frameworks might induce individuals to think in narrow channels, preventing them from noticing more innovative, new connections between specific instances (Baron & Ensley, 2006) and leading them to the recognize fewer original business opportunities than individuals with a less strong framework. Third, this specific type of experience allows the generation of a distinct entrepreneurial mindset. This mindset is characterized by a constant alertness to new business opportunities and the incorporation of people potentially helpful in pursuing the business opportunity (McGrath & MacMillan, 2000). Individuals might be incorporated not only into pursuing the business opportunity, but already into the prior step, its recognition. Together with the entrepreneurial mindset, experienced entrepreneurs possess opportunity registers, an "inventory of opportunities" (McGrath & MacMillan, 2000, p. 4) in which all potential business opportunities are listed. Opportunities from this inventory might be adapted to suit the current opportunity recognition task. Taken together, team size and entrepreneurial experience are two human capital measures representing quantitative and qualitative aspects, and accounting for the specific field of opportunity recognition.

Social capital

Besides human capital, social capital factors might play another decisive role in the field of opportunity recognition. Broadly understood, "social capital is the goodwill available to individuals or groups. Its source lies in the structure and content of the actor's social relations. Its effects flow from the information, influence, and solidarity it makes available to the actor" (Adler & Kwon, 2002, p. 23). It describes the possibility of benefitting from social structures and membership in networks (Portes, 1998). Since social capital is broadly defined in the literature, a categorization helps to explain relevant aspects. A division into *external* and *internal* aspects distinguishes between two relevant dimensions (Gittell & Vidal, 1998)[5]. The *external* part focuses on the direct and indirect links to other individuals in the external social network (Adler & Kwon, 2002). Examples of external social networks are memberships in organizations or contact with potential investors and other entrepreneurial teams in an entrepreneurial context. This bridging form of social capital provides resources and information, whereupon each network represents a non-redundant concentration of information (Burt, 2004; Han et al., 2014).

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[5] Some authors (e.g., De Carolis and Saparito , (2006); Nahapiet and Ghoshal (1998)) do not differentiate between external and internal aspects, nor between strong and weak ties, but concentrate on structural and relational dimensions. The structural dimension refers to the overall network structure and the positioning of individuals, while the relational dimension refers to personal relationships and their categorization into weak and strong ties.

The information is non-redundant if different external social capital sources do not provide similar information. External social ties to these networks are rather weak as compared to dense internal networks, but the networks provide information that is not available through other means (Davidsson & Honig, 2003; Granovetter, 1973). The external social ties are weak because the relationships between the individuals are rather superficial (Granovetter, 1973). Burt (2004) mentions structural holes when talking about gaps in social structures. The existence of a structural hole denotes that there is a gap between two individuals from two separate groups who have a focus on different activities, but who can provide each other with helpful and at the same time unfamiliar information. This hole can be bridged by a broker (Burt, 1992, 2004). The advantage of a network with many structural holes is the possibility of having access to many groups providing heterogeneous information if one acts as a mediator with regard to these groups. In addition, more and diverse contacts help individuals to receive more information at the same time, and to receive relevant information earlier than by searching on their own (Burt, 1992, 2004). From an entrepreneurial perspective, this external view describes the goodwill and resources arising from the entrepreneurs' external networks including information, influence, and solidarity the entrepreneurs can benefit from (Adler & Kwon, 2002; De Carolis & Saparito, 2006). For instance, during the opportunity recognition process, external social capital might support entrepreneurs by presenting them with new ideas or previously unknown world views, and external contacts might challenge predominant norms and offer new problem-solving approaches (Aldrich, Renzulli, & Langton, 1998; Kaufmann & Tödtling, 2001). The external social capital facilitates connecting the dots between otherwise unrelated and disconnected sources of information and facilitates the recognition of business opportunities others fail to realize (Baron & Ensley, 2006). But in general, these external, weak ties are temporary and the parties do not invest time in maintaining the relationship in the long run. Therefore, they have little emotional content (Bhagavatula et al., 2010).

On the other hand, the *internal* part of social capital contains the group's internal characteristics. The focus lies on the relationships of individuals within the group and how they might facilitate the achievement of collective goals (Adler & Kwon, 2002). For instance, psychological safety (Edmondson, 1999) and transfer of tacit knowledge (Nonaka & Krogh, 2009) are specific examples describing the integration of information and perspectives within a group. Examples of such groups are the family, close friends, or the entrepreneurial founder team in an entrepreneurial context. Ties in this internal view are stronger and more substantial than in the external view because the contact is more frequent, the relationships are based on mutual trust, and the

emotional connections are stronger (Hmieleski et al., 2015). This directly impacts the exchange of complex knowledge, because strong trust and collaboration reduce transaction costs (Lowik, van Rossum, Kraaijenbrink, & Groen, 2012). In an entrepreneurial founder team, members know each other very well. In the extreme case of knowing every single member of an internal network, it is defined as being completely closed (Burt, 2000; Coleman, 1988). In that case, information might be transmitted quickly between group members and group values are (implicitly) defined, promoting high levels of intra-group trust and reciprocity among group members (Bhagavatula et al., 2010). However, it is argued that strong internal ties might be less valuable than weak external ties because they might offer more redundant information (Granovetter, 1973), which is - especially in an entrepreneurial opportunity recognition task - less useful (Granovetter, 1973; Hmieleski et al., 2015).

In order to allow for both types of social capital - external, weak relationships and internal, strong relationships - to be taken into consideration, two different aspects are included that cover both perspectives. These variables are *boundary spanning* and *cohesion*, which are presented and classified in the following. First, "*boundary spanning* refers to actions a focal team undertakes to reach out into its environment to obtain important resources and support" (Faraj & Yan, 2009, p. 606). More specifically, this variable has an external perspective. Members of any group seldom have all necessary information within the team. They engage in relationships with others who might offer insights into changes and trends in markets, technologies, and government policies relevant for their working environment (Ozgen & Baron, 2007). For instance, Hargadon and Sutton (1997) analyze how IDEO, a product design firm, develops innovative products. The firm has access to ideas (technological solutions) from various industries, absorbs those ideas, and applies them to other industries. The company thus benefits from its external ties and its brokerage role in bridging industries otherwise not connected (Burt, 2004; Hargadon & Bechky, 2006). In the entrepreneurial field, the relevant external environment to bridge relationships to might include investors, business networks, other entrepreneurial teams, or banks. As mentioned above, the entrepreneur can then act as a broker connecting two otherwise unconnected groups (Burt, 1992, 2004). Not only might one entrepreneurial founder team member have contacts to an external network, but other team members will probably likewise leverage their relations to various networks and share acquired knowledge and information within the entrepreneurial founder team. Thus, for an entrepreneurial founder team, the boundary spanning variable has a clear external character associated with weak ties. These external ties are weak because, for example, the level of associability to other entrepreneurial teams or members of

business networks might be rather limited and trust might be weak. Nevertheless, these parties provide new information and knowledge. Empirical evidence is presented by Davidsson and Honig (2003). External social capital variables with weak ties - especially being a member of a business network - are found to be significant predictors for starting a company, having first sales, and being profitable.

Second, different conceptualizations of *cohesion* are prevalent in the literature (Evans & Jarvis, 1980; Festinger, 1950; Goodman et al., 1987; Steers, 1991). In this thesis, cohesion is described as "the commitment of members to the group task. The greater the level of commitment among group members, the greater the cohesiveness" (Goodman et al., 1987, p. 149). Festinger (1950) instead introduces three different facets of cohesion: member attraction, group activities, and prestige or group pride. Member attraction describes a shared liking for the members of the group. Group activities or task commitment (Mullen & Copper, 1994) is defined as the extent to which there is a shared commitment to the team task. Prestige or group pride is the extent to which members of a team identify with the status or ideology of the group (Beal et al., 2003). A further conceptualization is illustrated by Gross and Martin (1952), who divide cohesion into task cohesiveness and interpersonal cohesiveness. Task cohesiveness is the team's shared commitment to the team task, whereas interpersonal cohesiveness is team members' liking of the group (Hackman, 1994; Kozlowski & Ilgen, 2006). In general, the important facets are the internal focus of cohesion, the associated strong ties within the group, and the facilitation of reaching shared goals (Adler & Kwon, 2002). As mentioned above, the stronger the ties are within the group, the closer the group is (Coleman, 1988). Shared goals are reached because, in highly cohesive groups, members are assumed to discuss, negotiate, and refine arguments to arrive at a shared understanding (Ayas & Zeniuk, 2001; Newell, Tansley, & Huang, 2004). On top of that, research has shown that cohesion positively influences different indicators of performance. In their meta-study, Beal et al. (2003) find that the different aspects of cohesion - member attraction, group pride, and task commitment - are significantly and positively related to team performance. Moreover, they find that cohesion is more strongly related to performance measured as team behavior compared to a measurement as team outcome. Performance is defined as team behavior if it is measured as an evaluation of actions or behaviors relevant for either the goal of a study in an experiment or the goal of the organization in a field study (Beal et al., 2003). The influence of team cohesion on performance is stronger if the task to be fulfilled is more complex, making team work more interdependent. Additionally, teams with higher levels of cohesion (in which members are friendly, cooperative, and relaxed) are found to have

less social conflict than low-cohesion groups (in which members are hostile and aggressive) (Shaw & Shaw, 1962), and they are more likely to share information that is exclusively known by one individual (Leana, 1985). Lastly, in cohesive teams motivation, morale, and the willingness to work hard for the collective task are suggested to be prevalent besides facilitated group productivity (Ensley, Pearson, & Pearce, 2003). While these examples show the positive impact of cohesion from a team perspective, experienced venture capital funds, too, prefer to fund start-up teams incorporated with high levels of cohesion (Franke, Gruber, Harhoff, & Henkel, 2008). Venture capitalists rationally invest in the entrepreneurial founder teams that they believe to have the highest probability of success (Rosenbusch, Brinckmann, & Müller, 2013). Hence, experienced venture capital funds advance the view that high levels of cohesion are an indicator of a potentially successful entrepreneurial founder team. In summary, higher levels of cohesion foster trustworthiness and wellbeing within the team, thereby positively impacting various indicators of performance.

Having presented two human capital aspects - team size as a quantitative indicator, and entrepreneurial experience as a qualitative indicator - and two social capital aspects – boundary spanning with an external focus and weak ties, and cohesion with an internal focus and strong ties - in the following I categorize all of these aspects. First, human capital is less tangible than physical capital (which is completely tangible and included in tools, machines, or other equipment because of modifications of material), because it is not fully tangible and has no observable material form. But it is contained in the skills and knowledge of individuals, making it more tangible than social capital, which exists only in the relations between individuals (Coleman, 1988). More specifically, the human and social capital components can be compared on a continuum with the anchors explicit and tacit (Nonaka, 1994, 2007; Nonaka & Krogh, 2009). Based on different types of knowledge, Nonaka and Krogh (2009) argue that explicit knowledge is formulated in sentences and can be captured in explicit drawings and writings. It has a universal character, supporting the ability to act across contexts, is completely accessible through consciousness, and is created in the past. In contrast, tacit knowledge is connected with the senses, tactile experiences, movement skills, intuition, and implicit rules of thumb. Moreover, it "is rooted in action, procedures, routines, commitment, ideals, values, and emotions (Nonaka, 2000; Nonaka, Toyama, & Konno, 2000; Nonaka, Umemoto, & Senoo, 1996)" (Nonaka & Krogh, 2009, p. 636) and is subjective as well as experiential. Furthermore, it is procedural and practically useful (Sternberg, Wagner, Williams, & Horvath, 1995). The tacit part of the

continuum is largely inaccessible through consciousness and cannot be communicated to others through articulation.

Based on this differentiation, team size, entrepreneurial experience, boundary spanning, and cohesion can be categorized from tangible to intangible or explicit to tacit, as depicted in Figure 1.

	Team size	Entrepreneurial experience	Boundary Spanning	Cohesion
	Tangible ────────────────────────────▶ Intangible			
Human capital	✓	✓		
Social capital			✓	✓

Source: Own illustration

Figure 1: Categorization of human and social capital aspects

First, team size is the most tangible variable. The larger the entrepreneurial founder team, the greater the absolute level of human capital (Ucbasaran et al., 2003). Team size represents the skills and knowledge acquired by all team members. The number of entrepreneurial founder team members can be stated easily. Similarly, it is simple for entrepreneurial founder team members to communicate to other team members through articulation: The more founders there are in the team, the more knowledge is likely to be present in the team that can be articulated and discussed (Ucbasaran et al., 2003). Second, entrepreneurial experience has a more qualitative character than team size. It cannot be calculated as easily as team size, because experience is less objectively measurable. An entrepreneurial founder team member can easily communicate her or his entrepreneurial experience to others through articulation, but the statement might not always be rational and objective (Delmar & Shane, 2006). Entrepreneurial experience usually comprises different skills and knowledge about recognizing business opportunities, creating a new company, hiring new employees, or acquiring financial capital (Delmar & Shane, 2006) and is in most cases accessible through consciousness (Morris, Kuratko, Schindehutte, & Spivack, 2012). Third, boundary spanning is an external aspect of social capital and is associated with weak ties (Adler & Kwon, 2002). It describes the attempt to establish relations among individuals. Through its external character and a representation of indirect experience

(Gino, Argote, Miron-Spektor, & Todorova, 2010), it rather shows skills and knowledge acquired from outside of the entrepreneurial team. It represents tactile experiences as well as indirect knowledge and information and is generally more indirect than direct, personal entrepreneurial experience (Gino et al., 2010; Marrone, 2010). Fourth, cohesion is an internal aspect of social capital and is associated with strong ties. It has a merely internal character (Goodman et al., 1987). This social capital aspect is driven by intuition, since it is often accompanied by feelings like solidarity, harmony, or commitment among the group members (Mudrack, 1989). Cohesion is often not accessed through consciousness, because it describes how the group "sticks together" and the "sense of 'we-ness'" (Mudrack, 1989, p. 39) describes teams with high levels of cohesion. In most cases, there are no clear roles, but interaction among team members is supported by rules of thumb. Additionally, its affective character (Kozlowski & Ilgen, 2006) induces the importance of values and emotions in cohesive groups; cohesion is thus the most intangible and tacit variable considered in this thesis.

In essence, this section gives an overview of human and social capital and their role in opportunity recognition. They might play a decisive role in explaining why some entrepreneurial founder teams recognize specific business opportunities while others do not. Additionally, this section illustrates four variables - team size, entrepreneurial experience, boundary spanning, and cohesion - representing distinct aspects of human and social capital. Team size represents a quantitative aspect, whereas entrepreneurial experience depicts a specific qualitative aspect of human capital. On the other hand, boundary spanning illustrates the external focus of social capital associated with weak ties, while cohesion displays the internally focused aspect associated with strong ties. However, the role of human and social capital in opportunity recognition processes is still unclear and calls for further inquiry (Davidsson, 2003; Davidsson & Honig, 2003). In the following, this thesis aims to contribute to the research on human and social capital factors in opportunity recognition tasks of entrepreneurial founder teams.

2.4   Development of hypotheses

In the sections above, I summarize important tenets of opportunity recognition in entrepreneurial founder teams. Opportunity recognition is one of the most important tasks in entrepreneurship (Shane & Venkataraman, 2000). From a theoretical point of view, two important streams have defined the discourse on how opportunities might be recognized: discovery theory (Kirzner, 1973, 1997) and creation theory (Schumpeter, 1997). However, scholars integrate the two approaches and argue how they might complement instead of contradict each other (Alvarez

& Barney, 2007; Short et al., 2010). These two views are completed by the evolving idiosyncrasy perspective (Dimov, 2011; Sarason et al., 2006; Sarason et al., 2010). As to the level of analysis, academic interest in entrepreneurial opportunity recognition is largely focused on the individual entrepreneur (Baron, 2007), while research at the team level has only recently become more prevalent (Klotz et al., 2014). Additionally, most studies include the steps selection and exploration in their investigations (Moroz & Hindle, 2012). To the best of my knowledge, there is only one team-based study concentrating on the opportunity recognition process (without selection and exploration) or clearly distinguishing between the distinct steps of opportunity recognition, selection, and exploration (Perry-Smith & Coff, 2011). The study at hand is thus among the first studies to focus explicitly on the opportunity recognition process of entrepreneurial founder teams.

As Figure 2 shows, the study focuses on opportunity recognition processes at the team level.
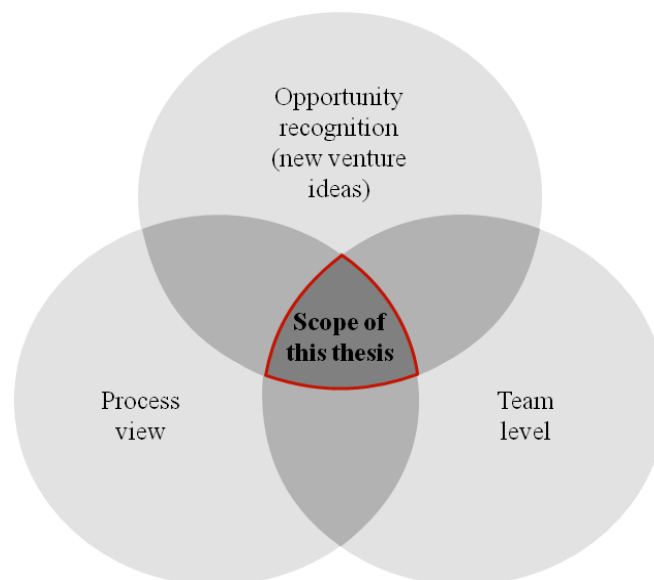
Source: Own illustration

Figure 2: Scope of this thesis

Furthermore, this thesis sheds light on opportunity recognition processes of entrepreneurial founder teams by including factors that are expected to be important in opportunity recognition tasks. As illustrated in section 2.3, human and social capital are expected to play a pivotal role in opportunity recognition (Davidsson & Honig, 2003; Ucbasaran et al., 2003). However, how they impact opportunity recognition processes at the team level is still unclear and calls for further inquiry. For Davidsson (2003), one core research question for entrepreneurship researchers is to better understand which of the entrepreneurial team characteristics relevant for

business opportunity recognition processes are responsible for differences across teams. Before the impact of different entrepreneurial team characteristics can be analyzed, the opportunity recognition process itself needs to be assessed in relevant dimensions as a first step. As section 2.2 shows, creativity is the core concept to assess the value of a business opportunity. I focus on originality and business value assessments for business opportunities to assess the process across different business opportunities. As has been argued, originality and business value are the two relevant components of creativity in the entrepreneurial context. The process consideration is important in order to understand whether the creativity components originality and business value evolve in the same or opposing directions. Furthermore, this analysis provides insights for entrepreneurial founder teams that are confronted with an opportunity recognition task. They might better reflect if more business opportunities during an opportunity recognition task necessarily coincide with a better result. Again, the separation between originality and business value provides insight into whether both components can be optimized at the same time. Moreover, the process analysis allows the possibility to test Mednick's (1962) model on creativity in the entrepreneurial context. Then, in the second step, I aim to understand the effects of human and social capital aspects on the development of the business opportunities' originality and business value assessments. More specifically, I analyze the impact of team size, entrepreneurial experience, boundary spanning, and cohesion on the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality, as well as on the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value.

In the following, I connect research on opportunity recognition, creativity, and human and social capital to derive my hypotheses. First, I theorize on the relationship between the dependent variables of the model, originality and business value (Hypothesis 1). Then, I outline the hypothesized relationships between the prior business opportunity's originality and a subsequent business opportunity's originality, and between the prior business opportunity's business value and a subsequent business opportunity's business value (Hypothesis 2 and Hypothesis 3). Lastly, I introduce team size, entrepreneurial experience, boundary spanning, and cohesion as hypothesized moderators for the originality and business value main effects (Hypotheses 4a, 4b, 5a, 5b, 6a, 6b, 7a, and 7b). Figure 3 gives an overview of the models for originality and business value.
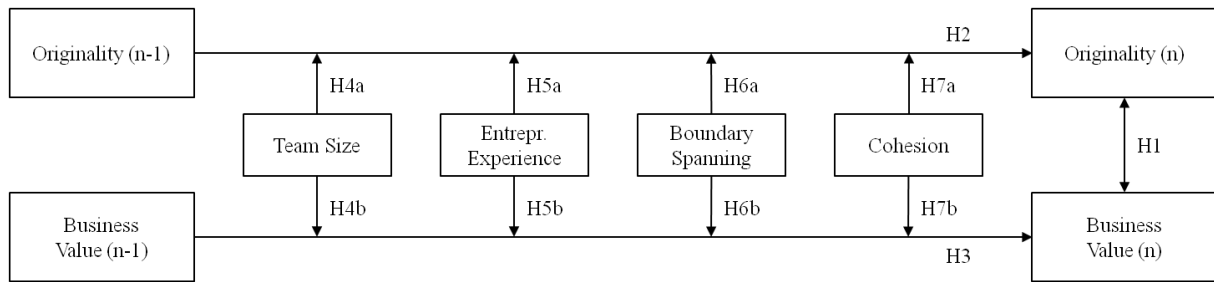
Source: Own illustration

Figure 3: Overview of theoretical models for originality and business value

2.4.1 The relation between originality and business value

Creativity is a major concept in opportunity recognition research in order to determine the value of a business opportunity (Ardichvili et al., 2003; Baron, 2006; DeTienne & Chandler, 2004). As argued in section 2.2, originality and business value are two core aspects of creativity (Diehl & Stroebe, 1987; Girotra et al., 2010). In the following, I briefly define originality and business value, then develop Hypothesis 1, arguing on the relationship between originality and business value.

First, originality is a defining feature of creativity and is even called the hallmark of creativity (DeDreu et al., 2008; Nijstad, DeDreu, Rietzschel, & Baas, 2010). The literature rarely provides explicit definitions. An exception are Rietzschel et al. (2010, p.52), who state that "unoriginal ideas (with an originality of 1) were explained to be very common, often concerning issues that already exist (rather than being new). In contrast, highly original ideas (with an originality of 5) were described as ideas that are mentioned rarely, are very innovative, and often introduce radically new applications of existing things or things that are completely new." Nijstad et al. (2010, p. 46) additionally mention "is the idea new, unusual, infrequent?"

Second, the business value of business opportunities is understood as "the utility of the ideas to a commercial organization that might develop and sell the products" (Girotra et al., 2010, p. 597). A business opportunity provides utility to the entrepreneurial founder team if it is feasible and profitable (see section 2.2 for more details). On the one hand, feasibility requires the business opportunity to be easily implementable into a commercial product. Hence, there should be only a low barrier from a technical or economic point of view. Additionally, the business opportunity should not require large investments in money or time (Poetz & Schreier, 2012; Rietzschel et al., 2010). On the other hand, the business opportunity should promise a significant level of potential profitability to compensate the entrepreneurial founder team at

least for the opportunity cost (Welpe et al., 2012). In contrast, a business opportunity associated with a low business value does not provide utility to the entrepreneurial founder team. The opportunity does not have a high feasibility and thus is not easily implementable from a technical and/or economic point of view and requires a large investment in money or time. Additionally, the business opportunity does not offer a sufficiently high level of potential profitability to induce the entrepreneurial founder team to exploit it.

Having defined originality and business value as the two key aspects of creativity, in the following I theorize on the assumed negative correlation between originality and business value. Three arguments are provided supporting the assumption that the relationship between originality and business value is negative. First, at the emergence of a new market, when it is still a niche, business opportunities are oftentimes original or innovative (Markides, 2006). A rare and uncommon opportunity is unusual especially because few other individuals think about the respective specific market or industry. Correspondingly, the size of the market might limit potential profitability and therefore the size of the business value. Even if growth and thereby a high business value is desired, the market itself might limit the growth potential and size of an original business opportunity in a niche market, and the technology, product, or service may need to undergo significant changes in order to exceed a specific growth threshold (Garnsey, 1998). Moreover, the potential profitability of the business opportunity may be so small that other market players might not think about the business opportunity, because they do not have the incentive or capabilities to provide the specific and specialized services or products to satisfy a customer's particular demand (Park & Bae, 2004). For such a specific business opportunity, the customer's requirements may be exceptionally high and difficult for the offering company to satisfy. Hence, the business opportunity's feasibility and associated problems and challenges may be unpredictable.

Second, original business opportunities might be original simply because they have not yet been implemented. The main reason for not implementing a business opportunity might be either difficult feasibility or low associated profitability. In the words of Nijstad et al. (2010), "original ideas tend to be less feasible, which is perhaps unsurprising given that original ideas have often not been implemented before." Thus, if the feasibility of a business opportunity has not been discussed in all detail or the opportunity has not yet been realized, implementation might be difficult due to the opportunity's novelty and the entrepreneurial founder team's lack of experience. Consequently, the more original the recognized opportunity, the lower the value that

might be associated with the opportunity, and the lower the assumed appropriate feasibility and business value.

Finally, business opportunities related to large, dynamic, and common industries might be associated with high profitability, but these opportunities might be identified by many potential entrepreneurial founder teams. Hence, these business opportunities are associated with low originality. In contrast to the slow growth rates mentioned in the first argument, rapidly growing firms that pursue business opportunities associated with a high business value are mainly found in industries and markets that are large and dynamic (Davidsson, Achtenhagen, & Naldi, 2005). These dynamic industries are in the focus of many potential entrepreneurial founder teams. Consequently, the recognized business opportunities, which are associated with high business value due to the dynamic market or industry structure, are no longer rare or new.

In summary, I propose that business opportunities associated with high originality are at the same time associated with low business value. Business opportunities linked with high business value are simultaneously linked to low originality. Thus,

Hypothesis 1: Originality and business value for the same business opportunities are negatively correlated.

2.4.2   The direct effects of the prior opportunity's originality on a subsequent opportunity's originality, and of the prior opportunity's business value on a subsequent opportunity's business value

Having investigated the relationship between originality and business value, I turn next to the relationship between a prior business opportunity's originality (in the following referred to as originality (n-1)) and a subsequent business opportunity's originality (in the following referred to as originality (n)), as well as between a prior business opportunity's business value (in the following referred to as business value (n-1)) and a subsequent business opportunity's business value (in the following referred to as business value (n)). I first provide a deeper understanding of the levels at which originality and business value are analyzed in the literature and the level that this thesis concentrates on. Further, I theorize, based on Mednick's (1962) model on creativity, on the relationship between a prior opportunity's originality and a subsequent opportunity's originality, as well as on the relationship between a prior opportunity's business value and a subsequent opportunity's business value.

Studies on originality in the creativity literature vary with respect to the level of analysis. Most of the studies concentrate on the individual level (DeDreu et al., 2008; Nijstad et al., 2010; Rietzschel et al., 2010), while only few studies examine originality at the group level (Diehl & Stroebe, 1987; Rietzschel et al., 2006). These studies compare nominal (each group member brainstorms individually and ideas are pooled at the end) and interactive groups (the group brainstorms together) concerning their idea generation abilities. For instance, DeDreu et al. (2008) argue that mood states in individuals that are activating (e.g., anger) lead to higher originality in idea generation than mood states that are deactivating (e.g., sadness) due to enhanced cognitive flexibility in the case of positive moods and enhanced persistence in the case of negative moods. They present four studies supporting their reasoning. In the case of a team-level consideration of originality, Rietzschel et al. (2006) show that nominal groups generate more original ideas than interactive groups in an idea generation task. Instead, for business value, only Girotra et al. (2010) present a study in which they focus on a comparison between interactive and hybrid (independent work prior to team work) groups and find that groups organized in the hybrid structure develop ideas with higher business value.

Davidsson and Wiklund (2001) and Davidsson (2003) acknowledge that research in entrepreneurship has been conducted at different levels. But they argue that further progress can be achieved through "a perspective on entrepreneurship that is focused on discovery and new combinations irrespective of the organizational context" (Davidsson & Wiklund, 2001, p. 89). In detail, according to the authors, the relevant level of analysis is *creation of new enterprise* (Low & MacMillan, 1988) or, in other words, the *venture idea* itself (Davidsson, 2003, 2015). As mentioned in section 2.1, *new enterprise* means new economic activity or business activity and is independent of any formal organizational structure. This level of analysis advances research in entrepreneurship for the following reasons: First, it is the economic activity that emerges, and not necessarily a new organizational structure, that is relevant for entrepreneurship (Davidsson & Wiklund, 2001; Gartner, 1989), leading to the conclusion that the firm-level perspective is frequently not adequate. Second, this level allows determining the quality of the venture idea and considering whether or not the opportunity is successful (Davidsson & Wiklund, 2001). Lastly, the venture idea level induces entrepreneurship to be a distinct research domain when the business opportunity enhances social wealth by establishing new markets, new industries, or new jobs, or by increasing real productivity (Venkataraman, 2012). This level is rarely used in other research fields (Davidsson, 2003). Hence, Davidsson and Wiklund (2001), Da-

vidsson (2003), and Davidsson (2015) conclude that the emergence of the new enterprise, understood as new economic activity or a new venture idea, and not as a formal organizational structure, should be the core of the analysis. In the study at hand, the *venture idea* or business activity is the relevant level to analyze the development of originality and business value across different business opportunities. The approach highlights the *venture ideas'* quality in terms of originality and business value.

Having provided a short overview of the levels at which originality and business value are analyzed in the literature and the relevant level in this thesis, in the following I elaborate on the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality, as well as between a prior business opportunity's business value and a subsequent business opportunity's business value. In his model on creativity, Mednick (1962) outlines the supposed relationship between associative behavior and creativity. He defines "the creative thinking process as the forming of associative elements into new combinations which either meet specified requirements or are in some way useful. The more mutually remote the elements of the new combination, the more creative the process or solution" (Mednick, 1962, p. 221). More specifically, individuals are characterized by associative hierarchies. The concept of associative hierarchies explains the fact that different individuals accomplish a creative solution with varying probability and speed of attainment when confronted with a creativity task (Mednick, 1962). For any concept, there are a number of associations that can be ordered according to their associative strength. At the beginning, individuals have many stereotypical associations with high associative strength. Everyone needs to first pass highly related, accessible responses before being able to arrive at more remote and distant associations (Benedek, Könen, & Neubauer, 2012; Benedek & Neubauer, 2013; Mednick, 1962; Milgram & Rabkin, 1980)[6]. Mednick assumes that the more associations an individual has regarding a specific concept, the greater the probability of reaching an original solution. At the beginning, a creative individual might not develop more ideas than a less creative individual. But since a creative individual does not have highly dominant responses (flat associative hierarchy), she or he will develop ideas more steadily and arrive at a higher number of ideas at the end than an individual with a

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[6] In Mednick 's ((1962)) original model, two types of individuals are analyzed: individuals with steep associative hierarchies (less creative) and individuals with flat associative hierarchies (more creative). Both groups have the same temporal trend in divergent thinking. They start with stereotypical associations and need time to arrive at more remote associations (Beaty and Silvia (2012)). But creative individuals have a higher probability of mentioning more remote associations over time because they are less stuck on dominant responses. Their rate of mentioning original answers is higher than that of uncreative individuals and they might continue to develop opportunities when uncreative individuals have stopped creating ideas (Ward (1969)).

strongly dominant response (steep associative hierarchy). The ideas will be more creative be-cause no dominant answer will prevent the development of more original ideas (Benedek & Neubauer, 2013; Mednick, 1962). Nijstad et al. (2010) mention that the phenomenon of as-sociative hierarchies might be explained by latent inhibition. Latent inhibition suggests that the brain unconsciously ignores stimuli that experience has shown to be irrelevant (Lubow, 1989). The better people are at finding remote associations, the lower their latent inhibition. The reason is that these individuals have more seemingly unrelated associations and, thus, develop more original opportunities.

Source: Own illustration (adapted from Mednick (1962), p. 223; Benedek and Neubauer (2013))

Figure 4 serves as an example to display the arguments mentioned in the previous paragraph. The y-axis denotes associative strength, while the x-axis denotes business opportunities related to the concept of mobile 3D scanning technology using smartphones (this technology is applied in this study's experiment. See section 3.3.2 for further details). At the beginning, individuals will probably first think about obvious business opportunities, e.g., using the technology for a software-as-a-service platform. The more opportunities founder teams develop, the more likely they are to arrive at more distant business opportunities (business opportunity examples of a 3D profile for online shopping, rental car scanning for insurance purposes, and relocation help in Source: Own illustration (adapted from Mednick (1962), p. 223; Benedek and Neubauer (2013))

Figure 4). The example of 3D scans of climbing paths is a strongly remote association which might be recognized only after more conventional business opportunities have been mentioned.
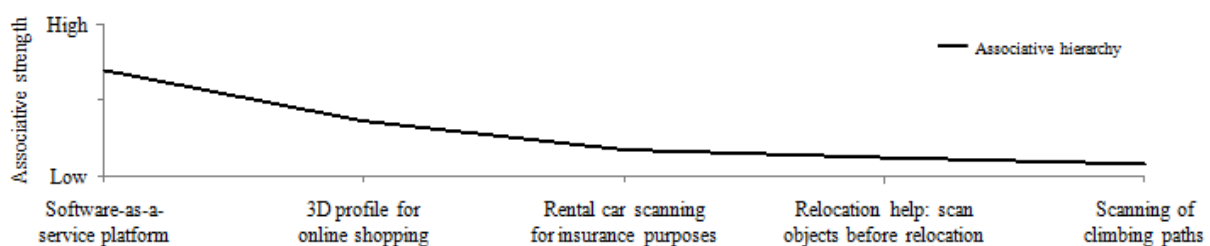
Source: Own illustration (adapted from Mednick (1962), p. 223; Benedek and Neubauer (2013))

Figure 4: Mednick's model on creativity: Association hierarchies for the concept "mobile 3D scanning using smartphones"

With this in mind, the next step is to assess Mednick's model in terms of originality and business value. On the one hand, the first business opportunities recognized with respect to a specific

topic are assumed to be stereotypical. They are developed by many people and, hence, are un-original and common. The more opportunities are generated, the higher the possibility that one of these business opportunities might serve as starting point for more remote associations and business opportunities, which are assumed to be original and rare because they are either associated with niche industries or recognized by few people (Benedek & Neubauer, 2013; Nijstad et al., 2010). Hence, the originality of recognized business opportunities is assumed to increase across business opportunities.

On the other hand, the business opportunities mentioned first are assumed to belong to large and dynamic industries or markets everyone knows. In this environment, the large number of potential customers allows for a high potential profit for the offered service or product. Moreover, the business opportunities recognized first might be associated with a high feasibility, because highly related responses tend to be habitual or uncreative and, therefore, easier to implement (Nijstad et al., 2010). The more business opportunities are developed, the more potential starting points allow searching for opportunities in small niche markets, which are associated with a lower business value. Additionally, the more opportunities are recognized, the more easily individuals might detach themselves from the strong focus on feasibility and instead focus on novel, not yet implemented business opportunities. These opportunities, which are assumed to be developed at a later stage of the opportunity recognition task, are associated with a lower business value than the opportunities recognized at the beginning of the task. Thus,

Hypothesis 2: The relationship between a prior business opportunity's originality and a subsequent business opportunity's originality will be positive.

Hypothesis 3: The relationship between a prior business opportunity's business value and a subsequent business opportunity's business value will be negative.

2.4.3 The moderating effect of team size on the direct originality effect and the direct business value effect

Having described the main effects - the relationship between a prior opportunity's originality and a subsequent opportunity's originality, as well as the relationship between a prior opportunity's business value and a subsequent opportunity's business value - I turn next to team size as the first moderator. In the following section, I first develop a deeper understanding of the role of team size in opportunity recognition and its impact on venture performance. Further, I

will argue that team size moderates the previously theorized relationships of originality and business value.

The effect of team size in opportunity recognition and especially on venture performance finds considerable attention in the literature (Amason et al., 2006; Chaganti, Watts, Chaganti, & Zimmerman-Treichel, 2008; Chandler, Honig, & Wiklund, 2005; Eisenhardt & Schoonhoven, 1990; Sine et al., 2006; Ucbasaran et al., 2003). Larger teams are able to absorb more information and execute more tasks at the same time (Eisenhardt & Schoonhoven, 1990). In contrast, smaller teams sizes ease coordination, communication, and an open exchange among team members (Amason & Sapienza, 1997; Shaw, 1981). The findings for the effect of team size on venture performance are mixed. Amason et al. (2006) and Chaganti et al. (2008) do not find a significant direct effect of team size on performance. In contrast, Sine et al. (2006) find that larger entrepreneurial founder teams tend to be connected to higher future revenues. With regard to performance measured as profitability and sales, Chandler et al. (2005) suggest starting with a large start-up management team and dismissing members without valuable contributions instead of starting with a small founder team and adding members where necessary. As mentioned by Chaganti et al. (2008), the effect of team size on venture performance calls for more research.

In this section, I theorize that team size positively moderates the relationship between a prior opportunity's originality and a subsequent opportunity's originality and attenuates the negative relationship between a prior opportunity's business value and a subsequent opportunity's business value. In the following, three arguments are outlined to propose these relationships.

First, production blocking in group discussions involves situations where only one group member can speak at a time and the remaining individuals are blocked (Diehl & Stroebe, 1987), with two consequences: Team members who cannot explain their opportunities in the moment they come to their mind may either forget or suppress them, because they may no longer seem relevant at a later point in time. The reason for the assessment of irrelevance may either be a reevaluation of the own opportunity due to another team member's comment or a directional change of the discussion. Team members might forget an opportunity because short-term memory only allows a few opportunities to be stored at a time (Diehl & Stroebe, 1987). Furthermore, if team members are forced to listen to others in a group discussion, they may be distracted from their own thinking about new potential opportunities or lose interest in developing opportunities of their own (Diehl & Stroebe, 1987; Gallupe, Bastianutti, & Cooper, 1991). The larger the group,

the longer each individual has to wait to explain their own opportunities. Hence, each team member not currently talking might forget their own opportunities, stop thinking about new opportunities, or become uninterested. Moreover, people might only mention the first business opportunities that come to their minds due to a time limitation on the opportunity recognition task (Kavadias & Sommer, 2009). If, in larger teams, only the first opportunities suggested by each team member are discussed, all of them might be low in terms of originality. As expressed in section 2.4.2, the business opportunities mentioned first have a high associative strength and lack newness compared to subsequent business opportunities. In contrast, in smaller teams everyone is able to mention more opportunities and, hence, more original opportunities. Then, the relationship across business opportunities will become more positive as compared to larger entrepreneurial founder teams.

With regard to business value, team size might moderate the relationship across business opportunities because of the phenomenon of production blocking. As mentioned in the previous paragraph, in larger teams only the first business opportunities of each member might be discussed and refined. In contrast, in smaller teams every team member might have the possibility to mention several business opportunities. The first business opportunities mentioned by each team member are assumed to be associated with the highest business value. If, in larger teams, only the first opportunities of each member are discussed, the relationship across opportunities described in section 2.4.2 will be less negative than in smaller teams, in which everyone discusses more of their own opportunities. The more own opportunities each team member can discuss in smaller teams, the more of them might be associated with a lower business value as the process advances.

Second, evaluation apprehension describes the observation that team members might not speak up during a discussion because of the potential presence of peer evaluation (Kavadias & Sommer, 2009). If individuals fear negative evaluation from others when they mention an idea, they might be reluctant to talk about more original opportunities. This effect is even more pronounced when the other group members are assumed to be experts (Diehl & Stroebe, 1987). Closely related to the phenomenon of evaluation apprehension is topic fixation (Larey & Paulus, 1999; Sawyer, 2007). If a team member does not dare to mention more original ideas, she or he will instead build on the ideas of others. In this case, recognized opportunities will go in the same direction, the group will follow a common train of thought, and discussions will focus around the same topic for a longer time span (Sawyer, 2007). The larger the entrepreneurial founder team, the higher the probability of being peer-evaluated by someone, and the higher

the probability that business opportunities will build on others' opportunities. Thus, if in larger teams one opportunity builds on another, they are less likely to become more original in the opportunity recognition process. More specifically, the opportunities will become more similar with regard to content from one opportunity to another. Instead, in smaller teams the probability of being peer-evaluated might be lower and team members might be more likely to risk mentioning their more original opportunities in reaction to an original business opportunity contributed to the team discussion.

Referring to the business value of opportunities in large teams, the effects of peer evaluation and topic fixation might induce team members to discuss more opportunities associated with a higher business value across opportunities as compared to smaller entrepreneurial founder teams. Hence, the relationship between two opportunities in terms of business value will be less negative for larger teams than for smaller teams. The reason is that teams will start discussing different opportunities with respect to one specific topic. If team members in larger teams tend to build on the business opportunities of others for not being peer-evaluated, they will develop opportunities on a similar search path, but improving the current opportunities in terms of feasibility or profitability, e.g., associating already mentioned opportunities with a larger industry or an easier feasibility.

Finally, free riding describes the phenomenon that team members do not contribute to a discussion because of the inability to observe effort (Diehl & Stroebe, 1987). Every external person (e.g., the experimenter in the opportunity recognition task) only notices what has been developed at the team level, but cannot relate contributions to specific individuals (Diehl & Stroebe, 1987). The external person might be substituted by the general public. If the entrepreneurial founder team presents its developed business opportunities to others, each team member might have the incentive to free ride because developed opportunities cannot be related to individual team members. The larger the team, the more difficult it is to relate opportunities to individuals. Moreover, the perceived effectiveness of each individual contribution might be lower in a large team than in a small team, because individuals might believe the additional own contribution to be irrelevant for the final group product (Diehl & Stroebe, 1987; Kavadias & Sommer, 2009). The originality of recognized opportunities in larger founder teams might increase less strongly than in smaller teams, because individuals might not mention their less common opportunities due to their potentially perceived irrelevance. Hence, if team members in larger entrepreneurial founder teams do not mention their more original business opportunities, the relationship be-

tween a prior business opportunity's originality assessment and a subsequent business opportunity's originality assessment will be less positive for larger entrepreneurial founder teams than for smaller teams.

In terms of business value in larger teams, the individuals' perceptions that their own contributions might be irrelevant due to an inability to observe effort or a perceived low effectiveness of additional own contributions might result in the relationship between a prior opportunity's business value assessment and a subsequent opportunity's business value assessment being less negative for larger entrepreneurial founder teams than for smaller teams. The reason is that individuals in larger teams will not make the effort to think about more original business opportunities, associated at the same time with a smaller business value. Accordingly, the larger team size will attenuate the negative business value main effect described in section 2.4.2.

In summary, production blocking, evaluation apprehension, and free riding lead to the propositions that smaller teams will positively influence the relationship between a prior opportunity's originality and a subsequent opportunity's originality, but will strengthen the negative relationship between a prior opportunity's business value and a subsequent opportunity's business value. Thus,

> *Hypothesis 4a: The relationship between a prior business opportunity's originality and a subsequent business opportunity's originality will be more positive for smaller teams than for larger teams.*

> *Hypothesis 4b: The relationship between a prior business opportunity's business value and a subsequent business opportunity's business value will be more negative for smaller teams than for larger teams.*

2.4.4   The moderating effect of entrepreneurial experience on the direct originality effect and the direct business value effect

One qualitative aspect of human capital that is assumed to play a significant role in opportunity recognition processes of entrepreneurial founder teams is entrepreneurial experience (Delmar & Shane, 2006). In this section, I first outline key aspects of the role of entrepreneurial experience in opportunity recognition and venture success. Then, I argue that entrepreneurial experience moderates the previously theorized relationships of originality and business value.

The role of entrepreneurial experience in opportunity recognition and its impact on start-up performance finds considerable attention in the literature (Baron & Ensley, 2006; Delmar & Shane, 2006; Gruber et al., 2008; Shepherd et al., 2000; Thornhill & Amit, 2003). Researchers present positive (Delmar & Shane, 2006; Klepper, 2001) as well as insignificant effects (Shane & Stuart, 2002; van Praag, 2003) of entrepreneurial experience on start-up performance. For instance, Delmar and Shane (2006) analyze 223 Swedish start-ups regarding survival and sales. According to their findings, companies of founders with prior start-up experience have a higher probability of surviving than start-ups founded by people without prior start-up experience. Simultaneously, the absolute level of experience is nearly irrelevant, only the difference between any and no entrepreneurial experience plays a role. Only entrepreneurial founder teams that have previously founded four or more ventures gain significantly higher sales than teams with less experience. However, in the case where sales is the variable of interest, only founder teams who have started at least four prior ventures display significantly higher sales than founder teams with less start-up experience. Baron and Ensley (2006) argue and provide empirical evidence that experienced entrepreneurs use different criteria in assessing business opportunities compared with novice entrepreneurs. More specifically, their cognitive frameworks differ in comparison to inexperienced entrepreneurs especially in terms of clarity, richness of content, the focus on translating a business opportunity directly into a potential financial gain, and balancing opportunities and risks in their thinking about potential business opportunities. Similar results are found by McGrath and MacMillan (2000), who describe experienced founders as having a specific entrepreneurial mindset with cognitive abilities allowing them to recognize business opportunities. Gruber et al. (2008) extend this view by adding that entrepreneurs with entrepreneurial experience identify more market opportunities than entrepreneurs without start-up experience.

In the next paragraph, I theorize that entrepreneurial experience positively moderates the relationship between a prior opportunity's originality and a subsequent opportunity's originality. In contrast, I argue that entrepreneurial experience strengthens the hypothesized negative relationship between a prior opportunity's business value and a subsequent opportunity's business value.

Teams learn directly from their own experience made as a team or individually (Levitt & March, 1988). Gino et al. (2010) use the expressions of direct task experience or learning by doing when describing the fact that a team handles a task similar to an already experienced one. Entrepreneurial experience as the number of previously founded start-ups contains facets that are

similar to an opportunity recognition task. For each previously founded start-up, a discussion about potential business opportunities was necessary before the act of actual founding was executed. This type of business opportunity recognition and discussion is similar and related to the task at hand in the experiment for this study[7]. The more start-ups have been founded by members of an entrepreneurial founder team, the more relevant direct task experience is available. If a team member shares this experience in the team, the whole team can benefit from it and build on it. The shared entrepreneurial experience in the entrepreneurial founder team has several implications. First, different individual entrepreneurial experiences from previously founded start-ups might stimulate creativity. If these experiences are shared, they improve the performance of each entrepreneurial founder team member and the ability of the team as a whole to develop original business opportunities. The reason is that the different shared experiences might contribute to the collective development of new business opportunities (Gino et al., 2010). Second, pattern recognition facilitated by entrepreneurial experience might help to identify new business opportunities by "noticing meaningful patterns in complex events, trends, or changes" (Baron, 2007, p. 171). In detail, pattern recognition helps to recognize ties between specific trends or events that at first glance seem to be unrelated, and to realize that these links denote an identifiable pattern. The basis for this quality is the entrepreneur's cognitive framework developed with the help of past entrepreneurial experience (Baron, 2007, 2012; Baron & Ensley, 2006). Lastly, past entrepreneurial experience might help individuals to better coordinate activities during the opportunity recognition task. When each entrepreneurial founder team member knows who is exceptionally good at which task and who is an expert on a specific topic or industry, this supports the founder team in exchanging business opportunities as smoothly as possible (Gino et al., 2010). Individuals confronted with a task they are already familiar with from past experience are aware of how to apply specific good practices and avoid bad practices, and team members might better know the role in which they can add the most value in an opportunity recognition task (Gino et al., 2010).

As to originality, more and more entrepreneurial experience is shared in the team during the process of opportunity recognition. In the course of the process, team members may recognize and present specific patterns based on previous experience, which support the development of additional business opportunities. Additionally, each team member will share his or her own entrepreneurial experience, and thus relevant information from previously founded ventures.

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[7] In the experiment, each entrepreneurial founder team was provided with a technology description. Founders were asked to develop business opportunities related to the technology for a time frame of 30 minutes as a team. See section 3.3 for more details.

This pool of shared entrepreneurial experience allows for recombination possibilities and serves as a starting point towards completely different opportunities. Consequently, the recognition of more original business opportunities might be induced because the founder team will - due to the sharing of previous experience, based on specific patterns, and because of an effective co-ordination of activities - link industries or concepts from past experience to products or services that have no directly visible association at first glance. Accordingly, the more entrepreneurial experience the team has, the more positive the relationship between a prior business opportunity's originality assessment and a subsequent business opportunity's originality assessment.

As to business value, business opportunities for large and well-known industries or with a clear and easy feasibility, which are associated with a high business value, might be recognized with or without entrepreneurial experience at the beginning of the task. But in the course of the process, entrepreneurial founder team members might recognize patterns from past experience, share experiences from previously founded ventures, and get a good impression regarding the expertise of each team member, allowing for a smooth exchange of potential additional business opportunities. This offers a high number of starting points, possibly inducing the team to de-velop more exotic opportunities. Each shared experience might serve as a source of more re-mote associations and business opportunities, associated with a lower feasibility or profitability. Accordingly, the more entrepreneurial experience the team has, the more negative the relation-ship between a prior business opportunity's business value assessment and a subsequent busi-ness opportunity's business value assessment.

In summary, experience from previously executed opportunity recognition tasks and pattern recognition in particular lead to the hypotheses that entrepreneurially more experienced founder teams will positively influence the relationship between a prior opportunity's originality and a subsequent opportunity's originality, but will strengthen the negative relationship between a prior opportunity's business value and a subsequent opportunity's business value. Thus,

> *Hypothesis 5a: The relationship between a prior business opportunity's originality and a subsequent business opportunity's originality will be more positive for teams with more entrepreneurial experience than for teams with less entrepreneurial experience.*

> *Hypothesis 5b: The relationship between a prior business opportunity's business value and a subsequent business opportunity's business value will be more negative for teams with more entrepreneurial experience than for teams with less entrepreneurial experi-ence.*

2.4.5   The moderating effect of boundary spanning on the direct originality effect and the direct business value effect

An external aspect of social capital with weak ties is boundary spanning, the "actions a focal team undertakes to reach out into its environment to obtain important resources and support" (Faraj & Yan, 2009, p. 606). In this section, I first shed light on key aspects of the role of boundary spanning in opportunity recognition and for venture success. I further elaborate on the role of boundary spanning as a moderator for the previously theorized relationships of originality and business value.

In the literature, boundary spanning has been analyzed by various academics with regard to opportunity recognition, creativity, and performance (Davidsson & Honig, 2003; Faraj & Yan, 2009, Fleming, Mingo, & Chen, 2007, 2007; Hargadon & Sutton, 1997; Sosa, 2011; Zou & Ingram, 2013). In terms of performance, the evidence is mixed. For example, Davidsson and Honig (2003) find business networks - an example of external social capital based on weak ties where the team reaches out into its environment to obtain resources and support (Faraj & Yan, 2009) - to be an effective and enduring source of support starting from business opportunity identification and the emergence of a business and extending to the company's probability of sales and profitability. Conversely, in a study with data from 64 software development teams, Faraj and Yan (2009) provide no evidence of boundary spanning having a direct positive influence on team performance, measured as the achievement of project goals. But if the team's resources are scarce, boundary spanning has a negative influence on team performance. Related to creativity, Fleming et al. (2007) show that brokerage - the connection of otherwise disconnected individuals - increases generative creativity, meaning the number of new combinations of existing things (in this study measured in terms of patents). Zou and Ingram (2013) support this view and provide evidence that managers who span structural holes (the gap between individuals who have complementary sources of information) show a better performance in terms of creativity than managers without these external connections.

In the following, I theorize that boundary spanning positively moderates the relationship between a prior opportunity's originality and a subsequent opportunity's originality. Moreover, I argue that boundary spanning strengthens the negative relationship assumed in section 2.4.2 between a prior opportunity's business value and a subsequent opportunity's business value.

Boundary spanning is a condition for learning from the experience and information of others (Kane, Argote, & Levine, 2005). If external, weak ties provide information not yet available

within a team, then individuals who have connections to relevant external actors might use this information and share it within the team to generate new combinations of otherwise disconnected technologies, industries, products, or services (Fleming et al., 2007). In many cases, valuable new business opportunities in one area are a familiar concept in some distant specialty (Burt, 2004). If entrepreneurial founder teams as a whole or individual members of an entrepreneurial founder team form collaborative ties with other founders, companies, potential investors, or banks, they will have more possibilities to develop further business opportunities. These external ties might supply opportunities for learning and knowledge transfer, various information spillovers, spillovers from partners, and even from partners' partners (Burt, 1992, 2004; Gulati & Gargiulo, 1999). This might allow them to gain early access to diverse information and interpretations of information (Burt, 2004), which serves as comparative advantage in developing new business opportunities. The external networks might serve as devices to collect and process information (Gulati & Gargiulo, 1999; Paruchuri, 2010; Zou & Ingram, 2013). During the opportunity recognition task, entrepreneurial founder team members have the information collected from their external network in mind, which guides them to new perspectives as well as to more and more novel opportunities. Having more information on products, markets, and customers might give the team more associations on the essential elements of an idea (Zou & Ingram, 2013). As a consequence, the probability of expressing new business opportunities increases (Burt, 2004)[8].

In terms of originality, the adoption of business opportunities from some distant market, industry, or product that has no direct, visible link to the task at hand will induce own developed business opportunities to become more original. If members of the entrepreneurial founder team gradually add information from their external network to the discussion, the team will have more and more starting points towards novel, more distant opportunities. Additionally, team members can recombine all business opportunities from different sources of the network as the process advances, and they can come up with completely new and innovative business opportunities. Even if some concepts will be familiar in the original industry, the adaptation to the task at hand might result in a completely new and rare business opportunity. This strengthens the positive relationship between subsequently developed opportunities regarding originality and, hence, the relationship between a prior business opportunity's originality assessment and

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[8] In the experimental setting in this thesis, entrepreneurial founder teams were not able to contact their network directly. But since they regularly contact it during their day-to-day business life, they have up-to-date knowledge concerning different markets and their specifics.

a subsequent business opportunity's originality assessment will be more positive for teams with higher levels of boundary spanning than for teams with lower levels of boundary spanning.

From a business value point of view, the implications are different. The entrepreneurial founder team might be able to develop opportunities for the largest markets and with a high feasibility independently, because they might be the first to come to someone's mind. In this case, information from the external network is not necessary to recognize these obvious opportunities. After those obvious opportunities associated with high business value have been stated, team members might start using their external network. Information gathered from these sources is probably highly relevant for the network's specific products, markets, and customers, but might reflect only niche products, niche markets, and niche customers for the entrepreneurial founder team's task (Burt, 2004). For example, if the external network provides information or concepts that are familiar in the network's respective industry, this might induce a new opportunity for the entrepreneurial founder team when adapting the information to the requirements of the opportunity recognition task. But at the same time, this might induce a low feasibility or profitability because it might represent only a niche market. The founder team will get more associations on the essential elements of an idea, but the related business opportunities might be associated with lower feasibility and profitability and, hence, lower business value. Accordingly, the relationship between a prior opportunity's business value assessment and a subsequent opportunity's business value assessment will be more negative for teams with higher levels of boundary spanning than for teams with lower levels of boundary spanning.

In summary, the various potential external networks enabling the founder teams to develop new business opportunities lead to the propositions that more boundary spanning will positively influence the relationship between a prior opportunity's originality and a subsequent opportunity's originality, but will strengthen the negative relationship between a prior opportunity's business value and a subsequent opportunity's business value. Thus,

Hypothesis 6a: The relationship between a prior business opportunity's originality and a subsequent business opportunity's originality will be more positive for teams with higher levels of boundary spanning than for teams with lower levels of boundary spanning.

Hypothesis 6b: The relationship between a prior business opportunity's business value and a subsequent business opportunity's business value will be more negative for teams with higher levels of boundary spanning than for teams with lower levels of boundary spanning.

2.4.6 The moderating effect of cohesion on the direct originality effect and the direct business value effect

Cohesion is an internal aspect of social capital relating to strong ties. It is defined as "the commitment of members to the group task. The greater the level of commitment among group members, the greater the cohesiveness" (Goodman et al., 1987, p. 149). Gross and Martin (1952) explicitly differentiate between task cohesion and interpersonal cohesion. Task cohesion describes the team's shared commitment to the common task and is expected to increase the commitment and effort of team members regarding the task. Interpersonal cohesion refers to team members' liking of the group (Evans & Jarvis, 1980) and allows for effective communication and coordination between individuals. In the next paragraph, I first concentrate on the role of cohesion (incorporating task cohesion, or the commitment of members to the group task, and interpersonal cohesion, or the commitment among group members) in opportunity recognition and for venture success. In the second step, I theorize on the role of cohesion as a moderator for the previously assumed relationships of originality and business value.

Cohesion finds considerable interest in the literature (Beal et al., 2003; Mullen & Copper, 1994). Regarding performance, Mullen and Copper (1994) divide cohesion into interpersonal cohesion, task cohesion, and group pride (see section 2.3 for a similar division of Festinger (1950), distinguishing between member attraction, group activities, and prestige). They argue that the critical part of cohesion with respect to performance is task cohesion (measured at the individual level) because team members are intrinsically motivated to complete a task they like. This is supported in their meta-analytical study of 49 publications, in which task cohesion is the strongest predictor of performance. In a further meta-analytical examination based on 64 articles, Beal et al. (2003) find that all parts of cohesion are significantly and positively related to performance and that effects are not significantly different between interpersonal cohesion, task cohesion, and group pride. In this thesis, cohesion is not separated into different parts, but measured as one construct. Ensley, Pearson, and Amason (2002) bring forward the argument that cohesive top management teams disagree effectively and interact efficiently without generating negative affections that might erode team performance. They base their statement that cohesion is positively related to start-up growth on a study of 70 venture management teams. With regard to opportunity recognition, Joo, Song, Lim, and Yoon (2012) assume that cohesive teams involve high levels of trust, support, and teamwork and therefore work in an environment of creative problem solving. They predict cohesion to be positively related to team creativity and gain support based on a web-based questionnaire with 228 responses. Instead, Fleming et

al. (2007) report a strong and negative influence of cohesion on the development of new ideas. This result contrasts their initial reasoning about cohesion fostering trust and indirectly encouraging the sharing of information and resources.

In the following, I argue that lower cohesion positively moderates the relationship between a prior opportunity's originality and a subsequent opportunity's originality. In contrast, I argue that lower cohesion strengthens the theorized negative relationship between a prior opportunity's business value and a subsequent opportunity's business value.

It is argued that cohesion is specifically important for entrepreneurial founder teams, because team tasks are often ambiguous and complex (Ensley et al., 2002). In team discussions based on unclear and complex requirements regarding the task's objective, cohesion fosters the transfer of information and knowledge through the intensification of trust and emotional safety between team members (Hansen, 1999; Joo et al., 2012; Uzzi, 1997). Strong ties between team members based on trust and emotional safety induce a fast and uncomplicated flow of information, accelerating the sharing of information (Hansen, 1999). But if highly cohesive teams concentrate primarily on the collective welfare of the group (Brewer & Gardner, 1996), they might prevent task conflict. Task conflict or minority dissent should play an important role in improving team performance (Jehn, 1995), because they increase the creativity of ideas and the rigor of decision-making (De Dreu, Carsten K. W. & West, 2001). Allowing for task conflict or dissent in a group task involves more meaningful discussions, because team members challenge the validity of existing opinions and keep other members from moving too quickly towards a crude agreement (Bradley, Postlethwaite, Klotz, Hamdani, & Brown, 2012; De Dreu, Carsten K. W. & West, 2001). If entrepreneurial founder teams avoid task conflict for reasons of interpersonal cohesion, the reduced readiness to disagree with conflicting opinions might induce counterproductive conditions like groupthink (Janis, 1973). Janis refers to the concept of groupthink when team members "are dominated by the concurrence-seeking tendency, when their strivings for unanimity override their motivation to appraise the consequences of their actions" (Janis, 1973, p. 21). If this state occurs, teams have strong conformity effects and minimize internal conflict (Ensley et al., 2002; Girotra et al., 2010; Van de Ven, Andrew H., 1986). Moreover, if task conflict arises in a highly cohesive team, there might be uncertainty about the validity of one's own perspective (Asch, 1952; Newcomb, 1968; Phillips, 2003). This uncertainty might be higher if the team member's own perspective is a minority perspective, potentially preventing that team member from adding his or her own opinion to the discussion (Phil-

lips, 2003). Individuals might be focused more on reestablishing a common understanding instead of concentrating on the actual task (Newcomb, 1968; Phillips, 2003; Thomas-Hunt, Ogden, & Neale, 2003).

From an originality perspective, the relationship between a prior business opportunity's originality assessment and a subsequent business opportunity's originality assessment is assumed to be less positive for a team with higher levels of cohesion as compared to a team with lower levels of cohesion. Highly cohesive entrepreneurial founder teams might easily share information and knowledge, but they avoid task conflict. The minimization of internal conflicts and lack of argumentation from unconventional perspectives prevent team members from talking about rare and unusual business opportunities. From the beginning of the opportunity recognition task, the founder team might follow a common train of thought. As argued in section 2.4.2, the business opportunities developed first are the least original ones. Then, preventing task conflict will restrict potentially emerging originality as the process advances and lead to a recognition of only conventional opportunities.

As to business value, entrepreneurial founder teams will first recognize business opportunities associated with a high feasibility and a high potential profitability. Since highly cohesive teams will prevent task conflict and will potentially follow some form of groupthink, they will not deviate from developing opportunities related to large, commonly known industries as the process advances. Uncommon and exotic opportunities would either implicate the pressure to justify oneself or entail possible conflicting discussions or points of view. Team members may try to avoid these situations in order to ensure task cohesion and interpersonal cohesion. Hence, they will continue to develop easy-to-implement business opportunities for large industries and markets, thereby attenuating the negative development of business value over time.

In summary, the avoidance of task conflict in highly cohesive entrepreneurial founder teams might induce states such as groupthink and thus lead to the propositions that higher cohesion will attenuate the positive relationship between a prior opportunity's originality assessment and a subsequent opportunity's originality assessment as well as attenuating the negative relationship between a prior opportunity's business value assessment and a subsequent opportunity's business value assessment. Thus,

> *Hypothesis 7a: The relationship between a prior business opportunity's originality and a subsequent business opportunity's originality will be more positive for teams with lower levels of cohesion than for teams with higher levels of cohesion.*

Hypothesis 7b: The relationship between a prior business opportunity's business value and a subsequent business opportunity's business value will be more negative for teams with lower levels of cohesion than for teams with higher levels of cohesion.

2.4.7 Overview of hypotheses

In sections 2.4.1 to 2.4.6, I derive the hypotheses for this thesis. They include relationships between the dependent variables, and for the direct effects as well as moderating effects for team size, entrepreneurial experience, boundary spanning, and cohesion. To summarize, Table 1 gives a short overview of the hypothesized relationships in this chapter.

Category	Originality	Business value
Relation of dependent variables	H1: Originality (n) and business value (n) are negatively correlated	
Direct effects	H2: The relationship between originality at (n-1) and originality at (n) will be positive	H3: The relationship between business value at (n-1) and business value at (n) will be negative
Moderating effects	H4a: The relationship between originality at (n-1) and originality at (n) will be more positive for smaller teams than for larger teams	H4b: The relationship between business value at (n-1) and business value at (n) will be more negative for smaller teams than for larger teams

	H5a: The relationship between originality at (n-1) and originality at (n) will be more positive for teams with more entrepreneurial experience than for teams with less entrepreneurial experience	H5b: The relationship between business value at (n-1) and business value at (n) will be more negative for teams with more entrepreneurial experience than for teams with less entrepreneurial experience
	H6a: The relationship between originality at (n-1) and originality at (n) will be more positive for teams with more boundary spanning than for teams with less boundary spanning	H6b: The relationship between business value at (n-1) and business value at (n) will be more negative for teams with more boundary spanning than for teams with less boundary spanning
	H7a: The relationship between originality at (n-1) and originality at (n) will be more positive for teams with lower levels of cohesion than for teams with higher levels of cohesion	H7b: The relationship between business value at (n-1) and business value at (n) will be more negative for teams with lower levels of cohesion than for teams with higher levels of cohesion

Source: Own illustration

Table 1: Overview of hypotheses

3 RESEARCH SETTING AND METHODOLOGY

This chapter provides an overview of the thesis' methodology to test the hypotheses developed in the previous chapter. In Section 3.1, I provide an overview of the research design. Section 3.2 covers the sample composition and description as well as the data adjustment. In Section 3.3, I explain the experimental design and procedure including the development of experimental materials and the execution of pretests. In section 3.4, the data processing is presented, divided into coding, rating, and structuring of the data. Variables and measures are described in Section 3.5. Finally, in section 3.6, the data analysis is explained in detail.

3.1 Research design

This thesis is part of an extensive research project - the *Building Entrepreneurial Success Teams (BEST)* study - conducted at the Entrepreneurship Research Institute (ERI) at Technische Universität München (TUM) under the leadership of Professor Dr. Dr. Holger Patzelt (TUM), Professor Dr. Nicola Breugst (TUM), and Prof. Dr. Marc Gruber (Ecole polytechnique fédérale de Lausanne (EPFL)). Two subprojects have been already executed, dealing with a broad spectrum of research questions around entrepreneurial founder teams. The third project – *BEST III* – has been operationally executed by three researchers of the TUM Entrepreneurship Research Institute: Inga vom Holtz, Manuel Braun, and myself.

The research project is set in the field of entrepreneurial founder teams and opportunity recognition. The main focus of the research is the topic of business opportunity recognition in entrepreneurial founder teams being confronted with a new technology. More specifically, the research was operationalized as an experiment. It included a manipulation component during which one part of the participating entrepreneurial teams was primed on high cohesion. Further, participating entrepreneurial founder team members individually completed three surveys as part of the experimental session and developed in their founder team business opportunities with regard to a new technology for a time frame of 30 minutes.

As depicted in Figure 5, our research team gathered empirical data from multiple perspectives and at various levels – individual, team, start-up, and environment – since "entrepreneurship can have a range of interesting and important outcomes on different levels" (Davidsson, 2008, p. 34) and "in showing a genuine interest in outcomes on different levels, […] entrepreneurship can distinguish itself from other fields and make strong contributions to social science at large (cf. Low, 2001; Venkataraman, 1997)" (Davidsson, 2008, p. 41). On top of that, research on

multiple levels enhances knowledge with regard to entrepreneurship (Davidsson & Wiklund, 2001). With this in mind, Figure 5 gives an overview of constructs studied in the *BEST III* research project. They have been sampled via surveys, a selection of these constructs will be investigated in more detail in this thesis. The opportunity recognition task was operationalized as entrepreneurial founder team discussion and recorded on video.

Level of analysis	Quantitative surveys		Qualitative task
Individual	• Founder identity (Gruber, 2011) • Identification (Mael & Ashforth, 1992) • Polychronicity (Hecht & Allen, 2010) • Trust (De Jong, Elfring, 2010)	• Perceived fit (Cable & DeRue, 2002) • Internal/ external antecedent (Gruber et al., 2013) • Creativity (Gong et al., 2013)	
Team	• Team performance (De Jong, Elfring, 2010) • Team reflexivity (De Jong, Elfring, 2010) • Team potency (Guzzo et al., 1993)	• Organization of the TMT (Talaulicar et al., 2005) • Boundary Spanning (Faraj & Yan, 2009) • Boundary Reinforcement (Faraj & Yan, 2009)	• Priming task • Opportunity recognition task
Start-up	• Phase of startup (Grégoire & Shepherd, 2012) • Number of employees (Grégoire & Shepherd, 2012) • Sales (Chandler & Jansen, 1992) • Importance of financial/ non financial criteria (Higashide & Birley, 2002)		
Environment	• Environmental hostility and dynamism (Garrett & Covin, 2013)		

Source: Own illustration

Figure 5: Levels of analysis and constructs

The *BEST III* research project started in January 2014 with the conceptual development of the experimental procedure including preparation of materials (formulation of texts for priming and opportunity recognition task), selection of relevant constructs for surveys, and preparation of a short entrepreneurial founder team interview subsequent to the opportunity recognition task. This preparation phase was closely harmonized with and supported by Professor Dr. Dr. Holger Patzelt, Professor Dr. Nicola Breugst, and Prof. Dr. Marc Gruber. We decided in favor of a mixed research design consisting of quantitative and qualitative elements, more specifically a survey split into three parts and the opportunity recognition task with prior priming task. One part of teams was primed on higher levels of cohesion whereas the remaining teams were held in a neutral condition.

Between April 2014 and August 2014 potentially relevant entrepreneurial founder teams were identified and recruited. Thereafter, data collection lasted seven months until February 2015. 118 experiments were conducted in seven cities, most of them at the start-ups' offices. After

collecting the data, different phases of the opportunity recognition task and all recognized busi-
ness opportunities were coded, followed by rating business opportunities on different dimen-
sions. Figure 6 gives an overview of the *BEST III* timeline.

1 Conceptualization of research design	**2** Identification of potential start-ups	**3** Recruitment of participating teams	**4** Collection of data	**5** Coding and Rating of data
January 2014 – April 2014	**April 2014 – June 2014**	**June 2014 – August 2014**	**August 2014 – February 2015**	**February 2015 – May 2015**
• Development of priming incl. qualitative and quantitative pretests • Elaboration of opportunity recognition task incl. technology description • Design of computer-based surveys • Preparation of interview	• Definition of participation criteria • Development of participation incentives • Preparation of list of relevant start-ups	• Flyer (offline/ online) • Personal emails • Phone calls • Direct contacting at startup fairs	• Pretests and trial runs • Execution of 118 onsite visits in Germany • Preparation of team feedback	• Coding of video material • Rating of originality and business value of business opportunities • Structuring of data set

Source: Own illustration

Figure 6: BEST III timeline

The research project *Best III* builds the basis for three dissertations. Vom Holtz (in preparation)
analyzes the influence of prior experience on opportunity recognition and selection under the
condition of intra-team trust. Braun (in preparation) focuses on market opportunity identifica-
tion in entrepreneurial teams, with a particular focus on the role of human capital resources and
collective team identity. My thesis focuses on the relationship between a prior opportunity's
originality and a subsequent opportunity's originality as well as between a prior opportunity's
business value and a subsequent opportunity's business value. Additionally, human and social
capital components influencing these relationships are investigated. In the upcoming sections,
I will provide more details on the procedure of the *BEST III* project, starting with a sample
overview in section 3.2.

3.2 Sample

The data collection of *BEST III* has been conducted between April 2014 and February 2015,
divided into three main steps: Buildup of a pool of potentially participating teams, effective

acquisition of teams, and execution of experiments. Figure 7 gives an overview of the whole process of data acquisition. Next, I will explain in more detail these steps and give an overview of the sample.

Acquisition of teams

April 2014   June 2014   August 2014   February 2015

Pool of potentially
participating teams

Execution of
experiments
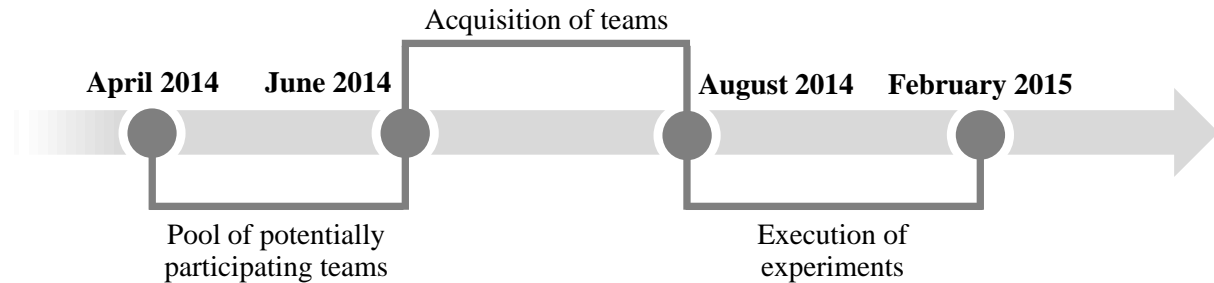
Source: Own illustration

Figure 7: Overview of data acquisition process

3.2.1   Sample composition

The sampling frame consists of German entrepreneurial founder teams. This proceeding has two reasons. First, discussions in mere German language allow for a consistent comparison in linguistically analyzing discussions and identifying business opportunities across teams. Second, German entrepreneurial founder teams operate in the same regulatory environment (Zott & Hui, 2007). Each participating team is composed of at least two founders and is, for reasons of comparability with existing research, not older than six years (Amason et al., 2006; Fauchart & Gruber, 2011; McDougall, Covin, Robinson Jr, Richard B., & Herron, 1994). Generally, the first six years of a start-up determine success or failure (The State of Small Business, 1992). Cooney (2005, p. 229) defines an entrepreneurial team as "two or more individuals who have a significant financial interest and participate actively in the development of the enterprise". All entrepreneurial founder team members considered in this thesis participated actively in the development of their start-ups and had, since they were shareholders, a financial interest[9]. Nevertheless, Cooney's definition ignores potential founders having a leadership position without a significant financial stake in the start-up (Klotz et al., 2014).

This choice of entrepreneurial founder teams has several advantages. First, the recognition of opportunities based on new technologies is one of the core activities of entrepreneurial founder

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[9] The Beatles, mentioned as entrepreneurial founder team in chapter 1.1, are suitable with this definition. They participated actively in the development of their band and had a financial interest because the band was their main source of revenue.

teams at the beginning of the company foundation (Chen, 2007) as well as in the day-to-day business life (Cooper & Park, 2008; Lumpkin & Lichtenstein, 2005). It crucially determines their venture's success or failure (Baron, 2007; Chandler & Jansen, 1992). Hence, we involve entrepreneurial teams who are familiar with the task of business opportunity recognition and reduce the risk of distorting results due to a task misunderstanding (Gregoire & Shepherd, 2012).

Second, many studies of business opportunity recognition are conducted drawing on student samples (Girotra et al., 2010; Shepherd & DeTienne, 2005). But there is evidence that students and entrepreneurs frame problems differently. For example, Dew, Read, Sarasvathy, and Wiltbank (2009) argue "that not only had expert entrepreneurs gained a pronounced decision-making frame or logic presumable through years and years of entrepreneuring, but the MBA students exhibited an equally well-defined logical frame opposite to that of the experts". In the study at hand, participating entrepreneurial founder teams are familiar with business opportunity recognition challenges and, thus, represent a sample with realistic reference to the task.

Third, we focused on business opportunity recognition at the team level. The entrepreneurial founding team is a clearly defined group of people working together in the long-run and taking decisions jointly which allows for a comprehensible comparability across teams. In contrast, apart from the organization of entrepreneurial founder teams, individuals in their day-to-day business life are often part of multiple teams and switch their membership over time (O'leary, Mortensen, & Woolley, 2011; Zika-Viktorsson, Sundström, & Engwall, 2006). Especially for ad hoc teams (Devine, Clayton, Philips, Dunford, & Melner, 1999) and short-term teams (Joshi & Roh, 2009), the collaboration is of short-time and might change on short notice. Student (project) teams only work together for some weeks and laboratory teams might even work together only for a few hours during a specific task (Hollenbeck, Beersma, & Schouten, 2012). These different types of teams do not have a sufficient practice in working together and cannot be compared due to their differing organizational and temporal composition. For these reasons, they can only deficiently represent an entrepreneurial business opportunity recognition discussion.

As to the data acquisition process, we used in the first step several different sources to construct a list of 593 teams fulfilling our criteria of participation. Divided according to their geographical location, the main part of our start-up list is located in Munich with a number of 241 teams. Remaining teams are based in Berlin (179 teams), Stuttgart/Karlsruhe (84 teams), Hamburg (62

teams), Freiburg (18 teams), and in parts of Bavaria outside Munich (9 teams). Figure 8 shows a geographical overview of the list of contacted teams (numbers to the left of the arrows).

Source: Own illustration

Figure 8: Geographical overview of contacted and participating teams. Number of teams in brackets (contacted teams to the left of the arrows, participating teams to the right of the arrows)

Main sources to contact teams were university based accelerators and entrepreneurship programs (UnternehmerTUM, KIT Center für Innovation & Entrepreneurship, Strascheg Center for Entrepreneurship, LMU Entrepreneurship Center, HAW Hamburg, Technische Universität Hamburg-Harburg Startup Dock, HDM Startup Center Stuttgart, Technologie-Transfer-Initiative Universität Stuttgart). Moreover, we analyzed venture capital funds portfolios (Earlybird, Holtzbrinck Ventures, High-Tech Gründerfonds, Target Partners, Creathor Ventures, IBB Beteiligungsgesellschaft, Redalpine Venture Partners) and private business incubators portfolios (Venture Stars, Project A Ventures, Rocket Internet, Hanse Ventures, You Is Now, Mountain Partners). Those sources were complemented by online platforms databases (Deutsche-Startups database, TechCrunch CrunchBase, app Tech Start-ups Bayern) as well as by blogs, homepages, and social networks for start-ups (Gründerszene homepage, Junge Gründer homepage, seedmatch homepage, various facebook start-up portals). To further enrich our database of potential participants, we attended business plan competitions (Deutscher Gründerpreis, Münchner Business Plan Wettbewerb, Elevator Pitch Baden-Württemberg), start-up coworking spaces (Werk1 München, betahaus Berlin, betahaus Hamburg, Grünhof Freiburg), and start-up fairs

(Bits & Pretzels Munich, TUM Entrepreneurship Day). To finalize our database, we asked personal contacts to suggest entrepreneurial founder teams to be added to our list and used the snowball sampling approach (Biernacki & Waldorf, 1981). The approach consists of asking participants to recommend further potential participants. This first step of identifying potential participants lasted two months from April 2014 to June 2014 (cf., Figure 7).

In the second step, to get into contact with our potential 593 participating teams, we used direct personal addressing. We approached entrepreneurial founder teams via personal emails (including online flyer), phone calls, or face-to-face verbally (including offline flyer).

During onsite visits, fairs, or events we talked to entrepreneurial founder teams and handed over a flyer with relevant information concerning timing, objectives, and incentives for participation (Figure 9). We then tried to fix an appointment for the study participation or agreed to discuss organizational issues via email.

Source: BEST III research team

Figure 9: BEST III flyer with relevant information

In cases where a direct face-to-face contact was not possible, we wrote an email including a flyer and organized a phone call to answer potential questions and to address ambiguities. At the end of the phone call, we fixed an appointment for our study. If we did not get any response

(positive or negative) within three days regarding the first email, we contacted the respective start-up via phone, explained the purpose and timing of our study, relevant incentives, and asked for participation. The main part of entrepreneurial founder teams was contacted via email (492 teams, 83% of all contacted teams), the alternative approaches face-to-face contact (71 teams, 12% of all contacted teams) and phone calls (30 teams, 5% of all contacted teams) represented a much smaller share.

Four reasons for refusal of participation were mentioned. First, entrepreneurial teams were in an important and stressful stage of the venture process. Second, they already participated in alternative academic studies. Third, the appointment of a date feasible for the entrepreneurial founder team and for the research team was not possible. Fourth, at the time of the appointment the start-up already exited the market or the entrepreneurial founder team had intra-team conflicts.

This procedure led to a participation of 118 entrepreneurial founder teams (participation rate of 19.9 percent). Participating teams come from different geographical locations: 62 teams (participation rate of 25.7 percent) from Munich, 11 teams (participation rate of 6.2 percent) from Berlin, 17 teams (participation rate of 20.2 percent) from Stuttgart / Karlsruhe, 14 teams (participation rate of 22.6 percent) from Hamburg, 7 teams (participation rate of 38.9 percent) from Freiburg, and 7 teams (participation rate of 77.8 percent) from parts of Bavaria outside Munich. Main reason for the low participation rate in Berlin was the difficulty to find an appointment of a date, since we were generally only able to offer few days for participation in cities outside Munich. In small cities and rural regions the high participation rate was mainly due to the fact that those entrepreneurial founder teams were rarely involved in academic studies and, hence, motivated to support us. Figure 8 (numbers to the right of the arrows) shows a geographical overview of the list of participating teams.

In order to encourage the teams' participation, we offered several incentives. Each team received a personal feedback package with an overview of the study results and tips to improve teamwork in business opportunity identification sessions. Additionally, each team had the opportunity to conduct a project study at the Technical University of Munich, i.e. a student team supported an ongoing project in the venture for three to six months, such as market and competitor analysis, internationalization to a foreign country, or lead generation and optimization for an online business model. Moreover, firms could present themselves as potential employers

and we distributed their job advertisements through various channels. This second step lasted two months from June 2014 to August 2014 (cf., Figure 7).

3.2.2 Adjustment of sample

The execution of experiments, third step in our data acquisition process, lasted six months from August 2014 to February 2015 (cf., Figure 7). All 118 participating teams filled out the survey and performed the opportunity recognition task which we recorded on video. One entrepreneurial founder team was removed from the sample due to malfunction of the video equipment (Gonzalo & Kim, 2010). Since it did not differ in any relevant dimension of the survey from the remaining participants, it can be concluded that its exclusion from further analysis does not distort the results.

After executing all experiments, I screened the data for outliers in order to identify if some data points are very different in a relevant aspect compared to the remaining population (Wooldridge, 2012). One team was identified as outlier and excluded from further analyses. An outlier is defined as an observation "that appears to deviate markedly from other members of the sample in which it occurs" (Grubbs, 1969, p. 1). More specifically, a value can be defined as extreme outlier if it is outside the following fence (Frigge, Hoaglin, & Iglewicz, 1989; Schwertman, Owens, & Adnan, 2004):

$$Fence\ for\ extreme\ outlier =\ Q_{0.75} + 3 \times IQ, \tag{1}$$

where in this case $Q_{0.75}$ is the 75th percentile of the number of developed business opportunities across teams and IQ is the interquartile range, defined as the difference between the 25th and 75th percentiles. The number of developed business opportunities is used as indicator for outliers, because it is a relevant aspect of the sample when analyzing the process of developing business opportunities. Additionally, a large difference in the number of developed business opportunities was observed (Wooldridge, 2012).

In the context of this study, the equation is

$$Fence\ for\ extreme\ outlier =\ 15 + 3 \times 5, \tag{2}$$

and, hence, teams with a higher number than 30 recognized opportunities are defined as outliers. This applies to one team having developed 35 business opportunities during the business opportunity recognition task. It is not considered anymore in the subsequent analyses. Accordingly, the successive analyses are based on 116 entrepreneurial founder teams.

3.2.3 Sample description

The remaining entrepreneurial team members were on average 31.8 years (s.d. = 6.4) old. The sample consisted of 286 founders, 249 of them were male (87.1 percent) and 37 female (12.9 percent) founders. The teams had an average size of 2.6 (s.d. = .81) people and founders worked for 2.0 years (s.d. = 1.9) in their current start-up. Only 26 participants did not have previous work experience. Their total individual work experience was 7.3 years (s.d. = 5.1 years) on average (including work experience in their current start-ups), they founded 1.5 companies (s.d. = 1.0) (including the current start-up), and had 2.8 years (s.d. = 2.8) of work experience in start-ups (including the current start-up). In their current start-up, the total number of full-time positions was on average 4.8 (s.d. = 5.4). The start-ups were on average 2.3 years (s.d. = 1.3) old.

The participants had various educational backgrounds. As highest degree, 19 founders (6.6 percent) hold A levels ("Abitur": German university entry qualification), 13 founders (4.5 percent) have completed an apprenticeship, 68 founders hold a Bachelor's degree, and the main part of the participants with 128 people (44.8 percent) holds a Master's degree. Slightly more than 13 percent of the participants pursued additional degrees, 27 of them (9.4 percent) hold a PhD and 13 (4.5 percent) hold a MBA. 18 founders (6.3 percent) indicated that they hold a different degree.

The founders cover a broad range of different study programs, some of them hold degrees in different majors (which is the reason for a higher number of degrees compared to participating individuals). Nearly half of the founders studied business (138 people or 48.3 percent), 71 individuals (24.8 percent) studied computer sciences, and engineering studies were pursued by 64 participants (22.4 percent). Furthermore, founders hold degrees in social sciences (9.1 percent), mathematics / natural sciences (6.6 percent), medicine / health care, teaching and law (~ 1 percent, respectively).

The participating start-ups cover many industry sectors. 43 start-ups (71.1 percent) work in professional, scientific, and technical services, 32 (27.6 percent) in companies in the information industry, 16 (13.8 percent) in manufacturing, 6 (5.2 percent) in wholesale trade, 5 (4.3 percent) in finance and insurance, 5 (4.3 percent) in accommodation and food services, 4 (3.4 percent) in art / entertainment / recreation. 3 (2.6 percent) firms work in the health care and social assistance sector, and 2 (1.7 percent) in the retail trade industry.

3.3   Design of experiment and procedure

We executed all experiments with the participating start-ups between August 2014 and February 2015 (cf. Figure 7). In this chapter, I discuss the type of experiment conducted, provide a detailed insight into the experimental procedure, and point to specificities of the video analysis.

3.3.1   Experiment type

In general, "an experiment is a recording of observations, quantitative or qualitative, made by defined and recorded operations and in defined conditions, followed by examination of the data, by appropriate statistical and mathematical rules, for the existence of significant rules" (Nesselroade & Cattell, 1988, p. 22). Additionally, due to the possibility of differencing between an experimental group and a control group, an independent variable can be manipulated. Lastly, the experiment allows for randomization, ensuring that each participant has the equal chance to be part of a particular group or condition (Fiske, Gilbert, Lindzey, & Jongsma, 2010). We decided on an experiment as scientific approach, because we were able to specifically address our focus of research via this instrument. We aimed for the opportunity to manipulate the influence of the founder identity (in terms of level of cohesion in the group) on the business opportunity recognition process. Our experimental set-up allowed us to manipulate the level of an independent variable, in our case priming of participating entrepreneurial founder teams into a neutral (lower levels of cohesion) or team (higher levels of cohesion) condition (Nesselroade & Cattell, 1988). Each team was randomly assigned either into the team or neutral condition. We were able to control for other potential distracting influences. Changes in the dependent variable were clearly attributable to the treatments of the independent variable, enhancing our experiment's internal validity (Schade & Burmeister-Lamp, 2009; Shadish, Cook, & Campbell, 2002). Internal validity is high when the influence of third variables is controlled for and a causal relationship can be ascertained (Schade & Burmeister-Lamp, 2009).

Typically, two types of experiments are distinguished, laboratory experiments and field experiments. Harrison and List (2004) present a more granular distinction between those two types of experiments. First, in a conventional lab experiment rules are imposed by the experimenter, there is a standard pool of participants, and an abstract framing (e.g., player A and player B) as compared to a context framing (e.g., the employer and the employee). Second, artefactual field experiments only differ in the fact that participants are from the field (e.g., conduction of an experiment with a representative sample of the population). Third, framed field experiments comprise, compared to artefactual field experiments, a contextual framing (e.g., a context where participants play roles or the inclusion of words with specific connotations). Fourth, natural field experiments include given rules. More specifically, the manipulation frequently results from an event the experimenter cannot control.

In our setting, we perform a framed field experiment, since our participants are entrepreneurs and we relied on a real life task for an entrepreneurial founder team based on an existing technology. Our approach allows the investigation of how business opportunity recognition works in a real-life environment. But participants know that they are part of an academic study.

3.3.2   Development of experimental materials and pretests

The experimental development followed two steps. In a first step, we developed the broad concept shown in Figure 10. In this step, the logical order of the experiment and the three survey parts were discussed.
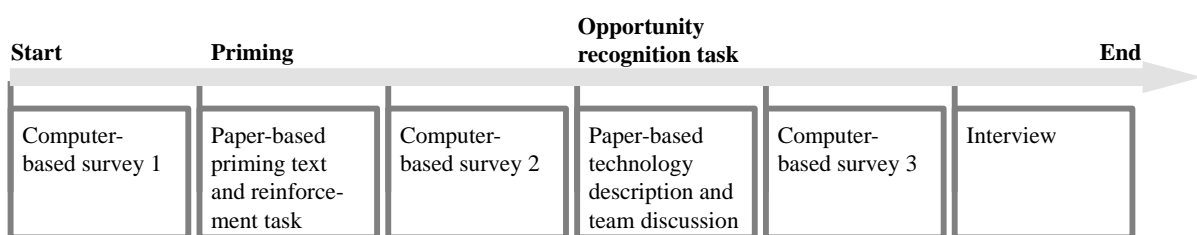
Source: Own illustration

Figure 10: Overview of experimental procedure

In a second step, the development of experimental materials was a core task before conducting the experiments. Two texts were prepared, the paper-based priming text and the paper-based technology description for the business opportunity recognition session.

First, the paper-based priming text was designed in a magazine style, thus both text versions gave the impression to be an extract out of a practitioners' magazine. They consisted of a written part, a picture, and an entrepreneur's quotation. The written part was divided into introduction, main statement, and detailing of main statement. The text ended with a description of factors of success and advices founders would give to novice entrepreneurs. To prime entrepreneurial teams on a team condition, the importance of the team factor in start-up teams was selected as topic. As main statement, the text accentuated the importance of working together, to come to a decision together, and to foster team spirit. For entrepreneurial teams in the neutral condition instead, the text described the number of worldwide entrepreneurial foundations as being constant in recent years. The main statement concentrated on the global stability of founder activity and the constancy of reasons to found a new company. Included pictures in the text represented the team and neutral condition, too. Individuals forming a team were chosen for the team text, one individual looking at the globe was used for the neutral text. Together with the written part and the picture, a founder's quotation represented the final section of each text. In both cases, the quotation started with reference to the written part and passed on to an exemplar advice of an experienced entrepreneur to a novice one. Again, the advice was either focused strongly on the team or held neutrally, respectively. Both versions of the text can be found in Appendix 1 (in English translation).

Second, the paper-based technology description was prepared. There is already well-documented research in the area of technology transfer (Grégoire et al., 2010; Mowery, Nelson, Sampat, & Ziedonis, 2015; Shane, 2000; 2001). Our experimental setting was closely connected to this research. Primarily, we relied on a real-life technology to augment the external validity of our task (Grégoire et al., 2010). MIT's three dimensional printing (3DP™) (Grégoire et al., 2010; Shane, 2000) has proven to be an adequate technology in business opportunity recognition tasks, but has already been too long commercialized and lacks newness. We chose a new technology not very popular yet, but which is comprehensible for individuals with various backgrounds. This technology was mainly developed in the university environment[10] and complies with all our requirements: Mobile 3D scanning via smartphones (Simonite, 2014). It is a real-

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[10] The 3D mobile technology is developed at ETH Zurich's Institute for Visual Computing in the Computer Vision and Geometry Group (http://www.ivc.ethz.ch/). The smartphone is transformed into a portable digital scanner allowing the scan of objects and persons inside as well as outdoor environments. The technology is available in the form of an app. The goal is to make three dimensional scanning as easy as taking pictures. In February 2015, the team of researchers received the *ERC-Proof-of-Concept-Grant* to test the technology's potential commercialization.
Similar research is pursued by Microsoft Research and the Oxford University, using a slightly different technology (Ondruska, Kohli, and Izadi (2015)).

life technology which is rather new and does not require a specialized background to understand its functioning. This characteristic is important since participating entrepreneurial founders have diverse educational backgrounds.

Next, we developed a clear and easily understandable technology description, consistent with Grégoire et al. (2010). The text was structured into four different sections. First, we shortly introduced the technology and gave an overview what it is about. The introduction was followed by a clear and concise functional explanation. In the last paragraph, we mentioned advantages compared to alternative 3D scanning possibilities. After the explanatory part, we stated the two questions defining the team's task to work on in a 30 minutes time frame:

- What business opportunity (ies) could you pursue with this technology?
- What business opportunity should be prioritized according to you?

To guarantee an as concise and clear as possible technology description, the text was repeatedly discussed with experts of the field, namely professors Nicola Breugst (TU Munich), Holger Patzelt (TU Munich), Marc Gruber (EPFL Lausanne), and Denis Grégoire (HEC Montréal). The text can be found in Appendix 2 (in English translation).

Before conducting each experiment, adequate preparation was necessary in order to guarantee a comparable experimental approach across teams and to ensure a collection of reliable data. We aimed to practice our proceeding to guarantee a standardized experiment execution (Hogg & Cooper, 2003). Therefore, we conducted two trial runs and two pretests with different entrepreneurial founder teams, after the survey was prepared and the concept development of the experimental materials was completed. In general, we practiced our behavior and the clarity of our instructions.

Moreover, we slightly adjusted the technology description after the two trial runs for the sake of comprehensibleness and clarity. In addition, we recognized for example the importance of providing a large enough table for the teams, such that the priming text was available and visible until the end of the opportunity recognition session. This helped to maintain the manipulation of higher levels of cohesion for an extended period of time.

With regards to the pretests, eight team founders took part in the first pretest. It was based on qualitative interviews and pursued two goals. First, the team of researchers wanted to understand if the manipulation text was understandable in terms of clarity and expression. Second,

the researchers aimed to clarify if the request to write pieces of advice after reading the text would work. Especially, participants should not have the impression of being disrupted by the task. Rather, the task should be framed as the logical next step after reading the text. Both questions were positively affirmed, but the priming text was slightly adjusted for better understanding and clearer focus on either of the conditions.

The second pretest was held with 16 team founders. It was conceptualized as telephone guided interview (Sarala & Vaara, 2010; Wiklund & Shepherd, 2003). This quantitative pretest was conducted to test the impact of our manipulation. For the manipulation check, we concentrated on the reinforcement task, more specifically on the pieces of advice written by the entrepreneurial founders (Goncalo & Staw, 2006; Lee, Oyserman, & Bond, 2010). Eight founders got the text held in the neutral condition, the remaining eight founders were provided with the team oriented text. For teams primed in the high cohesion condition, the number of team orientated words in their advice were counted and compared to teams primed in the low cohesion condition.

We defined two groups of team oriented words, a basic (conservative) and an extended (less conservative) group. Oyserman and Lee (2010) reviewed words that have been used for a scrambled sentence task (Srull & Wyer, 1979) to prime collectivism and individualism. Bezrukova, Jehn, Zanutto, and Thatcher (2009) defined key words based on work on organizational identity and identification in order to build a measure for team identification. Based on their overviews, we defined both lists of team oriented words. Appendix 3 lists both groups of words we selected.

For our calculation, we considered the length of each text, because the ratio of team-oriented words to total text is the relevant measure to make ratios comparable across teams. The ratio of team-oriented words for each participant was calculated as the number of team-oriented words divided by the total number of written words in the reinforcement task. This ratio was multiplied by 100 to get a percentage:

$$Ratio\ of\ team-oriented\ words\ per\ participant =$$

$$\frac{Number\ of\ team-oriented\ words}{Number\ of\ total\ words} \times 100 \tag{3}$$

To compare the neutral and team primed group in our sample, we calculated the ratio of team-oriented words compared to all words for each participant as described above. In the basic approach, the neutral group mentioned .69% of team-oriented words compared to 2.13% in the team primed group. For the extended group of team oriented words, the neutral group mentioned .78% of team-oriented words in their advices. Compared to the team primed group with 2.88%, they alluded a clearly smaller ratio. In both cases, the differences are significant at the one percent level, but they should be considered with caution due to the small number of observations. Nevertheless, these results of the pretest for the manipulation check confirm that the priming involves higher levels of cohesion in the team-oriented condition in comparison to the neutral condition.

3.3.3   Experiment procedure

As to the execution of experiments, each start-up could choose their office or rooms at the Entrepreneurial Research Institute (ERI) of Technische Universität München (TUM) for the experimental session. We preferred the teams' office in order to meet them in their natural environment where they normally lead a team discussion. 84 teams out of 118 decided to meet us at their office. Each experiment was attended by two researchers from our research team.

The broad procedure of each experimental session is described in the following. A first computer-based survey was succeeded by our manipulation task (priming on higher or lower le-vels of cohesion) and a second computer-based survey. The core was the business opportunity recognition task. Then, the participants filled out another computer based survey. Finally, team interviews were conducted. Figure 10 summarizes these different steps.

The successive paragraphs give a detailed overview of the process of an experiment. Before starting the experiment, the researchers prepared the site. We arranged two cameras and a microphone as well as post-its, flipchart, plain paper, markers, and pens as supporting material for the business opportunity recognition task. This supporting material could be used optionally to visualize ideas or to organize the task. At the beginning of each experiment, the researchers thanked teams for their participation and gave an overview of what they could expect, namely the steps depicted in Figure 10. We mentioned that more than 100 teams would be part of the study to show its importance and relevance. Furthermore, we already explained the use of cameras for the business opportunity recognition task and asked everyone not to use mobile phones during the experiment.

Our survey was split into three parts. It comprised psychological and team relevant scales, start-up relevant questions, and personal as well as professional information (see description below). Most scales included in the survey were established. All selected scales complied with clarity, comprehensiveness and acceptability. Clarity concerns the point that questions should be understood by respondents. Comprehensiveness considers the coverage of a reasonable complete range of alternatives. Acceptability includes an appropriate survey length and avoidance of invading a respondents' privacy (Rea & Parker, 2014). To split the survey into different parts is advantageous, since participants do not become exhausted of a too long survey at once.

Participants were not allowed to skip questions, but had the possibility to ask one of the experimenters to ask clarifying questions. The experimenters were present in the room for all parts of the survey. Thereby, none of the participants interrupted the survey at any point of time.

The survey was administered in German, since all of our participants were either German native speakers or fluent in German. Given that some of the scales included in the survey were originally developed in English language, we applied the back translation test (Brislin, 1970; Craig & Douglas, 2006). Two bilingual doctoral students, fluent in both German and English, translated English scales into German. Two further bilingual doctoral students translated the German version back into English. Another bilingual independent doctoral student compared the original and back translated version and found no categorical, functional, and conceptual difference (Brislin, 1970).

After all team members had finished the first survey, the paper-based priming text and reinforcement task were introduced. All founder team members of a start-up received a printed version of either a team-oriented text or a text held in a neutral condition. After reading the text, participants were individually asked to write down four to five pieces of advice they would like to share with a novice entrepreneur from their point of view as an experienced founder. This reinforcement task was computer-based.

Following the completion of the second survey part, the business opportunity recognition task as core of the experiment started. In order to explain the business opportunity recognition task to every team member, the researchers gave a short introduction before starting the task itself. Researchers handed out a detailed task description to every founding team member and again announced the time limit of 30 minutes. Then, everyone was asked to carefully read the task description and teams were pointed to the possibility of using different supporting material: post-its, flipchart, plain paper, markers, and pens. Lastly, all researchers left the room during

the business opportunity recognition task, briefly remembered the team after 25 minutes to come to an end, and reentered the room after 30 minutes of team discussion. The researchers waited for the team to finish their discussion and thanked for their participation.

After completing the third survey part, each experiment concluded with a team interview. The researchers covered two topics to become aware of any specific circumstances during the business opportunity recognition session and to collect information not observable via the video tapes. Business opportunity and decision centered questions were followed by questions concerning the team's collaboration during the opportunity recognition task. Researchers asked for the final business opportunity, reasons for this specific choice, the process of agreement, if market requirements were met and if the business opportunity was realizable (Gregoire, Shepherd, & Schurer Lambert, 2009). To better understand the team's collaboration, the general work collaboration during the team task was discussed, if teams used specific creativity techniques and what kind of provided material was used. Additionally, researchers asked for any previous knowledge with respect to technological aspects of the mobile 3D scanning via smartphones.

To conclude each session, business opportunities mentioned frequently across teams were presented and, if inquired, the researchers explained in more detail the development status of the 3D scanning technology. Finally, video cameras were switched off, supporting material was collected, and the researchers thanked teams again for their participation. In total, an experiment lasted 90 minutes. In some exceptional cases, the team interview led to a total duration of up to 120 minutes, since open-ended questions were posed.

Clearly, the core element of each of the 118 experiments was the business opportunity recognition task which was video recorded to get the opportunity to analyze each session carefully and repeatedly. Generally, if one works with video data, different potential biases need to be addressed. Therefore, two biases which might influence the behavior of teams during the task are described: demand characteristics and the Hawthorne effect. Additionally, strategies how we prevented them to occur are provided.

First, demand characteristics are all cues which might be given consciously or unconsciously to the experimental participant. This might be the experimenter himself or herself, information provided in order to recruit participants, all explicit or implicit communication during the experiment, or the experimental procedure itself (Orne, 1962). A participant's subsequent potential behavioral changes might influence the experimental outcome (Berkowitz, 1971; Orne,

1962; Podsakoff, Podsakoff, MacKenzie, & Klinger, 2013). We applied two measures to prevent any specific participant behavior in reaction to the experimenter. We standardized and practiced our behavior and instructions regarding different tasks during the two trial sessions as well as we formulated information as concise as possible (consistent with Hogg and Cooper (2003)). Moreover, we left the room during the business opportunity recognition task to not disturb and influence entrepreneurial founder teams at all (consistent with Maner, DeWall, Baumeister, and Schaller (2007)).

Second, the Hawthorne effect describes "the problem in field experiments that subjects' knowledge that they are in an experiment modifies their behavior from what it would have been without the knowledge" (Adair, 1984, p. 334). Consequently, any variation compared to the normal working environment might influence the teams' behavior. We addressed this potential issue via different measures. To meet each team in its natural environment, we preferred conducting the experiment at the team's office, which was possible in 84 out of 118 cases. Video cameras might be a distraction for the teams while discussing business opportunities. With this in mind, we tried in all experiments to avoid positioning cameras noticeably. Hence, the positioning of cameras aimed at preventing participants' potential nervousness (Jewitt, 2012). Cameras were arranged and switched on directly at the beginning of each experiment. We placed them close to a wall and sideways to the team members to remove them from their visual field. This practice was applied because teams should notice the cameras as slightly as possible or forget them after the experiment started (Flick, 2009).

3.4   Data processing

After conducting all experiments, the research team had ~ 59 hours of business opportunity recognition discussions available on video. As we wanted to code recognized business opportunities according to their originality and business value, we needed to bring them into a structure allowing us to work on them (Alge, Wiethoff, & Klein, 2003; Aquino, Freeman, Reed, Felps, & Lim, Vivien K. G., 2009; Harvey, 2013; Kauffeld & Lehmann-Willenbrock, 2012; Lehmann-Willenbrock & Allen, 2014).

A three step approach was pursued, consisting of two coding related steps and one subsequent step to structure the data set. First, all videos were coded by dividing them into different sequences and by extracting all mentioned business opportunities. Second, the work was concentrated on the developed and extracted business opportunities as well as on the assessment of

these opportunities on different dimensions. Third, I adjusted the structure of the data set to modify it according to the analyses.

3.4.1   Coding and Rating

The aim of the data analysis was to screen recognized business opportunities for each entrepreneurial founder team and to rate these opportunities in terms of business value and originality. As to potential biases, a prevention of deficient data interpretation was necessary. The halo effect and observer bias are potential biases to be paid attention to. In particular, the halo effect is a psychological phenomenon. Individuals extrapolate from known qualities of individuals to unknown qualities (Nisbett & Wilson, 1977). In order to prevent this effect, the research team closely kept step by step with the coding scheme (presented in more detail in the next paragraph) to consider only actually observable facts during the video analysis. Further, the observer bias describes the observer's tendency to attribute a personal disposition to an individual based on a specific situation and a specific belief (Snyder & Frankel, 1976). Consequently, to avoid such an undesirable bias, it is important to not interpret data subjectively and in a distorted way. The research team prevented the errors' appearance by defining a detailed coding scheme and by applying an independent coding process of three different researchers.

To establish a coding scheme, it is necessary to classify observations into different categories and themes to make the data manageable (Harvey, 2013). This is done by assigning "labels to describe each statement made by a participant during the group interaction" (Harvey, 2013, p. 827). Codes need to have some conceptual order (Kauffeld & Lehmann-Willenbrock, 2012). In the analysis for this thesis, these higher level and subdivided categories allowed classifying statements of entrepreneurial founder team members according to the structure of the developed coding scheme. The coding helped to move from a very detailed, unique level – where every start-up discussed opportunities according to its specific proceeding – to a conceptually higher level, where similar items are provided with the same code. This approach helped to easier synthesize data (Harvey, 2013).

The coding and rating part of the data was central for further analysis. To accommodate this fact, I will present in detail the coding process, which is illustrated in Figure 11.
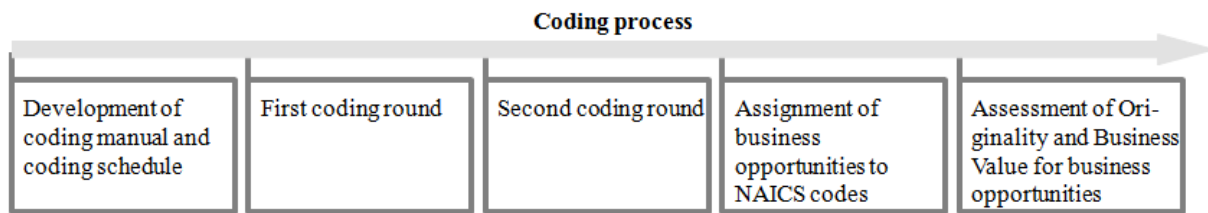
Source: Own illustration

Figure 11: Coding process

Before assessing business opportunities on different dimensions, the research team first developed the coding manual (Breugst, 2011; Bryman, 2012) and coding schedule (Howitt & Cramer, 2014). The coding manual (Table 2) includes instructions and all possible categories and dimensions with short and clearly formulated definitions and / or explanations. It was developed both exploratory and based on already exercised manuals (Gersick, 1988; Harvey, 2013; Harvey & Kou, 2013; Jackson & Poole, 2003). The research team started with a basic coding manual, coded two team discussions independently, compared the results, discussed ambiguities, and then adjusted the manual. It consists of different dimensions and sub dimensions (which are more detailed) as well as corresponding explanations. The explanations support the understanding of and boundaries between dimensions.

Dimension	Sub dimension	Explanation
Introduction phase	Introduction phase	Introduction by researcher
Reading phase	Reading phase	Individual reading by participants
Clarification phase	Clarification phase, Problem solving _or_ Clarification phase, Common understanding _or_ Clarification phase, Distracted conversation	Discussion about same understanding within the team regarding the technology or the task
Technical discussion phase	Technical discussion phase, Technical features/ advantages	Discussion on specific technical details (e.g., how the technology works, what the technology can and cannot provide)
Individual brainstorming	Individual brainstorming	Individual brainstorming
Structural phase	Structural phase, Process co-ordination (comment)	Process structure/ coordination/ timeline to solve problem
	_or_ Structural phase, Framework/ Classification, description (comment)	Discussion of a structure as basis for brainstorming or for

		classification/ grouping opportunities during/ after brainstorming, e.g., discussion of a framework of market trends *or* market structure *or* business model requirements (e.g., specific target customers) *or* underlying functions of technology *or* value chain *or* different user perspectives; specific triggering questions
	or Structural phase, Repeating of opportunities/ opportunity collection (comment)	Repeating of mentioned opportunities
Opportunity recognition / development phase	Opportunity generation phase, Opportunity number (opportunity introduction), short description *[for new opportunities]*	Phase of opportunity introduction
	or Opportunity generation phase, Opportunity number (further development), short description *[for already mentioned opportunities]*	Further opportunity development/ discussion (refining the opportunity, information exchange, integrating/ combining)
Evaluation/ prioritization phase	Evaluation phase, Opportunity number, Criteria: Criteria description and number (used) *and/or* Criteria description and number (not used) Mode: mode description [e.g. summary on flipcharts]	Evaluation/ prioritization oriented discussion of an opportunity or after collecting several opportunities (criteria can be, e.g., market potential, value add, feasibility, etc.)
Decision phase	Decision phase, Mode: Implicit *or* explicit Opportunity: Opportunity number *or* combination of different opportunity numbers (comment)	Phase when team decides on one opportunity or a combination of opportunities, - Explicit decisions (e.g. „we take that") - Implicit decisions (final opportunity evolves)

Source: Own illustration

Table 2: Overview of coding manual

With the help of the dimensions mentioned in Table 2, each video could be divided into different sections. The dimensions Introduction phase, Reading phase, Opportunity generation/ development phase, and Decision phase were part of each business opportunity discussion. Of course, some dimensions or sub dimensions were mentioned several times and they occurred

in alternating sequence depending on the team under consideration. Sub dimensions include further divisions. They detail which part of a sub dimension is exactly described (e.g., Decision phase, mode: implicit or Decision phase, mode: explicit).

Followed by the coding manual, the research team developed a coding schedule. A coding schedule is a list with all coding categories necessary to categorize the data (Howitt & Cramer, 2014). In this specific case, the numbering of each phase, its name, timing, and description were relevant. Each discussion was analyzed with the help of NVivo 10[11].

Since coding schedules for 116 team discussions of ~ 30 minutes had to be completed, four research assistants assisted the research team in analyzing videos. They were provided with the coding schedule and got an introductive training concerning both, the coding manual and NVivo. Then, all of them coded one of the videos already coded by the team of researchers for reasons of comparison and to discuss potential divergencies. After this training, videos were randomly assigned to the research assistants and they agreed upon meetings for clarification questions and further inquiries. Meetings were conducted, if possible, with all research assistants to guarantee the same handling of discussed video sequences and to ensure consistent coding over all videos.

As soon as all research assistants completed their coding schedules with the support of NVivo 10, a second coding round was started. Despite regular meetings and close coordination between research assistants, a complete consistency over all coding schedules could not be guaranteed. For this reason, a fifth research assistant, not involved in the first coding round, coded again all videos based on the coding manual and existing completed coding schedules from the first round. When necessary, coding schedules were again adjusted with the help of NVivo. This proceeding guaranteed consistency over all team discussions recorded on video. Since the research team tracked each coding adjustment between the first and the second round, it was able to calculate interrater reliabilities. The agreement between the coding of entrepreneurial business opportunities in the two rounds was 80.2% (κ = .79). This suggests that research assistants' evaluation was sufficiently similar, assuming a cutoff of .70 (LeBreton & Senter,

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[11] NVivo 10 is the standard software to analyze qualitative data (interviews, open-ended survey responses, articles, videos, social media, and web content) (cf., Breugst et al. (2015)). It facilitates the division of videos into different sequences / phases and assigns each phase a time stamp to easier find it again at a later stage of analysis.

2008). These coding schedules provided the research team with a necessary overview of different phases that entrepreneurial founder teams passed during the team discussion and a list as well as a corresponding description of each mentioned business opportunity.

The aim of the second coding step was to assess the aforementioned business opportunities on different dimensions. This step was further subdivided into two parts. After allocating an industry to each business opportunity, the research team was able to evaluate them on various dimensions.

To comprehensibly and consistently allocate different industries to business opportunities, we needed a scheme including a clear division of industries and corresponding subcategories. This links to the literature on firms' diversification in which various diversification measures are prevalent (Palich, Cardinal, & Miller, 2000; Rumelt, 1982). One of the widely accepted measures is the Standard Industrial Classification (SIC[12]) system (Gruber et al., 2013; Markides, 1995; Montgomery, 1982). However, since the chosen technology for opportunity recognition is new and many developed business opportunities are associated to non traditional industries, we decided to focus the allocation of opportunities to industries via the North American Industry Classification System (NAICS) codes. NAICS codes are currently used by the United States, Canada, and Mexico in their federal statistical agencies to classify business establishments and are the most exact industry classification codes (NAICS code, n.d.). They have been used as well by further researchers (Amato & Amato, 2007; Baron & Ensley, 2006; Baron & Tang, 2011; Haushalter, Klasa, & Maxwell, 2007). Their logic is similar to SIC codes, but they are more detailed and they are based on a consistent economic concept (SIC and NAICS codes, 2010). The NAICS codes are up to six digits of lengths. For our purposes, two-digit and four-digit industry group classifications were sufficient. NAICS codes include 20 two-digit sector codes and 312 four-digit industry group codes.

The procedure to conduct the first part of the second step - allocating an industry to each business opportunity - was the following. Three industry experts (all of them with several years of experience in strategic management consulting in different industries), one of them myself, classified each business opportunity to a four-digit NAICS code. In many cases, a first allocation to a two-digit code helped to identify a broad classification, then, the more specific four-digit code was assigned. We used the 116 coding schedules provided by the assistants as basis

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[12] Standard Industrial Classification (SIC) codes are numerical codes to identify businesses. Each company has a SIC code assigning it to a major industry group (two digits) and, more specifically, to a specific industry (four digits).

for classification. For each start-up, all recognized business opportunities were first coded independently to each other and then compared with the respective co-coders. Deviations concerning industry classifications were tracked and we were able to calculate an interrater agreement. A Cohen's kappa of $\kappa = .91$ between all three raters suggests that the assignment of business opportunities to NAICS codes was sufficiently similar, assuming a cutoff of .70 (LeBreton & Senter, 2008). In the rare cases where there was disagreement between raters, the corresponding opportunity and potential NAICS codes were discussed and a joint decision was taken.

Allocating industries to business opportunities gave us a first good overview concerning the potential financial size of the respective opportunities and their feasibility. Additionally, the classification according to the industry displayed their economic affiliation.

Afterwards, each business opportunity was evaluated on different dimensions to allow comparability across entrepreneurial founder teams and between business opportunities. Again, three industry experts (one of them was myself) with experience in strategic management consulting in various industries coded each business opportunity. All business opportunities were coded according to their originality (on a five-point scale, where one represents the lowest originality and five represents the highest originality) and business value (on a ten-point scale, where one represents the lowest business value and ten represents the highest business value). Scale anchors are similar compared to previous literature (Diehl & Stroebe, 1987; Girotra et al., 2010). Further details on these two dimensions are depicted in chapter 3.5. As for the classification into NAICS codes, all business opportunities for each start-up were first coded independently by every expert rater and then compared. Deviations were tracked and interrater agreement was calculated. As there was sufficient similarity of assessments between the three experts coders ($\kappa = .90$ for originality and $\kappa = .84$ for business value), we decided to average ratings for each business opportunity to a single index (Goncalo & Staw, 2006; Saad, Cleveland, & Ho, 2015). These values for originality and business value served as dependent variables in the analyses.

After finalizing these important coding and assessment steps, the next task was to bring the collected data into some logic order necessary for data analysis.

3.4.2   Data structure

The third and last step in restructuring the data consisted of rearranging the ratings for originality and business value to make it usable for analysis. The initial structure of the data set was at the team level. For each start-up team, I had the number of recognized business opportunities

in their chronological order. Hence, the logic of the original data set corresponded to a time series per team. More specifically, observations of one entity - recognized business opportunities - corresponded to different time periods (Verbeek, 2008). Each start-up developed the entities "business opportunity" over a 30 minutes time span and for each recognized opportunity a number for originality and business value was tracked. This is graphically depicted in the upper part of Figure 12. However, the hypotheses developed in chapter 2.4 relate to the business opportunity level. For instance, the data set should allow me to predict the subsequent (n-th) originality score or subsequent (n-th) business value score of any recognized business opportunity with the help of the prior (($n-1$)-th) score. Therefore, I needed to adjust the structure of the data set.
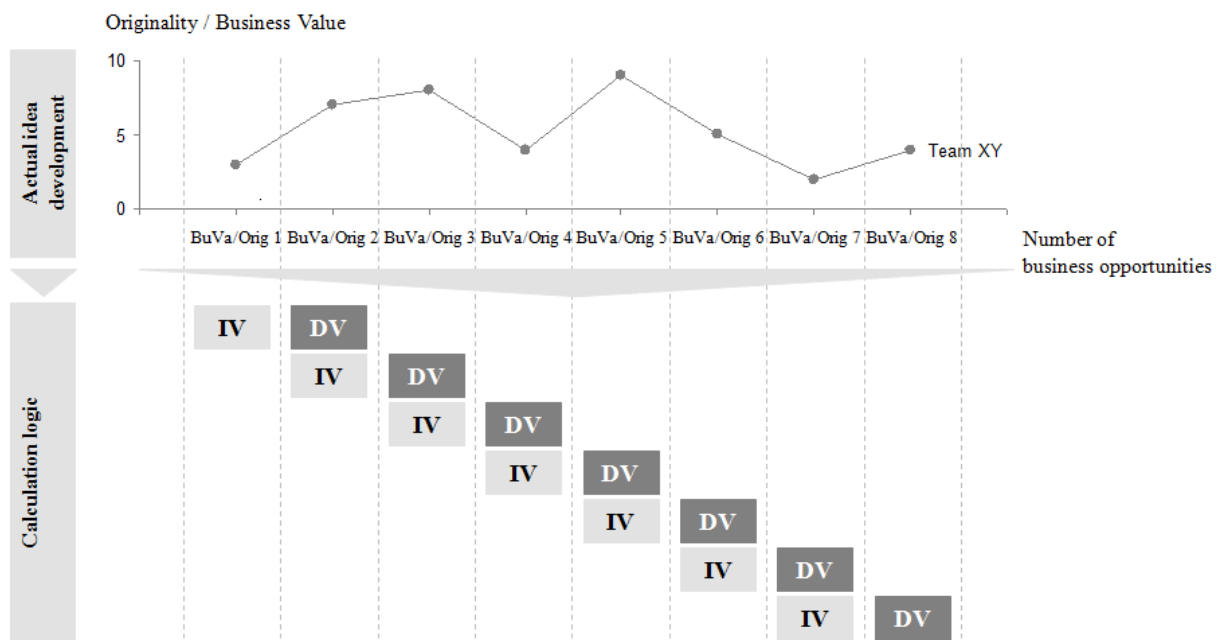
Source: Own illustration

Figure 12: Overview of data set structure

For this reason, each time series per start-up was converted into the logic of a panel, in other words, into repeated observations of several units (Verbeek, 2008). Except for the first and last developed business opportunity, each subsequent opportunity became both an independent and a dependent variable. Accordingly, if a start-up recognized X business opportunities, data transformation led to (X-1) pairs of observations. In the lower part, Figure 12 shows an example for a start-up having developed eight business opportunities. Instead of one dependent variable (namely the score for originality or business value for the last and eighth business opportunity) at the team level, the data transformation resulted in seven dependent variables.

Since I allocated to each individual business opportunity a specific business opportunity identification number, scores for originality and business value could be linked to the developed business opportunities. This procedure resulted in 1,279 observations nested in 116 teams.

3.5   Variables and measures

The participants filled out three surveys at different times during the data collection session and discussed business opportunities regarding the 3D scanning technology for a 30 minutes time frame (see description above). The dependent variables of this study were measured by rating recognized business opportunities in terms of originality and business value.

An established scale is used to measure one independent variable (boundary spanning) for the theoretical model. The three remaining independent variables did not relate to scales. Since the regressors might be confounded by variables not included in the model, I additionally included relevant control variables (Gruber et al., 2008). The control variables referred to team aspects and to the industry environment of the teams.

The participants were asked to answer all survey questions regarding to their current start-up and founding team members. I briefly summarize all measures in Table 3 and describe them in the following.

Originality (n). Originality is a relevant and important indicator for creativity (Amabile, 1983; Carson, Peterson, & Higgins, 2003; Guilford, 1950; Guilford, 1967; Roskes, De Dreu, Carsten K. W., & Nijstad, 2012). It describes unique and differentiating attributes of business opportunities (Bechtoldt, Choi, & Nijstad, 2012). The level of originality often captures creativity (Bechtoldt et al., 2012; DeDreu et al., 2008; Goncalo & Staw, 2006). Creative outputs are the nature of an opportunity (Dimov, 2007) and might explain why some individuals recognize business opportunities whereas others do not (Shane & Venkataraman, 2000). We measured the first dependent variable originality (n) by assigning to each coded business opportunity a value between 1 (very unoriginal) and 5 (very original). To ensure a common understanding of the term originality, we started with a definition of the construct itself. Despite frequently referring to the term originality, the literature rarely states explicit definitions (c.f., Diehl & Stroebe, 1987; Rietzschel et al., 2006). We concentrated on two clearly mentioned definitions of originality. Rietzschel et al. (2010, p.52) define originality as follows: "[…], unoriginal ideas (with an originality of 1) were explained to be very common, often concerning issues that already exist (rather than being new). In contrast, highly original ideas (with an originality of 5)

were described as ideas that are mentioned rarely, are very innovative, and often introduce radically new applications of existing things or things that are completely new". Nijstad et al. (2010, p. 46) complement the definition by mentioning: "[…] is the idea new, unusual, infrequent?".

Consequently, we defined unoriginal business opportunities to be very common and usual as well as often concerning issues that already exist (rather than being new). In contrast, original business opportunities were defined as being very rare and unusual. Furthermore, they are innovative and introduce radically new applications of existing things or things that are completely new (corresponding to an idea set with high novelty ideas in the opportunity assessment literature (Hill & Birkinshaw, 2010)). Starting from this basic definition, we assigned originality scores to each developed business opportunity. Three raters independently rated all business opportunities and interrater agreement between the three raters was calculated. The combined Cohen's kappa was $\kappa = .90$ which confirms significant agreement between the coders, assuming a cutoff of .70 (LeBreton & Senter, 2008). We decided to average the raters' assessments. For each business opportunity, the three values were averaged to one single index (Goncalo & Staw, 2006; Saad et al., 2015).

Business value (n). Business value is an important indicator for business opportunity quality (Girotra et al., 2010) and focuses, besides on a potential feasibility, on the commercial potential (Hill & Birkinshaw, 2010). Profitability is especially important for a start-up to survive (in the long-run) without permanent external financing. We measured the second dependent variable business value (n) by assigning to each developed and coded business opportunity a score between 1 (very low business value) and 10 (very large business value). We again first elaborated a common definition of the term business value to arrive at a common understanding.

The definition of the term business value is mainly based on the paper of Girotra et al. (2010). They compared group structures – team structures in which a group works together from the beginning and hybrid structures in which individuals first work independently before working together in the group – in terms of their effectiveness to generating a high number of business opportunities, a good quality of business opportunities, and to select the best of all mentioned business opportunities. They defined business value as "the utility of the ideas to a commercial organization that might develop and sell the products" (Girotra et al., 2010, p. 597). Since the study at hand is conducted in the start-up environment, two aspects are important for a young company in order to get a high "utility" of developing and selling the product, more specifically

feasibility and profitability. Feasibility checks are a necessary prerequisite in order to decide if a business opportunity is useful and should be further pursued (Ardichvili et al., 2003; Ozgen & Baron, 2007). Potential profitability of a business opportunity is a basic condition for starting a successful venture (Baron & Ensley, 2006; Kirzner, 1979; Shane, 2003).

First, a definition of feasibility is provided. The literature agrees, that "whereas unfeasible ideas cannot be implemented because the means are nonexistent or unavailable, highly feasible ideas are very easy to implement and would not require large investments, either in money or in time" (Rietzschel et al., 2010, p. 52). In addition, "the *feasibility* of an idea in terms of how easily it could be translated into a commercial product (the evaluators considered both technical and economic aspects when assessing an idea's feasibility)" (Poetz & Schreier, 2012, p. 250) is incorporated in the definition of business value. Taken together, feasible business opportunities are easy to implement into a commercial product from a technical and economic perspective and do not require large investments in money or time.

Second, profitability plays a crucial role when examining business value. Entrepreneurs need to be convinced of being compensated for their opportunity cost when engaging in an entrepreneurial activity (Busenitz & Barney, 1997; Welpe et al., 2012) Hence, high levels of potential profit should be possible. Given these points, business opportunities are associated with higher profitability if the exploitation of the business opportunity leads to a larger potential profit. The higher profitability is associated with a higher business value.

In essence, the highest business value is attributed to a business opportunity with high feasibility (easy implementation, only small investment in money or time required) and high profitability (large potential profit beyond opportunity costs). The lowest business value is attributed to a business opportunity with low feasibility and low profitability. Medium values refer to business opportunities with high feasibility and low profitability, low feasibility and high profitability, or medium values for both feasibility and profitability. Based on these definitions, three raters independently rated each mentioned business opportunity. Interrater agreement showed significant agreement with a value of .84, assuming a cutoff of .70 (LeBreton & Senter, 2008). Again, we decided to merge the assessments for each business opportunity. The three business value ratings for each business opportunity were averaged to one single index (Goncalo & Staw, 2006; Saad et al., 2015).

Originality (n-1). The level one predictor variable originality (n-1) corresponds to the score of originality at (n) lagged by one business opportunity. In other words, it is the prior business

opportunity's originality associated with the subsequent business opportunity's originality (originality (n)). Accordingly, I was able to use the same scores as for the dependent variable originality (n). Therefore, each developed business opportunity has a score of originality (n-1) between 1 (very unoriginal) and 5 (very original), as defined for the dependent variable originality (n). I group-mean centered each score for originality (n-1), i.e. centering observations around the average group value in one entrepreneurial founder team. More specifically, the team's mean originality (n-1) score is subtracted from each originality (n-1) score of a business opportunity recognized by the team. Group-mean centering level one predictor variables is a recommended approach when testing hypotheses concerning cross-level interaction effects (Aguinis et al., 2013). It allows a meaningful interpretation of the cross-level interaction effect, because it removes all between-team variation. More explicitly, group-mean centering allows for an interpretation of the moderating effect of a level two variable on a level one relationship without an interaction effect entailing group means of the independent level one regressor (Enders & Tofighi, 2007). Furthermore, group-mean centering leads to level one predictors being uncorrelated with level two predictors since it changes the mean and correlation structure of the data.

Business value (n-1). The second independent level one variable business value (n-1) corresponds to the score of business value at (n) lagged by one business opportunity. In other words, it is the prior business opportunity's business value associated with the subsequent business opportunity's business value (business value (n)). Hence, the same scores as for the dependent variable business value (n) could be used for each entrepreneurial founder team. Correspondingly, each score has a value between 1 (very low business value) and 10 (very large business value). As for the first level one predictor variable originality (n-1), I group-mean centered the business value (n-1) scores (Aguinis et al., 2013; Enders & Tofighi, 2007) in order to facilitate the interpretation of cross-level interaction effects.

Team size. We measured the level two moderator variable team size by asking for the number of members in the founding team of the start-up. We asked "How many founders comprise the founder team" and participants reported the number of co-founders including themselves. I grand-mean centered the variable team size, i.e. subtracting the overall mean of team size across all entrepreneurial founder teams from the team-specific moderator variable. This is done in order to facilitate the interpretation of the intercept value, which is the expected value of the dependent variable for an average level of the independent variables (Enders & Tofighi, 2007; Gruber et al., 2013).

Entrepreneurial experience. We measured the level two moderator variable entrepreneurial experience by asking for the number of start-ups already founded by each team member. We specifically asked: "How many companies did you already (co-) found?" We first summed up the number of (co-) founded companies for each team. In a second step, I grand-mean centered the entrepreneurial experience variable (Enders & Tofighi, 2007; Gruber et al., 2013).

Various experience variables are stated in the literature, for example whether the founding team possessed prior entrepreneurial experience (1) or not (0) (Gruber et al., 2008), in which industries founders have experience (Gruber et al., 2013; McGee & Dowling, 1994), the level of education (Davidsson & Honig, 2003; Marvel & Lumpkin, 2007), years of work experience (Davidsson & Honig, 2003; Marvel & Lumpkin, 2007), or entrepreneurial education and training (Martin, McNally, & Kay, 2013 for a meta-analysis). Our measure of the number of previously (co-) founded companies (Clarysse, Tartari, & Salter, 2011; Delmar & Shane, 2006) has already been proven to be relevant in the entrepreneurship literature.

Boundary spanning. We measured the level two moderator variable boundary spanning using Faray and Yan's (2009) four item scale. We asked participants "To what extent does the team encourage its members to solicit information and resources from elsewhere in and/or beyond the division?", "To what extent does the team encourage its members to try to influence important actors elsewhere in and/or beyond the division on behalf of the team and its work?", "To what extent does the team value team members for making use of their relationships with others on behalf of the team?" and "To what extent does the work of the team depend upon information and resources actively solicited by team members, that is, information and resources beyond what comes through official channels?". Each item was measured on a 7-point Likert scale, with the anchors "1, strongly disagree" and "7, strongly agree". The scale had a Cronbach's alpha of .72 and, thus, an internal consistency above the threshold of .7 (Hair, 2010). The team's perception of boundary spanning was derived from entrepreneurial founder team members' answers. The values were then averaged to obtain a team-level score of boundary spanning. An acceptable value of interrater agreement (median $r_{wg(J)}$ = .69, assuming a normal distribution. This describes "moderate agreement" (LeBreton & Senter, 2008, p. 836)) indicates that the aggregation is justified (LeBreton & Senter, 2008). Using average values across the four items of boundary spanning has two advantages. First, it overcomes potential measurement error because it uses multiple indicators to reduce the dependence on a single response. Second, it represents a multitude of aspects of the concept boundary spanning in one measure without complicating the interpretation of results (Hair, 2010). Taking the average value of boundary

spanning for each entrepreneurial team is necessary because the level of interest is the team level. Again, I grand-mean centered the dependent variable (Enders & Tofighi, 2007; Gruber et al., 2013).

Cohesion. The fifth and last level two predictor variable is cohesion. 41 teams were primed on a team condition, whereas 75 teams were held in a neutral condition. In particular, teams in the team condition were primed on high levels of cohesion (Priming = 1), whereas teams in the neutral condition were primed neutrally (Priming = 0).

Teams being primed on high levels of cohesion are seen as being in the team condition for the following reason. Generally, two distinct perspectives on the self are identified by researchers, an independent and an interdependent perspective (Gardner, Gabriel, & Lee, 1999; Haberstroh, Oyserman, Schwarz, Kühnen, & Ji, 2002). Priming teams on high levels of cohesion induces them to act from an interdependent perspective (Brewer & Gardner, 1996).

In the independent perspective, the individual's sense of self is fundamentally different as compared to others. Individuals see themselves as separate, distinct, and independent from others (Markus & Kitayama, 2010). This is achieved through referencing the own behavior to the own thoughts, feelings, and actions (Markus & Kitayama, 1991). In contrast, individuals with interdependent self construals define themselves with reference to their group memberships and relations with others (Bechtoldt et al., 2012; Markus & Kitayama, 1991). Thoughts, feelings, and actions of others are seen to be determining for the own behavior (Gaertner, Sedikides, & Graetz, 1999).

As explained by Brewer (1991), when the interdependent or collective self identity is activated, the most salient features of the self concept become those shared with other members of the group. I focus on the interdependent self construal and prime teams on a collective self condition[13] or a neutral condition, where the collective self is not activated. The basic social motivation in the collective condition is then the collective welfare of the group (Brewer & Gardner, 1996). This group welfare affects the opportunity recognition process in the form of a cohesion effect: "Within the in-group category, individuals develop a cooperative orientation toward shared problems" (Brewer & Gardner, 1996, p. 86). In this way, by strengthening the in-group, I operationalize cohesion as a measure for the priming variable.

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[13] This corresponds to the concept of social identity as represented in social identity theory (Tajfel (1974))

The literature offers various options to prime individuals or teams: pronoun circling manipulation (e.g., Brewer & Gardner, 1996; Gardner, Gabriel, & Lee, 1999; Kühnen & Oyserman, 2002), writing a text with specific pronouns (e.g.,Stapel & Koomen, 2001), word search puzzles (e.g.,Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001), language itself as prime (e.g.,Bond & Yang, 1982; Watkins & Gerong, 1999), scrambled sentence tests (e.g., Bargh, Chen, & Burrows, 1996; Kühnen & Hannover, 2000), answering of questions concerning uniqueness or similarity to other people (Bechtoldt et al., 2012; Goncalo & Staw, 2006) or family and friends (Swaminathan, Page, & Gürhan-Canli, 2007; e.g., Trafimow, Triandis, & Goto, 1991), verbal information (e.g., Brockner, Cremer, van den Bos, K., & Chen, 2005; Gaertner et al., 1999) including reinforcement (Nadler, Harpaz-Gorodeisky, & Ben-David, 2009), pictures (Dagovitch & Ganel, 2010; e.g., Seger, Smith, & Mackie, 2009), moral priming (Aquino et al., 2009; Mazar, Amir, & Ariely, 2008), material priming (e.g.,Kay, Wheeler, Bargh, & Ross, 2004), priming via a story (e.g.,Gardner et al., 1999; Trafimow et al., 1991; Yampolsky & Amiot, 2013), and further techniques.

We decided to conduct the priming via a text to read and a corresponding reinforcement task to control for the success of the priming. This procedure for the priming was chosen for two reasons: First, it fitted well into the experimental procedure. Participants did not feel interrupted, wondered about the text they were given to read, or suspected that the study consisted of a prime (Yampolsky & Amiot, 2013). Second, based on the text and the linked reinforcement task, we were able to perform the manipulation check.

Entrepreneurial founding team members read one of two texts, either focused on the neutral condition or the team condition. Both content and wording of the texts were developed with regard to priming cohesion (section 3.3.2 for a detailed description of the text development). Followed by the reading part, participants were individually asked to formulate pieces of advice they would provide to novice entrepreneurs based on their own entrepreneurial experience. This reinforcement task served as basis to conduct the manipulation check. Two groups of team-oriented words (a basic and an extended group) were considered to calculate a ratio of team-oriented words per team. Then, a check for significant differences between teams primed on higher levels of cohesion and neutrally primed teams allowed us to affirm if the procedure worked. Section 3.3.2 presents an overview of the calculation logic for the manipulation check as well as a description of performed pretests.

Control variables. In multiple regression models, coefficients can only be interpreted under ceteris paribus conditions. As a consequence, single coefficients can only be interpreted in a correct way if the model includes all relevant variables. Accordingly, I need to include relevant additional independent variables for the model as control variables (Verbeek, 2008; Wooldridge, 2003).

The first control variable is number of business opportunities. It represents the number of unique, distinct, and non redundant business opportunities developed by each team. Benedek et al. (2012) call this number ideational fluency. In the analysis of the quality of developed business opportunities (business value and originality), it should also be controlled for their quantity (Perry-Smith & Coff, 2011). Bechtoldt et al. (2012) mention that "Fluency is the number of non-redundant business opportunities and describes creativity in terms of quantity. […] Fluency, the quantitative indicator of creativity, may comprise more as well as less original business opportunities. Therefore, this measure is dependent on effort and on people's willingness to share each business opportunity that comes to their mind, irrespective of its quality." (Bechtoldt et al., 2012, p. 840). This efficiency measure (Stigliani & Ravasi, 2012) is not the primary goal of the analysis, but needs to be accounted for when investigating the development of business opportunities in terms of originality and business value across opportunities. I grand-mean centered this level two control variable (Enders & Tofighi, 2007; Gruber et al., 2013).

	Variable	Number of items	Source of item	Format scale	Interrater reliability
Dependent Variables	Originality (n)	1 item	Nijstad et al. (2010) Rietzschel et al. (2010)	1 (very low originality) to 5 (very high originality)	.90
	Business value (n)	1 item	Girotra et al. (2010)	1 (very low business value) to 10 (very large business value)	.84
Predictor variables level 1	Originality (n-1)	1 item	Nijstad et al. (2010) Rietzschel et al. (2010)	1 (very low originality) to 5 (very high originality)	.90
	Business value (n-1)	1 item	Girotra et al. (2010)	1 (very low business value) to 10 (very large business value)	.84
Predictor variables level 2	Team size	1 item	Farh, Lee, and Farh (2010)	Continuous (in number of founders)	n.a.
	Entrepreneurial experience	1 item	Delmar and Shane (2006)	Continuous (number of (co-) founded companies)	n.a.
	Boundary Spanning	4 items	Faray and Yan (2009)	7-point Likert scale	n.a.
	Cohesion	1 item	Brewer and Gardner (1996), Gardner et al. (1999), Lalwani and Shavitt (2013)	Dummy (0 = low cohesion; 1= high cohesion)	n.a.
Control Variables	Number of business opportunities	1 item	Benedek et al. (2012)	Continuous (number of business opportunities)	n.a.
	Technological Experience	1 item	Gruber et al. (2013)	7-point Likert scale	n.a.
	High-tech Industry	1 item	n.a.	Dummy (0 = low-tech industry; 1=high-tech industry)	n.a.

Source: Own illustration

Table 3: Overview of measures

The second control variable is *technological experience*. We asked entrepreneurs "Please assess the level of technological experience your founder team had at the time of foundation". Participants answered on a 7-point Likert scale with the anchors "very low" and "very high". Even though we chose a technology which is easy to understand independent of an individual's educational background, some specific technological experience might be an advantage for developing business opportunities. More specifically, technological experience "provides founders with the ability to assimilate market-related knowledge in technology-to-market linking and to recognize how their technological resources can be employed to cater to more distant market opportunities" (Gruber et al., 2013, pp. 282–283). This level two control variable was grand-mean centered (Enders & Tofighi, 2007; Gruber et al., 2013).

The third control variable is high-tech industry, a dummy variable with a value of 1 if the start up is working in a high-tech industry or a value of 0 if it is not. The selection of high-tech industries is based on Eurostat[14], the statistical office of the European Union. It defines start-ups as being part of the high-tech industry if they work in the automotive industry, (bio-) pharmaceutical industry, hardware and software industry, or in the medical engineering industry. I accounted for teams in high-tech industries, because those teams often handle new and cutting edge technologies and need to continually grapple with potential new markets (Park, 2005). On top of that, firms in high-tech industries work in extreme environments and need to balance scarce resources with technological challenges close to scientific possibilities (Julien, 1995), as represented by the mobile 3D-scanning technology which is still advanced in the scientific environment.

3.6 Hierarchical linear regression and regression equations

In order to test the hypotheses of both models, the special nature of the data set needs to be respected. The data set includes two levels: 116 entrepreneurial founder teams (level 2) and 1,279 business opportunities (level one). Usually, the lowest level in multilevel research is defined by individuals (Hox, 2010), but this is not always the case. Longitudinal studies, contain-

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[14] The overview of high-tech industries can be accessed under http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:High-tech_classification_of_manufacturing_industries . For our purposes, a team was classified as working in a high-tech industry if the industry is either defined as "high-technology" or "medium-high-technology".

ing data with repeated measurements which are nested within individuals, can be seen as multilevel data (Little, 2013). As an example, behavior might be nested within individuals (Hox, 2010; Little, 2013).Source: Own illustration

Figure 13 shows the nested nature of the data set.
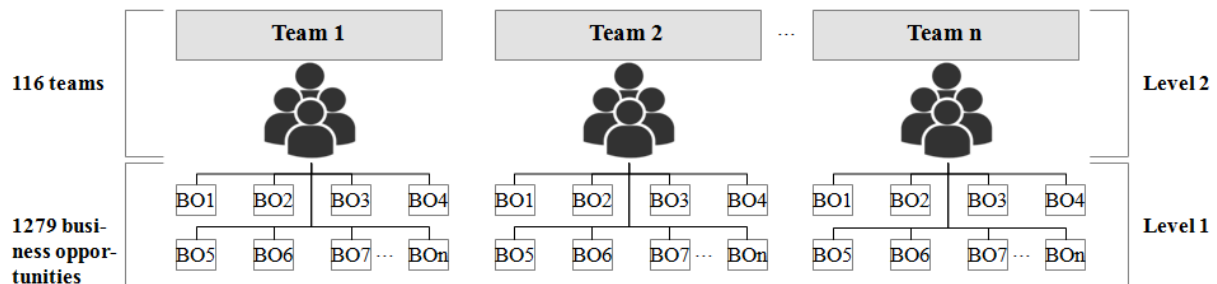
Source: Own illustration

Figure 13: Overview of nested data structure

The structure of the data is hierarchical since multiple business opportunities are developed by different teams. Hence, observations are not independent from each other because of potential similarities of business opportunity generation in a particular team. For instance, business opportunities being developed within the same team might be closer to each other as compared to business opportunities developed by other teams. To account for this violation of the independence of all observations assumption, the nested structure of the sample, and to be able to focus on cross-level interaction effects, I use a hierarchical linear modeling approach (HLM) (Cohen, 2003; HLM; Raudenbush & Bryk, 2002), also referred to as multilevel modeling.

HLM allows the researcher to separate the variance components of both levels, the business opportunity level (level one) and the team level (level two). I separate the variance of the entire model into three components, within-group variance (level one), intercept variance across teams (level two) and slope variance across teams (level two) (Aguinis et al., 2013). All analyses in this thesis were performed with Stata 13.1. The relevant command to perform multilevel modeling with Stata is *xtmixed.* The statistical method to fit the model is maximum likelihood. Fixed effects are estimated directly, random effects are summarized corresponding to their estimated variances and covariances. The structure of the covariance matrix for the random effects is unstructured for all models. The overall error structure is assumed to be Gaussian ("Stata 14 help for xtmixed").

Based on Aguinis et al. (2013), I will shortly graphically explain the three components of variance (cf., Figure 14) followed by a more detailed explanation. For the ease of representation, I do not show all 116 teams in each graph, but concentrate on two representative teams. In each graph, the subscript j denotes team ($j = 1…116$) and the subscript i denotes business opportunity ($i = 1…27$). Each of the graphs in Figure 14 represents on the x-axis an opportunity's business value assessment at (n-1) ranging from one to ten and the corresponding business value for the business opportunity at (n), ranging as well from one to ten, on the y-axis. The two dashed lines depict the relationship between a prior business opportunity's business value (business value (n-1)) and a subsequent business opportunity's business value (business value (n)) for two specific teams, the solid line represents the pooled regression line across all teams. The same logic holds for the relationship between a prior business opportunity's originality (originality (n-1)) and a subsequent business opportunity's originality (originality (n)).
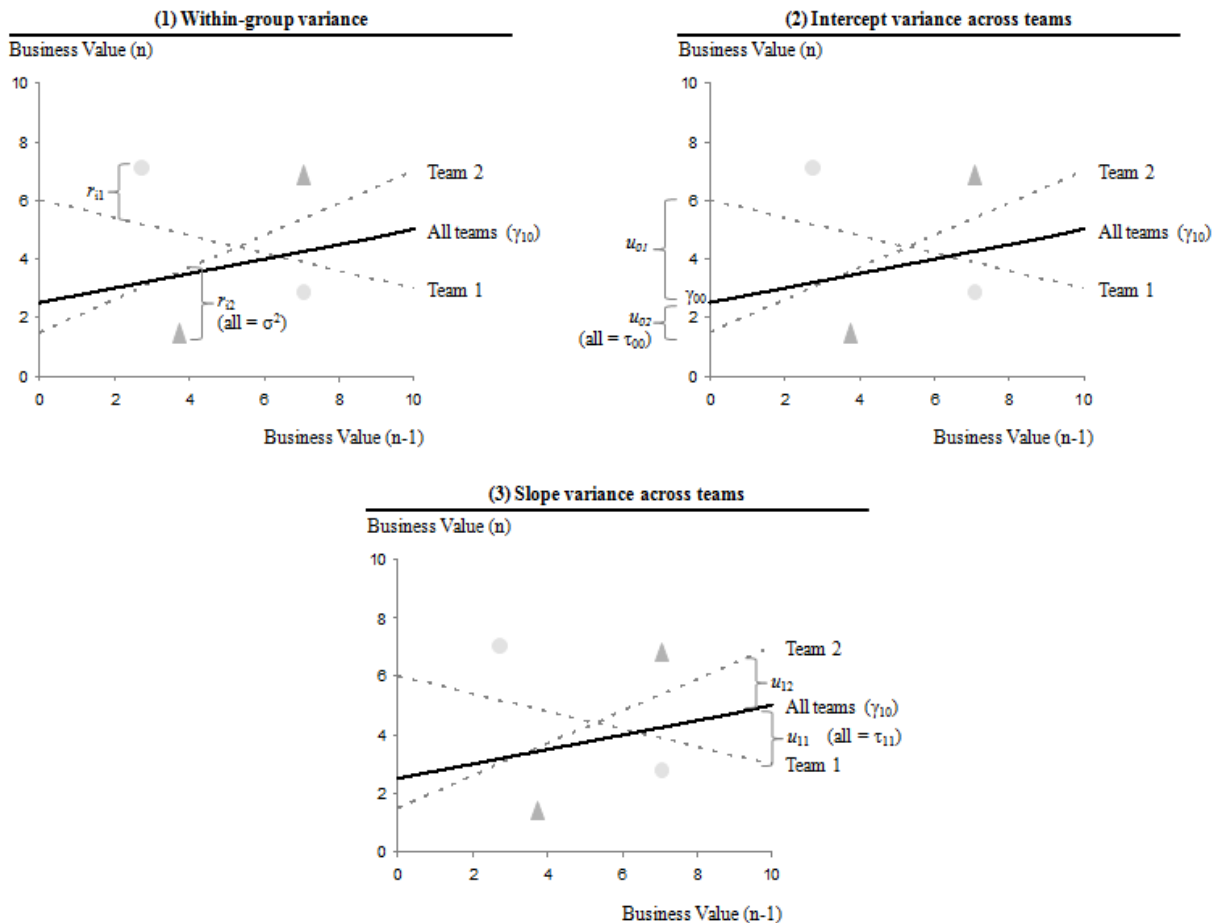
Source: Own illustration modified from Aguinis et al. (2013), p. 1495)

Figure 14: Components of variance

First, within-group variance is represented in graph (1). As can be seen, each team's ordinary least squares (OLS) regression line has one intercept and slope. The level one residuals for team 1 are represented by r_{i1} (showing the difference between observed and predicted business value (n) based on business value (n-1)), the level one residuals for team 2 are represented by r_{i2}. The variance of residuals per team is denoted with σ^2. Thus, σ^2 represents the variance of differences in business value (n) around the predicted business value (n) for business opportunities within each team.

Second, intercept variance across teams is depicted in graph (2). Each team has its own, individual intercept. The difference between team 1's intercept and the pooled regression line's intercept (γ_{00}, representing all teams) is denoted u_{u1}. For team 2, this difference is named u_{u2}. The variance of these across group differences or level two residuals is symbolized by τ_{00}.

Third, slope variance across teams is represented in graph (3). The variance across slopes is denoted by τ_{11}, representing the difference between all individual slopes - in our case u_{11} for team 1 and u_{12} for team 2 – and the pooled slope γ_{10}. It indicates whether the relationship between a prior opportunity's business value and a subsequent opportunity's business value varies across teams.

As mentioned above, it is possible to decompose the variance of the model into three different components. Hence, I can attribute the model's variables to those variance components (Aguinis et al., 2013; Hox, 2010; Raudenbush & Bryk, 2002; Wooldridge, 2003). Figure 15 gives an overview which variables describe which part of variance.

	Variance components	Model components with potential impact on Originality / Business value			
		Independent variables	Moderators	Control variables	
Level 2	Slope variance across teams		Team size Entrepr. experience Boundary spanning Cohesion		Cross level interaction effect of level 2 moderators on relationship between level 1 independent variable and dependent variable
	Intercept variance across teams			# of opportunities Technological experience High-tech industry	Cross level direct effect of level 2 measures on dependent variable
Level 1	Within-group variance	Originality (n-1) / Business value (n-1)			Level 1 direct effect of independent variable on dependent variable

Source: Own illustration

Figure 15: Overview of model measures and variance components

Specifically, the level one independent variables originality (n-1) and business value (n-1) explain within-group variance, whereas moderators at level two explain intercept variance across teams as well as slope variance across teams. Control variables only explain direct effects and, thus, intercept variance across teams. This setup allows me to explain the following three effects (Aguinis et al., 2013): (1), level one direct effects of a prior opportunity's originality or a prior opportunity's business value on a subsequent opportunity's originality or a subsequent opportunity's business value, respectively; (2), level two direct effects of moderators and control variables at level two on dependent variables originality (n) and business value (n); (3), cross-level interaction effect of moderators on the relationship between a prior opportunity's originality and a subsequent opportunity's originality or between a prior opportunity's business value and subsequent opportunity's business value.

In the next step, I will explain in more detail the analytical proceeding to analyze the different parts of variance. Therefore, I follow Hox (2010) and Aguinis et al. (2013) in using a bottom-up approach. This is recommended because it keeps the model simple, there are larger sample sizes at the lower level, and fixed parameters are calculated more precisely.

The model build-up consists of six steps: It first starts with the explanation of the *null model*. In a second step, control measures are added. Third, level one direct effects are added. Then, in the fourth step, I calculate a *Random Intercept and Fixed Slope model (RIFSM)* by adding level two independent variables. Fifth, a *Random Intercept and Random Slope model (RIRSM)* is calculated by allowing slopes to vary across teams. Lastly, the model is complemented by including interaction terms between moderators and the level one independent variable to calculate the *Cross-Level Interaction model*.

I start the analysis with the *null model,* which is also referred to as *intercept-only model* (Hox, 2010) or *one-way ANOVA* with random effects (Raudenbush & Bryk, 2002). In the following, the concentration lies on the model for business value, but a similar logic holds for the originality model. The model build-up starts by specifying the following relationships:

$$\text{Model 1 (level 1): } BV_{ij} = \beta_{0j} + r_{ij} \tag{4}$$

$$\text{Model 1 (level 2): } \beta_{0j} = \gamma_{00} + u_{0j} \tag{5}$$

Model 1 (combined): $BV_{ij} = \gamma_{00} + u_{0j} + r_{ij}$ (6)

BV_{ij} in model (4) is the outcome variable of the model and predicts business value (n) for business opportunity i of team j. The team intercepts β_{0j} for the $j = 1\ldots116$ teams, equation (5), are a function of the grand mean intercept γ_{00} (the average business value (n) across all teams) and the residual term u_{0j}, describing how individual team intercepts deviate from the grand mean intercept. Thus, each intercept reflects the average business value (n) for team j. The level one residuals are represented by r_{ij} and symbolize within-group differences in business value (n). Combining equations (4) and (5) leads to equation (6).

As can be seen, the combined model (6) does not include any explanatory variable. Hence, it does not explain any variance in business value (n). It only allows intercepts to vary across teams. Business value (n) is explained by the grand mean business value (n-1), across team differences in business value (n), and within-team differences in business value (n). Referring back to the graphical analysis, τ_{00}, the variance of u_{0j}, shows the variation in mean business value (n) across teams. The variance of the within-group differences in business value (n) is denoted, as in Figure 14, with σ^2.

At the beginning of the chapter, the need to use hierarchical linear modeling as regression technique is mentioned because of the nested data structure and the dependence of developed business opportunities within the same team. The amount of dependence of business opportunities from the same team can be expressed as a correlation coefficient (Hox, 2010). This intraclass correlation coefficient (ICC) "measures the proportion of the variance in the outcome that is between the level-2 units" (Raudenbush & Bryk, 2002, p. 24), representing in this case the proportion of variance in business value (n) due to entrepreneurial founder team differences. Alternatively interpreted, the ICC is the expected correlation between business value (n) for two business value (n-1) assessments in the same team (Aguinis et al., 2013). The ICC takes values from 0 to 1 and is an indicator to decide if multilevel modeling is necessary. A value close to 0 suggests that a model including only level one variables is sufficient (Hayes, 2006). Mathematically, the ICC is calculated as

ICC: $\rho = \dfrac{\tau_{00}}{(\tau_{00} + \sigma^2)}$ (7)

In the second step, only control variables are added to the null model in order to control for their variance and to check if these other variables explain more of the variance in business value (n).

I take equation (5) and add level two control variables number of business opportunities (BO), technological experience (TE) and high-tech industry (HI) to arrive at equation (9). Equation (4) for level one remains unchanged.

Model 2 (level 1): $BV_{ij} = \beta_{0j} + r_{ij}$ (8)

Model 2 (level 2): $\beta_{0j} = \gamma_{00} + \gamma_{01(1)}(BO_j - \overline{BO}) + \gamma_{01(2)}(TE_j - \overline{TE}) +$

$\gamma_{01(3)} \times HI_j + u_{0j}$ (9)

Model 2 (combined): $BV_{ij} = \gamma_{00} + \gamma_{01(1)}(BO_j - \overline{BO}) + \gamma_{01(2)}(TE_j - \overline{TE}) +$

$\gamma_{01(3)} \times HI_j + u_{0j} + r_{ij}$ (10)

Team intercepts β_{0j} are a function of the average intercept across all teams γ_{00} and the deviation of teams from this average intercept, u_{0j}, after having controlled for number of business opportunities, technological experience, and high-tech industry. Moreover, $\gamma_{01(1)}$ depicts the amount of change in a team's average business value (n) associated with a one unit increase in the variable number of business opportunities. $\gamma_{01(2)}$ is interpreted as the amount of change in team j's business value (n) associated with a one unit increase in the control variable technological experience. The same logic holds for $\gamma_{01(3)}$. As mentioned in section 3.5, BO_j and TE_j are grand-mean centered by the respective means $\overline{BO}, \overline{TE}$. HI_j is not grand-mean centered since it is a dummy variable.

Equation (10) represents the combination of equations (8) and (9).

In the third step, the level one direct effect is added.

Model 3 (level 1): $BV_{ij} = \beta_{0j} + \beta_{1j}\left(BV(n-1)_{ij} - \overline{BV(n-1)}_j\right) + r_{ij}$ (11)

BV_{ij}, the business value (n) value of the ith business opportunity for team j, is predicted by the intercept parameter of team j, β_{0j}, the slope parameter of team j, β_{1j}, the business value (n-1) value of business opportunity i for team j, $BV(t-1)_{ij}$, within-team centered by team jth average, $\overline{BV(t-1)}_j$, and the level one residual, r_{ij} .

Model 3 (level 2): $\beta_{0j} = \gamma_{00} + \gamma_{01(1)}\left(BO_j - \overline{BO}\right) + \gamma_{01(2)}\left(TE_j - \overline{TE}\right) +$

$\gamma_{01(3)} \times HI_j + u_{0j}$ (12)

The level two part of the model, equation (12), remains unchanged since only the level one independent variable is added.

Model 3 (level 2): $\beta_{1j} = \gamma_{10}$ (13)

Because I do not allow slopes to vary across teams in equation (11), the team slope parameter, β_{1j}, is equal to a fixed value for the slope of a subsequent opportunity's business value on a prior opportunity's business value, γ_{10}. The constant slope is used for all developed business opportunities across all teams. This is represented in equation (13).

Model 3 (combined): $BV_{ij} = \gamma_{00} + \gamma_{10}\left(BV(n-1)_{ij} - \overline{BV(n-1)}_j\right) +$

$$\gamma_{01(1)}(BO_j - \overline{BO}) + \gamma_{01(2)}(TE_j - \overline{TE}) + \gamma_{01(3)} \times HI_j + u_{0j} + r_{ij} \qquad (14)$$

Taken equations (11) to (13) together leads to equation (14), the combined model for level one and level two.

The fourth part of the model building process consists in calculating the *Random Intercept and Fixed Slope model*. I am now interested in explaining σ^2 and τ_{00}, that is the within-team variance at level one and intercept variance at level two. Again, intercepts are allowed to vary across teams, but slopes are fixed.

Accordingly, the relevant level two independent variables team size [TS], entrepreneurial experience [EXP], boundary spanning [BS], and cohesion [COH] are added.

The level one part of the model remains unchanged.

$$\text{Model 4 (level 1): } BV_{ij} = \beta_{0j} + \beta_{1j}(BV(n-1)_{ij} - \overline{BV(n-1)}_j) + r_{ij} \qquad (15)$$

At level two, the regressors are included which are necessary to test the hypotheses developed in chapter 2.

$$\text{Model 4 (level 2): } \beta_{0j} = \gamma_{00} + \gamma_{01(1)}(BO_j - \overline{BO}) + \gamma_{01(2)}(TE_j - \overline{TE}) +$$

$$\gamma_{01(3)} \times HI_j + \gamma_{01(4)}(TS_j - \overline{TS}) + \gamma_{01(5)}(EXP_j - \overline{EXP}) +$$

$$\gamma_{01(6)}(BS_j - \overline{BS}) + \gamma_{01(7)} \times COH_j + u_{0j} \qquad (16)$$

As in the third step, team intercepts for the j teams are a function of the across team average intercept, the amount of change in business value (n) due to a one unit increase in the respective level two regressors and a residual. Slopes are not allowed to vary and, hence,

Model 4 (level 2): $\beta_{1j} = \gamma_{10}$ (17)

Combining equations (15) to (17) results in the full *Random Intercept and Fixed Slope model:*

Model 4 (combined): $BV_{ij} = \gamma_{00} + \gamma_{10}\left(BV(n-1)_{ij} - \overline{BV(n-1)}_j\right) +$

$\gamma_{01(1)}\left(BO_j - \overline{BO}\right) + \gamma_{01(2)}\left(TE_j - \overline{TE}\right) + \gamma_{01(3)} \times HI_j +$

$\gamma_{01(4)}\left(TS_j - \overline{TS}\right) + \gamma_{01(5)}\left(EXP_j - \overline{EXP}\right) + \gamma_{01(6)}\left(BS_j - \overline{BS}\right) +$

$\gamma_{01(7)} \times COH_j + u_{0j} + r_{ij}$ (18)

As can be seen, business value (n) is a function of a common intercept, the value for business value (n-1) at level one, level two direct effects of number of business opportunities, technological experience, high-tech industry, team size, boundary spanning, and cohesion as well as a residual for predicting business value (n) after controlling for the level two independent variables and a residual depicting within-group differences in business value (n).

γ_{00} displays mean business value (n) for team *j* with level two variables at their respective means (except for the dummy variable cohesion) and $\gamma_{01(1)}$ to $\gamma_{01(7)}$ show the change in team *j*'s average business value (n) value associated with a one unit increase in the respective level two variable. To be able to interpret γ_{00} with regard to level two means, the level two variables are rescaled by their grand means. Cohesion is an exception since it is a dummy variable. More specifically, $\gamma_{01(7)}$ is interpreted as the amount of change in business value (n) associated with the change of a team not being primed on the team condition to a team being primed on the team condition.

Step 5 introduces the *Random Intercept and Random Slope* model.

This model analyses the variance of slopes across teams. In other words, it addresses the question if the relationship between a prior opportunity's business value and a subsequent opportunity's business value is different across teams.

The level one equation is identical to equation (15) for the *Random Intercept and Fixed Slope Model.*

Model 5 (level 1): $BV_{ij} = \beta_{0j} + \beta_{1j}\left(BV(n-1)_{ij} - \overline{BV(n-1)}_j\right) + r_{ij}$ (19)

Team intercepts remain unchanged.

Model 5 (level 2): $\beta_{0j} = \gamma_{00} + \gamma_{01(1)}\left(BO_j - \overline{BO}\right) + \gamma_{01(2)}\left(TE_j - \overline{TE}\right) +$

$\gamma_{01(3)} \times HI_j + \gamma_{01(4)}\left(TS_j - \overline{TS}\right) + \gamma_{01(5)}\left(EXP_j - \overline{EXP}\right) +$

$\gamma_{01(6)}\left(BS_j - \overline{BS}\right) + \gamma_{01(7)} \times COH_j + u_{0j}$ (20)

But now slopes are allowed to vary across teams:

Model 5 (Level 2): $\beta_{1j} = \gamma_{10} + u_{1j}$ (21)

The slope of a subsequent opportunity's business value on a prior opportunity's business value in equation (21) is a function of the mean slope across all teams, γ_{10}, and the residual, u_{1j}, describing the difference between team j's slope and the average slope across all teams.

The combination of equations (19) to (21) results in the following full model:

Model 5 (combined): $BV_{ij} = \gamma_{00} + \gamma_{10}\left(BV(n-1)_{ij} - \overline{BV(n-1)}_j\right) +$

$u_{1j}\left(BV(t-1)_{ij} - \overline{BV(t-1)}_j\right) + \gamma_{01(1)}\left(BO_j - \overline{BO}\right) +$

$\gamma_{01(2)}\left(TE_j - \overline{TE}\right) + \gamma_{01(3)} \times HI_j + \gamma_{01(4)}\left(TS_j - \overline{TS}\right) +$

$$\gamma_{01(5)}\left(EXP_j - \overline{EXP}\right) + \gamma_{01(6)}\left(BS_j - \overline{BS}\right) + \gamma_{01(7)} \times COH_j + u_{0j} + r_{ij} \tag{22}$$

Comparing equation (22) to the combined *Random Intercept and Fixed Slope model* (equation (18)) shows that the only difference between the two models is the possible variation in the slope of a subsequent opportunity's business value on a prior opportunity's business value across teams, denoted by u_{1j}.

As stated by Aguinis et al. (2013), there is one further new parameter in the model which is not explicit in the model. That is, the covariance between intercepts and slopes, τ_{01}. If τ_{01} is larger than zero, teams with a stronger relationship between a subsequent opportunity's business value and a prior opportunity's business value tend to have higher levels of a subsequent opportunity's business value.

In the last step of the model building process, the *Cross-Level Interaction model* is calculated. The aim is to understand if level two variables might explain some of the variance in slopes across teams (Aguinis et al., 2013). Therefore, cross-level interactions are included into the model. Starting with level one, the equation is similar to the *Random Intercept and Random Slope model*.

$$\text{Model 6 (level 1): } BV_{ij} = \beta_{0j} + \beta_{1j}\left(BV(n-1)_{ij} - \overline{BV(n-1)_j}\right) + r_{ij} \tag{23}$$

Now, intercepts as well as slopes are allowed to vary across teams.

$$\text{Model 6 (level 2): } \beta_{0j} = \gamma_{00} + \gamma_{01(1)}\left(BO_j - \overline{BO}\right) + \gamma_{01(2)}\left(TE_j - \overline{TE}\right) +$$

$$\gamma_{01(3)} \times HI_j + \gamma_{01(4)}\left(TS_j - \overline{TS}\right) + \gamma_{01(5)}\left(EXP_j - \overline{EXP}\right) +$$

$$\gamma_{01(6)}\left(BS_j - \overline{BS}\right) + \gamma_{01(7)} \times COH_j + u_{0j} \tag{24}$$

The equation for β_{0j} is equal as compared to model 5, equation (20). However, the slope β_{1j} includes a level two part which is assumed to play a moderating role:

Model 6 (level 2): $\beta_{1j} = \gamma_{10} + \gamma_{11(1)}\left(TS_j - \overline{TS}\right) + \gamma_{11(2)}\left(EXP_j - \overline{EXP}\right) +$

$\gamma_{11(36)}\left(BS_j - \overline{BS}\right) + \gamma_{11(4)} \times COH_j + u_{1j}$ (25)

As shown in equation (25), a moderating effect for each level two independent variable is included, which is captured by $\gamma_{11(1)}$ to $\gamma_{11(4)}$. For instance, $\gamma_{11(1)}$ represents the change in the slope of a subsequent opportunity's business value on a prior opportunity's business value across teams when team size increases by one individual. If the cross-level interaction effect is significantly positive, a subsequent opportunity's business value is more strongly positively related to a prior opportunity's business value when the team size is larger as compared to a smaller team size. Merging equations (23) to (25) yields the final *Cross-Level Interaction* model:

Model 6 (combined): $BV_{ij} = \gamma_{00} + \gamma_{10}\left(BV(n-1)_{ij} - \overline{BV(n-1)}_j\right) +$

$u_{1j}\left(BV(t-1)_{ij} - \overline{BV(n-1)}_j\right) + \gamma_{01(1)}\left(BO_j - \overline{BO}\right) + \gamma_{01(2)}\left(TE_j - \overline{TE}\right) +$

$\gamma_{01(3)} \times HI_j + \gamma_{01(4)}\left(TS_j - \overline{TS}\right) + \gamma_{01(5)}\left(EXP_j - \overline{EXP}\right) + \gamma_{01(6)}\left(BS_j - \overline{BS}\right) +$

$\gamma_{01(7)} \times COH_j + \gamma_{11(1)}\left(BV(n-1)_{ij} - \overline{BV(n-1)}_j\right)\left(TS_j - \overline{TS}\right) +$

$\gamma_{11(2)}\left(BV(n-1)_{ij} - \overline{BV(n-1)}_j\right)\left(EXP_j - \overline{EXP}\right) +$

$\gamma_{11(3)}\left(BV(n-1)_{ij} - \overline{BV(n-1)}_j\right)\left(BS_j - \overline{BS}\right) +$

$\gamma_{11(4)}\left(BV(n-1)_{ij} - \overline{BV(n-1)}_j\right) \times COH_j + u_{0j} + r_{ij}$ (26)

Equation (26) contains all level one and level two parts of the model. u_{0j} and u_{1j} vary across entrepreneurial founder teams. γ_{00}, γ_{10}, $\gamma_{01(1)}$, $\gamma_{01(2)}$, $\gamma_{01(3)}$, $\gamma_{01(4)}$, $\gamma_{01(5)}$, $\gamma_{01(6)}$, $\gamma_{01(7)}$, $\gamma_{11(1)}$, $\gamma_{11(2)}$, $\gamma_{11(3)}$ and $\gamma_{11(4)}$ are constant across entrepreneurial founder teams.

After this analytical examination and the specification of the relevant equations - level one direct effect on dependent variable, cross-level direct effects of level two independent variables on dependent variable and cross-level interaction effects of level two independent variables on the relationship between level one independent variable and dependent variable – I will present in the following section the results. As in this methodological part, I will follow the bottom-up approach (Hox, 2010) and present all six models.

4 RESULTS

In the following, the results of the statistical analysis are presented. I start with an overview of the descriptive statistics and correlations in section 4.1. Then, in section 4.2, an overview of recognized business opportunities is provided. In section 4.3, results of the manipulation check for cohesion are presented. Additionally, in sections 4.4.1 and 4.4.2, I elaborate on the hierarchical linear modeling estimates and test the hypotheses that I have presented in chapter 2. I follow, as in the previous chapter, the model buildup approach suggested by Hox (2010) and Aguinis et al. (2013) and present six different models for originality and business value. In section 4.5, I conclude with robustness checks.

4.1 Descriptive statistics and correlations

Means, standard deviations, and bivariate Pearson correlation coefficients for business opportunity level (level one) and team level (level two) variables are presented in Table 4. As indicated, the mean originality (n) score (mean of 2.84) and business value (n) score (mean of 5.43) are slightly above the average values of the respective scales[15]. The character *n* stands for the different recognized business opportunities. Hence, the coefficients represent the mean scores of originality and business value across all business opportunities. Consistent with previous research, originality is rated on a scale between one and five and business value is rated on a scale between one and ten. Therefore, scores in this thesis can be assessed in relation to existing findings. Compared to previous research, it displays a slightly higher mean for originality (n) as shown by Diehl and Stroebe (1987) who presented a score of 2.49, Rietzschel et al. (2006) with a score of 1.44, and Rietzschel et al. (2010) with 2.03. A similar picture shows the result of the business value consideration, leading to a slightly higher mean of this study in comparison to Girotra et al. (2010) who arrived at a mean business value of 4.52. In contrast to previous studies which relied on student samples, the study at hand is based on data from entrepreneurial founder teams. The slightly higher scores for originality and business value in this study might be an indicator for entrepreneurial teams having more experience with opportunity recognition tasks as compared to student samples. Overall, it can be noted that teams in this study display for both originality and business value higher average scores than the scale mean.

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[15] Values for originality (n) and originality (n-1) as well as for business value (n) and business value (n-1) are slightly different because for both independent variables the number of observations misses for the last period.

Regarding the variable cohesion, the mean of .35 shows that 35% (41 teams) of founder teams are primed on higher levels of cohesion whereas 65% (75 teams) of founder teams are held in the neutral condition. Nearly one third of participating teams are assigned by the author to the group working in a high-tech industry (details to the procedure can be found in section 3.5). Team members already founded four companies (including the current company) on average per team.

The correlation values in Table 4 represent linear associations between variables. The sign indicates the direction of the relationship and values can range between minus one and one, and those extreme values represent a perfect inverted and a perfect relationship (Verbeek, 2008). Especially, I expect a negative correlation between originality scores and business value scores for the same subsequent business opportunities (Hypothesis 1). The correlation is indeed negative and significant ($r = -.43$, $p<.001$), which is in line with my theoretical derivation in section 2.4.1. The same relationship holds for originality scores and business value scores for the same prior business opportunities ($r = -.45$, $p<.001$). Compared to previous literature, Nijstad et al. (2010) found a correlation of -.42 between originality and feasibility, which is in line with the result in this thesis even if feasibility is not congruent with business value.

Not surprising is the positive and significant relationship between team size and entrepreneurial experience ($r = .60$, $p<.001$), because based on the variable operationalization larger teams tend to have more aggregated entrepreneurial experience in the team as compared to smaller teams. In addition, larger teams are less involved in boundary spanning activities ($r = -.12$, $p<.001$). The members might provide the team with a large information basis and, thus, the team is less dependent on external information. Remarkably, teams working in a high-tech industry have a significant positive correlation with the number of developed business opportunities ($r = .13$, $p<.001$). Thus, working in this environment seems to foster productivity in business opportunity generation. Not only is the high-tech industry significantly positive related to the number of recognized business opportunities, but also to the level of technological experience ($r = .11$, $p<.001$). Founder teams seem to gain their technological experience in their ventures operating in a high-tech environment.

	Mean	s.d.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Originality (n)	2.81	1.03	1										
2. Business value (n)	5.48	2.37	-.43***	1									
3. Originality (n-1)	2.80	1.04	.09**	-.07*	1								
4. Business value (n-1)	5.46	2.36	-.07*	.07*	-.45***	1							
5. Team size	2.57	.81	.01	-.01	.02	-.01	1						
6. Entrepreneurial experience	3.98	2.26	.05†	-.02	.05†	-.03	.60***	1					
7. Boundary spanning	5.35	.74	.00	.03	.02	.01	-.12***	-.07*	1				
8. Cohesion	.35	.47	.02	-.07*	.03	-.06*	-.02	-.08**	.01	1			
9. Number of business opportunities	13.13	4.85	.07*	-.09**	.07*	-.08**	.37***	.34***	-.14***	-.05†	1		
10. Technological experience	4.71	1.62	-.02	.00	-.01	-.00	.03	.10***	-.04	-.02	.11***	1	
11. High-tech industry	.29	.45	-.07*	.10**	-.07*	.09**	-.05†	-.04	-.06*	.01	.13***	.37***	1

N = 1,279; exceptions for originality (n-1) and business value (n-1) with N = 1,163; †p <.1; *p<.05;**p<.01, ***p<.001.; (1) cohesion: 1 = high cohesion, 0 = low cohesion; high-tech industry: 1 = high-tech industry, 0 = no high-tech industry

Table 4: Descriptive statistics and Pearson correlation table (before mean-centering)

Moreover, the data is analyzed for potential multicollinearity. High, but no perfect correlation between independent variables in a regression model is called multicollinearity (Wooldridge, 2003). It decreases the possibility to predict the dependent variable and distorts the relative roles of each regressor in predicting the independent variable. Similarly, it can result in a wrong estimation of regression coefficients (Hair, 2010).

To determine if multicollinearity is an issue, I examine the correlation matrix, variance inflation factors (VIFs), and the condition number.

First, all pairwise correlations are well below the threshold of .7 as defined by Hair (2010) as an indicator of a lower risk of multicollinearity. As depicted in Table 4, the highest correlation is -.45 between originality (n-1) and business value (n-1) and, hence, this provides a first indication that multicollinearity is not likely to be a major issue in this study.

Second, I calculated variance inflation factors (VIFs) and the inverse, tolerance (Hair, 2010). Following recommendations from existing studies, the variables in Table 5 and Table 6 are centered before calculating interaction terms. It is important to notice that the centering of variables eliminates nonessential multicollinearity (Dalal & Zickar, 2012; Robins, Fraley, & Krueger, 2007). Nonessential multicollinearity exists between a regressor and an interaction term including the same regressor when they have a mean unequal to zero (Marquardt, 1980). Correlations stemming from the interactions of the same independent variables are reduced, but not eliminated to zero (Allison, 2012). Centering does not impair the interpretation of effects nor the fit of the regression model (Dalal & Zickar, 2012). Generally speaking, the variance inflation factor indicates the effect other regressors have on the standard error of the regression coefficient. High VIF values indicate high collinearity. A threshold of 10 denotes high collinearity (Hair, 2010; MacKenzie, Podsakoff, & Podsakoff, 2011). The tolerance "is defined as the amount of variability of the selected independent variable *not explained by the other independent variables*" (Hair, 2010, p. 198). Since the tolerance value is the part of a variable not explained by other regressors, high tolerance values indicate low collinearity. A common cutoff threshold is .10 (Hair, 2010). Table 5 and Table 6 illustrate the results for originality (n) and business value (n). The highest VIF is 1.69 for team size. Means are 1.35 for originality (n) and 1.36 for business value (n). Hence, there is no indication for serious problems of multicollinearity.

Variable	VIF	1 / VIF	Condition Index
Level 1			
Originality (n-1)	1.45	.69	1.00
Level 2			
Team size	1.69	.59	1.09
Entrepreneurial experience	1.67	.60	1.01
Boundary spanning	1.03	.97	1.34
Cohesion [1= high, 0=low]	1.01	.99	1.14
Level 2 control variables			
Number of business opportunities	1.24	.81	2.06
Technological experience	1.18	.85	2.34
High-tech industry [1 = yes, 0 = no]	1.19	.84	2.29
Cross level interaction			
Originality (n-1) x Team size	1.60	.62	1.45
Originality (n-1) x Entrepreneurial experience	1.63	.62	1.44
Originality (n-1) x Boundary spanning	1.02	.98	1.89
Originality (n-1) x Cohesion	1.46	.68	1.69
Mean Variance Inflation Factor (VIF)	1.35		
Condition number			2.55

Originality (n-1) is group-mean centered; team size, entrepreneurial experience, boundary spanning, number of business opportunities and technological experience are grand-mean centered.

Table 5: Variance Inflation Factors (VIFs) and Condition Index for originality (n)

Variable	VIF	1 / VIF	Condition Index
Level 1			
Business value (n-1)	1.49	.67	1.00
Level 2			
Team size	1.69	.59	1.10
Entrepreneurial experience	1.67	.60	1.01
Boundary spanning	1.03	.97	1.34
Cohesion [1= high, 0=low]	1.01	.99	1.13
Level 2 control variables			
Number of business opportunities	1.24	.81	2.16
Technological experience	1.18	.85	2.32
High-tech industry [1 = yes, 0 = no]	1.19	.84	2.29
Cross level interaction			
Business Value (n-1) x Team size	1.66	.60	1.44
Business Value (n-1) x Entrepreneurial experience	1.64	.61	1.44
Business Value (n-1) x Boundary spanning	1.02	.98	1.89
Business Value (n-1) x Cohesion	1.49	.67	1.69
Mean Variance Inflation Factor (VIF)	1.36		
Condition number			2.55

Business value (n-1) is group-mean centered; team size, entrepreneurial experience, boundary spanning, number of business opportunities s and technological experience are grand-mean centered.

Table 6: Variance Inflation Factors (VIFs) and Condition Index for business value (n)

Third, condition indices decompose the regression coefficient variance (Hair, 2010). They measure the sensitivity of the overall model concerning small changes in the regressors (Carlsson & Lundström, 2002). To analyze the entire model for multicollinearity with the condition number entails the advantage to acknowledge that multicollinearity is in most cases a problem of several variables together rather than only single variables (Flom, 1999). The condition number for originality (n) and business value (n) is 2.55. Since the suggested cutoff is 15.0 (Hair, 2010) [16], multicollinearity does not seem to be a severe concern.

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[16] Belsley, Kuh, and Welsch ((2004)) suggest that a condition index between 5 and 10 indicates weak dependencies. Bollen ((1989)) notes that rules of thumb regarding thresholds for condition indices are misleading because the indices are model specific.

Taken together, the inspection of the correlation table, variance inflation factors, and condition indices suggest that multicollinearity is unlikely to be a concern in this study.

4.2   Overview of recognized business opportunities

With regard to developed business opportunities, teams differ strongly in terms of number of recognized business opportunities. Table 7 gives an overview of differences across teams.

Observations	1279	Number of teams	116						
Percentiles	1%	5%	10%	25%	50%	75%	90%	95%	99%
Number of Business opportunities	3	6	8	9	13	15	19	23	27
Standard deviation	4.85	Variance	23.69	Mean	13				
Skewness	0.78	Kurtosis	3.80						

Source: Own illustration

Table 7: Descriptive statistics on the number of recognized business opportunities

In total, the data set contains 1279 business opportunities developed by entrepreneurial founder teams. On average, each team developed 13 business opportunities with a standard deviation of 4.85 opportunities. Founder teams recognized between 3 and 27 business opportunities. There is a range of 24 business opportunities between the best and worst team and more than half of the teams developed between 9 and 15 business opportunities. Figure 16 shows in more detail the distribution of recognized business opportunities across teams.

Number of entrepreneurial founder teams
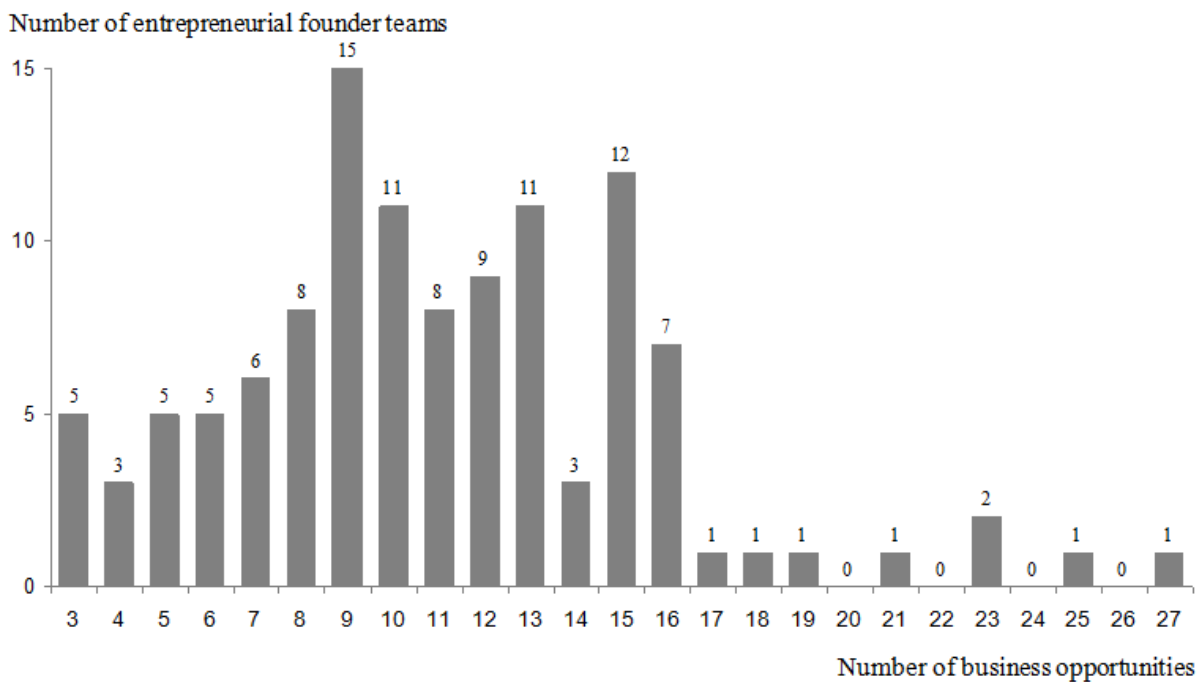
Source: Own illustration

Figure 16: Overview of number of recognized business opportunities by teams

The next section shortly presents the results of the manipulation check described in section 3.3.2. The manipulation check should test if entrepreneurial founder teams in the team condition display higher levels of cohesion as compared to teams in the neutral condition.

4.3   Results of manipulation check for cohesion

In order to examine if high levels of cohesion (priming = 1) are effectively primed, the reinforcement task serves as manipulation check (cf. section 3.3.2 for a detailed explanation). The level of cohesion for each team is calculated as the number of team-oriented words divided by the total number of written words in the reinforcement task (see section 3.3.2) (Bezrukova et al., 2009; Oyserman & Lee, 2010). Two groups of team-oriented words are defined, a basic and an extended group. This proceeding allows the separation between a strong and a weak case for the manipulation check. Then, entrepreneurial founder teams primed on higher levels of cohesion and teams in the neutral condition are compared with respect to their ratio of team-oriented words. More specifically, we first counted the total number of written words for each founder team member. Second, the number of team-oriented words was counted. Third, the ratio of team-oriented words was calculated as the number of team-oriented words divided by the total

number of words. Fourth, numbers were aggregated to the team level. The median $r_{wg(j)}$ of .91 justifies the aggregation and a comparison at the team level, assuming a cutoff of .7 (LeBreton & Senter, 2008). Fifth, both conditions were compared. For both the basic and extended group of team-oriented words, differences are significant between the group of entrepreneurial founder teams primed on high levels of cohesion and the group in the neutral condition. In detail, considering the basic group of team-oriented words, the mean value for the group of entrepreneurial founder teams being associated with higher levels of cohesion (mean = .0201, s.d. = .0121) is significantly higher as compared to the group in the neutral condition (mean = .0090, s.d. = .0106), resulting in $t(114) = 5.05$, p < .001. Additionally, for the extended group of team-oriented words, the mean value of cohesion for the teams primed on higher levels of cohesion (mean = .0438, s.d. = .0226) is significantly higher compared to the group in the neutral condition (mean = .0153, s.d. = .0151), resulting in $t(114) = 8.09$, p < .001. Thus, the priming works. Entrepreneurial founder teams in the higher levels of cohesion group show for both groups of team-oriented words a significantly higher number for the manipulation check as compared to teams in the neutral group.

4.4   Hypotheses testing

The following regression results are split into two sections. Chapter 4.4.1 presents regression results for all models for the dependent variable originality at (n). Chapter 4.4.2 describes regression results for all models for the dependent variable business value at (n). Both chapters follow the bottom-up approach suggested by Hox (2010) and Aguinis et al. (2013) and described in section 3.6. I start with the null model, subsequently add control variables, followed by the inclusion of the level one direct effect. Then, I present results for the *Random Intercept and Fixed Slope model* and conclude with a description of the *Random Intercept and Random Slope* model and the *Cross-Level Interaction model*.

Besides pure regression results, I present additional information for the models of originality and business value. Variance components are shown for the business opportunity and team level. Intraclass correlation coefficients are presented to show how strong business opportunities from the same entrepreneurial founder team resemble each other. Deviance describes the model fit and Pseudo R^2 is used as a goodness-of-fit measure.

4.4.1 Regression results for the originality of business opportunities as dependent variable

Table 8 comprises the results of the hierarchical linear modeling (HLM) analysis for the dependent variable originality at (n). Specifically, the upper part of the table depicts the coefficients, standard errors, and levels of significance. The lower part presents variance components and additional model information.

Model 1: Null model. The null model or intercept-only model is a benchmark model serving as a comparison for the remaining models (Hox, 2010).

A main purpose of this null model is to give an indication if the nature of the data structure is hierarchical and, hence, if HLM is the appropriate statistical instrument of analysis. It provides all necessary information to calculate the intraclass correlation coefficient (ICC) which depicts the proportion of variance in the originality of opportunity (n) due to differences between entrepreneurial founder teams. The ICC in the model to predict the originality of the subsequent opportunity is 2%, meaning that differences across entrepreneurial founder teams account for 2% of the variability in a subsequent opportunity's originality. Mathieu, Aguinis, Culpepper, and Chen (2012) report in a review of multilevel studies ICC values ranging between .15 and .30. Peugh (2010) found ICC values between .05 and .20 in a review of multilevel modeling in the school psychology literature. Although ICCs presented in the literature are higher than in this study, it is still appropriate to use multilevel modeling in the present case for the following reasons: Entrepreneurial founder teams of the present study are similar to each other. All participants in the sample are entrepreneurs and part of an entrepreneurial founder team. Hence, they all have entrepreneurial experience with the recognition of business opportunities, reducing the variance between teams. Additionally, the fact that there is little between-group variance does not necessarily mean that the relationship between two measures is the same across all teams, an assumption being made when ignoring the grouped structure of the data (Nezlek, 2008). In brief, to treat the data correctly, multilevel analysis is the accurate way of analyzing the data despite a low ICC.

	Model										
Level and Variable	Model 1: Null		Model 2: Adding control variables		Model 3: Adding level 1 Direct Effect		Model 4: Random Intercept and Fixed Slope		Model 5: Random Intercept and Random Slope		Model 6: Cross-Level Interaction	
Level 1												
Intercept	2.807***	(0.032)	2.876***	(0.037)	2.907***	(0.040)	2.878***	(0.046)	2.880***	(0.046)	2.880***	(0.046)
OR (n-1)					-0.025	(0.031)	-0.025	(0.031)	-0.028	(0.019)	-0.001	(0.037)
Level 2												
TS							-0.078	(0.052)	-0.079	(0.053)	-0.079	(0.053)
EXP							0.028	(0.019)	0.028	(0.019)	0.027	(0.019)
BS							0.011	(0.045)	0.009	(0.045)	0.011	(0.045)
COH [1= high, 0=low]							0.088	(0.070)	0.086	(0.070)	0.089	(0.070)
Level 2 control variables												
BO			0.017**	(0.006)	0.017*	(0.007)	0.018*	(0.008)	0.018*	(0.008)	0.018*	(0.008)
TE			0.002	(0.020)	-0.001	(0.022)	-0.003	(0.022)	-0.003	(0.022)	-0.003	(0.022)
HI [1 = yes, 0 = no]			-0.187*	(0.074)	-0.214**	(0.079)	-0.211**	(0.079)	-0.215**	(0.079)	-0.215**	(0.079)
Cross-level interaction												
OR (n-1) x TS											-0.021	(0.046)
OR (n-1) x EXP											0.032†	(0.017)
OR (n-1) x BS											-0.086*	(0.041)
OR (n-1) x COH											-0.096	(0.067)
Variance components												
Within-team (L1) Variance	1.034		1.030		1.037		1.035		1.023		1.022	
Intercept (L2) Variance	0.021		0.014		0.019		0.016		0.017		0.018	
Slope (L2) Variance									0.011		0.000	
Intercept-slope (L2) Covariance									-0.003		-0.003	
Additional information												
ICC	0.020											
-2 log likelihood (FIML)	3,695		3,683**		3,361**		3,357**		3,356		3,344	
Number of estimated parameters	3		6		7		11		13		17	
L1 number of observations	1,279		1,279		1,163		1,163		1,163		1,163	
L2 sample size	116		116		116		116		116		116	
Pseudo R^2 L1[a]			0.004		-0.003		-0.001		0.011		0.012	
Pseudo R^2 L2[a]			0.333		0.095		0.238		0.190		0.143	

Note: FIML= Full information maximum likelihood estimation; ICC = Intraclass correlation coefficient; L1 = Level 1; L2 = Level 2; OR = Originality; TS = Team size; EXP = Entrepreneurial experience; BS = Boundary spanning; COH = Cohesion; BO = Number of business opportunities; TE = Technological experience; HI = High-tech industry. Values in parentheses are standard errors; t-statistics were computed as the ratio of each regression coefficient divided by its standard error. a) The Pseudo R-squared are calculated as described by Raudenbush and Bryk (2002)

†p <.1; *p<.05; **p<.01, ***p<.001.

Table 8: Results of multilevel analysis for originality at (n)

The null model also provides a benchmark value to compare more complex models with respect to the model deviance. It is estimated as -2 times the log of the likelihood value (Hair, 2010) and examines the model fit. The lower the deviance value, the better is the fit of the model (Hair, 2010). The null model is the baseline for comparisons with further models. Thus, the difference of deviance values between two models describes the change of the model fit due to the inclusion of additional independent variables. Table 8 shows that for each model the deviance value is decreasing. In other words, each model in the bottom-up approach shows an improved model fit which indicates a confirmation for the consideration of the more complex models.

Model 2: Adding control variables. In the second step, only control variables are added to examine if they make a significant contribution to the prediction of the dependent variable originality (n). The number of business opportunities, technological experience, and a dummy variable for ventures operating in high-tech industries are included into the model. Two control variables, number of business opportunities ($\gamma_{01(1)}$ = .017, p < .01) and high-tech industry ($\gamma_{01(3)}$ = -.187, p < .05), are significantly related to originality (n). The third control variable technological experience is not significant ($\gamma_{01(2)}$ = .002, p > .1). A higher overall number of recognized business opportunities significantly improves the dependent variable defined as the subsequent opportunity's originality. Working in a high-tech industry leads to a significantly lower value of originality (n). For entrepreneurial founder teams working in a high-tech industry, the originality of the *n*-th business opportunity is .187 points lower as compared to teams not working in the high-tech industry. In other words, there is a stronger negative relationship between a subsequent opportunity's originality and entrepreneurial founder teams in a high-tech industry than in a non high-tech industry. The intercept can be interpreted as the expected value of originality (n) when all explanatory variables - number of business opportunities, technological experience, and high-tech industry – are at their mean values. Thus, in this case the originality assessment for the *n*-th business opportunity is 2.876.

As to the goodness-of-fit measure of the model, Pseudo R² for the business opportunity level and the team level are examined, which describe the increased variance explained in the dependent variable associated with the addition of coefficients (Aguinis et al., 2013). I base the Pseudo R² calculation on Raudenbush and Bryk (2002)[17]. For each level, the residual variance

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[17] Alternative calculations for Pseudo R² are presented for example by McFadden ((1974)), Cox and Snell (1989)), Nagelkerke (1991)), or Snijders and Bosker ((1999)).

is used to compare variance explained in the model under consideration with the null model. For level two, the value of .33 indicates that the addition of control variables at the team level increases variance explained of differences across teams by 33.3% as compared to the null model. In short, the inclusion of control variables at the team level accounts for a substantial explanation of variation across teams.

Model 3: Adding level one direct effect. In model three, I only add a prior opportunity's originality as level one independent variable.

As can be seen in Table 8, the number of observations decreases from 1,279 to 1,163, representing a difference of 116 business opportunities. This is the case because each business opportunity being a dependent variable needs a prior business opportunity as independent variable. Hence, the inclusion of the prior business opportunity's originality involves the first business opportunity of each team to only be an independent variable and not a dependent variable. Accordingly, each team's first business opportunity is not included as dependent variable in the model.

Hypothesis 2 (see section 2.4.2) predicts that the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality will be positive. For model three, results reported in Table 8 do not support this hypothesis and reveal a non significant, slightly negative coefficient (γ_{10} = -.025, p > .10).

Regarding the goodness-of-fit measures of model three, deviance is decreasing as compared to previous models indicating a better fit of the model. Pseudo R² for level one and level two instead is decreasing and is negative for level one. Decreasing or negative Pseudo R² due to the inclusion of additional variables can have two potential reasons. The first reason may be a group-mean centered independent variable where all between-group information is removed. The second justification might be a time series design at level one where there is no variation of time points across business opportunities (Hox, 2010). More specifically, the underlying assumption for calculating Pseudo R² is that entrepreneurial founder teams are sampled at random from a population of entrepreneurial founder teams and business opportunities are sampled randomly within the teams. Generally, "in grouped data some of the information about the population within-groups variance is in the observed between-groups variance, and the between-groups variance calculated in the sample is an upwardly biased estimator of the population between-groups variance" (Hox, 2010, p. 74). Thus, a variable at the business opportunity level (level one) will show some between-group variance in any case. If one adds a group-mean

centered variable (originality (n-1)) to the model which does not include between-group variance, only within-group variance can be reduced. As a result, the estimate of the between-group variance τ_{00} will increase (Hox, 2010; Snijders & Bosker, 1999). In Table 8, between-group variance increases from .014 to .019 and, hence, the addition of the explanatory variable will result in decreasing explained variance for level two.

Regarding the explained variance at level one, "when predictor variables are added that have more group-level variance than a random sampling process produces, the apparent within-groups variance […] can increase, which may produce a negative estimate for the explained variance at the lowest level" (Hox, 2010, p. 75). Referring to Table 8, σ^2 increases from 1.030 to 1.037.

Model 4: Random Intercept and Fixed Slope. In model four, I allow intercepts to vary across teams. Slopes instead are assumed to be fixed.

In this model, all level two direct effects are included, namely team size (TS), entrepreneurial experience (EXP), boundary spanning (BS), and cohesion (COH). The cross-level direct effect for team size ($\gamma_{01(4)}$ = -.078, p > .10) is negative, effects of entrepreneurial experience ($\gamma_{01(5)}$ = .028, p > .10), boundary spanning ($\gamma_{01(6)}$ = .011, p > .10), and cohesion ($\gamma_{01(7)}$ = .088, p > .10) are positive. None of the effects is significant. The moderators number of business opportunities and high-tech industry are, as in previous models, significantly related to a subsequent opportunity's originality. As in model three, the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality is -.025 across teams.

Regarding the model fit, deviance is decreasing and level two Pseudo R^2 is with 23.8% larger as compared to model three. Level one Pseudo R^2 is 0.

Model 5: Random Intercept and Random Slope. In model five, I allow the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality to vary across teams.

Level two direct effects and control variables have nearly identical values as compared to model 4. The level one direct effect (γ_{10} = -.028, p > .10) is slightly larger in absolute terms as compared to previous models, but still not significant. Two additional parameters are included in the model. τ_{11} represents the variance of the residual term u_{1j} and τ_{01} depicts the covariance between intercepts and slopes.

Table 8 shows an estimate of .011 for τ_{11}. A first indicator supporting the assumption that the slope of a subsequent business opportunity's originality on a prior business opportunity's originality varies across teams is the fact that the lower bound of a confidence interval around τ_{11} (resulting in values of .001 and .111) does not include zero (Aguinis et al., 2013). Due to the possibility of inaccurate standard errors (Maas & Hox, 2004) and an unfulfilled assumption of normally distributed variance estimates (Snijders & Bosker, 2012), a nonparametric residual bootstrap procedure is suggested by Carpenter, Goldstein, and Rasbash (2003), Field and Welsh (2007), and Aguinis et al. (2013). Following Aguinis et al. (2013), I include 1,500 replications to implement the procedure. τ_{11} results in .011 and the assigned 95% confidence interval anchors between .007 and .019. Hence, it does not include zero. Furthermore, deviance can be calculated as an additional alternative indicator. The *Random Intercept and Random Slope* model has a deviance of 3,356, which is slightly smaller compared to the deviance value of 3,357 for the *Random Intercept and Fixed Slope* model. The difference is not significant (3,357 − 3,356 = 1; p > .10).

Taken together, results for the τ_{11} confidence interval of the model in Table 8, the bootstrap confidence interval, and deviance support the assumption of slope variance across teams. Team-level differences in the relationship between a prior opportunity's originality and a subsequent opportunity's originality are likely to exist.

The parameter for τ_{01} is slightly negative (τ_{01} = -.003), indicating that teams with a stronger relationship between a prior opportunity's originality and a subsequent opportunity's originality tend to have lower originality levels for subsequent opportunities (Aguinis et al., 2013). Next, I will analyze which variables might be responsible for this variance.

Model 6: Cross-Level Interaction. In model six, I include level two variables into the model in order to analyze if they explain the variance in slopes across teams. First, the level one direct effect itself - the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality will be positive (Hypothesis 2) - is close to zero ($\gamma_{11(1)}$ = -.001, p > .1) and insignificant. Thus, Hypothesis 2 is not confirmed.

For each cross-level interaction effect hypothesized in chapter 2.4, it is tested if it moderates the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality. Second, the cross-level interaction effect for boundary spanning ($\gamma_{11(3)}$ = -.086, p < .05) is significant. More specifically, $\gamma_{11(3)}$ represents the change in the

slope of a subsequent opportunity's originality on a prior opportunity's originality across teams when boundary spanning increases by one point. The relationship between a prior business opportunity's originality and a subsequent business opportunity's originality is more positive for teams with lower levels of boundary spanning as compared to teams with higher levels of boundary spanning. Accordingly, Hypothesis 6a (the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality will be more positive for teams with higher levels of boundary spanning than for teams with lower levels of boundary spanning) is not confirmed. Third, the moderation effect for entrepreneurial experience ($\gamma_{11(2)}$ = .032, p < .1) is not significant and does not confirm the hypothesis developed in section 2.4.4. The relationship between a prior business opportunity's originality and a subsequent business opportunity's originality is not significantly more positive for teams with more entrepreneurial experience than for teams with less entrepreneurial experience (Hypothesis 5a). Fourth, team size ($\gamma_{11(1)}$ = -.021, p > .1) has no significant impact on the level one direct effect. The relationship between a prior business opportunity's originality and a subsequent business opportunity's originality is not significantly more positive for smaller teams than for larger teams. Hence, Hypothesis 4a is not confirmed. Lastly, cohesion ($\gamma_{11(4)}$ = -.096, p > .1) does neither have a significant influence on the level one direct effect. The relationship between a prior business opportunity's originality and a subsequent business opportunity's originality is not significantly more positive for teams with lower levels of cohesion than for teams with higher levels of cohesion. Accordingly, Hypothesis 7a is not confirmed. Figure 17 summarizes these results.
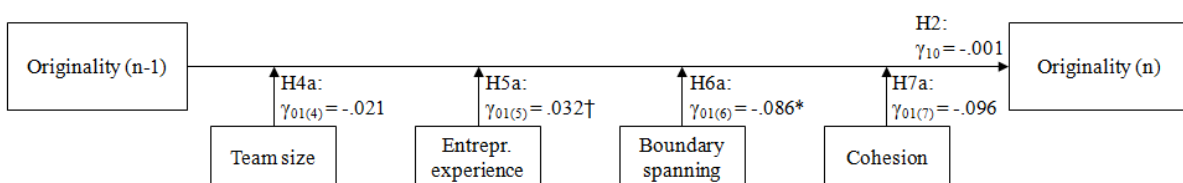
†p <.1; *p<.05;**p<.01, ***p<.001.

Source: Own illustration

Figure 17: Overview of results for developed hypotheses for originality at (n)

For a better illustration and understanding of the nature of the significant cross-level interaction effect, a graphical representation for high and low values of the moderator is provided. Figure 18 shows separate lines for high (grand mean + one standard deviation) and low (grand mean -

one standard deviation) levels (Aiken, West, & Reno, 1991) of the significant level two inde-pendent variable boundary spanning.

In the graph of Figure 18, the y-axis denotes originality at (n), whereas the x-axis depicts orig-inality at (n-1).
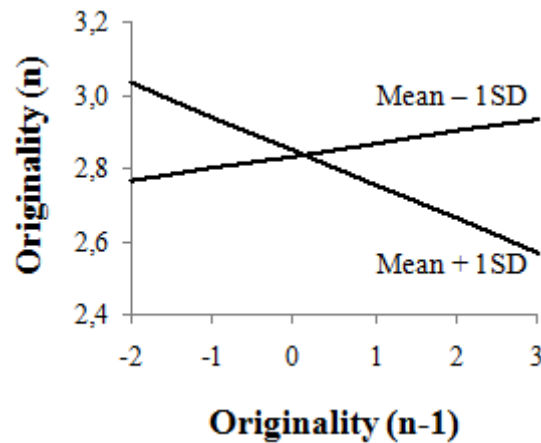
Moderating effect of boundary spanning on the relationship between originality (n-1) and originality (n)

Source: Own illustration

Figure 18: Graphical representation of the moderating effect of the level two variable on the originality main effect

Lines for higher and lower levels of boundary spanning are illustrated in Figure 18. Since teams with higher levels of boundary spanning show a negative relationship between a prior business opportunity's originality and a subsequent business opportunity's originality, Hypothesis 6a - the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality will be more positive for teams with higher levels of boundary span-ning than for teams with lower levels of boundary spanning - is not supported. Teams charac-terized by lower levels of boundary spanning show a positive relationship between originality at (n-1) and originality at (n). Nevertheless, the observed effect is significant and explains var-iance in slopes across teams. Interestingly, for low levels of originality (n-1) (left part of Figure 18), originality (n) is higher for teams with higher levels of boundary spanning than for teams with lower levels of boundary spanning. In contrast, for high levels of originality (n-1) (right part of Figure 18), teams with lower levels of boundary spanning develop business opportuni-ties with higher originality (n) than teams with higher levels of boundary spanning. Because slopes for higher and lower levels of boundary spanning have opposed signs, the difference in

a subsequent business opportunity's originality becomes larger for high levels of originality (n-1).

4.4.2 Regression results for the business value of business opportunities as dependent variable

Table 9 presents the results of the hierarchical linear modeling analysis for the subsequent opportunity's business value as dependent variable. It presents coefficients, standard errors, and levels of significance for the business opportunity level and the team level direct effects as well as for cross-level effects. Further, variance components and additional relevant model information is provided in the lower part of Table 9.

Model 1: Null model. The intercept-only model is the baseline model serving as benchmark for the following models (Hox, 2010).

The intraclass correlation coefficient (ICC), serving as indicator if the nature of the data structure is hierarchical, is 2.9%. Hence, the differences between entrepreneurial founder teams account for 2.9% of the variability in the business value of a subsequent opportunity. As noted in section 4.4.1 and reported by Mathieu et al. (2012) and Peugh (2010) in their reviews, previously presented ICCs are larger than in the present study. Nevertheless, it seems to be justified to use multilevel modeling in the present case for the reasons described in section 4.4.1. Therefore, I analyze the data with multilevel modeling techniques to respect its hierarchical nature despite a low ICC.

The within-team variance is $\sigma^2 = 5.455$, whereas the across-team variance is $\tau_{00} = .162$. The mean business value score of a subsequent business opportunity across entrepreneurial teams is $\gamma_{00} = 5.504$. Regarding the model fit, deviance for the null model is 5,832. Since a lower deviance describes a better model fit, it can already be concluded that the inclusion of additional independent variables in models two to six leads to an improved model fit, as indicated in Table 9.

	Model										
Level and Variable	Model 1: Null		Model 2: Adding control variables		Model 3: Adding level 1 Direct Effect		Model 4: Random Intercept and Fixed Slope		Model 5: Random Intercept and Random Slope		Model 6: Cross-Level Interaction	
Level 1											
Intercept	5.504***	(0.076)	5.270***	(0.083)	5.213***	(0.090)	5.332***	(0.103)	5.352***	(0.105)	5.337***	(0.104)
BV (n-1)					-0.050	(0.031)	-0.050	(0.031)	-0.053†	(0.031)	-0.010	(0.038)
Level 2											
TS							0.180	(0.118)	0.196	(0.120)	0.176	(0.119)
EXP							-0.013	(0.042)	-0.023	(0.043)	-0.014	(0.042)
BS							0.072	(0.101)	0.067	(0.102)	0.073	(0.101)
COH [1= high, 0=low]							-0.411**	(0.157)	-0.436**	(0.159)	-0.411**	(0.158)
Level 2 control variables											
BO			-0.050**	(0.014)	-0.047**	(0.016)	-0.057**	(0.017)	-0.053**	(0.017)	-0.055**	(0.017)
TE			-0.051	(0.046)	-0.045	(0.049)	-0.049	(0.049)	-0.046	(0.050)	-0.048	(0.049)
HI [1 = yes, 0 = no]			0.651***	(0.164)	0.710***	(0.178)	0.742***	(0.177)	0.729***	(0.180)	0.736***	(0.178)
Cross-level interaction											
BV (n-1) x TS											0.112*	(0.050)
BV (n-1) x EXP											-0.038*	(0.018)
BV (n-1) x BS											-0.023	(0.040)
BV (n-1) x COH											-0.132*	(0.066)
Variance components											
Within-team (L1) Variance	5.455		5.455		5.422		5.386		5.347		5.319	
Intercept (L2) Variance	0.162		0.042		0.083		0.072		0.094		0.085	
Slope (L2) Variance									0.004		0.001	
Intercept-slope (L2) Covariance									-0.019		-0.009	
Additional information											
ICC	0.029											
-2 log likelihood (FIML)	5,832		5,809**		5,283**		5,273**		5,272		5,262	
Number of estimated parameters	3		6		7		11		13		17	
L1 number of observations	1,279		1,279		1,163		1,163		1,163		1,163	
L2 sample size	116		116		116		116		116		116	
Pseudo R^2 L1[a)]			0.000		0.006		0.013		0.020		0.025	
Pseudo R^2 L2[a)]			0.741		0.488		0.556		0.420		0.475	

Note: FIML= Full information maximum likelihood estimation; ICC = Intraclass correlation coefficient; L1 = Level 1; L2 = Level 2; BV = Business value; TS = Team size; EXP = Entrepreneurial experience; BS = Boundary spanning; COH = Cohesion; BO = Number of business opportunities; TE = Technological experience; HI = High-tech industry. a) The Pseudo R-squared are calculated as described by Raudenbush and Bryk (2002)
†p <.1; *p<.05; **p<.01, ***p<.001.
Table 9: Results of multilevel analysis for business value at (n)

Model 2. Adding control variables. In the second step, only control variables are added to test if they are significantly related to the dependent variable business value at (n).

The number of business opportunities, technological experience, and a dummy for high-tech industry as control variables are added. Technological experience ($\gamma_{01(2)}$ = -.051, p > .1) is not significant, number of business opportunities ($\gamma_{01(1)}$ = -.050, p < .01) and high-tech industry ($\gamma_{01(3)}$ = .651, p < .001) are significantly related to a subsequent opportunity's business value. For entrepreneurial founder teams working in a high-tech industry, the business value of the subsequent business opportunity is .651 points higher as compared to teams not working in a high-tech industry. Interestingly, all control variables affect business value at (n) contrarily as compared to originality at (n) in Table 8. Unfortunately, there is no previous study focusing on the impact of these control variables on business value at (n)[18]. Therefore, there is no possibility of comparison regarding size and direction of the respective effects. The intercept is interpreted as the expected subsequent opportunity's business value when all independent variables are at their mean values. In this case, the subsequent opportunity's business value is associated with a score of γ_{00} = 5.270.

Regarding the goodness-of-fit of model two in Table 9, I calculate the Pseudo R^2 for each level. For level two, the addition of control variables increases variance explained in the dependent variable by 74.1% as compared to model one. That is to say, the inclusion of control variables accounts for a sizable amount of variation between teams. Clearly, R^2 for level one is zero since no independent variable on the business opportunity level is included in the model.

Model 3. Adding level one direct effect. In model three, the level one direct effect of a prior business opportunity's business value is added as independent variable.

As for the originality model, the number of observations is reduced from 1,279 to 1,163 when the level one direct effect is added because there is no corresponding independent variable, i.e. "previous" opportunity, for the first opportunity recognized. In chapter 2.4.2, I hypothesized the correlation between a prior business opportunity's business value and a subsequent business opportunity's business value to be negative. A coefficient of γ_{10} = -.50 is consistent with the

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[18] To my best knowledge, the only study analyzing business value in opportunity recognition is from Girotra et al. ((2010)). But in their study, number of business opportunities, technological experience, and a dummy for high-tech industry do not play a role as regressors.

negative direction of Hypothesis 3, but the effect is not significant (p > .1) and, hence, Hypothesis 3 is not confirmed.

In terms of goodness-of-fit measures, deviance in model three is decreasing as compared to model two, indicating a better model fit. Pseudo R^2 for level one is increasing to .006 due to the inclusion of the prior business opportunity's business value (business value (n-1)). Pseudo R^2 for level two instead decreases from 74.1% to 48.8%. As argued in section 4.4.1, the addition of a group-mean centered variable (business value (n-1)) which does not include any between-group variance can only induce a reduction of within-group variance. Consequently, the estimate for between-group variance will increase (Hox, 2010; Snijders & Bosker, 1999). In Table 9, between-group variance τ_{00} increases from 0.042 in model two to 0.083 in model three. As a result, the inclusion of the prior business opportunity's business value into the model leads to a reduced level two Pseudo R^2.

Model 4: Random Intercept and Fixed Slope: In model four, intercepts are allowed to vary across teams, but slopes are assumed to be fixed.

All level two direct effects - namely team size (TS), entrepreneurial experience (EXP), boundary spanning (BS), and cohesion (COH) - are added to the model. Only the cross-level direct effect for cohesion ($\gamma_{01(7)} = -.411$, p < .01) is significant. Effects for team size ($\gamma_{01(4)} = .180$, p > .1), entrepreneurial experience ($\gamma_{01(5)} = -.013$, p > .1), and for boundary spanning ($\gamma_{01(6)} = .072$, p > .1) are insignificant. As in the previous models, the control variables number of business opportunities and high-tech industry are significantly related to the subsequent opportunity's business value. The coefficient for the prior business opportunity's business value, γ_{10}, is -.050 and therefore similar as compared to model three.

All goodness-of-fit indicators improve compared to model three. Deviance decreases to 5,273 and Pseudo R^2 for level one and level two increase to 1.3% and 55.6%, respectively.

Model 5. Random Intercept and Random Slope. In model five, a random slope component is added to answer the question, if the relationship between a prior opportunity's business value and a subsequent opportunity's business value varies across teams.

The level two direct effects are similar in terms of significance and direction compared to model four. The cross-level direct effect for cohesion ($\gamma_{01(7)} = -.436$, p < .01) is significant. In contrast, the cross-level direct effects for team size ($\gamma_{01(4)} = .196$, p > .1), entrepreneurial experience

($\gamma_{01(5)}$ = -.023, p >, .1), and boundary spanning ($\gamma_{01(6)}$ = .067, p > .1) are insignificant. The level one direct effect for the prior business opportunity's business value (γ_{10} = -.053, p < .1) is neither significant in this model and does not confirm Hypothesis 3, arguing that the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value will be negative.

As in section 4.4.1 for the originality model, model 5 includes two additional parameters. These parameters are the variance of the residual term u_{1j}, τ_{11}, and a coefficient for the covariance between intercepts and slopes, τ_{01}.

The estimate for the variance of the residual term u_{1j}, τ_{11}= .004, is a first indicator supporting the assumption that the slope of a subsequent opportunity's business value on a prior opportunity's business value varies across teams. The reason is the fact that a 95% confidence interval around this coefficient does not include zero (exact values of the confidence interval result in .0001 and .1220). Potentially inaccurate standard errors (Maas & Hox, 2004) and an assumption of normally distributed variance estimates which might not be fulfilled (Snijders & Bosker, 2012) can be overcome with a nonparametric residual bootstrap procedure (Aguinis et al., 2013; Carpenter et al., 2003; Field & Welsh, 2007). As exercised in section 4.4.1 and following Aguinis et al. (2013), 1,500 replications are included to implement the procedure. The resulting 95% confidence interval for τ_{11}= .004 lies between .002 and .007. Here again, the confidence interval does not include zero. Additionally, deviance for model five is smaller than for model four. But the difference between the values is not significant (5,273 − 5,272 = 1; p > .10).

The non inclusion of zero in the τ_{11}confidence interval in model five of Table 9 and in the bootstrap confidence interval as well as the deviance value support the assumption of slope variance across teams. Thus, team-level differences are supposed to be present in the relation between a prior business opportunity's business value and a subsequent business opportunity's business value.

The coefficient for τ_{01} (-.019) indicates that teams with a stronger negative relationship between a prior business opportunity's business value and a subsequent business opportunity's business value tend to provide lower business value (n) levels (Aguinis et al., 2013). Following, I will investigate which variables might be responsible for the variation in business value scores.

Model 6. Cross-Level Interaction. In model six, cross-level interaction effects are included into the model to analyze whether level two variables might be responsible for slope variance

across teams. First, the level one direct effect is negative, but not significant (γ_{10} = -.010, p > .1). Hence, Hypothesis 3, arguing that the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value will be positive, is not confirmed.

Each level two independent variable has a moderating role to test if the slope of the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value changes when the moderator variable varies (Hair, 2010). Second, the cross-level interaction effect for team size ($\gamma_{11(1)}$ = .112, p < .05) is significant. To clarify, $\gamma_{11(1)}$ represents the change in the slope of a subsequent business opportunity's business value on a prior business opportunity's business value across founder teams when the coefficient for team size increases by one point. Consequently, Hypothesis 4b, arguing that the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value will be more negative for smaller teams than for larger teams, is confirmed. Third, the cross-level interaction effect for entrepreneurial experience ($\gamma_{11(2)}$ = -.038, p < .05) is significant and confirms Hypothesis 5b (the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value will be more negative for teams with more entrepreneurial experience than for teams with less entrepreneurial experience). Fourth, the moderating effect for cohesion ($\gamma_{11(4)}$ = -.132, p < .05) is significant but impacts the business value direct effect oppositional as hypothesized. Thus, Hypothesis 7b, arguing that the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value will be more negative for teams with lower levels of cohesion than for teams with higher levels of cohesion, is not confirmed. Lastly, the moderating effect of boundary spanning ($\gamma_{11(3)}$ = -.023, p > .1) is not significant and, accordingly, Hypothesis 6b (the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value will be more negative for teams with higher levels of boundary spanning than for teams with lower levels of boundary spanning) is not confirmed. Interestingly, boundary spanning is the only moderator which is significant at the five percent level in the originality model of Table 8. Instead, coefficients for the moderating effects of team size, entrepreneurial experience, and cohesion are only significant for the business value model. Figure 19 summarizes these results.
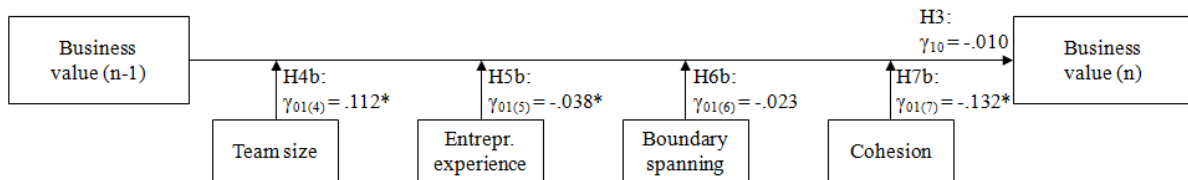
†p <.1; *p<.05;**p<.01, ***p<.001.

Source: Own illustration

Figure 19: Overview of results for developed hypotheses for business value at (n)

A graphical depiction of the moderators' influence on the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value is provided in Figure 20. For team size and entrepreneurial experience a graph shows two separate lines for high (grand mean + one standard deviation) and low (grand mean – one standard deviation) levels (Aiken et al., 1991). An exception is cohesion, because its nature as dummy variable implicates to draw lines for higher levels of cohesion and lower levels of cohesion. In each of the plots, the x-axis represents a prior business opportunity's business value, whereas the y-axis denotes a subsequent business opportunity's business value.
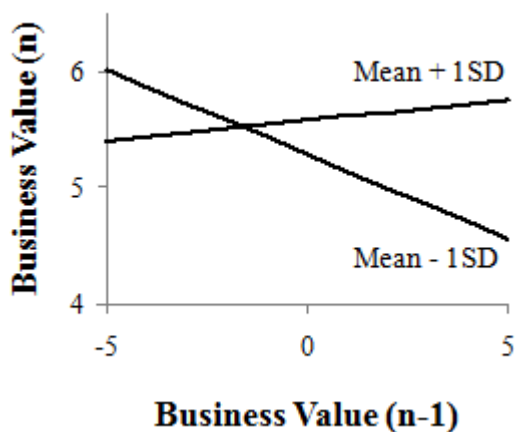
20a) Moderating effect of team size on the relationship between business value (n-1) and business value (n)
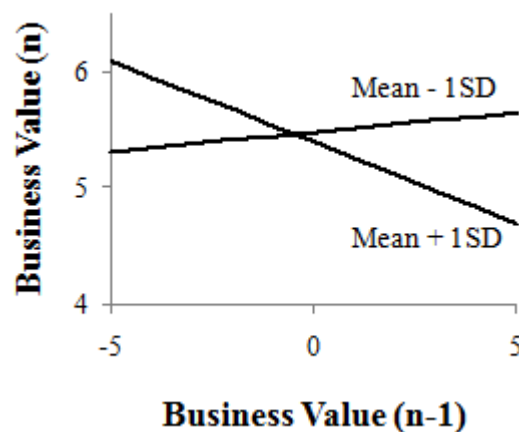
20b) Moderating effect of entrepreneurial experience on the relationship between business value (n-1) and business value (n)
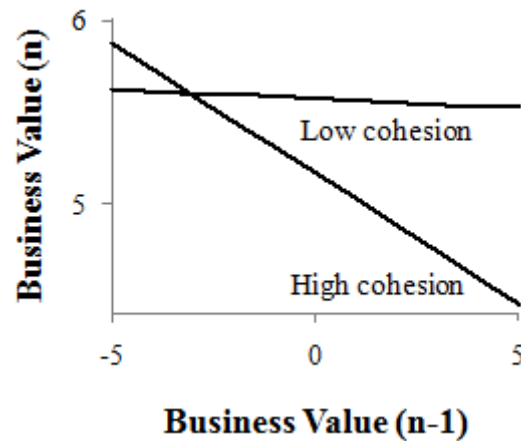
20c) Moderating effect of cohesion on the relationship between business value (n-1) and business value (n)

Source: Own illustration

Figure 20: Graphical representation of moderating effects of level two variables on business value main effect

First, Figure 20a indicates that larger teams have a positive influence on the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value. For smaller teams, the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value is negative. Hence, Hypothesis 4b (the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value will be more negative for smaller teams than for larger teams) is supported. For low levels of business value (n-1) (left part of Figure 20a), business value (n) is higher for smaller teams than for larger teams, whereas for high levels of business value (n-1) (right part of Figure 20a) larger teams demonstrate higher levels of business value (n) than smaller teams. Due to opposite signs of the lines for larger and smaller teams, the difference between business value (n) scores becomes larger for higher levels of business value (n-1).

Second, the moderating effect for teams with more and less entrepreneurial experience is depicted in Figure 20b. Teams with more entrepreneurial experience negatively influence the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value. For teams with less entrepreneurial experience, the relationship between a prior opportunity's business value and a subsequent opportunity's business value is

positive. Thus, Hypothesis 5b, arguing that the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value will be more negative for teams with more entrepreneurial experience than for teams with less entrepreneurial experience, is confirmed. As for the moderator team size, lines for more and less entrepreneurial experience are crossing. For low levels of business value (n-1) (left part of Figure 20b), business value (n) is higher for teams with more entrepreneurial experience than for teams with less entrepreneurial experience. For high levels of business value (n-1) (right part of Figure 20b) teams with less entrepreneurial experience have higher business value (n) scores as compared to teams with more entrepreneurial experience.

Finally, lines for the dummy variable cohesion are depicted in Figure 20c. Teams with higher levels of cohesion show a stronger negative relationship between a prior business opportunity's business value and a subsequent business opportunity's business value than teams with lower levels of cohesion. More exactly, the steeper negative slope for the higher levels of cohesion line indicates that the relationship between a prior opportunity's business value and a subsequent opportunity's business value is more negative for teams with higher levels of cohesion than for teams with lower levels of cohesion. As a consequence, Hypothesis 7b, indicating that the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value will be more negative for teams with lower levels of cohesion than for teams with higher levels of cohesion, is not supported.

4.5   Robustness Checks

After having illustrated results for descriptive statistics, the correlation table, and multilevel analysis, I will present in the following part two robustness checks for the *Cross-Level Interaction model*. First, the model is recalculated for only two raters for originality and business value. Second, the sample is reduced by excluding extreme values.

As to the first robustness check, three expert raters with experience in different industries assigned scores for business value and originality for each recognized business opportunity. One of the raters was the author of this thesis. Hence, there is the risk that the hypothesized relationships between a prior business opportunity's originality and a subsequent business opportunity's originality as well as between a prior business opportunity's business value and a subsequent business opportunity's business value impacted the scoring of the author for the business opportunities. In order to control for this potential bias, I calculated in Table 10 the *Cross-Level*

Interaction model only with the scores for originality assigned by the two remaining expert raters.

Results are similar in size, direction, and significance as compared to Table 8. Thus, the risk of a potentially biased scoring by the author of this thesis is not confirmed.

Dependent variable: Originality (n)		
Level and Variable	Cross-Level Interaction	
Level 1		
Intercept	2.886***	(0.046)
OR (n-1)	-0.003	(0.037)
Level 2		
TS	-0.078	(0.053)
EXP	0.028	(0.019)
BS	0.008	(0.045)
COH [1= high, 0=low]	0.089	(0.070)
Level 2 control variables		
BO	0.018*	(0.008)
TE	-0.004	(0.022)
HI [1 = yes, 0 = no]	-0.215**	(0.080)
Cross-level interaction		
OR (n-1) x TS	-0.018	(0.046)
OR (n-1) x EXP	0.032†	(0.017)
OR (n-1) x BS	-0.088*	(0.042)
OR (n-1) x COH	-0.095	(0.068)
Variance components		
Within-team (L1) Variance	1.047	
Intercept (L2) Variance	0.017	
Slope (L2) Variance	0.001	
Intercept-slope (L2) Covariance	-0.003	
Additional information		
-2 log likelihood (FIML)	3,373	
Number of estimated parameters	17	
L1 number of observations	1,163	
L2 sample size	116	

Note: FIML= full information maximum likelihood estimation; L1 = Level 1; L2 = Level 2; OR = Originality; TS = Team size; EXP = Entrepreneurial experience; BS = Boundary spanning; COH = Cohesion; BO = Number of business opportunities; TE = Technological experience; HI = High-tech industry. Values in parentheses are standard errors; t-statistics were computed as the ratio of each regression coefficient divided by its standard error.
†p <.1; *p<.05; **p<.01, ***p<.001.

Table 10: Results of Cross-Level Interaction model for originality (n) under consideration of two raters for originality scores

Table 11 presents the results for the *Cross-Level Interaction model* based on the business value scores of the two remaining raters. Again, coefficients are similar in size and direction as compared to Table 9. The only difference is the moderating effect of cohesion having a p-value of exactly .05 and, thus, does not meet the conventional level of significance.

Level and Variable	Dependent variable: Business value (n)	
	Cross-Level Interaction	
Level 1		
Intercept	5.387***	(0.105)
BV (n-1)	-0.010	(0.038)
Level 2		
TS	0.180	(0.119)
EXP	-0.013	(0.042)
BS	0.073	(0.102)
COH [1= high, 0=low]	-0.408*	(0.158)
Level 2 control variables		
BO	-0.056**	(0.017)
TE	-0.046	(0.050)
HI [1 = yes, 0 = no]	0.733***	(0.179)
Cross-level interaction		
BV (n-1) x TS	0.111*	(0.049)
BV (n-1) x EXP	-0.037*	(0.018)
BV (n-1) x BS	-0.030	(0.040)
BV (n-1) x COH	-0.130†	(0.066)
Variance components		
Within-team (L1) Variance	5.441	
Intercept (L2) Variance	0.079	
Slope (L2) Variance	0.001	
Intercept-slope (L2) Covariance	-0.009	
Additional information		
-2 log likelihood (FIML)	5,287	
Number of estimated parameters	17	
L1 number of observations	1,163	
L2 sample size	116	

Note: FIML= full information maximum likelihood estimation; L1 = Level 1; L2 = Level 2; BV = Business value; TS = Team size; EXP = Entrepreneurial experience; BS = Boundary spanning; COH = Cohesion; BO = Number of business opportunities; TE = Technological experience; HI = High-tech industry. Values in parentheses are standard errors; t-statistics were computed as the ratio of each regression coefficient divided by its standard error. †p <.1; *p<.05; **p<.01, ***p<.001.

Table 11: Results of Cross-Level Interaction model for business value (n) under consideration of two raters for business value scores

Taken together, I nevertheless conclude that the author's scorings for both originality and business value are not biased and that Table 10 and Table 11 confirm previously presented results in Table 8 and Table 9.

As to the second robustness check, extreme values for the sample are eliminated. The maximum of recognized business opportunities is 27 across teams. I truncate teams with the lowest and

highest ten percent of developed business opportunities. This proceeding results in the elimination of teams with less than six and more than 24 business opportunities. Thus, 52 observations at the top and the bottom of the business opportunity distribution are eliminated.

Table 12 presents results for originality (n). The level one sample size is reduced from 1,163 observations to 1,074 observations and the level two sample size is reduced from 116 to 101 teams. Results are similar in size and direction as compared to Table 8. The cross-level interaction effect for boundary spanning does not meet conventional levels of significance ($\gamma_{11(3)} = -.080$, p < .1). Still, the direction is the same as in Table 8. The control variable number of business opportunities is significant at the one percent level ($\gamma_{01(1)} = .027$, p < .01).

Dependent variable: Originality (n)		
Level and Variable	Cross-Level Interaction	
Level 1		
Intercept	2.885***	(0.048)
OR (n-1)	-0.003	(0.038)
Level 2		
TS	-0.089	(0.056)
EXP	0.020	(0.019)
BS	0.012	(0.047)
COH [1= high, 0=low]	0.110	(0.074)
Level 2 control variables		
BO	0.027**	(0.010)
TE	-0.003	(0.023)
HI [1 = yes, 0 = no]	-0.231**	(0.085)
Cross-level interaction		
OR (n-1) x TS	-0.031	(0.048)
OR (n-1) x EXP	0.032†	(0.018)
OR (n-1) x BS	-0.080†	(0.043)
OR (n-1) x COH	-0.095	(0.071)
Variance components		
Within-team (L1) Variance	1.038	
Intercept (L2) Variance	0.019	
Slope (L2) Variance	0.001	
Intercept-slope (L2) Covariance	-0.003	
Additional information		
-2 log likelihood (FIML)	3,106	
Number of estimated parameters	17	
L1 number of observations	1,074	
L2 sample size	101	

Note: FIML= full information maximum likelihood estimation; L1 = Level 1; L2 = Level 2; OR = Originality; TS = Team size; EXP = Entrepreneurial experience; BS = Boundary spanning; COH = Cohesion; BO = Number of business opportunities; TE = Technological experience; HI = High-tech industry. Values in parentheses are standard errors; t-statistics were computed as the ratio of each regression coefficient divided by its standard error.
†p <.1; *p<.05; **p<.01, ***p<.001.

Table 12: Results of Cross-Level Interaction model for originality (n) for reduced sample

Table 13 presents results for the reduced size *Cross-Level Interaction model* for business value (n). Again, effect sizes and directions of the model excluding entrepreneurial founder teams with an extreme number of recognized business opportunities are comparable as to Table 9. Only the cross-level interaction effect for cohesion does not meet conventional levels of significance ($\gamma_{11(4)} = -.138$, $p < .1$) with a p-value of .051. Still, the direction is the same as in Table 9.

Level and Variable	Dependent variable: Business value (n)	
	Cross-Level Interaction	
Level 1		
Intercept	5.287***	(0.105)
BV (n-1)	-0.007	(0.039)
Level 2		
TS	0.195	(0.122)
EXP	-0.006	(0.043)
BS	0.104	(0.105)
COH [1= high, 0=low]	-0.475**	(0.164)
Level 2 control variables		
BO	-0.079***	(0.022)
TE	-0.066	(0.050)
HI [1 = yes, 0 = no]	0.784***	(0.187)
Cross-level interaction		
BV (n-1) x TS	0.112*	(0.052)
BV (n-1) x EXP	-0.041*	(0.018)
BV (n-1) x BS	-0.016	(0.042)
BV (n-1) x COH	-0.138†	(0.071)
Variance components		
Within-team (L1) Variance	5.289	
Intercept (L2) Variance	0.069	
Slope (L2) Variance	0.001	
Intercept-slope (L2) Covariance	-0.009	
Additional information		
-2 log likelihood (FIML)	5,851	
Number of estimated parameters	17	
L1 number of observations	1,074	
L2 sample size	101	

Note: FIML= full information maximum likelihood estimation; L1 = Level 1; L2 = Level 2; BV = Business value; TS = Team size; EXP = Entrepreneurial experience; BS = Boundary spanning; COH = Cohesion; BO = Number of business opportunities; TE = Technological experience; HI = High-tech industry. Values in parentheses are standard errors; t-statistics were computed as the ratio of each regression coefficient divided by its standard error. †p <.1; *p<.05; **p<.01, ***p<.001.

Table 13: Results of Cross-Level Interaction model for business value (n) for reduced sample

In total, results for the reduced size model further support the robustness of the main model and suggest that results are solid even when the sample is truncated by extreme values.

5 DISCUSSION

In this chapter, I first briefly summarize the findings of the study in section 5.1. Then, in section 5.2, I highlight theoretical contributions, followed by practical implications in section 5.3. I then address limitations of this study in section 5.4 and end with the conclusion in section 5.5.

5.1 Synthesis of results

This thesis aims to shed light on the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality, as well as between a prior business opportunity's business value and a subsequent business opportunity's business value. It is important to understand these relationships because originality and business value are the two components of creativity in the entrepreneurial context (cf. Perry-Smith and Coff (2011), who use the slightly different expressions usefulness and novelty). Additionally, I analyze the impact of human and social capital components on these relationships. Business opportunities are developed by entrepreneurial founder teams as part of an experimental session. The study is motivated by the fact that the team-level view on opportunity recognition processes is still rare despite its practical relevance. Drawing on the literature on associative behavior and creativity, I theorize that, at the venture idea level (Davidsson, 2003, 2015), the relationship between the prior opportunity's originality and a subsequent opportunity's originality will be positive and the relationship between the prior opportunity's business value and a subsequent opportunity's business value will be negative. Moreover, I theorize on how these relationships are influenced by different human capital components, i.e., team size and boundary spanning, and social capital components, i.e., boundary spanning and cohesion.

In the following, I briefly recap my findings. The dependent variables originality and business value are significantly negatively correlated. Thus, a business opportunity associated with high originality tends to be equally associated with low business value. On the other side, an unoriginal business opportunity tends to have a high business value (Hypothesis 1). At the venture

idea level, I find neither a significant direct relationship between a prior business opportunity's originality and a subsequent business opportunity's originality (Hypothesis 2) nor a significant direct relationship between a prior business opportunity's business value and a subsequent business opportunity's business value (Hypothesis 3). Hence, the creativity components originality and business value are not significantly related to each other across business opportunities. The picture changes when moderating effects are considered at the team level. The quantitative human capital component team size does not have a significant influence on the originality main effect (Hypothesis 4a), but a larger team size causes the relationship between a prior opportunity's business value and a subsequent opportunity's business value to become significantly more negative (Hypothesis 4b). The qualitative human capital component incorporated in the model is entrepreneurial experience. More entrepreneurial experience does not significantly strengthen the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality (Hypothesis 5a), but it does significantly strengthen the negative relationship between a prior business opportunity's business value and a subsequent business opportunity's business value (Hypothesis 5b). Regarding social capital components, boundary spanning significantly influences the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality, but in the opposite way as hypothesized. The relationship is more positive for teams with lower levels of boundary spanning (Hypothesis 6a). On the other side, more boundary spanning does not have a significant effect on the relationship between a prior opportunity's business value and a subsequent opportunity's business value (Hypothesis 6b). The internally focused social capital component cohesion does not significantly affect the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality (Hypothesis 7a). However, I find a significant effect of cohesion on the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value, although this effect is the opposite of what was hypothesized and the relationship is more negative for teams with higher levels of cohesion than those with lower levels of cohesion (Hypothesis 7b). The results are summarized in Table 14.

Category	Originality	Result	Business value	Result
Relation of dependent variables	H1: Originality (n) and business value (n) are negatively correlated			Con-firmed***
Direct ef-fects	H2: The relationship between originality at (n-1) and original-ity at (n) will be positive	Not con-firmed	H3: The relationship between business value at (n-1) and busi-ness value at (n) will be negative	Not con-firmed
Moderating effects	H4a: The relationship between originality at (n-1) and original-ity at (n) will be more positive for smaller teams than for larger teams	Not con-firmed	H4b: The relationship between business value at (n-1) and busi-ness value at (n) will be more neg-ative for smaller teams than for larger teams	Confirmed*
	H5a: The relationship between originality at (n-1) and original-ity at (n) will be more positive for teams with more entrepre-neurial experience than for teams with less entrepreneurial experience	Not con-firmed†	H5b: The relationship between business value at (n-1) and busi-ness value at (n) will be more neg-ative for teams with more entre-preneurial experience than for teams with less entrepreneurial experience	Confirmed*
	H6a: The relationship between originality at (n-1) and original-ity at (n) will be more positive for teams with more boundary spanning than for teams with less boundary spanning	Not con-firmed*	H6b: The relationship between business value at (n-1) and busi-ness value at (n) will be more neg-ative for teams with more bound-ary spanning than for teams with less boundary spanning	Not con-firmed
	H7a: The relationship between originality at (n-1) and original-ity at (n) will be more positive for teams with lower levels of cohesion than for teams with higher levels of cohesion	Not con-firmed	H7b: The relationship between business value at (n-1) and busi-ness value at (n) will be more neg-ative for teams with lower levels of cohesion than for teams with higher levels of cohesion	Not con-firmed*

Note: The moderators boundary spanning for the originality main effect and cohesion for the business value main effect are significant at the five percent level, but impact main effects in the opposite way as hypothesized. †p <.1; *p<.05; **p<.01, ***p<.001.

Table 14: Results of HLM regression – overview of hypotheses

In the following sections 5.2 to 5.3, I highlight the theoretical and practical implications based on my empirical findings.

5.2 Theoretical implications

The findings of this thesis involve various theoretical implications. In the following, the implications are structured into implications for opportunity recognition research and for human and social capital research.

5.2.1 Theoretical implications for opportunity recognition research

This thesis contributes to opportunity recognition research by introducing a conceptualization allowing the analysis of business opportunities at the level of the *venture idea*. Furthermore, I shed light on the role of creativity and its two components originality and business value in opportunity recognition processes.

**Study conceptualization and level of analysis of opportunity recognition**

Prior research on opportunity recognition concentrates mainly on the individual (Baron & Ensley, 2006; Hmieleski et al., 2015) and to a lesser extent on the team level (e.g., Amason et al., 2006; Ucbasaran et al., 2003) as input factors to measure different outcomes (in most cases some form of venture performance). However, scholars call for an investigation of opportunity recognition beyond the individual or the entrepreneurial team and propose involving the opportunity itself, related characteristics, and the interaction between entrepreneurs and opportunities (Davidsson, 2015; Shane & Venkataraman, 2001). Accordingly, there is a call for developing an understanding of "how characteristics of 'opportunities,' directly and in interaction with actor characteristics, give shape to entrepreneurial processes" (Davidsson, 2015, p. 675).

In order to better understand the influence of entrepreneurial founder team characteristics on the entrepreneurial process of opportunity recognition, a well-defined opportunity level has to be established. Davidsson and Wiklund (2001), Davidsson (2003), and Davidsson (2015) argue that the often cited opportunity construct is not adequate because most scholars have a different understanding of the concept and lack a consistent view. For instance, there is no common understanding regarding salient characteristics of business opportunities, and the opportunity construct lacks construct clarity (Davidsson, 2015; Suddaby, 2010). Instead, the *new venture idea* level is an appropriate level of investigation. As stated in the theoretical part of this thesis, the new venture idea concept of an opportunity is independent of any organizational context, and new venture ideas are purely cognitive. Furthermore, as they describe only distinct economic activities, they are clearly defined (see section 2.1 for further details of the concept).

As mentioned by Davidsson (2003), while this unit of analysis is rarely considered in entrepreneurial research, it is highly relevant and allows unique contributions to be made. Only few studies have been published taking into account this level of analysis (Der Foo, Kam Wong, & Ong, 2005; Klofsten, 2005). To the best knowledge of the author, this study is among the first to relate the *new venture idea* concept to the field of opportunity recognition, while relying on entrepreneurial founder teams as the crucial actors. It contributes to the opportunity recognition research by providing insights on how an experimental task needs to be conceptualized and how data needs to be readjusted in order to analyze it at the venture idea level. Moreover, because the process of opportunity recognition is studied as it happens, the experimental design in this thesis and subsequent data handling avoid selection bias (although the obtained sample is not representative of the population) as well as hindsight bias (individuals' tendency to change the perception of the inevitability of an event after the outcome is known) (Christensen-Szalanski & Willham, 1991; Davidsson, 2003).

From the perspective of new venture ideas, Davidsson (2015) emphasizes the importance of external enablers. External enablers are specific external circumstances evoking opportunity recognition processes by entrepreneurs. These enablers might be demographics, technologies, environmental changes, or the introduction of a new regulation (Davidsson, 2015). Each of these triggers is assumed to potentially play an important role for new entrepreneurial activities. Hence, they can be seen as a starting point for new venture creation. Furthermore, actors - defined as individuals, teams, or organizations – play a pivotal role in opportunity recognition, since they work on new venture idea development (Davidsson & Wiklund, 2001). As depicted on the left-hand side of Figure 21, one important research question for Davidsson (2015, p. 689) is "How do characteristics of Actors and attributes of External Enablers independently and interactively influence new venture creation processes?", where new venture processes mean the identification of new venture ideas. With respect to future empirical studies, the author points to the challenge of introducing multiperiod or longitudinal research designs regarding this type of research question and calls for more observational studies. This might also help to attend to related research on, e.g., "which Actors build more Opportunity Confidence and come up with (what kind of) New Venture Ideas in response to particular External Enablers?" (Davidsson, 2015, p. 689). Additionally, it is suggested to move away from intensely individually focused research on opportunity recognition and to draw attention to the early stages of economic activities, where entrepreneurship research can add most knowledge to economic and organiza-

tional research (Davidsson, 2003, 2015). Moreover, it is important to clearly differentiate between the recognition and the selection of business opportunities (Lumpkin & Lichtenstein, 2005).
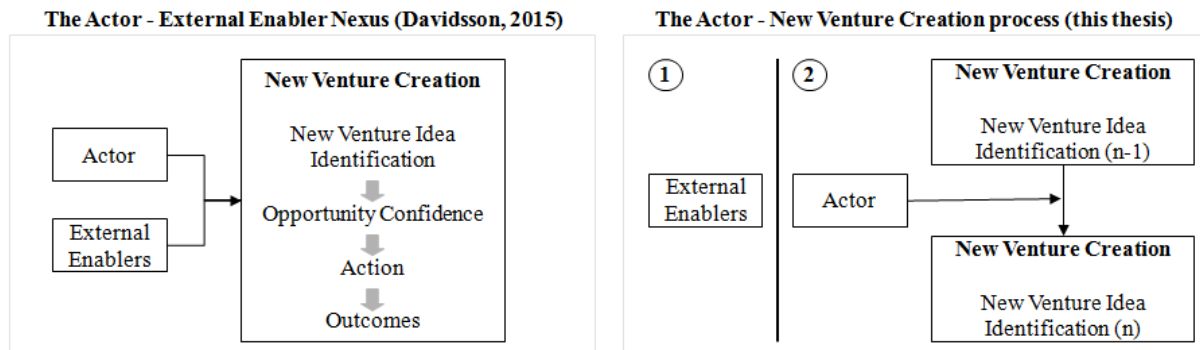
Source: Own illustration

Figure 21: External enablers, actors, and new venture creation

The thesis at hand and the associated experimental design contribute to the research on opportunity recognition processes by addressing many of the aforementioned challenges and suggestions for research. First, the experimental design and data adjustments allow for a longitudinal analysis - subsequently developed business opportunities – over the 30-minute time frame of business opportunity discussion. At the same time, the study at hand is an observational one, in which the development process of each business opportunity can be followed.

Second, this study does not focus entirely on either the individual or the team level, but instead follows a multilevel design that offers manifold research possibilities that are rich in content (Low & MacMillan, 1988; Shepherd, 2011). The multilevel design comprises two levels, the new venture idea level and the team level. In addition, the experimental design, which combines multilevel research with an observational and longitudinal analysis, is especially relevant for entrepreneurial research in order to display the individual–opportunity nexus (in this thesis, the individual is replaced by the entrepreneurial team) or the actor–new venture idea nexus (Shane, 2003; Shane & Venkataraman, 2000). Thus, this study adds to the opportunity recognition research by offering a benchmark conceptualization for future research showing interest in multilevel research in the field of entrepreneurship, including the framework of new venture ideas, actors, and external enablers (Davidsson, 2015).

Third, this thesis focuses on the early stages of entrepreneurship and clearly differentiates between opportunity recognition and selection. More specifically, this study sheds light on the

early process of opportunity recognition, before the business opportunity to be followed in greater detail is selected. The inclusion of 116 experienced entrepreneurial founder teams enables a realistic representation of this process. The design of the study contributes to opportunity recognition research by providing a conceptualization that allows teams to only vaguely formulate business opportunities, as required by Davidsson (2015), Sarasvathy (2001), and Smith, Matthews, and Schenkel (2009).

Fourth, Davidsson (2015) mentions specific potential future research questions on the topic of opportunity recognition (cf. Figure 21). In the experimental design incorporated in this study, the external enabler is represented by 3D scanning technology using smartphones, which serves as a starting point or trigger for the following opportunity recognition process. Actors are represented by the entrepreneurial founder teams. While this study does not follow Davidsson's (2015) research questions exactly, it addresses important elements with respect to the characteristics of actors and their influence on the new venture creation process. Further, it addresses elements regarding the different kinds of actors discovering different new venture ideas based on the external enabler of the 3D scanning technology using smartphones. The right-hand side of Figure 21 shows the difference from Davidsson's (2015) research questions. In the study at hand, the technology is kept constant to study the distinct impact of entrepreneurial founder team characteristics on the development of quality (in terms of originality and business value) across business opportunities.

Taken together, this study enriches the research on opportunity recognition by providing a benchmark study design that includes the possibility of longitudinal, multilevel analyses and the specific inspection of the new venture idea level. This allows for a better understanding of the team–opportunity nexus or the actor–new venture idea nexus. Furthermore, the study demonstrates how a study design might allow a focus on the early stages of entrepreneurship.

Creativity in opportunity recognition processes

Creativity is admittedly a core characteristic in the development of business opportunities (Baron & Ensley, 2006). It is present in opportunity recognition research from a theoretical perspective (Corbett, 2005; Lumpkin & Lichtenstein, 2005), but an empirical analysis of how creative processes unfold in opportunity recognition tasks is still lacking. Even more pronounced is the absence of testable, salient characteristics of new venture ideas (Davidsson, 2015). The literature suggests a number of characteristics like market newness (Dahlqvist &

Wiklund, 2012), the deviation of the final business opportunity from the original business opportunity (Hmieleski & Baron, 2008), or the uniqueness of the business opportunity (Parker, 2011). However, according to Davidsson (2015), novelty is the only characteristic that possesses an adequate conceptual background. Nevertheless, the novelty characteristic is still in its beginnings regarding research on the operationalization for the early stage of entrepreneurship, opportunity recognition.

This study adds to the opportunity recognition research by providing a *theoretical reasoning* for creativity components to be relevant in opportunity recognition. I provide evidence in particular that the two aspects of creativity – originality and business value – are important indicators in order to assess business opportunities. Additionally, I theoretically argue and provide empirical support for a negative correlation between originality and business value. Lastly, the study demonstrates an implication for the opportunity recognition literature regarding the development of originality and business value assessments across business opportunities as the opportunity recognition process advances. The following paragraphs discuss these findings and contributions in more detail.

First, this thesis undertakes an attempt to amplify potential characteristics of new venture ideas and, simultaneously, to consider Davidsson's (2015, p. 687) call for "a manageable set of well-defined and -operationalized New Venture Idea characteristics." The characteristics of business opportunities are especially important at the beginning of the venture process in order to establish a basis for objectively comparing different opportunities. This starting point of most venture processes represents a key step (Davidsson, 2015) before effective founding. The study at hand explicitly focuses on the early processes of entrepreneurship and provides insight into how business opportunities can be assessed. The literature on creativity is used in this thesis as a starting point to decompose creativity into the components of originality and business value. In existing studies, creativity is viewed largely as one construct - the production of novel and useful ideas (Amabile, 1988) - without decomposing it into its different facets. More specifically, creative ideas are defined as being useful to an organization (Oldham & Cummings, 1996). With this in mind, I argued in section 2.2 that, in the context of entrepreneurship, originality and business value are the two core components of creativity. This separation adds to the research on the early stages of entrepreneurship because it adapts the traditional and broad view of creativity in the creativity literature (Amabile, 1988; Oldham & Cummings, 1996) to the

more specific case of entrepreneurial business opportunities, tracing the importance of originality as well as feasibility and potential profitability. The financial aspect - potential profitability - should play a particularly central role for entrepreneurial founder teams when comparing different business opportunities. While high feasibility is obviously helpful from an implementation point of view, adequate financial compensation for the entrepreneurial founder team is a crucial prerequisite for the decision to pursue an entrepreneurial career (Welpe et al., 2012). Of course, creativity and its decomposition into originality and business value is only a necessary but not a sufficient characteristic for valuable business opportunities. Further aspects of business opportunities need to be taken into consideration when assessing and comparing them. Examples are the potential market size of the business opportunity, a prospective lack of competition regarding the resulting product or service, government funds available to subsidize the development of the product or service, and the necessary investment size (Kaish & Gilad, 1991). Hence, in this regard I first shed light on necessary attributes of business opportunities for comparison and assessment during the recognition phase, but deal with only a small fraction of the multidimensional characteristics of business opportunities.

Second, the breakdown of creativity into originality and business value is an insightful step in that it shows the oppositional aspects that are inherent in the concept of creativity. This study is among the first to theoretically argue and empirically show that creativity per se is conceptually too broad as measure when assessing business opportunities. Perry-Smith and Coff (2011) mention the difficulty of measuring the creativity of an outcome - which is divided in their study into novelty and usefulness - in one scale in their study on the influence of mood on the generation and selection of ideas for new ventures. In particular, they differentiate between novelty and usefulness of selected ideas because the two creativity components are driven by different collective moods. The isolated consideration helps to better understand the effects of mood (Perry-Smith & Coff, 2011). I agree on the importance of differentiating between different aspects of creativity, but for a different reason and under different circumstances. Perry-Smith and Coff (2011) concentrate solely on the selected idea and find a positive but insignificant correlation between novelty and usefulness of .19. I include all business opportunities developed in the opportunity recognition task and show a significant negative correlation of -.43 (p<.001) between originality and business value for the n-th opportunity and -.45 (p<.001) for

the *(n-1)*-th opportunity[19]. The diverse view on the creativity concept as compared to extant literature (Amabile, 1988; Shalley, 1991) regarding the subdivision of creativity is worthwhile and justified. Perry-Smith and Coff's (2011) argument for separating creativity into novelty and usefulness is the differential influence of a third variable on these aspects. In contrast, in this thesis the inherent dichotomy between originality and business value serves as the reason for a separate consideration. Hence, I connect the research on creativity and opportunity recognition by integrating and adjusting the creativity concept for use in research on entrepreneurial opportunities. Concerning creativity, a further distinction of business value between feasibility and profitability might provide even more precise insights in future research. With regard to future studies and potentially relevant characteristics of new venture ideas (Davidsson, 2015), this study shows the necessity of a precise reasoning and appropriate level choice for the inclusion of certain business opportunity characteristics in the analysis of the early stages of entrepreneurship. This is even more relevant if concepts are adapted from other literature streams to the context of opportunity recognition (e.g., the choice of adequate creativity components from the broad creativity literature, which in the study at hand are originality and business value).

Third, I extend the previous research by not only focusing on a static examination of these aspects of opportunity recognition, but further incorporating a process component. Again, creativity research and, more specifically, Mednick's (1962) model of creativity is the source of argumentation and is transferred to the field of opportunity recognition. His argument for a serial order effect (Beaty & Silvia, 2012) is only established for originality. In translating and adapting this logic to the business value component of creativity, I theoretically add to opportunity recognition research by not only arguing for a negative correlation between originality and business value from a static point of view, but by additionally providing theoretical support for an opposed development of the two components as the opportunity recognition process advances.

Mednick's (1962) proposition of associative hierarchies influencing an individual's development of creative ideas has been empirically tested by several academics with mixed results regarding the development of originality (Benedek et al., 2012). The studies all have a slightly different approach, but aim to test the assumption of ideas becoming more original over the

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[19] Differences in correlations might be partly explained by the fact that Perry-Smith and Coff ((2011)) consider novelty and usefulness, whereas this thesis uses the slightly different creativity aspects of originality and business value. Additionally, Perry-Smith and Coff ((2011)) only incorporate selected ideas that might have been chosen in an attempt to maximize their scores in both dimensions.

course of the process. Studies test the hypothesized effect with children or adults, use slightly different tasks, and apply different scoring methods for originality (Beaty & Silvia, 2012). While some studies support Mednick's (1962) prediction of associative hierarchies explaining the creativity of developed ideas (Benedek & Neubauer, 2013; Olczak & Kaplan, 1969; Piers & Kirchner, 1971), other studies find that individuals create more original ideas first, before developing more common ideas (Merten & Fischer, 1999; Riegel, Riegel, & Levine, 1966). However, it is important to note that all these studies test the serial order effect for individuals. For instance, Benedek and Neubauer (2013) revisit Mednick's model with the help of a free association task (participants state all associations related to a specific word, e.g., street or light) and a sample of 150 university students. Continuous word association tasks are the traditional tool in this field of creativity research in order to study the originality of answers during a task (Olczak & Kaplan, 1969; Piers & Kirchner, 1971). However, this type of task is not representative of any necessary day-to-day creativity. Beaty, Silvia, Nusbaum, Jauk, and Benedek (2014) question whether such an approach sufficiently represents real-world creativity.

The study at hand not only investigates the development of the originality of different business opportunities during the opportunity recognition task, but also introduces a theoretical argumentation and an empirical test for business value. The underlying logic of Mednick's model of flattening associative hierarchies across ideas is applied to the business value component of creativity in order to fully represent the entire concept of creativity in the entrepreneurship environment. From a theoretical point of view, I argue that different core components of business opportunities might evolve in opposite directions, leading to a potential conflict of objectives. Ideally, the business opportunity is at the same time very original and associated with a very large business value. But, as stated in section 2.4.2, this might be the case only rarely if the most original business opportunities are developed at the end of an opportunity recognition task and opportunities associated with large business value at its beginning. Hence, the transfer of Mednick's model to entrepreneurship research extends the view on the characteristics of creativity: If the aim is to present the entire picture of creativity for the development of different business opportunities, it is not only originality but also business value that needs to be taken into account when analyzing creative thinking from an associative perspective.

Fourth, in contrast to previous research, the study at hand analyzes the development of originality and business value during a team-based opportunity recognition task. Additionally, it transfers Mednick's model to the context of entrepreneurship, as mentioned above. Moreover,

the exercised task represents real-world creativity for entrepreneurial founder teams (Beaty et al., 2014). Accordingly, I contribute to the literature on creativity and opportunity recognition by providing insights on how a task can be tailored to a specific group of people in order to represent creativity in day-to-day working life. For entrepreneurial founder teams, an opportunity recognition task is relevant. For a different group of people (e.g., managers in a large corporation), this might be a completely different task and would require a new conceptualization. Importantly, creativity is only rarely required of an individual alone, but in most circumstances is a team task (Paulus, 2000). Therefore, this thesis suggests a stronger focus on teams when analyzing associative behavior related to creativity. There is still ample room for research regarding creative thinking in teams and a related associative perspective.

The *empirical analysis* does not reveal any significant effect for the relationship between a prior business opportunity's originality and a subsequent business opportunity's originality, nor for the relationship between a prior business opportunity's business value and a subsequent business opportunity's business value (Hypotheses 2 and 3). In the following, I discuss two potential explanations for this result: the role of the number of recognized opportunities and the role of executive influences.

First, in their revision of Mednick's model, Benedek and Neubauer (2013) find that individuals' responses become more uncommon over time. However, after controlling for fluency (either using fluency as an independent variable or restricting the analysis on a constant number of ideas per individual), this tendency is strongly reduced. Hence, they assume that "association fluency may be the main driving force underlying associative uncommonness" (Benedek & Neubauer, 2013, p. 285). In this thesis, the empirical model explicitly controls for the number of recognized business opportunities. Yet the direct effects for the prior opportunity's originality and business value do not become significant when excluding the number of recognized business opportunities as a control variable; thus, this cannot be the explanation for the insignificance of effects.

Second, Beaty and Silvia (2012) test and provide evidence of a serial order effect in a study with 133 young adults. A serial order effect describes responses as being more original at the end of a divergent thinking task than at its beginning. Intelligence moderates this effect. The more intelligent the participants, the less pronounced the serial order effect. The authors offer top-down executive influences as an explanation for this phenomenon, namely strategy use, interference management, and executive switching, and mention the possibility of controlling

them for intelligent individuals. More specifically, strategy use describes the identification, use, and refusal of strategies during a divergent thinking task (Beaty & Silvia, 2012). Examples of strategies are the memory-retrieval strategy (retrieval from long-term memory regarding previous application of a specific task) leading to very common opportunities, or the disassembly-use strategy (imagined disassembly of an object and different recombination of parts), which reveals more original opportunities (Gilhooly, Fioratou, Anthony, & Wynn, 2007). There might also be a temporal structure with respect to strategy use. Opportunities become more original as strategies become better (Beaty & Silvia, 2012).

Furthermore, interference management specifies the individual's potential to overcome the highly related associations that are prevalent at the beginning of a divergent thinking task. Regarding a serial order effect, the process advancement might play a role. Individuals may first think about common opportunities before overcoming this interference and developing more original opportunities (Beaty & Silvia, 2012; Unsworth, 2010).

Moreover, executive switching describes the process of developing opportunities related to one conceptual category before switching to another (Beaty & Silvia, 2012). Individuals mention all opportunities that come to their mind with regard to one category. As soon as a category is exhausted, it is changed and the process of developing opportunities starts again for the next category. Again, there might be a process structure. People might first develop opportunities associated with obvious categories before changing to more distant categories (Beaty & Silvia, 2012).

Beaty and Silvia (2012) then argue that, for most individuals, these executive processes would be displayed as the process advances, implicating a serial order effect: The development of a good strategy, interference management from common opportunities, and identification of distant categories take time. However, very intelligent individuals are more effective in managing their minds and might proceed directly to more original opportunities. They conclude that more time is not necessary to develop more original opportunities and that "Good ideas needn't be 'farther away' in semantic space than bad ideas" (Beaty & Silvia, 2012, p. 314). The main ability required to control executive processes is to block salient but obvious or irrelevant information. This associative blocking is helpful in order to directly develop original opportunities (Friedman & Miyake, 2004). Given these points, entrepreneurial founder teams' opportunity recognition processes might not have revealed a significant main effect for originality because founder

teams could represent a sample of exceptionally intelligent people. I did not include any measurement of intelligence or cognitive abilities in the context of my study due to the potentially low acceptance of these types of measurements (e.g., Fiori & Antonakis, 2011). Moreover, entrepreneurs' intelligence compared to that of the remaining population is not yet researched (Baum & Bird, 2010). Only Sternberg's (2004) introduction of successful intelligence, incorporating analytical, practical, and creative aspects of creativity, sheds some light on the relationship between an entrepreneur's intelligence and entrepreneurial success. But it does not give any note regarding the distribution of intelligence between entrepreneurs and non-entrepreneurs. Consequently, it cannot be resolved whether the experiment participants in this study might represent a group of extraordinarily intelligent individuals. This is an interesting research avenue for future studies.

To summarize, this study concentrates conceptually on the early stages of entrepreneurship, thereby incorporating a multilevel design and a longitudinal analysis to represent the actor–new venture nexus. In addition, it theoretically motivates the introduction of originality and business value as the two relevant creativity components for business opportunities/new venture ideas. Based on Mednick's model of creativity, I argue for an oppositional development of originality and business value assessments as the opportunity recognition process advances. This is not confirmed empirically in the thesis' experimental task, which incorporates real-world creativity of entrepreneurial teams. Executive processes might be an explanation for the insignificant direct effects in the development of originality and business value across opportunities. Beaty and Silvia (2012) suggest studying further moderators that may potentially influence the serial order effect in creative processes. The next section discusses the impact of the moderators team size, entrepreneurial experience, boundary spanning, and cohesion on the relationship between a prior opportunity's originality and a subsequent opportunity's originality, as well as between a prior opportunity's business value and a subsequent opportunity's business value.

5.2.2 Theoretical implications for human and social capital research

The introduction of the moderators team size, entrepreneurial experience, boundary spanning, and cohesion into the statistical models for originality and business value development across business opportunities leads to a multilevel design, offering many possibilities to contribute to the field of entrepreneurship and, more specifically, to the research on opportunity recognition (Shepherd, 2011). There are two important and essential differences between this study and previous research. Existing studies concentrate on a static analysis and mostly have some kind

of performance measure as a dependent variable. Performance is measured among other varia-
bles such as sales or profit (Davidsson & Honig, 2003), the achievement of project goals (Faraj
& Yan, 2009), or the number of identified opportunities (Ucbasaran et al., 2009). Additionally,
the abovementioned moderators are analyzed regarding their direct effect on a dependent vari-
able in the existing literature (Davidsson & Honig, 2003; Faraj & Yan, 2009; Ucbasaran et al.,
2009). In contrast, in this study the team-level variables moderate the direct effects of the prior
business opportunity's originality on a subsequent business opportunity's originality, and of the
prior business opportunity's business value on a subsequent business opportunity's business
value. Thus, in the study at hand, team-level variables moderate a process and not a value at a
specific point in time. The different approaches limit the comparability with previous studies.
The remaining part of this section discusses, for each moderator, the impact on the direct orig-
inality and business value effect.

Implications for team size

Team size has no significant impact on the direct effect of the prior opportunity's originality on
a subsequent opportunity's originality. Apparently, production blocking, evaluation apprehen-
sion, and free riding do not have different effects for smaller entrepreneurial founder teams than
for larger teams regarding the uncommonness of opportunities as the opportunity recognition
process advances.

Regarding business value, the hypothesis that the relationship between a prior opportunity's
business value and a subsequent opportunity's business value will be more negative for smaller
teams than for larger teams is confirmed. I theoretically propose three potential explanations
for this effect: production blocking, evaluation apprehension, and free riding. It is not clear
which of these three potential explanations is primarily responsible for this effect, or whether it
is a combination of the three. Free riding in particular should not play a decisive role if the
opportunity recognition task is real and relevant for the entrepreneurial founder team's future
success. In this case, every team member should be aware of the fact that each idea or comment
might be relevant for the final result. Nevertheless, in the task executed for this experiment, the
founder team's performance during the task had no consequences on any subsequent step.
Hence, free riding might be a valid explanation under those circumstances. With regard to po-
tential future studies, academics should first analyze opportunity recognition tasks that are not
part of an experiment but represent a task associated with consequences for the entrepreneurial
founder team. This would help to exclude free riding as a potential explanation for the observed

moderation effect. However, it would be almost impossible to fully observe the process in which entrepreneurial teams develop the opportunity for their actual venture in real life. Second, a task conceptualization which allows differentiation between production blocking and evaluation apprehension would serve academics in order to understand in more detail why the relationship between a prior opportunity's business value and a subsequent opportunity's business value is more negative for smaller teams than for larger ones. The potential effect of peer evaluation could be avoided by clearly asking for exotic, unoriginal business opportunities. In this case, team members might be ready to mention their least original opportunities without fearing being peer evaluated.

A classification of this result with reference to the existing literature is a challenging task due to a lack of comparable studies. In this thesis, larger teams attenuate the negative relationship between a prior opportunity's business value and a subsequent opportunity's business value. Even if the underlying rationale is different and analyses are not entirely comparable, this result permits a related conclusion to Sine et al.'s (2006) finding that larger entrepreneurial founder teams tend to be correlated with higher future revenues. In their empirical model, founding team size has a significant positive impact on performance measured as the venture's revenue. Additionally, founding team size positively moderates the impact of functional specialization on venture performance. The measurement of performance as well as the studied circumstances differ in the two studies, but in both cases a larger team size positively moderates a relationship with a performance measure as dependent variable, depicted either as revenue or as business value. Yet, additional empirical evidence allowing a closer comparison of results with further studies is required for future research.

Implications for entrepreneurial experience
Entrepreneurial experience has no significant impact on the direct effect of the prior opportunity's originality on a subsequent opportunity's originality. In other words, more entrepreneurial experience in the entrepreneurial founder team in terms of previously founded ventures has no influence on the relationship between a prior opportunity's originality and a subsequent opportunity's originality.

As to business value, the relationship between a prior opportunity's business value and a subsequent opportunity's business value is more negative for teams with more entrepreneurial experience than for teams with less entrepreneurial experience. With this finding, I contribute to the human capital literature. Ucbasaran et al. (2008) focus on the early stage of entrepreneurship

and analyze general (e.g., education and work experience) and entrepreneurship-specific (e.g., business ownership experience and managerial capabilities) human capital aspects and their impact on the number of identified business opportunities. In their sample of 588 individual entrepreneurs, they find entrepreneurship-specific experience to be the most significant explanatory variable for opportunity identification. Especially prior business ownership experience and managerial and entrepreneurial capabilities are found to have a significant impact on the number of identified business opportunities. They mention the sole concentration on the number of business opportunities and the disregard of their quality as a limitation of their study and conclude that "Future research might usefully explore the relationships between entrepreneurs' GHK [general human capital] and ESHK [entrepreneurship-specific human capital] profiles and their propensity to identify and pursue opportunities with significant wealth creating potential" (Ucbasaran et al., 2008, p. 170). Furthermore, they suggest focusing on the business opportunity directly rather than on the start-up or the entrepreneur as the unit of analysis to advance research theoretically and empirically. The study at hand incorporates both of these suggestions by analyzing the quality of business opportunities in terms of originality and business value at the new venture idea level and by analyzing the impact of entrepreneurial experience on the development of these creativity components of different business opportunities across the opportunity recognition process. Hence, I can offer a first insight - that the development of business value across business opportunities is more negative for teams with more entrepreneurial experience than for teams with less entrepreneurial experience - but I cannot answer the question of whether teams with more or less entrepreneurial experience generally recognize ideas associated with a larger business value. Moreover, I focus on entrepreneurial teams as actors in the opportunity recognition process, in contrast to Ucbasaran et al. (2008), who concentrate on the individual entrepreneur. Thus, future research is encouraged to further work on this topic. For example, it would be interesting to better understand whether more entrepreneurial experience plays a different role in opportunity recognition with respect to the quality of recognized business opportunities for individual entrepreneurs as compared to entrepreneurial founder teams.

Ucbasaran et al. (2009) detect an inverse U-shaped relationship between entrepreneurial experience measured as business ownership experience and the number of identified business opportunities. Entrepreneurs with fewer than 4.5 business ownership experiences show a positive relationship between experience and business opportunity identification, while entrepreneurs with more than 4.5 business ownership experiences display a negative relationship between

experience and business opportunities identified. In contrast, this thesis only shows that more entrepreneurial experience strengthens the negative relationship between a prior opportunity's business value and a subsequent opportunity's business value. There is no indication of a tipping point leading the moderator to influence the direct business value effect differently according to the level of entrepreneurial experience. Nevertheless, future research might shed more light on this question.

In section 2.4.4, I offered several potential explanations of how more entrepreneurial experience might lead the relationship between a prior opportunity's business value and a subsequent opportunity's business value to be more negative than with less entrepreneurial experience. These explanations are a recombination of already existing ideas (Gino et al., 2010), pattern recognition (Baron, 2006; Baron & Ensley, 2006), or just a better coordination of activities during the opportunity recognition task (Gino et al., 2010). The empirical examination supports the hypothesized result, but cannot isolate the underlying responsible reason. All of the mentioned arguments may be responsible for the results. Future researchers – especially in the field of opportunity recognition and human capital research – can add considerable knowledge by answering the question of what kinds of processes account for the mentioned result. For example, the coordination of activities across teams could be observed and assessed based on a scale in an experimental setting. To assess whether the recombination of already existing ideas plays a crucial role, experimental participants could be asked in detail about their previous entrepreneurial experience. These insights could then be analyzed with respect to newly developed business opportunities during the experiment. Pattern recognition could potentially be measured by means of think-aloud verbalizations.

Implications for boundary spanning

For originality, I hypothesized in section 2.4.5 that the relationship between a prior opportunity's originality and a subsequent opportunity's originality will be more positive for entrepreneurial founder teams with more boundary spanning than for teams with less boundary spanning. On the contrary, the result reveals that the relationship between a prior and a subsequent opportunity's originality is more positive for teams with less boundary spanning than for teams with more boundary spanning. The following reasoning might explain this result.

In the real world, entrepreneurial founder team members might first think about potential business opportunities regarding a specific technology themselves without talking to anyone outside the team. When they cannot advance any further, they might contact their external network in

order to gather new inputs regarding markets, customers, and potential products that may be relevant for further business opportunities. These new inputs might lead to the development of more original business opportunities across the opportunity recognition process. Hence, teams might gradually integrate new information leading to more and more starting points for new opportunities and to a higher level of originality of opportunities throughout the opportunity recognition process. However, during the experimental task, entrepreneurial founder team members did not have any contact to their external networks. Accordingly, only information they previously collected from their external networks is available and all information is present from the beginning. No contact to the network was possible during the opportunity recognition task. All potential starting points for original business opportunities are available from the beginning. Hence, teams with more boundary spanning might start with the most original business opportunities from the beginning since they have more information regarding markets, customers, and products available than teams with less boundary spanning. Future research focusing specifically on the influence of boundary spanning on the relationship between a prior opportunity's originality and a subsequent opportunity's originality might conceptualize an experimental task in such a way as to better incorporate founder teams' external networks.

Prior research, mainly based on Ancona (1990) and Ancona and Caldwell (1992), focuses on the role of boundary spanning and various outcomes. It finds a positive impact of team boundary spanning on team outcomes, for example on team innovation. Moreover, with a focus on consulting teams, Marrone, Tesluk, and Carson (2007) find that a high level of boundary spanning positively influences consulting team performance as measured by ratings of client teams. This result is based on a specific point-in-time consideration and does not reflect the analysis across business opportunities pursued in this thesis. Marrone (2010, p. 932) suggests future research to investigate "if the performance benefits associated with boundary spanning activity differ in meaningful ways over time." Before this call, Ancona and Caldwell (1992) already addressed this question with respect to innovative team outcomes by showing that product development teams with a high degree of boundary spanning are the most innovative teams over time. More specifically, ambassadorial activities (protecting the team from outside pressure, lobbying for resources, and persuading others to support the team (Ancona & Caldwell, 1992)) positively impact performance measures at a first point in time, but they do not have any impact two years later. This thesis adds to the literature on boundary spanning by not only focusing on two points in time, but by examining multiple business opportunities across the opportunity recognition process and the impact of boundary spanning on the development of originality.

Nevertheless, the time frame under consideration in this thesis has a duration of only 30 minutes. Thus, future longitudinal studies could analyze the role of boundary spanning on longer processes in opportunity recognition.

In this study, boundary spanning has no impact on the direct effect of a prior opportunity's business value on a subsequent opportunity's business value. In other words, this study does not reveal the relationship between a prior opportunity's business value and a subsequent opportunity's business value to be significantly different for entrepreneurial founder teams with lower levels of boundary spanning than for teams with higher levels of boundary spanning.

Implications for cohesion

Cohesion has no impact on the direct effect of a prior opportunity's originality on a subsequent opportunity's originality. Expressed differently, in this study the relationship between a prior opportunity's originality and a subsequent opportunity's originality is not significantly different for entrepreneurial founder teams with lower levels of cohesion than for teams with higher levels of cohesion.

Instead, with regard to business value, cohesion has a significant moderating effect. Hypothesis 7b, developed in section 2.4.6, suggests that the relationship between a prior opportunity's business value and a subsequent opportunity's business value will be more negative for entrepreneurial founder teams with lower levels of cohesion than for teams with higher levels of cohesion. The result is significant, but revealed the opposite effect as hypothesized: The relationship between a prior opportunity's business value and a subsequent opportunity's business value is more negative for entrepreneurial founder teams with higher levels of cohesion than for teams with lower levels of cohesion. Two potential lines of reasoning might explain this result.

First, if there is a higher level of cohesion in a team, it is motivated to complete a task as successfully as possible (Beal et al., 2003). Because of this motivation, entrepreneurial founder teams with higher levels of cohesion might conduct a longer, deeper, and broader search for business opportunities when confronted with a business opportunity recognition task. According to Mednick's (1962) model of associative creativity, teams will first develop obvious business opportunities. These obvious opportunities are related to large and commonly known industries and are associated with high feasibility and a high probability of large profits. The higher the motivation to successfully complete the task, and the longer and broader the search for business opportunities, the more associations the entrepreneurial founder team might have

to the necessary elements of the problem, which in turn increases the probability of uncommon answers as the opportunity recognition process advances. These uncommon opportunities might correspond to niche industries and might be associated with low profits and difficulties in implementation. Hence, the relationship between the business values of subsequent business opportunities will be more negative for teams with higher levels of cohesion than for teams with lower levels of cohesion.

Second, a higher level of cohesion in the entrepreneurial founder team leads to higher trust and more intense sharing of information and resources (Fleming et al., 2007). At the beginning of the opportunity recognition session, this might not have any influence because business opportunities for large industries may be obvious and easily recognized by the team. But due to the high level of trust among entrepreneurial founder team members, all potential information and resources are shared within the team. Consequently, the team has more associations with the essential elements of the task. These associations might serve as starting points toward more remote business opportunities belonging to niche industries or associated with a difficult implementation. These opportunities are tied to a low business value and might lead to the result that the relationship between subsequent business opportunities will be more negative for teams with higher levels of cohesion than for teams with lower levels of cohesion.

The study at hand is not directly comparable to previous studies because dependent variables are defined slightly differently. In a meta-analytical analysis, Mullen and Copper (1994) find task cohesion to have a positive impact on performance. Moreover, Beal et al. (2003) find in their meta-analysis that not only task cohesion but all facets of cohesion - task commitment, interpersonal attraction, and group pride - are significantly positively related to performance. More recent individual studies find diverging results. For example, Fleming et al. (2007) use archival patent data between 1975 and 2002 and find that team cohesion has a strongly negative impact on the generation of new ideas. In contrast, Joo et al. (2012) analyze a questionnaire filled out by 228 employees of six Korean companies and identify a significant positive relationship between intra-team cohesion and team creativity. I add to this stream of cohesion literature by showing that cohesion - not divided into different parts - has no significant influence on the development of originality but on the business value development across the opportunity recognition task. Thus, the creativity level as a dependent variable might lack detail, since cohesion might influence one aspect of creativity but not another. A more granular examination

of creativity helps to better understand the aspects of creativity for which a higher level of cohesion is either helpful or harmful.

When comparing the impact of bridging and bonding forms of social capital, Stam, Arzlanian, and Elfring (2014) find bridging forms to be more valuable for small firms. In particular, new information extracted from bridging networks was found to be critical for entrepreneurs as compared to that extracted from cohesive networks. As to the development of business opportunities across an opportunity recognition task, I contribute to the literature on boundary spanning and cohesion by showing that both moderators are significant, albeit for different aspects of creativity. Boundary spanning significantly moderates the relationship between a prior and a subsequent opportunity's originality, whereas cohesion moderates the relationship between a prior and a subsequent opportunity's business value.

5.3   Practical implications

In addition to the theoretical contributions outlined in sections 5.2.1 and 5.2.2, this thesis also has practical implications. They are outlined in the following, first for entrepreneurial founder teams and then for (potential) investors.

Implications for entrepreneurial founder teams

The results of this thesis show that the relationship between a prior opportunity's originality and a subsequent opportunity's originality, as well as the relationship between a prior opportunity's business value and a subsequent opportunity's business value is neither positively nor negatively significant. Hence, there is no clear positive or negative trend in the development of different business opportunities across the opportunity recognition process. Entrepreneurial founder teams should bear in mind that there is no minimum process length or basic number of business opportunities that has to be achieved in order to be sure of having recognized a sufficiently "good" business opportunity. Rather, opportunities associated with high and low originality or business value might alternate. It is hardly predictable at what point of the process opportunities satisfy a lower limit of originality or business value, since "skill and chance factors are closely associated and it is often hard to discriminate between chance and skill elements" (Keh, Foo, & Lim, 2002, p. 131). Team discussions might take an unexpected turn and suddenly lead to business opportunities with exceptionally high scores of originality or business value.

Moreover, the results of this thesis reveal that the originality and business value of business opportunities are significantly negatively correlated. Many recognized business opportunities either have a high score for originality and a low score for business value (light gray quadrant at the top left in Figure 22), or they have a low score for originality and a high score for business value (light gray quadrant at the bottom right in Figure 22)[20].
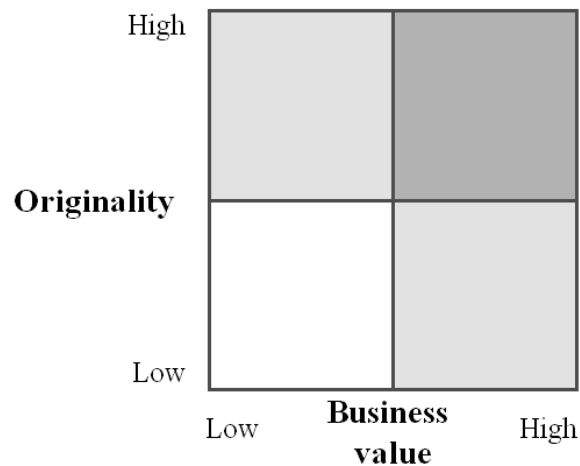
Source: Own illustration

Figure 22: The relationship between originality and business value

For most entrepreneurial founder teams, the goal will be to recognize business opportunities associated with both high originality and high business value (dark gray quadrant at the top right in Figure 22); however, teams should be aware that this will likely not be the case for most developed business opportunities. This is even more important because the final step of deciding on one of the developed business opportunities can have significant and long-term implications (Gruber et al., 2008).

In order to reach the top right quadrant in Figure 22, two approaches might help to actively consider the frequently existing negative relationship between originality and business value. First, team discussions could be actively guided in a specific direction. For example, if a highly original business opportunity has been recognized, the team could actively try to find a market, industry, customer, or product adaption associated with a higher business value without compromising on the originality side. Second, a three-step approach could be applied. In the first

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[20] For instance, in the experiment of this thesis, 382 different business opportunities were developed. Thereof, 235 business opportunities are associated either with an originality score higher than two and a business value score lower than five or with an originality score lower than three and a business value score higher than five. Only 78 business opportunities are associated with an originality score higher than two and at the same time a business value score higher than five.

step, only the development of business opportunities with a focus on originality could be pursued. In the second step, the focus could be concentrated solely on business opportunities associated with a high business value. In the final step, opportunities could be compared in order to extract the opportunity with the largest overlap in the originality and business value categories.

Additionally, the influence of the moderators - team size, entrepreneurial experience, boundary spanning, and cohesion - on the development of originality and business value across business opportunities might be relevant for entrepreneurial founder teams. The results indicate that the composition and structure of the team might influence the success of an opportunity recognition task. For instance, I find that the relationship between a prior opportunity's business value and a subsequent opportunity's business value is more negative for smaller teams than for larger teams. Thus, selectively adding particular employees to an opportunity recognition task might attenuate the negative development of business value across opportunities.

Apparently, to decelerate the negative development of the opportunities' business value, the additionally involved individuals should not have a lot of entrepreneurial experience. The reason is that the relationship between a prior opportunity's business value and a subsequent opportunity's business value is more negative for teams with more entrepreneurial experience than for teams with less entrepreneurial experience. Hence, although more entrepreneurial experience is generally seen as positive for opportunity recognition (e.g., Ucbasaran et al., 2009), there might be cases in which novice entrepreneurs enrich the team and help consider multiple perspectives. Therefore, entrepreneurial teams should pay attention to the multifaceted implications a decision might have.

Furthermore, entrepreneurial founder teams should keep in mind that seemingly obvious connections might not hold. For example, while it may seem obvious that teams with higher levels of cohesion should be able to attenuate the negative development of business value across opportunities because of their strong solidarity and team spirit, the relationship between a prior opportunity's business value and a subsequent opportunity's business value will actually be more negative for entrepreneurial founder teams with higher levels of cohesion than for teams with lower levels of cohesion. Hence, teams should consider that higher levels of cohesion can have positive implications (e.g., intensification of trust and emotional safety) as well as negative ones. Negative effects like groupthink (Janis, 1973) might occur, so entrepreneurial founder teams should take care to create a counterbalance to the cohesion-induced team harmony.

Lastly, the same moderator might have opposing effects on different aspects of creativity. To enumerate, the relationship between a prior opportunity's business value and a subsequent opportunity's business value is more negative for teams with more entrepreneurial experience than for teams with less entrepreneurial experience. In contrast, the relationship between a prior opportunity's originality and a subsequent opportunity's originality is more positive for teams with more entrepreneurial experience than for teams with less entrepreneurial experience (even if this effect is only small). Accordingly, entrepreneurial teams should be aware of the fact that some team characteristics might affect creativity components differently. These opposing effects should be actively managed and accounted for.

Implications for (potential) investors

An opportunity recognition task might not only be necessary or meaningful at the beginning of the venture creation process, but also if the founder team is thinking about a strategic change in direction of the start-up after foundation. With this in mind, the results of this thesis might be relevant for current or future investors involved in a start-up and its future development.

For investors, it is easier to evaluate the level of entrepreneurial experience or boundary spanning than to directly observe an opportunity recognition task. Thus, based on these variables, they can give specific advice to the entrepreneurial founder team regarding pitfalls and unobvious interrelations. More specifically, they can point out to the founder team the different influence of entrepreneurial experience on the development of originality and business value across business opportunities. Moreover, they could sensitize the founder team to the negative correlation of originality and business value should it plan to conduct an opportunity recognition task.

To summarize, this thesis has several important implications for the entrepreneurship literature and entrepreneurial practice. Nevertheless, a number of limitations apply to this thesis. These limitations might also provide fruitful avenues for future research and are presented in the following sections 5.4 and 5.5.

5.4   Limitations

As is common in quantitative and qualitative empirical research, several limitations to this study must be acknowledged. In the following, I outline the specific limitations applying to this thesis. The first set of limitations concerns the sample. The second set of limitations applies to the

study design. The third set of limitations is related to the measurement of predictor and outcome variables.

As part of the first set of limitations, the size of the sample, while adequate, is small. 116 start-ups with a total of 286 founder team members represent only a small share of all German start-ups that are active and founded each year (Ripsas & Tröger, 2015). Nevertheless, compared to other studies using videotaping, coding, and quantitative analyses, the sample size seems to be adequate. For example, Kauffeld and Lehmann-Willenbrock (2012) include a total number of 92 teams from medium-sized organizations in their study on meeting effectiveness, which was videotaped. Also based on video analysis, Lehmann-Willenbrock and Allen (2014) analyze 54 meetings on potential humor-performance links. In a creativity-based study, Pirola-Merlo and Mann (2004) concentrate on 54 research and development teams to relate individual to team creativity. Focusing on entrepreneurial teams, Ensley et al. (2002) consider 70 entrepreneurial top management teams while investigating the role of cohesion and conflict for venture performance. Unlike other studies (Gino et al., 2010; Lewis, 2004; Shepherd & DeTienne, 2005; Tang, Kacmar, & Busenitz, 2012), the study at hand does not use student samples as proxies for entrepreneurial teams. The use of student samples has been criticized in entrepreneurial research (Robinson, Huefner, & Hunt, 1991). In contrast to the low relevance for student samples, the opportunity recognition task that is a core part of the experiment is significant for an entrepreneurial founder team. Each entrepreneurial founder team already experienced an opportunity recognition task for its own start-up. Additionally, the measured moderators are more meaningful for entrepreneurial founder teams than for student teams. To the best of my knowledge, a study comparable to the one at hand with a videotaped experimental approach in the field of entrepreneurial founder teams does not exist.

Further, the sample in this study consists solely of German entrepreneurial founder teams. Accordingly, this limits the degree to which these results can be generalized to non-German entrepreneurial founder teams. We focus on German teams mainly due to linguistic and institutional factors. The comparability of opportunity recognition discussions across different languages might be complicated for the researchers and subject to potential errors in understanding. Nevertheless, opportunity recognition tasks should play out similarly for teams from culturally related countries, but might be different from, for instance, those completed by North American or Asian entrepreneurial founder teams (Kitayama, Park, Sevincer, Karasawa, & Uskul, 2009; Markus & Kitayama, 2010; Matsumoto & Yoo, 2006).

The second set of limitations relates to the study design. The opportunity recognition task is probably more artificial than an effective opportunity recognition task for an entrepreneurial founder team. The amount of information entrepreneurial founder teams can normally use is much larger than that available in the experimental task. For instance, they are free to use the Internet or newspapers, or to contact any expert they wish to. But during the experimental task, entrepreneurial teams were not allowed to contact their external network (as part of their boundary spanning activities), which could give further insights regarding specific topics. Furthermore, in contrast to a normal opportunity recognition task, the experimental task was limited to 30 minutes, while entrepreneurial founder teams will usually discuss for a longer time span when developing new business opportunities. Additionally, we manipulated and measured a core construct (cohesion) and controlled for potential influences during the experimental task. This enhances the internal validity of the study (differences in the dependent variables of the two groups are assigned to experimental manipulation), but also induces some kind of artificial environment (e.g., additional reading of a text and writing of a commentary, no use of additional information sources) limiting the external validity (generalizability of results to non-experimental situations) (Schade & Burmeister-Lamp, 2009). The limited access to information resources, the 30-minute time frame, and the potentially artificial environment during the task might limit the ability to perfectly reflect the real world (Girotra et al., 2010).

Moreover, besides the experimental task and its 30-minute duration, the study relies on a cross-sectional design, meaning that all survey measures were collected at the same point in time. The causal relationships of the direct effects (effects of the prior opportunity's originality on a subsequent opportunity's originality and of the prior opportunity's business value on a subsequent opportunity's business value) are distinct due to their development across the opportunity recognition task. But the cross-sectional design only highlights relationships on a short-term basis and does not allow for a statement concerning the stability of the moderating effects over time. For instance, entrepreneurial experience as a variable might change considerably if the founder team is expanded or reduced (Ucbasaran et al., 2003). In addition, the design of the study does not allow the researcher to determine at what stage of an opportunity recognition task (which might take longer than a week or even a month in the real world) human and social capital factors become influential (Davidsson & Honig, 2003). However, this shortcoming is mitigated as long as the moderating variables (team size, entrepreneurial experience, boundary spanning, and cohesion) remain constant.

Also, I cannot finally conclude whether I have incorporated all factors that are relevant for the model. There is extant literature on potentially influential factors for opportunity recognition (e.g., Baron (2006), Ozgen and Baron (2007)). The focus of this study is on human and social capital factors; however, other factors at the individual level, team level, or environmental level might also play a role which I did not measure or consider. Even moderators like entrepreneurial experience or boundary spanning could be operationalized in a different way. For example, Davidsson and Honig (2003) included dummies if the entrepreneurs' parents owned a business, if friends and family encouraged the idea of starting a business, or if entrepreneurs were members of a business network as indicators of social capital. However, based on my theoretical derivation, I am confident to have incorporated the essential moderators.

The third set of limitations concerns the measurement of the data. The identification of business opportunities is not independent of the coding scheme used in order to structure the video data. Creativity in terms of originality and business value is measured in a subjective way based on coded business opportunities. A different coding scheme might have led to a different coding of business opportunities and, hence, to different assessments of originality and business value. However, our coding scheme is based on already existing material and adjusted where necessary. As to the coding, three independent raters assessed values for originality and business value, following the standard procedure in the literature (Rietzschel et al., 2006, 2010). We calculate inter-rater agreement not only for a subset of business opportunities, as in previous studies (Rietzschel et al., 2006), but for all of them and show that the coding is highly consistent across raters.

Further, this study worked with video data. When video cameras are used during the opportunity recognition task, the social situation may be biased (Kauffeld & Lehmann-Willenbrock, 2012). Entrepreneurial founder teams might be influenced in their behavior due to the presence of the camera and the recording of their performance. However, we positioned the cameras outside the visual field of participants where possible. In addition, after the opportunity recognition task, we asked participants whether they felt affected by the cameras. Participants verbally described the sessions as being typical compared to normal team meetings in their day-to-day environment. Thus, cameras are assumed not to play an influential role disturbing teams in their teamwork. Besides the presence of cameras during the opportunity recognition task, the researchers only had an outside view on the team discussions. The entire coding process was based on the video data and there was no possibility to check with participants if something

was unclear or difficult to understand. A specific clarifying supplementary interview was not conducted. Likewise, the video recording was only a snapshot. Furthermore, entrepreneurial founder teams discussed business opportunities related to a technology to which they did not have any personal link. It is possible that some teams might have discussed in a different way if the technology was more closely related to the team's real-life activities.

Lastly, the study is partly based on survey data. Two potential biases are associated with survey data: self-report bias and retrospective bias. First, the self-report bias describes the behavior of individuals responding to surveys in a way that makes them look as good as possible or shows them in a socially desirable light (Donaldson & Grant-Vallone, 2002). Hence, inappropriate modes of behavior might be under-reported, while appropriate modes of behavior might be over-reported. However, for entrepreneurial experience or boundary spanning, a socially desirable level is difficult to define and, hence, this bias is assumed not to be pronounced in this study. Second, retrospective bias describes the bias of participants' evaluations after having experienced an event or performed a task (Weinstein & Roediger, 2010). Thus, individuals might retrospectively misjudge their behavior or performance and give incorrect answers in surveys. However, the relevant survey items in this study - team size, entrepreneurial experience, and boundary spanning – do not seem to give much room for unobjective answers.

In summary, limitations regarding the sampling approach, the study design, and the measurement of predictor and outcome variables have to be acknowledged. I tried to account for these limitations as much as possible. Nevertheless, they present fruitful avenues for future research, which are discussed in section 5.5.

5.5   Avenues for future research and conclusion

After discussing this thesis' implications for the entrepreneurship literature and for practice, as well as addressing the limitations of this study, in the following I offer additional avenues for future research that may build on and extend my findings. First, future studies could adjust the approach to different parts of the experiment. Researchers could more specifically try to limit any kind of artificial environment during the study to further enhance external validity (Breugst, 2011; Haynie, Shepherd, & McMullen, 2009). For example, they could concentrate solely on the opportunity recognition task without the potentially distracting priming task and reinforcement task. Moreover, a further step to strengthen external validity (Schade & Burmeister-Lamp, 2009) could be to allow the use of more external help. In reality, every entrepreneurial founder

team might use the Internet or consult any potentially helpful individual from the external net-work in order to achieve the best possible result. Thus, future studies could allow the use of these external resources and analyze how this might change the opportunity recognition pro-cess. Furthermore, we set a time limit of 30 minutes for the opportunity recognition task. Some team members may have subconsciously felt under pressure during the task and thus may not have shown their standard performance. Hence, future studies could eliminate this time limit and give participating teams as much time as they need. Additionally, future studies could measure survey variables at different points in time in order to investigate their influence if they change. In this study, survey measures were recorded at one specific point in time and represent only a cross-sectional design. Different waves of surveys could sharpen the focus on time with respect to team characteristics, since "making time a more central aspect of our theoretical lan-guage will promote better process descriptions that are likely to reflect the experiences of or-ganization members more directly" (Ford, 2002, p. 645). In addition, a new technology is not the only external enabler leading to the possibility of developing new business opportunities. Alternatively, regulatory, demographic, or social changes (Davidsson, 2015) as well as the ap-pearance of a new type of market or customer might serve as a starting point for the develop-ment of new business opportunities. Based on these external enablers, future research could investigate whether they trigger different behavior in entrepreneurial founder teams during op-portunity recognition tasks.

Second, researchers could investigate the opportunity recognition process for different samples. Instead of concentrating solely on German start-ups, as in this study, they could include ven-tures from various countries in order to examine potential structural differences of opportunity recognition processes. For example, Ma, Huang, and Shenkar (2011) emphasize the importance of cultural contexts in opportunity recognition. These cultural contexts may also play a role for the team processes in opportunity recognition tasks. Further, instead of focusing on entrepre-neurial teams from different countries, researchers could also center their analysis on potential differences in methodological proceedings for teams from different industries. In addition, en-trepreneurial teams and individual entrepreneurs could be confronted concerning their behavior and approach in opportunity recognition tasks. Although most ventures are founded by entre-preneurial teams (Ripsas & Tröger, 2015), this analysis could be insightful for a better under-standing of structural cognitive and process differences between teams and individuals in op-portunity recognition.

Third, different measures have diverse impacts on the development of business value and originality scores across opportunities, as this thesis confirms. In this study, only a small selection of human and social capital variables are included in the statistical models. Future research could consider different human and social capital variables, e.g., level of education, managerial experience, existence of entrepreneurs in the personal environment (parents, spouse), or membership in specific associations (Davidsson & Honig, 2003). In addition, measures independent of human and social capital might influence the development of originality and business value across time in opportunity recognition tasks. A wide range of further factors like personality, general mental ability, changes in membership over time, or team conflicts could be incorporated in future research (Klotz et al., 2014). Not only is there potential for the use of alternative independent variables, the dependent variables also offer a promising field for further research. Adjacent to originality and business value, business opportunities have various characteristics that might be examined in more detail. For instance, researchers could rate business opportunities based on how promising they are, or the degree to which the situation of exploiting a business opportunity is seen as a chance (Grichnik, Smeja, & Welpe, 2010).

Fourth, the new venture idea concept is a suitable construct to analyze entrepreneurial processes because it "facilitate[s] theoretical precision and can help develop more fruitful designs for empirical investigations" (Davidsson, 2015, p. 675). Unfortunately, this concept has not been considered by many researchers (exceptions are, e.g., Der Foo et al. (2005) and Klofsten (2005)). It might serve as a component of multilevel research and can easily be combined with team-level variables. Based on an experimental approach, future research could, for example, combine the analysis at the new venture idea level with different external enablers and team- or individual-level inputs.

Fifth, the analysis of the development of opportunity characteristics across the opportunity recognition task provides several research opportunities around the topic of opportunity recognition. This thesis concentrates on the recognition part. Future research might connect the recognition with evaluation and selection. It would be interesting to better understand whether entrepreneurial teams tend to select opportunities developed at earlier or later stages of the opportunity recognition process. More generally, future research could shed more light on the question of how the process of opportunity recognition and team characteristics shape the evaluation of specific opportunities (Autio, Dahlander, & Frederiksen, 2013; Tumasjan, Welpe, & Spörrle, 2013). In this regard, it would also be interesting to gain deeper insight into the question

of whether originality and business value scores of business opportunities play a crucial role for entrepreneurial founder teams or whether their assessments are based on completely different measures. Furthermore, on a long-term basis, not only the selection but also the exploitation success of the business opportunity could be examined.

Finally, future research could adopt a qualitative approach in order to better understand underlying (team) processes in an opportunity recognition task. In this case, researchers could, for example, attend real opportunity recognition tasks by entrepreneurial founder teams based on different topics and industries, thereby maximizing external validity and uncovering the real-world process in detail. A qualitative approach would allow further investigation of why the recognition of business opportunities may follow a specific path, and would give room for new theoretical models.

To conclude, originality and business value are the two core creativity components describing important facets of business opportunities in the entrepreneurial context. The human and social capital components team size, entrepreneurial experience, boundary spanning, and cohesion impact the relationship between a prior opportunity's originality and a subsequent opportunity's originality, and the relationship between a prior opportunity's business value and a subsequent opportunity's business value in different ways. Drawing on Mednick's associative model of creativity as a general theoretical framework, I theoretically and empirically examine the relationship between a prior opportunity's originality and a subsequent opportunity's originality, as well as between a prior opportunity's business value and a subsequent opportunity's business value. Additionally, I investigate the relationship between a business opportunity's originality and business value, which shows a strongly negative correlation. The results do not reveal any significance for the originality and business value direct effects. However, human and social capital components of entrepreneurial founder teams influence these relationships. Boundary spanning significantly influences the originality main effect: The relationship between a prior opportunity's originality and a subsequent opportunity's originality is more positive for teams with less boundary spanning than for teams with more boundary spanning. For business value, the relationship between a prior opportunity's business value and a subsequent opportunity's business value is more negative for larger teams than for smaller teams. Additionally, the relationship between a prior opportunity's business value and a subsequent opportunity's business value is more negative for teams with more entrepreneurial experience than for teams with less entrepreneurial experience. Lastly, the relationship between a prior opportunity's business value

and a subsequent opportunity's business value is found to be more negative for entrepreneurial founder teams with a high level of cohesion than for teams with a low level of cohesion.

These findings show how important it is to consider different aspects of business opportunities that might even have oppositional characteristics and might be driven by different factors. Furthermore, the findings suggest explicitly paying attention to the team composition during opportunity recognition tasks. Different team characteristics might influence the development of originality and business value across business opportunities positively or negatively.

The objective of this thesis is to deepen the understanding of the development of characteristics of business opportunities during opportunity recognition tasks in entrepreneurial founder teams. At the same time, this study aims to shed light on the importance of human and social capital components as inherent characteristics of the entrepreneurial founder team and their impact on the relationship between a prior opportunity's originality and a subsequent opportunity's originality, as well as on the relationship between a prior opportunity's business value and a subsequent opportunity's business value. I thereby create insights for scholars and founders alike. With this study, I contribute to the research on opportunity recognition, human capital, and social capital. Additionally, this thesis offers an experiment conceptualization that allows business opportunities to be analyzed at the new venture idea level. Founders gain deeper insight into the way different team characteristics behave during opportunity recognition discussions. At the same time, this study might serve as a starting point for future research on the topic of opportunity recognition processes in the entrepreneurial field.

REFERENCES

Adair, J. G. (1984). The Hawthorne Effect A Reconsideration of the Methodological Artifact. *Journal of Applied Psychology*, *69*(2), 334–345.

Adler, P. S., & Kwon, S.-W. (2002). Social Capital: Prospects for a new concept. *Academy of Management Review*, *27*(1), 17–40.

Aguinis, H., Gottfredson, R. K., & Culpepper, S. A. (2013). Best-Practice Recommendations for Estimating Cross-Level Interaction Effects Using Multilevel Modeling. *Journal of Management*, *39*(6), 1490–1528.

Aiken, L. S., West, S. G., & Reno, R. R. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, Calif.: Sage Publications.

Aldrich, H. E., Renzulli, L. A., & Langton, N. (1998). Passing on Privilege: Resources orivuded by self-employed parents to their self-employed children. *Research in Social Stratification & Mobility*, *16*, 291–317.

Alge, B. J., Wiethoff, C., & Klein, H. J. (2003). When does the medium matter?: Knowledge-building experiences and opportunities in decision-making teams. *Organizational Behavior and Human Decision Processes*, *91*(1), 26–37.

Allison, P. (2012). When Can You Safely Ignore Multicollinearity? Retrieved from http://statisticalhorizons.com/multicollinearity

Alvarez, S. A., & Barney, J. B. (2007). Discovery and creation: Alternative theories of entrepreneurial action. *Strategic Entrepreneurship Journal*, *1*(1-2), 11–26.

Amabile, T. (1996). *Creativity in context*. Boulder, Colo.: Westview Press.

Amabile, T. M. (1983). The social psychology of creativity: A componential conceptualization. *Journal of Personality and Social Psychology*, *45*(2), 357–376.

Amabile, T. M. (1988). A model of creativity and innovation in organizations. *Research in Organizational Behavior*, *10*, 123.

Amabile, T. M. (2012). *Componential Theory of Creativity*.

Amabile, T. M., & Pillemer, J. (2012). Perspectives on the Social Psychology of Creativity. *The Journal of Creative Behavior*, *46*(1), 3–15.

Amason, A. C., & Sapienza, H. J. (1997). The Effects of Top Management Team Size and interaction Norms on Cognitive and Affective Conflict. *Journal of Management*, *23*(4), 495–516.

Amason, A. C., Shrader, R. C., & Tompson, G. H. (2006). Newness and novelty: Relating top management team composition to new venture performance. *Journal of Business Venturing*, *21*(1), 125–148.

Amato, L., & Amato, C. (2007). The Effects of Firm Size and Industry on Corporate Giving. *Journal of Business Ethics*, *72*(3), 229–241.

Ancona, D. (1990). Outward Bound: Strategic for Team Survival in an Organization. *Academy of Management Journal*, *33*(2), 334–365.

Ancona, D. G., & Caldwell, D. F. (1992). Bridging the Boundary: External Activity and Performance in Organizational Teams. *Administrative Science Quarterly*, *37*(4), 634.

Anderson, N., Potočnik, K., & Zhou, J. (2014). Innovation and Creativity in Organizations: A State-of-the-Science Review, Prospective Commentary, and Guiding Framework. *Journal of Management*, *40*(5), 1297–1333.

Aquino, K., Freeman, D., Reed, A., Felps, W., & Lim, Vivien K. G. (2009). Testing a social-cognitive model of moral behavior: the interactive influence of situations and moral identity centrality. *Journal of Personality and Social Psychology*, *97*(1), 123–141.

Ardichvili, A., Cardozo, R., & Ray, S. (2003). A theory of entrepreneurial opportunity identification and development. *Journal of Business Venturing*, *18*(1), 105–123.

Asch, S. E. (1952). *Social psychology. Oxford science publications*. Oxford [Oxfordshire], New York: Oxford University Press.

Athanassiou, N., Crittenden, W. F., Kelly, L. M., & Marquez, P. (2002). Founder centrality effects on the Mexican family firm's top management group: Firm culture, strategic vision and goals, and firm performance. *Journal of World Business*, *37*(2), 139–150.

Audia, P. G., & Goncalo, J. A. (2007). Past Success and Creativity over Time: A Study of Inventors in the Hard Disk Drive Industry. *Management Science*, *53*(1), 1–15.

Audretsch, D. B., & Keilbach, M. (2010). Entrepreneurship Capital and Economic Performance. In Z. J. Acs (Ed.), *Entrepreneurship and Regional Development* (pp. 126–136). Elgar Reference Collection. International Library of Entrepreneurship, vol. 16. Northampton, Mass. and Cheltenham, U.K.: Elgar.

Autio, E., Dahlander, L., & Frederiksen, L. (2013). Information Exposure, Opportunity Evaluation, and Entrepreneurial Action: An Investigation of an Online User Community. *Academy of Management Journal*, *56*(5), 1348–1371.

Avolio, B. J., Walumbwa, F. O., & Weber, T. J. (2009). Leadership: current theories, research, and future directions. *Annual review of psychology*, *60*, 421–449.

Ayas, K., & Zeniuk, N. (2001). Project-Based Learning: Building Communities of Reflective Practitioners. *Management Learning*, *32*(1), 61–76.

Baer, J. (1993). *Creativity and divergent thinking: A task-specific approach*. Hillsdale, N.J.: L. Erlbaum Associates.

Bargh, J. A., Chen, M., & Burrows, L. (1996). Automaticity of Social Behavior: Direct Effects of Trait Construct and Stereotype Activation on Action. *Journal of Personality and Social Psychology*, *71*(2), 230–244.

Bargh, J. A., Gollwitzer, P. M., Lee-Chai, A., Barndollar, K., & Trötschel, R. (2001). The Automated Will: Nonconscious Activation and Pursuit of Behavioral Goals. *Journal of Personality and Social Psychology*, *81*(6), 1014–1027.

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. A. (2006). Opportunity Recognition as Pattern Recognition: How Entrepreneurs "Connect the Dots" to Identify New Business Opportunities. *Academy of Management Perspectives*, *20*(1), 104–119.

Baron, R. A. (2007). Behavioral and cognitive factors in entrepreneurship: Entrepreneurs as the active element in new venture creation. *Strategic Entrepreneurship Journal*, *1*(1-2), 167–182.

Baron, R. A. (2012). Cognitive Mechanisms in Entrepreneurship: Why and When Entrepreneurs Think Differently Than Other People. In H. Landstrom & F. T. Lohrke (Eds.), *Intellectual Roots of Entrepreneurship Research* (pp. 628–647). Elgar Research Collection. International Library of Entrepreneurship, vol. 23. Cheltenham, U.K. and Northampton, Mass.: Elgar.

Baron, R. A., & Tang, J. (2011). The role of entrepreneurs in firm-level innovation: Joint effects of positive affect, creativity, and environmental dynamism. *Journal of Business Venturing*, *26*(1), 49–60.

Bass, B. M., & Avolio, B. J. (1994). *Improving organizational effectiveness through transformational leadership*. Thousand Oaks: Sage Publications.

Baum, J. R., & Bird, B. J. (2010). The Successful Intelligence of High-Growth Entrepreneurs: Links to New Venture Growth. *Organization Science*, *21*(2), 397–412.

Baumol, W. J., & Strom, R. J. (2007). Entrepreneurship and economic growth. *Strategic Entrepreneurship Journal*, *1*(3-4), 233–237.

Beal, D. J., Cohen, R. R., Burke, M. J., & McLendon, C. L. (2003). Cohesion and performance in groups: a meta-analytic clarification of construct relations. *The Journal of applied psychology*, *88*(6), 989–1004.

Beaty, R. E., & Silvia, P. J. (2012). Why do ideas get more creative across time?: An executive interpretation of the serial order effect in divergent thinking tasks. *Psychology of Aesthetics, Creativity, and the Arts*, *6*(4), 309–319.

Beaty, R. E., Silvia, P. J., Nusbaum, E. C., Jauk, E., & Benedek, M. (2014). The roles of associative and executive processes in creative cognition. *Memory & Cognition*, *42*(7), 1186–1197.

Bechtoldt, M. N., Choi, H.-S., & Nijstad, B. A. (2012). Individuals in mind, mates by heart: Individualistic self-construal and collective value orientation as predictors of group creativity. *Journal of Experimental Social Psychology*, *48*(4), 838–844.

Becker, G. S. (1993). *Human capital: A theoretical and empirical analysis, with special reference to education* (3rd ed.). Chicago: The University of Chicago Press.

Beckman, C. M. (2006). The Influence of Founding Team Company Affiliations on Firm Behavior. *Academy of Management Journal*, *49*(4), 741–758.

Beckman, C. M., Burton, M. D., & O'Reilly, C. (2007). Early teams: The impact of team demography on VC financing and going public. *Journal of Business Venturing*, *22*(2), 147–173.

Belsley, D. A., Kuh, E., & Welsch, R. E. (2004). *Regression diagnostics: Identifying influential data and sources of collinearity*. *Wiley series in probability and statistics*. Hoboken, N.J.: Wiley.

Benedek, M., Könen, T., & Neubauer, A. C. (2012). Associative abilities underlying creativity. *Psychology of Aesthetics, Creativity, and the Arts*, *6*(3), 273–281.

Benedek, M., & Neubauer, A. C. (2013). Revisiting Mednick's Model on Creativity-Related Differences in Associative Hierarchies. Evidence for a Common Path to Uncommon Thought. *The Journal of Creative Behavior*, *47*(4), 273–289.

Berkowitz, L. (1971). The "weapons effect," demand characteristics, and the myth of the compliant subject. *Journal of Personality and Social Psychology*, *20*(3), 332–338.

Bezrukova, K., Jehn, K. A., Zanutto, E. L., & Thatcher, S. M. B. (2009). Do Workgroup Faultlines Help or Hurt?: A Moderated Model of Faultlines, Team Identification, and Group Performance. *Organization Science*, *20*(1), 35–50.

Bhagavatula, S., Elfring, T., van Tilburg, A., & van de Bunt, G. (2010). How social and human capital influence opportunity recognition and resource mobilization in India's handloom industry. *Journal of Business Venturing*, *25*(3), 245–260.

Bhave, M. P. (1994). A process model of entrepreneurial venture creation. *Journal of Business Venturing*, *9*(3), 223–242.

Biernacki, P., & Waldorf, D. (1981). Snowball Sampling: Problems and Techniques of Chain Referral Sampling. *Sociological Methods & Research*, *10*(2), 141–163.

Blatt, R. (2009). Tough Love: How Communal Schemas and Contracting Practices Build Relational Capital in Entrepreneurial Teams. *Academy of Management Review*, *34*(3), 533–551.

Bollen, K. A. (1989). *Structural equations with latent variables. Wiley series in probability and mathematical statistics. Applied probability and statistics*. New York: Wiley.

Bond, M. H., & Yang, K.-S. (1982). Ethnic Affirmation Versus Cross-Cultural Accommodation: The Variable Impact of Questionnaire Language on Chinese Bilinguals from Hong Kong. *Journal of Cross-Cultural Psychology*, *13*(2), 169–185.

Bosma, N., van Praag, M., Thurik, R., & Wit, G. D. (2004). The Value of Human and Social Capital Investments for the Business Performance of Startups. *Small Business Economics*, *23*(3), 227–236.

Bradley, B. H., Postlethwaite, B. E., Klotz, A. C., Hamdani, M. R., & Brown, K. G. (2012). Reaping the benefits of task conflict in teams: The critical role of team psychological safety climate. *Journal of Applied Psychology*, *97*(1), 151–158.

Breugst, N. (2011). *Entrepreneurial behavior in social contexts: the role of families, teams and employees for entrepreneurial individuals* (Dissertation). Friedrich-Schiller-Universität, Jena.

Breugst, N., Patzelt, H., & Rathgeber, P. (2015). How should we divide the pie? Equity distribution and its impact on entrepreneurial teams. *Journal of Business Venturing*, *30*(1), 66–94.

Breugst, N., & Shepherd, D. A. (2015). If You Fight With Me, I'll Get Mad!: A Social Model of Entrepreneurial Affect. *Entrepreneurship Theory and Practice*, forthcoming.

Brewer, M. B. (1991). The Social Self: On Being the Same and Different at the Same Time. *Personality and Social Psychology Bulletin*, *17*(5), 475–482.

Brewer, M. B., & Gardner, W. (1996). Levels of collective identity and self representations. *Journal of Personality and Social Psychology*, *71*(1), 83–93.

Brislin, R. W. (1970). Back-Translation for Cross-Cultural Research. *Journal of Cross-Cultural Psychology*, *1*(3), 185–216.

Brockner, J., Cremer, D. d., van den Bos, K., & Chen, Y.-R. (2005). The influence of interdependent self-construal on procedural fairness effects. *Organizational Behavior and Human Decision Processes*, *96*(2), 155–167.

Bryman, A. (2012). *Social Research Methods 4e* (4th rev ed). Oxford, UK: Oxford University Press.

Burt, R. S. (1992). *Structural holes: The social structure of competition*. Cambridge, Mass.: Harvard University Press.

Burt, R. S. (2000). The Network Structure Of Social Capital. *Research in Organizational Behavior*, *22*, 345–423.

Burt, R. S. (2004). Structural Holes and Good Ideas. *American Journal of Sociology*, *110*(2), 349–399.

Busenitz, L. W., & Barney, J. B. (1997). Differences between entrepreneurs and managers in large organizations: Biases and heuristics in strategic decision-making. *Journal of Business Venturing*, *12*(1), 9–30.

Busenitz, L. W., Plummer, L. A., Klotz, A. C., Shahzad, A., & Rhoads, K. (2014). Entrepreneurship Research (1985-2009) and the Emergence of Opportunities. *Entrepreneurship Theory and Practice*, *38*(5), 981–1000.

Cantillon, R. (2001). *Essays on the nature of commerce in general*. *Classics in economics series*. New Brunswick, N.J: Transaction Publishers.

Carland, J. C., & Carland, J. W. (2012). A Model of Shared Entrepreneurial Leadership. *Academy of Entrepreneurship Journal*, *18*(2), 71–81.

Carlsson, F., & Lundström, S. (2002). Economic Freedom and Growth: Decomposing the Effects. *Public Choice*, *112*(3), 335–344.

Carpenter, J. R., Goldstein, H., & Rasbash, J. (2003). A novel bootstrap procedure for assessing the relationship between class size and achievement. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, *52*(4), 431–443.

Carroll, G. R., & Mosakowski, E. (1987). The Career Dynamics of Self-Employment. *Administrative Science Quarterly*, *32*(4), 570–589.

Carson, S. H., Peterson, J. B., & Higgins, D. M. (2003). Decreased Latent Inhibition Is Associated With Increased Creative Achievement in High-Functioning Individuals. *Journal of Personality and Social Psychology*, *85*(3), 499–506.

Chaganti, R. S., Watts, A. D., Chaganti, R., & Zimmerman-Treichel, M. (2008). Ethnic-immigrants in founding teams: Effects on prospector strategy and performance in new Internet ventures. *Journal of Business Venturing*, *23*(1), 113–139.

Chandler, G. N., & Hanks, S. H. (1998). An examination of the substitutability of founders human and financial capital in emerging business ventures. *Journal of Business Venturing*, *13*(5), 353–369.

Chandler, G. N., Honig, B., & Wiklund, J. (2005). Antecedents, moderators, and performance consequences of membership change in new venture teams. *Journal of Business Venturing*, *20*(5), 705–725.

Chandler, G. N., & Jansen, E. (1992). The founder's self-assessed competence and venture performance. *Journal of Business Venturing*, *7*(3), 223–236.

Chen, M.-H. (2007). Entrepreneurial Leadership and New Ventures: Creativity in Entrepreneurial Teams. *Creativity and Innovation Management*, *16*(3), 239–249.

Choi, Y. R., Lévesque, M., & Shepherd, D. A. (2008). When should entrepreneurs expedite or delay opportunity exploitation? *Journal of Business Venturing*, *23*(3), 333–355.

Christensen-Szalanski, J. J., & Willham, C. F. (1991). The hindsight bias: A meta-analysis. *Organizational Behavior and Human Decision Processes*, *48*(1), 147–168.

Clarysse, B., Tartari, V., & Salter, A. (2011). The impact of entrepreneurial capacity, experience and organizational support on academic entrepreneurship. *Research Policy*, *40*(8), 1084–1093.

Clydesdale, G. (2006). Creativity and Competition: The Beatles. *Creativity Research Journal*, *18*(2), 129–139.

Cohen, J. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed). Mahwah, N.J: L. Erlbaum Associates.

Coleman, J. S. (1988). Social Capital in the Creation of Human Capital. *American Journal of Sociology*, *94*, 95–120.

Cooney, T. (2005). What is an Entrepreneurial Team? *International Small Business Journal*, *23*(3), 226–235.

Cooper, S. Y., & Park, J. S. (2008). The Impact of `Incubator' Organizations on Opportunity Recognition and Technology Innovation in New, Entrepreneurial High-technology Ventures. *International Small Business Journal*, *26*(1), 27–56.

Corbett, A., Covin, J. G., O'Connor, G. C., & Tucci, C. L. (2013). Corporate Entrepreneurship: State-of-the-Art Research and a Future Research Agenda. *Journal of Product Innovation Management*, *30*(5), 812–820.

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

Corbett, A. C. (2007). Learning asymmetries and the discovery of entrepreneurial opportunities. *Journal of Business Venturing*, *22*(1), 97–118.

Cornelius, B., Landström, H., & Persson, O. (2006). Entrepreneurial Studies: The Dynamic Research Front of a Developing Social Science. *Entrepreneurship Theory and Practice*, *30*(3), 375–398.

Cox, D. R., & Snell, E. J. (1989). *Analysis of binary data* (2nd ed.). *Monographs on statistics and applied probability: Vol. 32*. London, New York: Chapman and Hall.

Craig, S. C., & Douglas, S. P. (2006). Beyond national culture: implications of cultural dynamics for consumer research. *International Marketing Review*, *23*(3), 322–342.

Crossan, M. M., Lane, H. W., & White, R. E. (1999). An organizational learning framework: from intuition to institution. *Academy of Management Review*, *24*(3), 522–537.

Cyr, L. A., Johnson, D. E., & Welbourne, T. M. (2000). Human Resources in Initial Public Offering Firms: Do Venture Capitalists Make a Difference? *Entrepreneurship: Theory & Practice*, *25*(1), 77.

Dagovitch, Y., & Ganel, T. (2010). Effects of Facial Identity on Age Judgments. *Experimental Psychology*, *57*(5), 390–397.

Dahlqvist, J., & Wiklund, J. (2012). Measuring the market newness of new ventures. *Journal of Business Venturing*, *27*(2), 185–196.

Dalal, D. K., & Zickar, M. J. (2012). Some Common Myths About Centering Predictor Variables in Moderated Multiple Regression and Polynomial Regression. *Organizational Research Methods*, *15*(3), 339–362.

Davidsson, P., & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing*, *18*(3), 301–331.

Davidsson, P. (2003). The Domain of Entrepreneurship Research: Some Suggestions. In J. A. Katz & A. C. Corbett (Eds.), *Advances in Entrepreneurship, Firm Emergence and Growth. Cognitive Approaches to Entrepreneurship Research* (Vol. 6, pp. 315–372). Emerald Group Publishing Limited.

Davidsson, P. (2008). *The entrepreneurship research challenge*. Cheltenham: Edward Elgar.

Davidsson, P. (2015). Entrepreneurial opportunities and the entrepreneurship nexus: A re-conceptualization. *Journal of Business Venturing*, *30*(5), 674–695.

Davidsson, P., Achtenhagen, L., & Naldi, L. (2005). *Research on Small Firm Growth: A Review*.

Davidsson, P., & Wiklund, J. (2001). Levels of Analysis in Entrepreneurship Research: Current Research Practice and Suggestions for the Future. *Entrepreneurship: Theory & Practice*, *25*(4), 81–100.

De Carolis, D. M., & Saparito, P. (2006). Social Capital, Cognition, and Entrepreneurial Opportunities: A Theoretical Framework. *Entrepreneurship: Theory & Practice*, *30*(1), 41–56.

De Dreu, Carsten K. W., & West, M. A. (2001). Minority dissent and team innovation: The importance of participation in decision making. *Journal of Applied Psychology*, *86*(6), 1191–1201.

Decker, R., Haltiwanger, J., Jarmin, R., & Miranda, J. (2014). The Role of Entrepreneurship in US Job Creation and Economic Dynamism. *The Journal of Economic Perspectives*, *28*(3), 3–24.

DeDreu, C. K. W., Baas, M., & Nijstad, B. A. (2008). Hedonic tone and activation level in the mood-creativity link: toward a dual pathway to creativity model. *Journal of Personality and Social Psychology*, *94*(5), 739–756.

Delmar, F., & Shane, S. (2006). Does experience matter? The effect of founding team experience on the survival and sales of newly founded ventures. *Strategic Organization*, *4*(3), 215–247.

Der Foo, M., Kam Wong, P., & Ong, A. (2005). Do others think you have a viable business idea?: Team diversity and judges' evaluation of ideas in a business plan competition. *Journal of Business Venturing*, *20*(3), 385–402.

DeTienne, D. R., & Chandler, G. N. (2004). Opportunity Identification and Its Role in the Entrepreneurial Classroom: A Pedagogical Approach and Empirical Test. *Academy of Management Learning & Education*, *3*(3), 242–257.

Devine, D. J., Clayton, L. D., Philips, J. L., Dunford, B. B., & Melner, S. B. (1999). Teams in Organizations: Prevalence, Characteristics, and Effectiveness. *Small Group Research*, *30*(6), 678–711.

Dew, N., Read, S., Sarasvathy, S. D., & Wiltbank, R. (2009). Effectual versus predictive logics in entrepreneurial decision-making: Differences between experts and novices. *Journal of Business Venturing*, *24*(4), 287–309.

Diehl, M., & Stroebe, W. (1987). Productivity Loss In Brainstorming Groups: Toward the Solution of a Riddle. *Journal of Personality and Social Psychology*, *53*(3), 497–509.

Dimov, D. (2007). Beyond the Single-Person, Single-Insight Attribution in Understanding Entrepreneurial Opportunities. *Entrepreneurship Theory and Practice*, *31*(5), 713–731.

Dimov, D. (2010). Nascent Entrepreneurs and Venture Emergence: Opportunity Confidence, Human Capital, and Early Planning. *Journal of Management Studies*, *47*(6), 1123–1153.

Dimov, D. (2011). Grappling With the Unbearable Elusiveness of Entrepreneurial Opportunities. *Entrepreneurship Theory and Practice*, *35*(1), 57–81.

Dimov, D. P., & Shepherd, D. A. (2005). Human capital theory and venture capital firms: exploring "home runs" and "strike outs". *Journal of Business Venturing*, *20*(1), 1–21.

Donaldson, S. I., & Grant-Vallone, E. J. (2002). Understanding Self-Report Bias in Organizational Behavior Research. *Journal of Business and Psychology*, *17*(2), 245–260.

Dubin, R. (1978). *Theory building* (Rev. ed.). New York: Free Press.

Dutta, D. K., & Crossan, M. M. (2005). The Nature of Entrepreneurial Opportunities: Understanding the Process Using the 4I Organizational Learning Framework. *Entrepreneurship Theory and Practice*, *29*(4), 425–449.

Dyer, J. H., Gregersen, H. B., & Christensen, C. (2008). Entrepreneur behaviors, opportunity recognition, and the origins of innovative ventures. *Strategic Entrepreneurship Journal*, *2*(4), 317–338.

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

Eckhardt, J. T., & Shane, S. A. (2012). Response to the Commentaries: The Individual-Opportunity (IO) Nexus Integrates Objective and Subjective Aspects of Entrepreneurship. *Academy of Management Review*, *38*(1), 160–163.

Eddleston, K. A., Kellermanns, F. W., & Sarathy, R. (2008). Resource Configuration in Family Firms: Linking Resources, Strategic Planning and Technological Opportunities to Performance. *Journal of Management Studies*, *45*(1), 26–50.

Edmondson, A. (1999). Psychological Safety and Learning Behavior in Work Teams. *Administrative Science Quarterly*, *44*(2), 350–383.

Eisenhardt, K. M., & Schoonhoven, C. B. (1990). Organizational Growth: Linking Founding Team, Strategy. Environment, and Growth among U.S. Semiconductor Ventures. 1978-1988. *Administrative Science Quarterly*, *35*(3), 504–529.

Eisenhardt, K. M. (2013). Top management teams and the performance of entrepreneurial firms. *Small Business Economics*, *40*(4), 805–816.

Enders, C. K., & Tofighi, D. (2007). Centering predictor variables in cross-sectional multilevel models: A new look at an old issue. *Psychological Methods*, *12*(2), 121–138.

Ensley, M. D., Pearson, A. W., & Amason, A. C. (2002). Understanding the dynamics of new venture top management teams: Cohesion, conflict, and new venture performance. *Journal of Business Venturing*, *17*(4), 365–386.

Ensley, M. D., Hmieleski, K. M., & Pearce, C. L. (2006). The importance of vertical and shared leadership within new venture top management teams: Implications for the performance of startups. *The Leadership Quarterly*, *17*(3), 217–231.

Ensley, M. D., Pearson, A., & Pearce, C. L. (2003). Top management team process, shared leadership, and new venture performance: A theoretical model and research agenda. *Human Resource Management Review*, *13*(2), 329–346.

Evans, N. J., & Jarvis, P. A. (1980). Group Cohesion: A Review and Reevaluation. *Small Group Behavior*, *11*(4), 359–370.

Faraj, S., & Yan, A. (2009). Boundary work in knowledge teams. *Journal of Applied Psychology*, *94*(3), 604–617.

Farh, J.-L., Lee, C., & Farh, C. I. C. (2010). Task conflict and team creativity: a question of how much and when. *The Journal of applied psychology*, *95*(6), 1173–1180.

Fauchart, E., & Gruber, M. (2011). Darwinians, Communitarians, and Missionaries: The Role of Founder Identity in Entrepreneurship. *Academy of Management Journal*, *54*(5), 935–957.

Festinger, L. (1950). Informal social communication. *Psychological Review*, *57*(5), 271–282.

Field, C. A., & Welsh, A. H. (2007). Bootstrapping clustered data. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, *69*(3), 369–390.

Fiet, J. O. (2007). A Prescriptive Analysis of Search and Discovery *Journal of Management Studies*, *44*(4), 592–611.

Findlay, C. S., & Lumsden, C. J. (1988). The creative mind: Toward an evolutionary theory of discovery and innovation. *Journal of Social and Biological Systems*, *11*(1), 3–55.

Fiori, M., & Antonakis, J. (2011). The ability model of emotional intelligence: Searching for valid measures. *Personality and Individual Differences*, *50*(3), 329–334.

Fiske, S. T., Gilbert, D. T., Lindzey, G., & Jongsma, A. E. (2010). *Handbook of social psychology* (5th ed.). Hoboken, N.J.: Wiley.

Fleming, L., Mingo, S., & Chen, D. (2007). Collaborative Brokerage, Generative Creativity, and Creative Success. *Administrative Science Quarterly*, *52*(3), 443–475.

Flick, U. (2009). *An introduction to qualitative research* (4th ed). Los Angeles: Sage Publications.

Flom, P. L. (1999). Multicollinearity diagnostics for multiple regression: A Monte Carlo study. *ETD Collection for Fordham University*.

Forbes, D. P., Borchert, P. S., Zellmer-Bruhn, M. E., & Sapienza, H. J. (2006). Entrepreneurial Team Formation: An Exploration of New Member Addition. *Entrepreneurship Theory and Practice*, *30*(2), 225–248.

Ford, C. M. (1996). A Theory of Individual Creative Action in Multiple Social Domains. *Academy of Management Review*, *21*(4), 1112–1142.

Ford, C. M. (2002). The futurity of decisions as a facilitator of organizational creativity and change. *Journal of Organizational Change Management*, *15*(6), 635–646.

Franke, N., Gruber, M., Harhoff, D., & Henkel, J. (2008). Venture Capitalists' Evaluations of Start-Up Teams: Trade-Offs, Knock-Out Criteria, and the Impact of VC Experience. *Entrepreneurship Theory and Practice*, *32*(3), 459–483.

Friedman, N. P., & Miyake, A. (2004). The Relations Among Inhibition and Interference Control Functions: A Latent-Variable Analysis. *Journal of Experimental Psychology: General*, *133*(1), 101–135.

Frigge, M., Hoaglin, D. C., & Iglewicz, B. (1989). Some Implementations of the Boxplot. *The American Statistician*, *43*(1), 50–54.

Gaertner, L., Sedikides, C., & Graetz, K. (1999). In Search of Self-Definition: Motivational Primacy of the Individual Self, Motivational Primacy of the collective Self, or Contextual Primacy? *Journal of Personality and Social Psychology*, *76*(1), 5–18.

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

Gallupe, R. B., Bastianutti, L. M., & Cooper, W. H. (1991). Unblocking Brainstorms. *Journal of Applied Psychology*, *76*(1), 137–142.

Gardner, W. L., Gabriel, S., & Lee, A. Y. (1999). "I" value freedom, but "WE" value relationships: Self-Construal Priming Mirrors Cultural Differences in Judgment. *Psychological Science*, *10*(4), 321–326.

Gargiulo, M., & Benassi, M. (2010). Trapped in Your Own Net? Network Cohesion, Structural Holes, and the Adaptation of Social Capital. In K. W. Koput & J. P. Broschak (Eds.), *Social Capital in Business* (pp. 130–143). Elgar Reference Collection. Cheltenham, U.K. and Northampton, Mass.: Elgar.

Garnsey, E. W. (1998). A Theory of the Early Growth of the Firm. *Industrial and Corporate Change*, *7*(3), 523–556.

Gartner, W. B. (1989). "Who Is an Entrepreneur?" Is the Wrong Question. *Entrepreneurship: Theory & Practice*, *13*(4), 47–68.

Gartner, W. B., Carter, N. M., & Hills, G. E. (2003). The Language of Opportunity. In C. Steyaert & D. Hjorth (Eds.), *New movements in entrepreneurship* (pp. 103–124). Cheltenham, U.K. and Northampton, Mass; Elgar in association with the Entrepreneurship and Small Business Research Institute.

Gartner, W. B., Shaver, K. G., Gatewood, E., & Katz, J. A. (1994). Finding the Entrepreneur in Entrepreneurship. *Entrepreneurship: Theory & Practice*, *18*(3), 5–9.

George, J. M. (2007). Creativity in Organizations. *The Academy of Management Annals*, *1*(1), 439–477.

Gersick, C. (1988). Time and Transition in Work Teams Toward a New Model of Group Development. *Academy of Management Journal*, *31*(1), 9–41.

Giddens, A. (1979). *Central problems in social theory: Action, structure, and contradiction in social analysis*. Berkeley: University of California Press.

Giddens, A. (1991). *Modernity and self-identity: Self and society in the late modern age*. Cambridge, U.K.: Polity Press in association with Basil Blackwell.

Gielnik, M. M., Frese, M., Graf, J. M., & Kampschulte, A. (2012). Creativity in the opportunity identification process and the moderating effect of diversity of information. *Journal of Business Venturing*, *27*(5), 559–576.

Gilhooly, K. J., Fioratou, E., Anthony, S. H., & Wynn, V. (2007). Divergent thinking: Strategies and executive involvement in generating novel uses for familiar objects. *British Journal of Psychology*, *98*(4), 611–625.

Gilson, L., & Shalley, C. E. (2004). A Little Creativity Goes a Long Way: An Examination of Teams' Engagement in Creative Processes. *Journal of Management*, *30*(4), 453–470.

Gino, F., Argote, L., Miron-Spektor, E., & Todorova, G. (2010). First, get your feet wet: The effects of learning from direct and indirect experience on team creativity. *Organizational Behavior and Human Decision Processes*, *111*(2), 102–115.

Girotra, K., Terwiesch, C., & Ulrich, K. T. (2010). Idea Generation and the Quality of the Best Idea. *Management Science*, *56*(4), 591–605.

Gittell, R. J., & Vidal, A. (1998). *Community organizing: Building social capital as a development strategy*. Thousand Oaks, CA: Sage Publications.

Goncalo, J. A., & Staw, B. M. (2006). Individualism–collectivism and group creativity. *Organizational Behavior and Human Decision Processes*, *100*(1), 96–109.

Gonzalo, J. A., & Kim, S. H. (2010). Distributive justice beliefs and group idea generation: Does a belief in equity facilitate productivity?, *46*(5), 836–840.

Goodman, P., Ravlin, E., & Schminke, M. (1987). Understanding Groups in Organizations. In L. Cummings & B. Staw (Eds.), *Research in Organizational Behavior* (pp. 121–173). JAI Press. Retrieved from http://repository.cmu.edu/tepper/1034

Granovetter, M. S. (1973). The Strength of Weak Ties. *American Journal of Sociology*, *78*(6), 1360–1380.

Gregoire, D. A., & Shepherd, D. A. (2012). Technology-Market Combinations and the Identification of Entrepreneurial Opportunities: An Investigation of the Opportunity-Individual Nexus. *Academy of Management Journal*, *55*(4), 753–785.

Gregoire, D. A., Shepherd, D. A., & Schurer Lambert, L. (2009). Measuring Opportunity-Recognition Beliefs: Illustrating and Validating an Experimental Approach. *Organizational Research Methods*, *13*(1), 114–145.

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.

Greve, A., & Salaff, J. W. (2003). Social Networks and Entrepreneurship. *Entrepreneurship Theory and Practice*, *28*(1), 1–22.

Grichnik, D., Smeja, A., & Welpe, I. (2010). The importance of being emotional: How do emotions affect entrepreneurial opportunity evaluation and exploitation? *Journal of Economic Behavior & Organization*, *76*(1), 15–29.

Gross, N., & Martin, W. E. (1952). On Group Cohesiveness. *American Journal of Sociology*, *57*(6), 546–564.

Grubbs, F. E. (1969). Procedures for Detecting Outlying Observations in Samples. *Technometrics*, *11*(1), 1–21.

Gruber, M., MacMillan, I. C., & Thompson, J. D. (2008). Look Before You Leap: Market Opportunity Identification in Emerging Technology Firms. *Management Science*, *54*(9), 1652–1665.

Gruber, M., MacMillan, I. C., & Thompson, J. D. (2013). Escaping the Prior Knowledge Corridor: What Shapes the Number and Variety of Market Opportunities Identified Before Market Entry of Technology Start-ups? *Organization Science*, *24*(1), 280–300.

Guilford, J. P. (1950). Creativity. *American Psychologist*, *5*(9), 444–454.

Guilford, J. P. (1967). *The nature of human intelligence*. New York, N.Y., [etc.]: McGraw-Hill.

Gulati, R., & Gargiulo, M. (1999). Where Do Interorganizational Networks Come From?: 1. *American Journal of Sociology*, *104*(5), 1439–1493.

Hackman, J. R. (1994). Group influences on individuals in organizations. In M. D. Dunnette, L. M. Hough, & H. C. Triandis (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., pp. 199–267). Palo Alto, Calif.: Consulting Psychologists Press.

Hair, J. F. (2010). *Multivariate data analysis* (7th ed). Upper Saddle River, NJ: Prentice Hall.

Hall, R. E., & Woodward, S. E. (2010). The Burden of the Nondiversifiable Risk of Entrepreneurship. *American Economic Review*, *100*(3), 1163–1194.

Hambrick, D. C., & Abrahamson, E. (1995). Assessing Managerial Discretion Across Industries: A Multimethod Approach. *Academy of Management Journal*, *38*(5), 1427–1441.

Han, J., Han, J., & Brass, D. J. (2014). Human capital diversity in the creation of social capital for team creativity. *Journal of Organizational Behavior*, *35*(1), 54–71.

Hansen, D. J., Lumpkin, G. T., & Hills, G. E. (2011). A multidimensional examination of a creativity-based opportunity recognition model. *International Journal of Entrepreneurial Behavior & Research*, *17*(5), 515–533.

Hansen, D. J., Shrader, R., & Monllor, J. (2011). Defragmenting Definitions of Entrepreneurial Opportunity *Journal of Small Business Management*, *49*(2), 283–304.

Hansen, M. T. (1999). The Search-Transfer Problem: The Role of Weak Ties in Sharing Knowledge across Organization Subunits. *Administrative Science Quarterly*, *44*(1), 82–111.

Hargadon, A. (2006). Bridging Old Worlds and Building New Ones: Toward a Microsociology of Creativity. In L. L. Thompson & H.-S. Choi (Eds.), *LEA's organization and management series. Creativity and innovation in organizational teams* (pp. 199–215). Mahwah, N.J.: Lawrence Erlbaum Associates.

Hargadon, A., & Sutton, R. I. (1997). Technology Brokering and Innovation in a Product Development Firm. *Administrative Science Quarterly*, *42*(4), 716–749.

Hargadon, A. B., & Bechky, B. A. (2006). When Collections of Creatives Become Creative Collectives: A Field Study of Problem Solving at Work. *Organization Science*, *17*(4), 484–500.

Harper, D. A. (2008). Towards a theory of entrepreneurial teams. *Journal of Business Venturing*, *23*(6), 613–626.

Harrison, G. W., & List, J. A. (2004). Field Experiments. *Journal of Economic Literature*, *42*(4), 1009–1055.

Harvey, S. (2013). A different perspective: The multiple effects of deep level diversity on group creativity. *Journal of Experimental Social Psychology*, *49*(5), 822–832.

Harvey, S., & Kou, C.-Y. (2013). Collective Engagement in Creative Tasks: The Role of Evaluation in the Creative Process in Groups. *Administrative Science Quarterly*, *58*(3), 346–386.

Haushalter, D., Klasa, S., & Maxwell, W. F. (2007). The influence of product market dynamics on a firm's cash holdings and hedging behavior. *Journal of Financial Economics*, *84*(3), 797–825.

Hayes, A. F. (2006). A Primer on Multilevel Modeling. *Human Communication Research*, *32*(4), 385–410.

Haynie, J. M., Shepherd, D. A., & McMullen, J. S. (2009). An Opportunity for Me?: The Role of Resources in Opportunity Evaluation Decisions. *Journal of Management Studies*, *46*(3), 337–361.

Henry, J. (1991). *Creative management*. London, Newbury Park: Sage Publications.

Hessels, J., & van Stel, A. (2011). Entrepreneurship, export orientation, and economic growth. *Small Business Economics*, *37*(2), 255–268.

Hill, S. A., & Birkinshaw, J. M. (2010). Idea Sets: Conceptualizing and Measuring a New Unit of Analysis in Entrepreneurship Research. *Organizational Research Methods*, *13*(1), 85–113.

Hirst, G., van Knippenberg, D., & Zhou, J. (2009). A Cross-Level Perspective on Employee Creativity: Goal Orientation, Team Learning Behavior, and Individual Creativity. *Academy of Management Journal*, *52*(2), 280–293.

Hmieleski, K. M., & Baron, R. A. (2008). Regulatory focus and new venture performance: A study of entrepreneurial opportunity exploitation under conditions of risk versus uncertainty. *Strategic Entrepreneurship Journal*, *2*(4), 285–299.

Hmieleski, K. M., Carr, J. C., & Baron, R. A. (2015). Integrating Discovery and Creation Perspectives of Entrepreneurial Action: The Relative Roles of Founding CEO Human Capital, Social Capital, and Psychological Capital in Contexts of Risk Versus Uncertainty. *Strategic Entrepreneurship Journal*, *9*(4), 289–312.

Hoever, I. J., van Knippenberg, D., van Ginkel, W. P., & Barkema, H. G. (2012). Fostering team creativity: perspective taking as key to unlocking diversity's potential. *The Journal of applied psychology*, *97*(5), 982–996.

Hogg, M. A., & Cooper, J. (2003). *The Sage handbook of social psychology*. London, Thousand Oaks, Calif.: Sage.

Hollenbeck, J. R., Beersma, B., & Schouten, M. E. (2012). Beyond Team Types and Taxonomies: A Dimensional Scaling Conceptualization for Team Description. *Academy of Management Review*, *37*(1), 82–106.

Howitt, D., & Cramer, D. (2014). *Introduction to research methods in psychology* (Fourth edition). Harlow, England, New York: Pearson.

Hox, J. J. (2010). *Multilevel analysis: Techniques and applications* (2nd ed). *Quantitative methodology series*. New York: Routledge.

Huovinen, S., & Pasanen, M. (2010). Entrepreneurial and management teams: What makes the difference? *Journal of Management & Organization*, *16*(3), 436–453.

Jackson, M. H., & Poole, M. S. (2003). Idea-Generation in Naturally Occurring Contexts: Complex Appropriation of a Simple Group Procedure. *Human Communication Research*, *29*(4), 560–591.

Janis, I. L. (1973). Groupthink and group dynamics: A social psychological analysis of defective policy decisions. *Policy Studies Journal*, *2*(1), 19–25.

Jehn, K. A. (1995). A Multimethod Examination of the Benefits and Detriments of Intragroup Conflict. *Administrative Science Quarterly*, *40*(2), 256–282.

Jewitt, C. (2012). *An Introduction to Using Video for Research.*

Joo, B.-K. B., Song, J. H., Lim, D. H., & Yoon, S. W. (2012). Team creativity: The effects of perceived learning culture, developmental feedback and team cohesion. *International Journal of Training and Development*, *16*(2), 77–91.

Joshi, A., & Roh, H. (2009). The Role of Context in Work Team Diversity Research: A Meta-Analytic Review. *Academy of Management Journal*, *52*(3), 599–627.

Julien, P.-A. (1995). New technologies and technological information in small businesses. *Journal of Business Venturing*, *10*(6), 459–475.

Kaish, S., & Gilad, B. (1991). Characteristics of opportunities search of entrepreneurs versus executives: Sources, interests, general alertness. *Journal of Business Venturing*, *6*(1), 45–61.

Kamm, J. B., Shuman, J. C., Seeger, J. A., & Nurick, A. J. (1990). Entrepreneurial Teams in New Venture Creation: A Research Agenda. *Entrepreneurship Theory and Practice*, *14*(4), 7–17.

Kane, A. A., Argote, L., & Levine, J. M. (2005). Knowledge transfer between groups via personnel rotation: Effects of social identity and knowledge quality. *Organizational Behavior and Human Decision Processes*, *96*(1), 56–71.

Kauffeld, S., & Lehmann-Willenbrock, N. (2012). Meetings Matter: Effects of Team Meetings on Team and Organizational Success. *Small Group Research*, *43*(2), 130–158.

Kaufmann, A., & Tödtling, F. (2001). Science–industry interaction in the process of innovation: The importance of boundary-crossing between systems. *Research Policy*, *30*(5), 791–804.

Kavadias, S., & Sommer, S. C. (2009). The Effects of Problem Structure and Team Diversity on Brainstorming Effectiveness. *Management Science*, *55*(12), 1899–1913.

Kay, A. C., Wheeler, S. C., Bargh, J. A., & Ross, L. (2004). Material priming: The influence of mundane physical objects on situational construal and competitive behavioral choice. *Organizational Behavior and Human Decision Processes*, *95*(1), 83–96.

Keh, H. T., Foo, M. D., & Lim, B. C. (2002). Opportunity Evaluation under Risky Conditions: The Cognitive Processes of Entrepreneurs. *Entrepreneurship Theory and Practice*, *27*(2), 125–148.

Kerr, S., & Jermier, J. M. (1978). Substitutes for leadership: Their meaning and measurement. *Organizational Behavior and Human Performance*, *22*(3), 375–403.

Kirton, M. J., & McCarthy, R. M. (1988). Cognitive climate and organizations. *Journal of Occupational Psychology*, *61*(2), 175–184.

Kirzner, I. M. (1979). *Perception, opportunity, and profit: Studies in the theory of entrepreneurship*. Chicago: University of Chicago Press.

Kirzner, I. M. (1973). *Competition and entrepreneurship*. Chicago: University of Chicago Press.

Kirzner, I. M. (1997). Entrepreneurial Discovery and the Competitive Market Process: An Austrian Approach. *Journal of Economic Literature*, *35*(1), 60–85.

Kitayama, S., Park, H., Sevincer, A. T., Karasawa, M., & Uskul, A. K. (2009). A cultural task analysis of implicit independence: Comparing North America, Western Europe, and East Asia. *Journal of Personality and Social Psychology*, *97*(2), 236–255.

Klepper, S. (2001). Employee Startups in High-Tech Industries. *Industrial and Corporate Change*, *10*(3), 639–674.

Klofsten, M. (2005). New venture ideas: An analysis of their origin and early development. *Technology Analysis & Strategic Management*, *17*(1), 105–119.

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.

Kozlowski, S. W. J., & Bell, B. S. (2003). Work groups and teams in organizations. In W. C. Borman, D. R. Ilgen, & R. J. Klimoski (Eds.), *Handbook of psychology: Industrial and organizational psychology* (pp. 333–375). London, England: Wiley.

Kozlowski, S. W. J., & Ilgen, D. R. (2006). Enhancing the Effectiveness of Work Groups and Teams. *Psychological science in the public interest : a journal of the American Psychological Society*, *7*(3), 77–124.

Kühnen, U., & Hannover, B. (2000). Assimilation and contrast in social comparisons as aconsequenceof self-construal activation. *European Journal of Social Psychology*, *30*(6), 799–811.

Kühnen, U., & Oyserman, D. (2002). Thinking about the self influences thinking in general: cognitive consequences of salient self-concept. *Journal of Experimental Social Psychology*, *38*(5), 492–499.

Lalwani, A. K., & Shavitt, S. (2013). You Get What You Pay For?: Self-Construal Influences Price-Quality Judgments. *Journal of Consumer Research*, *40*(2), 255–267.

Larey, T. S., & Paulus, P. B. (1999). Group Preference and Convergent Tendencies in Small Groups: A Content Analysis of Group Brainstorming Performance. *Creativity Research Journal*, *12*(3), 175–184.

Leana, C. R. (1985). A Partial Test of Janis' Groupthink Model: Effects of Group Cohesiveness and Leader Behavior on Defective Decision Making. *Journal of Management*, *11*(1), 5–18.

LeBreton, J. M., & Senter, J. L. (2008). Answers to 20 Questions About Interrater Reliability and Interrater Agreement. *Organizational Research Methods*, *11*(4), 815–852.

Lee, S. W., Oyserman, D., & Bond, M. H. (2010). Am I doing better than you?: That depends on whether you ask me in English or Chinese: Self-enhancement effects of language as a cultural mindset prime. *Journal of Experimental Social Psychology*, *46*(5), 785–791.

Lehmann-Willenbrock, N., & Allen, J. A. (2014). How fun are your meetings? Investigating the relationship between humor patterns in team interactions and team performance. *The Journal of applied psychology*, *99*(6), 1278–1287.

Levitt, B., & March, J. G. (1988). Organizational Learning. *Annual Review of Sociology*, *14*(1), 319–338.

Lewis, K. (2004). Knowledge and Performance in Knowledge-Worker Teams: A Longitudinal Study of Transactive Memory Systems. *Management Science*, *50*(11), 1519–1533.

Lim, J. Y.-K., Busenitz, L. W., & Chidambaram, L. (2013). New Venture Teams and the Quality of Business Opportunities Identified: Faultlines Between Subgroups of Founders and Investors. *Entrepreneurship Theory and Practice*, *37*(1), 47–67.

Little, T. D. (2013). *The Oxford handbook of quantitative methods*. New York [u.a.]: Oxford University Press.

Low, M. B., & MacMillan, I. C. (1988). Entrepreneurship: Past Research and Future Challenges. *Journal of Management*, *14*(2), 139–161.

Lowik, S., van Rossum, D., Kraaijenbrink, J., & Groen, A. (2012). Strong Ties as Sources of New Knowledge: How Small Firms Innovate through Bridging Capabilities *Journal of Small Business Management*, *50*(2), 239–256.

Lubow, R. E. (1989). *Latent Inhibition and Conditioned Attention Theory*. *Problems in the Behavioural Sciences: Vol. 9*. Cambridge: Cambridge University Press.

Lumpkin, G. T., Hills, G. E., & Shrader, R. C. (2004). Opportunity recognition. In H. P. Welsch (Ed.), *Entrepreneurship. The way ahead* (pp. 73–90). New York: Routledge.

Lumpkin, G. T., & Lichtenstein, B. B. (2005). The Role of Organizational Learning in the Opportunity-Recognition Process. *Entrepreneurship Theory and Practice*, *29*(4), 451–472.

Ma, R., Huang, Y.-C., & Shenkar, O. (2011). Social networks and opportunity recognition: A cultural comparison between Taiwan and the United States. *Strategic Management Journal*, *32*(11), 1183–1205.

Maas, C. J., & Hox, J. J. (2004). The influence of violations of assumptions on multilevel parameter estimates and their standard errors. *Computational Statistics & Data Analysis*, *46*(3), 427–440.

MacKenzie, S. B., Podsakoff, P. M., & Podsakoff, N. P. (2011). Construct measurement and validation procedures in MIS and behavioral research: integrating new and existing techniques. *MIS Quarterly*, *35*(2), 293–334.

Mahnke, V., Venzin, M., & Zahra, S. A. (2007). Governing Entrepreneurial Opportunity Recognition in MNEs: Aligning Interests and Cognition Under Uncertainty. *Journal of Management Studies*, *44*(7), 1278–1298.

Maner, J. K., DeWall, C. N., Baumeister, R. F., & Schaller, M. (2007). Does Social Exclusion Motivate Interpersonal Reconnection? Resolving the "Porcupine Problem.". *Journal of Personality & Social Psychology*, *92*(1), 42–55.

Markides, C. C. (1995). Diversification, restructuring and economic performance. *Strategic Management Journal*, *16*(2), 101–118.

Markides, C. (2006). Disruptive Innovation: In Need of Better Theory *Journal of Product Innovation Management*, *23*(1), 19–25.

Markus, H. R., & Kitayama, S. (1991). Culture and the Self: Implications for Cognition, Emotion, and Motivation. *Psychological Review*, *98*(2), 224–253.

Markus, H. R., & Kitayama, S. (2010). Cultures and Selves: A Cycle of Mutual Constitution. *Perspectives on Psychological Science*, *5*(4), 420–430.

Marquardt, D. (1980). You should standardize the predictor variables in your regression models. *Journal of the Anerican Statistical Association*, *75*, 74–103.

Marrone, J. A. (2010). Team Boundary Spanning: A Multilevel Review of Past Research and Proposals for the Future. *Journal of Management*, *36*(4), 911–940.

Marrone, J. A., Tesluk, P. E., & Carson, J. B. (2007). A Multilevel Investigation of Antecedents and Consequences of Team Member Boundary-Spanning Behavior. *Academy of Management Journal*, *50*(6), 1423–1439.

Martin, B. C., McNally, J. J., & Kay, M. J. (2013). Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes. *Journal of Business Venturing*, *28*(2), 211–224.

Marvel, M. R., & Lumpkin, G. T. (2007). Technology Entrepreneurs' Human Capital and Its Effects on Innovation Radicalness. *Entrepreneurship Theory and Practice*, *31*(6), 807–828.

Marvel, M. R. (2013). Human Capital and Search-Based Discovery: A Study of High-Tech Entrepreneurship. *Entrepreneurship Theory and Practice*, *37*(2), 403–419.

Marvel, M. R., Griffin, A., Hebda, J., & Vojak, B. (2007). Examining the Technical Corporate Entrepreneurs' Motivation: Voices from the Field. *Entrepreneurship Theory and Practice*, *31*(5), 753–768.

Mathieu, J. E., Aguinis, H., Culpepper, S. A., & Chen, G. (2012). Understanding and estimating the power to detect cross-level interaction effects in multilevel modeling. *The Journal of applied psychology*, *97*(5), 951–966.

Matsumoto, D., & Yoo, S. H. (2006). Toward a New Generation of Cross-Cultural Research. *Perspectives on Psychological Science*, *1*(3), 234–250.

Mazar, N., Amir, O., & Ariely, D. (2008). The Dishonesty of Honest People: A Theory of Self-Concept Maintenance. *Journal of Marketing Research*, *45*(6), 633–644.

McDougall, P. P., Covin, J. G., Robinson Jr, Richard B., & Herron, L. (1994). The Effects of Industry Growth and Strategic Breadth on New Venture Performance and Strategy Content. *Strategic Management Journal*, *15*(7), 537–554.

McFadden, D. F. (1974). Conditional Logit Analysis of Qualitative Choice Behaviour. In P. Zarembka (Ed.), *Economic theory and mathematical economics. Frontiers in econometrics* (pp. 105–142). New York: Academic Press.

McGee, J. E., & Dowling, M. J. (1994). Using R&D cooperative arrangements to leverage managerial experience: A study of technology-intensive new ventures. *Journal of Business Venturing*, *9*(1), 33–48.

McGrath, R. G., & MacMillan, I. C. (2000). *The entrepreneurial mindset: Strategies for continuously creating opportunity in an age of uncertainty*. Boston, Mass.: Harvard Business School Press.

Mednick, S. (1962). The associative basis of the creative process. *Psychological Review*, *69*(3), 220–232.

Merten, T., & Fischer, I. (1999). Creativity, personality and word association responses: Associative behaviour in forty supposedly creative persons. *Personality and Individual Differences*, *27*(5), 933–942.

Milgram, R. M., & Rabkin, L. (1980). Developmental test of Mednick's associative hierarchies of original thinking. *Developmental Psychology*, *16*(2), 157–158.

Montgomery, C. A. (1982). The Measurement of Firm Diversification Some New Empirical Evidence. *Academy of Management Journal*, *25*(2), 299–307.

Moroz, P. W., & Hindle, K. (2012). Entrepreneurship as a Process: Toward Harmonizing Multiple Perspectives. *Entrepreneurship Theory and Practice*, *36*(4), 781–818.

Morris, M. H., Kuratko, D. F., Schindehutte, M., & Spivack, A. J. (2012). Framing the Entrepreneurial Experience. *Entrepreneurship Theory and Practice*, *36*(1), 11–40.

Moscovici, S. (1984). The phenomenon of social representations. In R. M. Farr & S. Moscovici (Eds.), *European studies in social psychology. Social representations* (pp. 3–69). Cambridge [Cambridgeshire], New York, Paris: Cambridge University Press; Editions de la Maison des Sciences de l'Homme.

Mowery, D., Nelson, R., Sampat, B., & Ziedonis, A. (2015). *Ivory Tower and Industrial Innovation: University-industry Technology Transfer Before and After the Bayh-dole Act*: Stanford Business Books.

Mudrack, P. E. (1989). Defining Group Cohesiveness: A Legacy of Confusion? *Small Group Research*, *20*(1), 37–49.

Mullen, B., & Copper, C. (1994). The relation between group cohesiveness and performance: An integration. *Psychological Bulletin*, *115*(2), 210–227.

Nadler, A., Harpaz-Gorodeisky, G., & Ben-David, Y. (2009). Defensive helping: threat to group identity, ingroup identification, status stability, and common group identity as determinants of intergroup help-giving. *Journal of Personality and Social Psychology*, *97*(5), 823–834.

Nagelkerke, N. J. D. (1991). A Note on a General Definition of the Coefficient of Determination. *Biometrika*, *78*(3), 691–692.

Nahapiet, J., & Ghoshal, S. (1998). Social Capital, Intellectual Capital, and the Organizational Advantage. *Academy of Management Review*, *23*(2), 242–266.

NAICS code. (n.d.). Retrieved from http://siccode.com/en

Nemiro, J. E. (2002). The Creative Process in Virtual Teams. *Creativity Research Journal*, *14*(1), 69–83.

Nesselroade, J. R., & Cattell, R. B. (1988). *Handbook of Multivariate Experimental Psychology*. Boston, MA: Springer US.

Newcomb, T. (1968). Interpersonal balance. In R. Abelson, E. Aronson, W. McGuire, T. Newcomb, M. Rosenberg, & T. Tannenbaum (Eds.), *Theories of cognitive consistency: a sourcebook*. Chicago: Rand McNally.

Newell, S., Tansley, C., & Huang, J. (2004). Social Capital and Knowledge Integration in an ERP Project Team: The Importance of Bridging AND Bonding. *British Journal of Management*, *15*(S1), 43–57.

Nezlek, J. B. (2008). An Introduction to Multilevel Modeling for Social and Personality Psychology. *Social and Personality Psychology Compass*, *2*(2), 842–860.

Nijstad, B. A., DeDreu, C. K. W., Rietzschel, E. F., & Baas, M. (2010). The dual pathway to creativity model: Creative ideation as a function of flexibility and persistence. *European Review of Social Psychology*, *21*(1), 34–77.

Nisbett, R. E., & Wilson, T. D. (1977). The halo effect: Evidence for unconscious alteration of judgments. *Journal of Personality and Social Psychology*, *35*(4), 250–256.

Nonaka, I. (2000). A firm as a knowledge-creating entity: A new perspective on the theory of the firm. *Industrial and Corporate Change*, *9*(1), 1–20.

Nonaka, I. (1994). A Dynamic Theory of Organizational Knowledge Creation. *Organization Science*, *5*(1), 14–37.

Nonaka, I. (2007). The Knowledge-Creating Company. *Harvard Business Review*, *85*(7/8), 162–171.

Nonaka, I., & Krogh, G. von. (2009). Perspective—Tacit Knowledge and Knowledge Conversion: Controversy and Advancement in Organizational Knowledge Creation Theory. *Organization Science*, *20*(3), 635–652.

Nonaka, I., Toyama, R., & Konno, N. (2000). SECI, Ba and Leadership: A Unified Model of Dynamic Knowledge Creation. *Long Range Planning*, *33*(1), 5–34.

Nonaka, I., Umemoto, K., & Senoo, D. (1996). From information processing to knowledge creation: A Paradigm shift in business management. *Technology in Society*, *18*(2), 203–218.

Olczak, P. V., & Kaplan, M. F. (1969). Originality and Rate of Response in Association as a Function of Associative Gradient. *The American Journal of Psychology*, *82*(2), 157–167.

Oldham, G. R., & Cummings, A. (1996). Employee creativity: Personal and contextual factors at work. *Academy of Management Journal*, *39*(3), 607–634.

O'leary, M. B., Mortensen, M., & Woolley, A. W. (2011). Multiple Team Membership: A Theoretical Model of its Effects on Productivity and Learning for Individuals and Teams. *Academy of Management Review*, *36*(3), 461–478.

Ondruska, P., Kohli, P., & Izadi, S. (2015). MobileFusion: Real-Time Volumetric Surface Reconstruction and Dense Tracking on Mobile Phones. *IEEE Transactions on Visualization and Computer Graphics*, *21*(11), 1251–1258.

Orne, M. T. (1962). On The Social Psychology of the Psychological Experiment: With Particular Reference to Demand Characteristics and Their Implications. *American Psychologist*, *17*(11), 776–783.

Osborn, A. F. (1979). *Applied imagination: Principles and procedures of creative problem-solving* (3rd rev. ed.). New York: Charles Scribner's.

Oyserman, D., & Lee, S. W.-S. (2010). Priming "Culture": Culture as Situated Cognition. In S. Kitayama & D. Cohen (Eds.), *Handbook of cultural psychology*. New York, London: Guilford.

Ozgen, E., & Baron, R. A. (2007). Social sources of information in opportunity recognition: Effects of mentors, industry networks, and professional forums. *Journal of Business Venturing*, *22*(2), 174–192.

Palich, L. E., Cardinal, L. B., & Miller, C. C. (2000). Curvilinearity in the diversification-performance linkage: an examination of over three decades of research. *Strategic Management Journal*, *21*(2), 155–174.

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.

Park, S., & Bae, Z.-T. (2004). New venture strategies in a developing country: Identifying a typology and examining growth patterns through case studies. *Journal of Business Venturing*, *19*(1), 81–105.

Parker, S. C. (2011). Intrapreneurship or entrepreneurship? *Journal of Business Venturing*, *26*(1), 19–34.

Paruchuri, S. (2010). Intraorganizational Networks, Interorganizational Networks, and the Impact of Central Inventors: A Longitudinal Study of Pharmaceutical Firms. *Organization Science*, *21*(1), 63–80.

Paulus, P. B., Dzindolet, M. T., Poletes, G., & Camacho, L. M. (1993). Perception of Performance in Group Brainstorming: The Illusion of Group Productivity. *Personality and Social Psychology Bulletin*, *19*(1), 78–89.

Paulus, P. (2000). Groups, Teams, and Creativity: The Creative Potential of Idea-generating Groups. *Applied Psychology*, *49*(2), 237–262.

Paulus, P. B., & Dzindolet, M. T. (1993). Social influence processes in group brainstorming. *Journal of Personality and Social Psychology*, *64*(4), 575–586.

Paulus, P. B., & Yang, H.-C. (2000). Idea Generation in Groups: A Basis for Creativity in Organizations. *Organizational Behavior and Human Decision Processes*, *82*(1), 76–87.

Pérez-Luño, A., Wiklund, J., & Cabrera, R. V. (2011). The dual nature of innovative activity: How entrepreneurial orientation influences innovation generation and adoption. *Journal of Business Venturing*, *26*(5), 555–571.

Perry-Smith, J. E., & Coff, R. W. (2011). In the mood for entrepreneurial creativity? How optimal group affect differs for generating and selecting ideas for new ventures. *Strategic Entrepreneurship Journal*, *5*(3), 247–268.

Peugh, J. L. (2010). A practical guide to multilevel modeling. *Journal of school psychology*, *48*(1), 85–112.

Phillips, K. W. (2003). The Effects of Categorically Based Expectations on Minority Influence: The Importance of Congruence. *Personality and Social Psychology Bulletin*, *29*(1), 3–13.

Piers, E. V., & Kirchner, E. P. (1971). Productivity and uniqueness in continued word association as a function of subject creativity and stimulus properties. *Journal of Personality*, *39*(2), 264–276.

Pirola-Merlo, A., & Mann, L. (2004). The relationship between individual creativity and team creativity: Aggregating across people and time. *Journal of Organizational Behavior*, *25*(2), 235–257.

Podsakoff, N. P., Podsakoff, P. M., MacKenzie, S. B., & Klinger, R. L. (2013). Are we really measuring what we say we're measuring? Using video techniques to supplement traditional construct validation procedures. *Journal of Applied Psychology*, *98*(1), 99–113.

Poetz, M. K., & Schreier, M. (2012). The Value of Crowdsourcing: Can Users Really Compete with Professionals in Generating New Product Ideas? *Journal of Product Innovation Management*, *29*(2), 245–256.

Portes, A. (1998). Social Capital: Its Origins and Applications in Modern Sociology. *Annual Review of Sociology*, *24*, 1–24.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed). *Advanced quantitative techniques in the social sciences: Vol. 1*. Thousand Oaks: Sage Publications.

Rea, L. M., & Parker, R. A. (2014). *Designing and conducting survey research: A comprehensive guide* (Fourth edition): John Wiley & Sons Inc.

Riegel, K. F., Riegel, R. M., & Levine, R. S. (1966). An analysis of associative behavior and creativity. *Journal of Personality and Social Psychology*, *4*(1), 50–56.

Rietzschel, E. F., Nijstad, B. A., & Stroebe, W. (2006). Productivity is not enough: A comparison of interactive and nominal brainstorming groups on idea generation and selection. *Journal of Experimental Social Psychology*, *42*(2), 244–251.

Rietzschel, E. F., Nijstad, B. A., & Stroebe, W. (2010). The selection of creative ideas after individual idea generation: Choosing between creativity and impact. *British Journal of Psychology*, *101*(1), 47–68.

Rietzschel, E. F., Nijstad, B. A., & Stroebe, W. (2007). Relative accessibility of domain knowledge and creativity: The effects of knowledge activation on the quantity and originality of generated ideas. *Journal of Experimental Social Psychology*, *43*(6), 933–946.

Ripsas, S., & Tröger, S. (2015). *3. Deutscher Startup Monitor.*

Robins, R. W., Fraley, R. C., & Krueger, R. F. (2007). *Handbook of research methods in personality psychology*. New York: Guilford Press.

Robinson, P. B., Huefner, J. C., & Hunt, H. K. (1991). Entrepreneurial Research on Student Subjects Does Not Generalize to Real World Entrepreneurs. *Journal of Small Business Management*, *29*(2), 42.

Rogers, C. R. (1954). Toward a theory of creativity. *ETC: A Review of General Semantics*, *11*(4), 249–260.

Rosenbusch, N., Brinckmann, J., & Müller, V. (2013). Does acquiring venture capital pay off for the funded firms?: A meta-analysis on the relationship between venture capital investment and funded firm financial performance. *Journal of Business Venturing*, *28*(3), 335–353.

Roskes, M., De Dreu, Carsten K. W., & Nijstad, B. A. (2012). Necessity is the mother of invention: Avoidance motivation stimulates creativity through cognitive effort. *Journal of Personality and Social Psychology*, *103*(2), 242–256.

Ruef, M., Aldrich, H. E., & Carter, N. M. (2003). The Structure of Founding Teams: Homophily, Strong Ties and Isolation Among U.S. Entrepreneurs. *American Sociological Review*, *68*(2), 195–222.

Rumelt, R. P. (1982). Diversification Strategy and Profitability. *Strategic Management Journal*, *3*(4), 359–369.

Saad, G., Cleveland, M., & Ho, L. (2015). Individualism–collectivism and the quantity versus quality dimensions of individual and group creative performance. *Journal of Business Research*, *68*(3), 578–586.

Salancik, G. R., & Pfeffer, J. (1978). A Social Information Processing Approach to Job Attitudes and Task Design. *Administrative Science Quarterly*, *23*(2), 224–253.

Sapienza, H. J., Herron, L., & Menendez, J. (1991). The founder and the firm: A qualitative analysis of theentrepreneurial process. In N. C. Churchill (Ed.), *Frontiers of entrepreneurship research 1991. Proceedings of the Eleventh Annual Babson College Entrepreneurship Research Conference* (pp. 254–270). Babson Park, Mass.: Babson College.

Sarala, R. M., & Vaara, E. (2010). Cultural differences, convergence, and crossvergence as explanations of knowledge transfer in international acquisitions. *Journal of International Business Studies*, *41*(8), 1365–1390.

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.

Sarason, Y., Dillard, J. F., & Dean, T. (2010). How can we know the dancer from the dance? *Journal of Business Venturing*, *25*(2), 238–243.

Sarasvathy, S. D. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review*, *26*(2), 243–263.

Sarasvathy, S. D., Dew, N., Velamuri, S. R., & Venkataraman, S. (2005). Three Views of Entrepreneurial Opportunity. In Z. J. Ács & D. B. Audretsch (Eds.), *International Handbook Series on Entrepreneurship: v. 1. Handbook of entrepreneurship research. An interdisciplinary survey and introduction* (Vol. 1, pp. 141–160). New York: Springer.

Sawyer, R. K. (2007). *Group genius: The creative power of collaboration*. New York: Basic Books.

Schade, C., & Burmeister-Lamp, K. (2009). Experiments on Entrepreneurial Decision Making: A Different Lens Through Which to Look at Entrepreneurship. *Foundations and Trends in Entrepreneurship*, *5*(2), 81–134.

Schjoedt, L., Monsen, E., Pearson, A., Barnett, T., & Chrisman, J. J. (2013). New Venture and Family Business Teams: Understanding Team Formation, Composition, Behaviors, and Performance. *Entrepreneurship: Theory & Practice*, *37*(1), 1–15.

Schoonhoven, C. B., Eisenhardt, K. M., & Lyman, K. (1990). Speeding Products to Market: Waiting Time to First Product Introduction in New Firms. *Administrative Science Quarterly*, *35*(1), 177–207.

Schumpeter, J. A. (1997). *Theorie der wirtschaftlichen Entwicklung: Eine Untersuchung über Unternehmergewinn, Kapital, Kredit, Zins und den Konjunkturzyklus* (9. Aufl., unveränd. Nachdr). Berlin: Duncker und Humblot.

Schwertman, N. C., Owens, M. A., & Adnan, R. (2004). A simple more general boxplot method for identifying outliers. *Computational Statistics & Data Analysis*, *47*(1), 165–174.

Seger, C. R., Smith, E. R., & Mackie, D. M. (2009). Subtle activation of a social categorization triggers group-level emotions. *Journal of Experimental Social Psychology*, *45*(3), 460–467.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Belmont, CA: Wadsworth Cengage Learning.

Shalley, C. E. (1991). Effects of productivity goals, creativity goals, and personal discretion on individual creativity. *Journal of Applied Psychology*, *76*(2), 179–185.

Shalley, C. E., Zhou, J., & Oldham, G. R. (2004). The Effects of Personal and Contextual Characteristics on Creativity: Where Should We Go from Here? *Journal of Management*, *30*(6), 933–958.

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

Shane, S. (2001). Technology opportunities and new firm creation. *Management Science*, *47*(2), 205–220.

Shane, S. (2003). *A general theory of entrepreneurship: The individual-opportunity nexus*. *New horizons in entrepreneurship*. Cheltenham, UK, Northampton, MA, USA: E. Elgar.

Shane, S. (2012). Reflections on the 2010 AMR Decade Award: Delivering on the Promise of Entrepreneurship As a Field of Research. *Academy of Management Review*, *37*(1), 10–20.

Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, *25*(1), 217–226.

Shane, S., & Venkataraman, S. (2001). Entrepreneurship As a Field of Research: A Response to Zahra and Dess, Singh, and Erikson. *Academy of Management Review*, *26*(1), 13–16.

Shane, S., & Cable, D. (2002). Network Ties, Reputation, and the Financing of New Ventures. *Management Science*, *48*(3), 364–381.

Shane, S., & Stuart, T. (2002). Organizational Endowments and the Performance of University Start-ups. *Management Science*, *48*(1), 154–170.

Shaw, M. E., & Shaw, L. M. (1962). Some Effects of Sociometric Grouping upon Learning in a Second Grade Classroom. *The Journal of Social Psychology*, *57*(2), 453–458.

Shaw, M. E. (1981). *Group dynamics* (3d ed.). *McGraw-Hill series in psychology*. New York: McGraw-Hill.

Shenk, J. W. (July/August 2014). The Power of Two. *The Atlantic*, p. 76.

Shepherd, D. A. (2011). Multilevel Entrepreneurship Research: Opportunities for Studying Entrepreneurial Decision Making. *Journal of Management*, *37*(2), 412–420.

Shepherd, D. A., & DeTienne, D. R. (2005). Prior Knowledge, Potential Financial Reward, and Opportunity Identification. *Entrepreneurship Theory and Practice*, *29*(1), 91–112.

Shepherd, D. A., Douglas, E. J., & Shanley, M. (2000). New venture survival: Ignorance, external shocks, and risk reduction strategies. *Journal of Business Venturing*, *15*(5–6), 393–410.

Short, J. C., Ketchen, Jr., David 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.

Shrivastava, P. (1983). A Typology of Organizational Learning Systems. *Journal of Management Studies*, *20*(1), 7–28.

SIC and NAICS codes. (2010). Retrieved from http://www.dor.wa.gov/Content/Home/Default.aspx

Simonite, T. (2014). 3D-Scanner werden mobil. *Technology Review*, p. 36.

Sine, W. D., Mitsuhashi, H., & Kirsch, D. A. (2006). Revisiting burns and stalker: Formal structure and new venture performance in emerging economic sectors. *Academy of Management Journal*, *49*(1), 121–132.

Singh, J. V., Tucker, D. J., & House, R. J. (1986). Organizational Legitimacy and the Liability of Newness. *Administrative Science Quarterly*, *31*(2), 171–193.

Singh, R. P., Hills, G. E., Lumpkin, G. T., & Hybels, R. C. (1999). The entrepreneurial opportunity recognition process: Examining the role of self-perceived alertness and social networks. *Academy of Management Proceedings*, *1999*(1), 1–6.

Smith, B. R., Matthews, C. H., & Schenkel, M. T. (2009). Differences in Entrepreneurial Opportunities: The Role of Tacitness and Codification in Opportunity Identification. *Journal of Small Business Management*, *47*(1), 38–57.

Snijders, T. A. B., & Bosker, R. J. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. London, Thousand Oaks, Calif.: Sage Publications.

Snijders, T. A. B., & Bosker, R. J. (2012). *Multilevel analysis: An introduction to basic and advanced multilevel modeling* (2nd ed.). Los Angeles: Sage.

Snyder, M. L., & Frankel, A. (1976). Observer bias A stringent test of behavior engulfing the field. *Journal of Personality and Social Psychology*, *34*(5), 857–864.

Sobel, A. (2006). The Beatles Principles: Lessons about teamwork and creativity from the most successful band in history. *Strategy + Business*. (42), 32–35.

Sosa, M. E. (2011). Where Do Creative Interactions Come From?: The Role of Tie Content and Social Networks. *Organization Science*, *22*(1), 1–21.

Spörrle, M., Breugst, N., & Welpe, I. M. (2009). That seems to be promising! – Predicting opportunity evaluation by means of situational characteristics and individual cognitions. *International Journal of Entrepreneurial Venturing*, *1*(1), 41–56.

Srull, T. K., & Wyer, R. S. (1979). The role category accessibility in the interpretation of information about persons: Somer determinants and implications. *Journal of Personality and Social Psychology*, *37*(10), 1660–1672.

Stam, W., Arzlanian, S., & Elfring, T. (2014). Social capital of entrepreneurs and small firm performance: A meta-analysis of contextual and methodological moderators. *Journal of Business Venturing*, *29*(1), 152–173.

Stapel, D. A., & Koomen, W. (2001). I, we, and the effects of others on me: How self-construal level moderates social comparison effects. *Journal of Personality and Social Psychology*, *80*(5), 766–781.

Stata 14 help for xtmixed. Retrieved from http://www.stata.com/help.cgi?xtmixed

Steers, R. M. (1991). *Introduction to organizational behavior* (4th ed.). New York, NY: HarperCollins Publishers.

Sternberg, R. J. (2004). Successful intelligence as a basis for entrepreneurship. *Journal of Business Venturing*, *19*(2), 189–201.

Sternberg, R. J., Wagner, R. K., Williams, W. M., & Horvath, J. A. (1995). Testing common sense. *American Psychologist*, *50*(11), 912–927.

Stewart, G. L. (2006). A Meta-Analytic Review of Relationships Between Team Design Features and Team Performance. *Journal of Management*, *32*(1), 29–55.

Steyaert, C. (2007). 'Entrepreneuring' as a conceptual attractor? A review of process theories in 20 years of entrepreneurship studies. *Entrepreneurship & Regional Development*, *19*(6), 453–477.

Stigliani, I., & Ravasi, D. (2012). Organizing Thoughts and Connecting Brains: Material Practices and the Transition from Individual to Group-Level Prospective Sensemaking. *Academy of Management Journal*, *55*(5), 1232–1259.

Stinchcome, A. (1965). Social structure and organization. In J. G. March (Ed.), *Handbook of organizations*. Chicago: Rand McNally.

Suddaby, R. (2010). Editor's Comments: Construct Clarity in Theories of Management and Organization. *Academy of Management Review*, *35*(3), 346–357.

Swaminathan, W., Page, K. L., & Gürhan-Canli, Z. (2007). "My" Brand or "Our" Brand: The Effects of Brand Relationship Dimensions and Self-Construal on Brand Evaluations. *Journal of Consumer Research*, *34*(2), 248–259.

Taggar, S. (2002). Individual creativity and group ability to utilize individual creative resources: a multilevel model. *Academy of Management Journal*, *45*(2), 315–330.

Tajfel, H. (1974). Social identity and intergroup behaviour. *Social Science Information/sur les sciences sociales*, *13*(2), 65–93.

Tang, J., Kacmar, K. M., & Busenitz, L. (2012). Entrepreneurial alertness in the pursuit of new opportunities. *Journal of Business Venturing*, *27*(1), 77–94.

Taylor, D. W., Berry, P. C., & Block, C. H. (1958). Does Group Participation When Using Brainstorming Facilitate or Inhibit Creative Thinking? *Administrative Science Quarterly*, *3*(1), 23–47.

The Beatles anthology (1st ed.). (2000). San Francisco: Chronicle Books.

The State of Small Business. (1992). *Report from the U.S. Small Business Administration*. Washington, DC.

Thomas-Hunt, M. C., Ogden, T. Y., & Neale, M. A. (2003). Who's Really Sharing? Effects of Social and Expert Status on Knowledge Exchange Within Groups. *Management Science*, *49*(4), 464–477.

Thornhill, S., & Amit, R. (2003). Learning About Failure: Bankruptcy, Firm Age, and the Resource-Based View. *Organization Science*, *14*(5), 497–509.

Trafimow, D., Triandis, H. C., & Goto, S. G. (1991). Some Tests of the Distinction Between the Private Self and the Collective Self. *Journal of Personality and Social Psychology*, *60*(5), 649–655.

Tumasjan, A., Welpe, I., & Spörrle, M. (2013). Easy Now, Desirable Later: The Moderating Role of Temporal Distance in Opportunity Evaluation and Exploitation. *Entrepreneurship Theory and Practice*, *37*(4), 859–888.

Ucbasaran, D., Lockett, A., Wright, M., & Westhead, P. (2003). Entrepreneurial Founder Teams: Factors Associated with Member Entry and Exit. *Entrepreneurship Theory and Practice*, *28*(2), 107–128.

Ucbasaran, D., Westhead, P., & Wright, M. (2008). Opportunity Identification and Pursuit: Does an Entrepreneur's Human Capital Matter? *Small Business Economics*, *30*(2), 153–173.

Ucbasaran, D., Westhead, P., & Wright, M. (2009). The extent and nature of opportunity identification by experienced entrepreneurs. *Journal of Business Venturing*, *24*(2), 99–115.

Unger, J. M., Rauch, A., Frese, M., & Rosenbusch, N. (2011). Human capital and entrepreneurial success: A meta-analytical review. *Journal of Business Venturing*, *26*(3), 341–358.

Unsworth, N. (2010). Interference control, working memory capacity, and cognitive abilities: A latent variable analysis. *Intelligence*, *38*(2), 255–267.

Uzzi, B. (1997). Social Structure and Competition in Interfirm Networks: The Paradox of Embeddedness. *Administrative Science Quarterly*, *42*(1), 35–67.

Vaghely, I. P., & Julien, P.-A. (2010). Are opportunities recognized or constructed? *Journal of Business Venturing*, *25*(1), 73–86.

Van de Ven, Andrew H. (1986). Central Problems in the Management of Innovation. *Management Science*, *32*(5), 590–607.

Van Der Vegt, Gerben S., & Bunderson, J. S. (2005). Learning and performance in multidisciplinary teams: the importance of collective team identification. *Academy of Management Journal*, *48*(3), 532–547.

van Praag, C. M. (2003). Business Survival and Success of Young Small Business Owners. *Small Business Economics*, *21*(1), 1–17.

Venkataraman, S. (2012). The Distinctive Domain of Entrepreneurship Research. In H. Landstrom & F. T. Lohrke (Eds.), *Intellectual Roots of Entrepreneurship Research* (pp. 228–247). Elgar Research Collection. International Library of Entrepreneurship, vol. 23. Cheltenham, U.K. and Northampton, Mass.: Elgar.

Verbeek, M. (2008). *A guide to modern econometrics* (3rd ed). Chichester, England, Hoboken, NJ: John Wiley & Sons.

Ward, W. C. (1969). Rate and Uniqueness in Children's Creative Responding. *Child Development*, *40*(3), 869–878.

Watkins, D., & Gerong, A. (1999). Language of Response and the Spontaneous Self-Concept: A Test of the Cultural Accommodation Hypothesis. *Journal of Cross-Cultural Psychology*, *30*(1), 115–121.

Weinstein, Y., & Roediger, H. L. (2010). Retrospective bias in test performance: Providing easy items at the beginning of a test makes students believe they did better on it. *Memory & Cognition*, *38*(3), 366–376.

Welpe, I. M., Spörrle, M., Grichnik, D., Michl, T., & Audretsch, D. B. (2012). Emotions and Opportunities: The Interplay of Opportunity Evaluation, Fear, Joy, and Anger as Antecedent of Entrepreneurial Exploitation. *Entrepreneurship Theory and Practice*, *36*(1), 69–96.

West, G. P. (2007). Collective Cognition: When Entrepreneurial Teams, Not Individuals, Make Decisions. *Entrepreneurship Theory and Practice*, *31*(1), 77–102.

West, M. A., & Farr, J. L. (1990). Innovation at work. In M. A. West & J. L. Farr (Eds.), *Innovation and creativity at work: Psychological and organizational strategies* (pp. 3–13). Oxford, England: John Wiley & Sons.

West, M. A. (1990). The social psychology of innovation in groups. In M. A. West & J. L. Farr (Eds.), *Innovation and creativity at work: Psychological and organizational strategies* (pp. 309–333). Oxford, England: John Wiley & Sons.

Whittlesea, B. W. A. (1997). The representation of general and particularknowledge. In K. Lamberts & D. R. Shanks (Eds.), *Studies in cognition. Knowledge, concepts, and categories* (1st ed., p. 1997). Cambridge, Mass.: MIT Press.

Wiklund, J., & Shepherd, D. (2003). Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses. *Strategic Management Journal*, *24*(13), 1307–1314.

Wooldridge, J. M. (2003). *Introductory econometrics: A modern approach* (2nd ed). Australia, Cincinnati, Ohio: South-Western College Pub.

Wooldridge, J. M. (2012). *Introductory econometrics: A modern approach* (5th ed). Mason, Ohio: South-Western Cengage Learning.

Wright, M., Hmieleski, K. M., Siegel, D. S., & Ensley, M. D. (2007). The Role of Human Capital in Technological Entrepreneurship. *Entrepreneurship Theory and Practice*, *31*(6), 791–806.

Yampolsky, M. A., & Amiot, C. E. (2013). Priming self-determined and non-self-determined group identification: Effects on well-being and ingroup bias. *Group Dynamics: Theory, Research, and Practice*, *17*(3), 137–149.

Zahra, S. A. (1996). Governance, ownership, and corporate entrepreneurship: The moderating impact of industry technological opportunities. *Academy of Management Journal*, *39*(6), 1713–1735.

Zhou, J., & George, J. M. (2001). When job dissatisfaction leads to creativity: Encouraging the expression of voice. *Academy of Management Journal*, *44*(4), 682–696.

Zhou, J., & George, J. M. (2003). Awakening employee creativity: The role of leader emotional intelligence. *The Leadership Quarterly*, *14*(4-5), 545–568.

Zhou, W., & Rosini, E. (2015). Entrepreneurial Team Diversity and Performance: Toward an Integrated Model. *Entrepreneurship Research Journal*, *5*(1), 31–60.

Zika-Viktorsson, A., Sundström, P., & Engwall, M. (2006). Project overload: An exploratory study of work and management in multi-project settings. *International Journal of Project Management*, *24*(5), 385–394.

Zott, C., & Hui, Q. N. (2007). How Entrepreneurs UseSymbolic Management to Acquire Resources. *Administrative Science Quarterly*, *52*(1), 70–105.

Zou, X., & Ingram, P. (2013). Bonds and boundaries: Network structure, organizational boundaries, and job performance. *Organizational Behavior and Human Decision Processes*, *120*(1), 98–109.

APPENDIX

Appendix 1: Paper based priming text for neutral condition and team condition

Source: Own illustration

VENTURE NEWS
RESEARCH INSIGHTS

Team spirit as driver of success in a start-up

In the early phase of a start-up there is a vision to create something radically new based on a brilliant idea. The motives for founding a company and working in the own business can be of different nature.

Close relationships as co-founders, cooperation as equal partners, and consequently sharing responsibility for a business is oftentimes very important for successful founders. The relevance of these aspects appears in the daily work, but also the long-term strategic decisions for the venture.

Collaborative problem solving and joint decision making thereby represent critical success factors. This is the base for prioritizing and achieving collective goals, in order to ensure persistent success of the joint company. Working in a collaborative venture is a great opportunity for contributing and advancing own strengths within a team.

The resulting team dynamics are beneficial to creative processes. With respect to the fundament of success, many founders emphasize the importance of their team spirit, as one of their key characteristic as a successful founder.
[...]

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Blog comment of a successful founder:
„It is similar in our case. We thought a while, on what general advice we would give to young founders. Our strengths are our ability to work as a team and our trust. If we wouldn't continuously collaborate with all our energy, and wouldn't be strongly convinced of our ideas, our company wouldn't be that successful.
From the beginning onwards, we never shirked risky decisions, so that our venture can elicit its full potential and our ideas can become reality.   We always would repeat turning our passion into profession, because this is most important fundament of our success as a team.

Source: Own illustration

Appendix 2: Technology description

> ## Mobile 3D Scanners
>
> Researchers and engineers are currently developing a new technology for mobile 3D scanning. This technology enables an easy recognition of data on the shape and design of three-dimensional objects. The almost market-ready applications and sensors for mobile devices are highly innovative and have the potential to revolutionize a large variety of markets.
>
> Researchers from a leading institution in Europe are developing this technology and thereby rely on conventional cameras and sensors (yaw-rate-sensors and acceleration sensors), which are featured with most smartphones/tablets. The technology works by continuously focusing the device on and around a specific environment or object, which shall be scanned. Thereby a 3D model in sequentially built up and displayed on the screen of the mobile device. In this process graphic pixels are captured and the absolute size as well as directions are determined. The data reconstruction is accelerated by highly efficient algorithms and the graphics processor of the mobile terminal. As a consequence, 3D scans with high resolution can not only be generated everywhere and anytime, but are also presented instantly on the display of the mobile device.
>
> Initial tests have shown that this technology was compatible with most mobile devices and operating systems. Currently comparable methods are typically complex and require intense computing power. The new technology is faster, user-optimized and cheaper as comparable solutions for 3D scanning. Based on these results, you now have the chance to commercialize this technology in an entrepreneurial way.
>
> - *Which alternative market opportunities would you pursue with this technology?*
> - *What business opportunity should be prioritized in your opinion?*

Source: Own illustration

Appendix 3: List of team-oriented words for basic / conservative group (group 1) and for extended / less conservative group (group 2)

English word	Original German word	Group of analysis
Team	Team	Group 1, 2
Teams	Teams	Group 1, 2
Founder team	Gründerteam	Group 1, 2
Founding team	Gründungsteam	Group 1, 2
Founder teams	Gründerteams	Group 1, 2

Founding member	Gündungsmitglied	Group 1, 2
Founding team colleague	Gründungsteamkollege	Group 1, 2
Founding teams	Gründungsteams	Group 1, 2
Founding members	Gründungsmitgliedern	Group 1, 2
Cofounder	Mitgründerin	Group 1, 2
Cofounder	Mitgründer	Group 1, 2
Cofounders	Mitgründern	Group 1, 2
Co-founder	Mit-Gründerin	Group 1, 2
Co-founder	Mit-Gründer	Group 1, 2
Team member	Teammitglied	Group 1, 2
Team members	Teammitglieder	Group 1, 2
Team members	Teammitgliedern	Group 1, 2
Team player	Teamplayer	Group 1, 2
Partner	Partnerin	Group 1, 2
Partner	Partner	Group 1, 2
We	wir	Group 2
Together	zusammen	Group 2
Us	uns	Group 2
Our	unser	Group 2
Our	unsere	Group 2
Common	Gemeinsam	Group 2

Common	Gemeinsame	Group 2
Common	Gemeinsamer	Group 2
Common	Gemeinsames	Group 2
Together	Miteinander	Group 2
Teamwork	Zusammenarbeit	Group 2
Solidarity	Zusammenhalt	Group 2
Trust	Vertrauen	Group 2
Trust	Vertraue	Group 2
Trusted	vertraut	Group 2
Team spirit	Teamgeist	Group 2
Team goals	Teamziele	Group 2
Team feeling	Teamgefühl	Group 2
Team spirit	Teamgedanke	Group 2
Team composition	Teamzusammensetzung	Group 2
Collaborate	zusammenarbeiten	Group 2

Source: Own illustration

Note: Group 1 is the more conservative approach with more restricted number of words. Group 2 is less conservative and contains more team related words