

**Sustainable Opportunity Identification and Opportunity Deviation:
Insights from a Process Perspective Approach**

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Abstract

The process perspective provides a unifying framework that has substantially contributed to our understanding of entrepreneurship. However, much of the research up to now has neglected this process oriented conception of entrepreneurship. There is therefore a need for studies that take the inherent dynamic processes into account and analyze the underlying mechanisms when researching entrepreneurship. This dissertation aims to improve our understanding of the entrepreneurial process. Specifically, this dissertation focuses on new venture creation and the processes of sustainable opportunity identification and opportunity deviation.

Chapter 1 provides a general introduction that highlights the theoretical contributions of this dissertation and gives an overview over the conducted studies. Chapter 2 argues for a process model of entrepreneurship that places entrepreneurs and their actions center stage. The model combines different perspectives and levels of analysis and provides an integrative framework for researching new venture creation. In chapter 3 we establish and test a theoretical model of sustainable opportunity identification. The chapter explains how younger generations identify sustainable opportunities. The findings indicate that sustainable opportunity identification is a process with two transitions from problem to solution identification and from solution identification to sustainable opportunity identification. These transitions are contingent on awareness of consequences and entrepreneurial attitude. Chapter 4 offers insights into how deviation from the original opportunity increases the performance of entrepreneurial teams. The findings indicate that entrepreneurial teams with a high level of error orientation set themselves higher goals when deviating from their original opportunity. Higher goals then lead to higher team performance. Chapter 5 summarizes the overall findings and outlines the general theoretical and practical implications.

Each chapter thus contributes to the process perspective by focusing on how different phases of the entrepreneurial process unfold and develop over time. Thereby, this dissertation advances our understanding of entrepreneurship as a process.

Table of Contents

1. General Introduction	1
1.1 Contribution to the Literature	2
1.2 Outline of this Dissertation	4
2. Perspectives on New Venture Creation.....	7
2.1 Introduction	7
2.2 New Venture Creation as an Outcome of the Entrepreneurial Process	8
2.3 New Venture Creation from a Psychological Perspective.....	9
2.3.1 The Trait Approach.....	10
2.3.3 The Cognitive Approach.....	11
2.3.4 The Self- or Action-Regulation Approach.....	12
2.3.5 The Affect Approach	14
2.4 New Venture Creation from a Team Perspective	15
2.4.1 The Formation of Founding Teams	16
2.4.2 Founding Team Diversity	17
2.4.3 The Initial Team Size.....	18
2.4.4 Social Processes within Founding Teams.....	18
2.5 New Venture Creation from a Resource Perspective	20
2.5.1 The Role of Tangible and Intangible Resources in New Venture Creation.....	21
2.5.2 The Effects of Resource Constraints on New Venture Creation	23
2.5.3 Overcoming Resource Constraints	23
2.6 New Venture Creation from an Institutional Perspective.....	26
2.6.1 The Role of Formal, Informal and Social Institutions in New Venture Creation....	26
2.6.2 The Effects of Institutional Change on New Venture Creation.....	28
2.6.3 New Venture Creation as a Driver of Institutional Change.....	29
2.7 Future Research	30
2.7.1 Future Research Directions for Different Perspectives	30
2.7.2 Future Research: Combining the Different Perspectives and Taking an Integrative Approach.....	33
2.8 Conclusion	37
3. How Do They Do It? How Younger Generations Identify Sustainable Opportunities.....	40
3.1 Introduction	41

3.2 Theory and Hypotheses Development.....	45
3.2.1 Transitions from Problem Identification to Solution Identification and from Solution Identification to Sustainable Opportunity Identification.....	45
3.2.2 Awareness of Consequences: Facilitating the Transition from Problem Identification to Solution Identification.....	46
3.2.3 Entrepreneurial Attitude: Facilitating the Transition from Solution Identification to Sustainable Opportunity Identification.....	47
3.2.4 The Conditional Indirect Effects.....	48
3.3 Field Study: Methods.....	50
3.3.1 Sample and Procedure.....	50
3.3.2 Study Measures.....	51
3.3.3 Method of Analysis.....	54
3.4 Field Study: Results.....	55
3.4.1 Test of Hypotheses.....	55
3.5 Field Study: Discussion.....	62
3.6 Experiment I (Manipulating Awareness of Consequences): Method.....	62
3.6.1 Sample and Procedure.....	62
3.6.2 Measures.....	64
3.7 Experiment I: Results.....	66
3.8 Experiment II (Manipulating Entrepreneurial Attitude): Method.....	69
3.8.1 Sample and Procedure.....	69
3.8.2 Measures.....	71
3.9 Experiment II: Results.....	72
3.10 Overall Discussion.....	75
3.10.1 Contributions.....	75
3.10.2 Strengths and Limitations.....	77
3.11 Conclusion.....	80
4. Adjusting the Sails: How Deviation from the Business Opportunity affects Performance in Entrepreneurial Teams.....	81
4.1 Introduction.....	82
4.2 Hypotheses Development.....	85
4.2.1 Deviation from the Business Opportunity, Goal Setting and the Moderating Effect of Error Orientation.....	85
4.2.2 The effect of goals on performance.....	87

4.2.3 The conditional indirect effect of error orientation.....	88
4.3 Method.....	88
4.3.1 Procedure	88
4.3.2 Sample.....	89
4.3.3 Measures	90
4.3.4 Method of Analysis.....	93
4.4 Results	94
4.4.1 Test of Hypotheses.....	97
4.4.2 Robustness Tests and Supplemental Analysis	103
4.5 Discussion.....	103
4.5.1 Strength and Limitations.....	106
4.5.2 Implications for Practice and Future Research	107
4.6 Conclusion	108
5. General Discussion.....	109
5.1 General Theoretical Implication	109
5.2 General Practical Implication	111
5.3 General Conclusion	112
6. References	113

List of Tables

Table 1. Field Study Results for the Transition from Problem Identification to Solution Identification	57
Table 2. Field Study Results for the Transition from Solution Identification to Sustainable Opportunity Identification.....	59
Table 3. Field Study Results for the Conditional Indirect Effects of Entrepreneurial Attitude and Awareness of Consequences	61
Table 4. Results for Experiment 1 - Manipulating Awareness of Consequences	68
Table 5. Results for Experiment 2 - Manipulating Entrepreneurial Attitude	74
Table 6. Correlations of Aggregated Variables	95
Table 7. Correlations of Aggregated Variables at t and t+1	96
Table 8. Goals regressed on Deviation from the Business Opportunity and Error Orientation over Time	98
Table 9. Performance (t+1) regressed on Goals (t)	100
Table 10. Indirect and Conditional Indirect Effect of Deviation from Business Opportunity and Error Orientation on Performance through Goals	102

List of Figures

Figure 1. The Integrative Model of New Venture Creation	8
Figure 2. Theoretical Model of how the Younger Generations Identify Sustainable Opportunities	44
Figure 3. The Moderating Effect of Awareness of Consequences on the Relationship between Problem and Solution Identification	57
Figure 4. The Moderating Effect of Entrepreneurial Attitude on the Relationship between Solution Identification and Sustainable Opportunity Identification	59
Figure 5. Our Theoretical and Analytical Model of the Interplay between Deviation from the Business Opportunity, Error Orientation, Goals and Performance	84
Figure 6. The Three-way Interaction of Deviation from the Business Opportunity, Error Orientation and Time on Goals	100

1. General Introduction

Entrepreneurship plays an integral part in economic, societal, and individual development (Acs, Desai, & Hessels, 2008; Boyd & Vozikis, 1994; Carree & Thurik, 2008; McMullen, Bagby, & Palich, 2008). Entrepreneurs drive this development by recognizing, evaluating, and exploiting business opportunities in order to create new services or products (Brandstätter, 2011; Shane, 2003; Shane & Venkataraman, 2000). The importance of entrepreneurship is highlighted by the active research in numerous social science disciplines like economics, psychology, education, or development studies (Baumol, 1968; Benson, 2004; Frese & Gielnik, 2014; McMullen, 2011). However, the field is still fragmented and entrepreneurship scholars call for more research on central entrepreneurial processes that explain new venture creation (Baron, 2007b; Lumpkin, Moss, Gras, Kato, & Amezcua, 2013; McMullen & Dimov, 2013; Shane & Venkataraman, 2000). Accordingly, the process perspective has received increasing attention (Baron, 2007b; DeTienne, 2010; Jack & Anderson, 2002; McMullen & Dimov, 2013; Moroz & Hindle, 2012; Shane, 2003, 2012). The process perspective defines entrepreneurship as a continuous, evolving process with different phases (Shane, Locke, & Collins, 2003). This is exemplified in the work by Baron (2007b), who distinguishes between the pre-launch phase (i.e. the identification and initial evaluation of the opportunity), the launch phase (i.e. registering the business, developing plans and strategies), and the post-launch phase (i.e. managing the business). Another example is the work by Bhave (1994), who distinguished between the intangible stage of opportunity recognition and the tangible stages of organization creation, and the exchange stage, in which the entrepreneur interacts with costumers. Although scholars may divide the process differently, they generally agree on a common set of activities that the entrepreneur has to perform. In principle, these activities include the identification, evaluation, and exploitation of

opportunities (Shane, 2003). The process perspective thus provides a unifying framework for research on entrepreneurship and thereby contributes substantially to the entrepreneurship literature (Moroz & Hindle, 2012). However, there is a continuing need for research on entrepreneurial processes (Shane, 2012). Specifically, scholars call for studies that take the inherent dynamic processes into account and analyze the underlying sub-processes when researching entrepreneurship (McMullen & Dimov, 2013). This dissertation aims to answer this call by providing an integrative process model of new venture creation and by analyzing the underlying mechanisms and boundary conditions of sustainable opportunity identification and deviation from the original opportunity.

1.1 Contribution to the Literature

This dissertation seeks to deepen our understanding of the entrepreneurial process. Specifically, we¹ contribute to the literature on entrepreneurship in three ways.

First, we develop an integrative process model that combines different perspectives and variables at the micro, meso, and macro level into a single theoretical framework to explain new venture creation. Developing integrative models with variables at multiple levels is important for three reasons. First, to date, the entrepreneurship literature is still dominated by micro level analysis, focusing on the individual level. Second, the number of studies that apply a team level approach remains low. Third, mixed level approaches are still underrepresented (Davidsson & Wiklund, 2001). These are serious weaknesses because entrepreneurship occurs and has effects on different levels simultaneously (Davidsson & Wiklund, 2001; Low & MacMillan, 1988). The combination and integration of theories from different levels thus offers a more promising approach that can result in theoretical models with higher predictive value.

¹ I use the term “we” because the research that is reported in this dissertation has benefitted from close collaboration with my co-authors.

Second, we develop and test a theoretical model of sustainable opportunity identification. Opportunity identification has provided substantial insights into new venture creation (Baron, 2006, 2007b; Davidsson, 2015; Dimov, 2007; Eckhardt & Shane, 2003; Shane, 2003; Shane & Venkataraman, 2000; Wood & McKinley, 2010). The process of opportunity identification is generally understood as the starting point of the entrepreneurial process and can broadly be defined as the process of elaborating, refining and changing initial business ideas (Baron, 2007b; Dimov, 2007; Gartner, 1985; McMullen & Shepherd, 2006; Wood & McKinley, 2010). While the process of opportunity identification has been examined already in the entrepreneurship literature (Ardichvili, Cardozo, & Ray, 2003; Baron, 2006; DeTienne & Chandler, 2004; Gaglio & Katz, 2001; Gielnik, Frese, Graf, & Kampschulte, 2012; Ucbasaran, Westhead, & Wright, 2008), an examination of the conditions leading to opportunity identification in sustainable entrepreneurship is still on-going. Given the relevance of sustainable entrepreneurship, researchers begun to investigate the phenomenon and discovered that especially the younger generations are more likely to engage in sustainable entrepreneurship (Bosma & Levie, 2010; Bosma, Schott, Terjesen, & Kew, 2016). However, we do not know how they actually do it. To address this gap, we analyze how and when younger generations identify sustainable opportunities. Our study thus informs theories that seek to explain how opportunities are identified in sustainable entrepreneurship.

Third, we develop and test a theoretical model of deviation from the business opportunity. Entrepreneurs constantly have to deviate from their original opportunity while launching a new venture. Ample evidence is provided by Ravasi and Turati (2005). They show that opportunities are often immature and intuitive ideas. Before these ideas can be implemented in a marketable manner, it usually requires additional information regarding the market itself, the customer preferences, distribution channels, functionality of the product and so on (Ravasi & Turati, 2005). Further evidence is provided by Hmieleski and Baron (2008)

who found that deviating from the original business opportunity positively affects the business's performance. However, we lack an understanding of why and under which conditions deviation has a positive effect on the performance of entrepreneurial teams. To address this gap we analyze the underlying mechanism and boundary condition of how and when entrepreneurial teams deviate successfully from their business opportunity. Our study thus informs theories that seek to explain how deviation from the business opportunity increases performance over time.

1.2 Outline of this Dissertation

A thorough understanding of the entrepreneurial process requires that one understands the bigger picture as well as the underlying mechanisms. To this end, we first develop an integrative process model that combines different perspectives and variables at the micro, meso, and macro level into a single theoretical framework, and second, we develop and test the underlying mechanisms and boundary conditions of sustainable opportunity identification, and deviation from the original opportunity.

In chapter 2 we argue for an integrated approach that combines different perspectives and levels of analysis when researching entrepreneurship. More specifically we first provide an overview of the psychological, team, resource, and institutional perspective and the main theoretical approaches these perspectives adopted to explain entrepreneurship. Second, we propose a theoretical process model that integrates the different perspectives in order to explain new venture creation. Specifically, we place entrepreneurs and their actions center stage because entrepreneurs are the ones who identify, evaluate, and exploit opportunities for new venture creation and engage in start-up activities (Shane & Venkataraman, 2000; Shane, 2000, Gartner, 1985). We, therefore, understand new venture creation as the outcome of the actions and decisions taken by entrepreneurs to exploit opportunities (Baron, 2007b; Lichtenstein, Carter, Dooley, & Gartner, 2007; McMullen & Shepherd, 2006). We further

argue that factors on the individual, team, and societal level influence new venture creation either indirectly through the entrepreneurs' actions or interact with the entrepreneurs' actions on new venture creation. Third, we outline particular research gaps for each perspective and how future research may address these gaps. This chapter thus provides an integrative process model that future researchers can use to study new venture creation.

In the third chapter we analyze in detail how and under which conditions the younger generations identify sustainable opportunities. We provide an individual level approach that combines theories from the domain of entrepreneurship and sustainable behavior. Specifically, we propose that sustainable opportunity identification is based on a process model with two transitions. The first transition is from problem identification to solution identification and the second transition from solution identification to sustainable opportunity identification. The question why the younger generations make the transitions in the process of sustainable opportunity identification can be answered by including moderating effects in our model. We propose that the transitions from problem to solution identification and from solution to sustainable opportunity identification are contingent on awareness of consequences and entrepreneurial attitude, respectively. To test the theoretical model, we conducted a field study as well as two randomized controlled experiments. The results confirmed the successive process and the hypothesized moderating effects of awareness of consequences and entrepreneurial attitude. Our findings show that the process of sustainable opportunity identification is contingent on awareness of consequences and entrepreneurial attitude.

In chapter four we analyze how deviating from the business opportunity increases the entrepreneurial team's goals and performance. We develop a theoretical model that draws on action regulation theory to better understand the dynamic process of goal-setting within entrepreneurial teams. More specifically, we argue that entrepreneurial teams need to have a

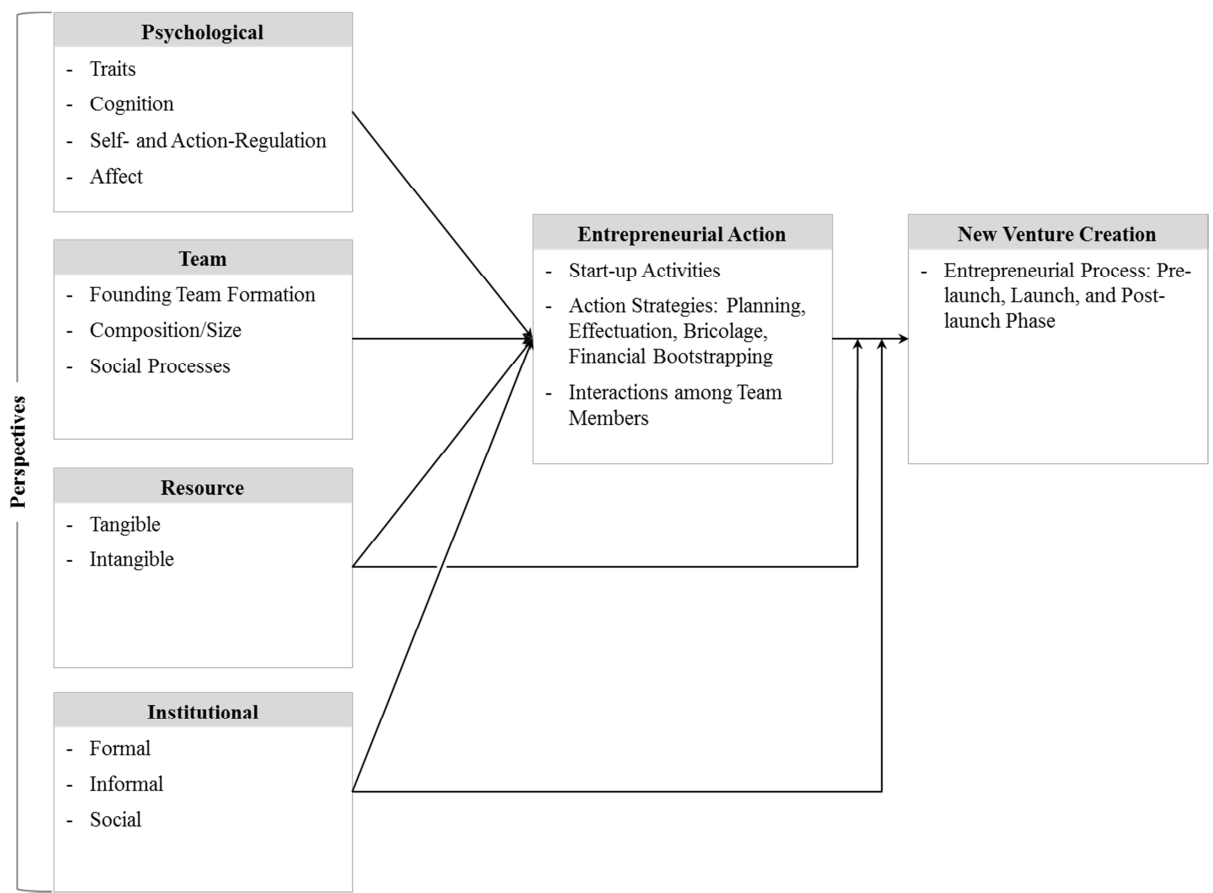
high level of error orientation when deviating from their original opportunity in order to set higher goals over time. In accordance with goal-setting theory we further argue that higher goals will have a positive effect on the team's performance. We suggest that action regulation theory and error orientation help to understand the mechanism of how and when entrepreneurial teams deviate successfully from their original opportunity. To test our theoretical model we conducted a longitudinal field study with one baseline measurement and 5 bi-weekly measurements. Our findings indicate that entrepreneurial teams with a high level of error orientation set themselves higher goals when deviating from their business opportunity. Higher goals then lead to higher team performance.

2. Perspectives on New Venture Creation

2.1 Introduction

In this chapter, we provide an overview of theories useful to understand new venture creation. In particular, we focus on theories from four broader perspectives: the psychological, team, resource, and institutional perspective. This allows us to consider individual-level factors as well as interpersonal factors and societal-level factors. The four perspectives we discuss in this chapter cover the main theoretical approaches scholars have adopted to explain new venture creation. Against this background, we will first outline and explain the different theoretical frameworks. Second, we will clarify what the main research questions for each perspective are, and how previous research has sought to address these questions. In the third part, we will highlight specific gaps in the literature and how future research could address these gaps. We propose a theoretical model that combines the different perspectives in an integrative model (see Figure 1). At the center of this integrative model we place the entrepreneur, whose actions are fundamental to the creation of new ventures (Baron, 2007a; Frese, 2009). We thus understand new venture creation as a process in which entrepreneurial action is the only factor directly influencing new venture creation. The other factors either indirectly influence new venture creation through the entrepreneurs' actions or interact with the entrepreneurs' actions on new venture creation (Frese & Gielnik, 2014). The last part of this chapter will provide a specific approach that future researchers can use to study new venture creation.

Figure 1. The Integrative Model of New Venture Creation



2.2 New Venture Creation as an Outcome of the Entrepreneurial Process

We understand new venture creation as an outcome of the entrepreneurial process. According to Gartner (1988), new venture creation or the process by which new ventures and organizations come into existence is the ‘primary phenomenon of entrepreneurship’ (p. 57). The entrepreneurial process comprises the discovery, evaluation, and exploitation of a business opportunity (Baron, 2007b; Shane & Venkataraman, 2000). Baron (2007b) defines three major phases in the entrepreneurial process, distinguishing between the pre-launch, launch, and post-launch phase. In the pre-launch phase entrepreneurs identify opportunities, and develop these into a viable and feasible product or service. In the launch phase, they create an overall strategy to advance the business idea and start with the acquisition of resources necessary for starting the venture. Finally, the post-launch phase refers to managing the new venture.

The central research questions to understand the entrepreneurial process can be summarized as follows: (1) What are the specific tasks and steps in the entrepreneurial process (Baron, 2007b; Carter, Gartner, & Reynolds, 1996; Gartner, 1988; Hisrich, Langan-Fox, & Grant, 2007; Shane, 2003)? (2) What are the main factors driving success in the entrepreneurial process (Baron, 2007b)? Scholars have approached these two questions from different perspectives. Scholars adopting a psychological perspective have examined micro-level factors, such as entrepreneurs' competencies (including knowledge, skills, cognitions, motivations, and personal characteristics) that are required in the different phases of the entrepreneurial process (psychological perspective) (Baron, 2007b; Hisrich et al., 2007; Jack & Anderson, 2002; Zhou, 2008). On a macro level, scholars have examined the role institutional and resource factors play in the entrepreneurial process (institutional and resource perspective) (Aldrich & Zimmer, 1986; Alvarez & Busenitz, 2001; Jack & Anderson, 2002; Meek, Pacheco, & York, 2010; Welter, 2011). Finally, on a meso level, scholars have adopted a team perspective examining team processes that influence the entrepreneurial process (team perspective) (Cooney, 2005; Cooper, Woo, & Dunkelberg, 1989; Kamm, Shuman, Seeger, & Nurick, 1990).

In the next sections, we describe in more detail the different perspectives that explain new venture creation and the entrepreneurial process.

2.3 New Venture Creation from a Psychological Perspective

Brandstätter (2011) stated that the psychological perspective on entrepreneurship substantially contributed to the understanding of how entrepreneurs think, what they aim for, what they do, and what they actually achieve. Central to the psychological perspective of new venture creation is (a) the trait approach, (b) the cognitive approach, (c) the self- and action-regulation approach, and (d) the affect approach. Essentially, the psychological perspective

emphasizes the importance of psychological mechanisms underlying and leading to entrepreneurial action (see Figure 1).

2.3.1 The Trait Approach

The trait approach can be described as the search for characteristics and traits of the entrepreneur (Gartner, 1988). ‘In this approach the entrepreneur is the basic unit of analysis and the entrepreneur’s traits and characteristics are the key to explaining entrepreneurship as a phenomenon [...]’ (Gartner, 1988, p. 48). The general assumption of the trait approach is that traits and individual characteristics have an effect on entrepreneurs’ actions through motivation and decision making (cf. Judge & Ilies, 2002). The trait approach combines a number of different theories, for example, the big five personality traits concept, which describes the following five personality dimensions: openness, conscientiousness, extraversion, agreeableness, and neuroticism (Norman, 1963). Zhao and Seibert (2006) show in their meta-analytical study that entrepreneurs differ substantially from managers with regard to conscientiousness, openness to experience, neuroticism, and agreeableness. The results suggest that entrepreneurs are more conscientious and open to new experiences as well as less neurotic and less agreeable. However, scholars agree that the five factor model is too distal to explain entrepreneurship (Baum & Frese, 2007). Consequently, the trait approach has developed more specific constructs that go beyond the big five and are more proximal to entrepreneurship (Baum & Frese, 2007; Frese & Gielnik, 2014; Rauch & Frese, 2007). An example is McClelland’s (1965) need theory. McClelland’s theory is based on three basic needs: need for achievement, need for power, and need for affiliation, which affect peoples’ actions. McClelland (1965) has argued that entrepreneurs are especially high in need for achievement because they strive for situations in which they can excel. In fact, meta-analytic research has supported this theory, showing that need for achievement is related to entrepreneurship (Collins, Hanges, & Locke, 2004; Rauch & Frese, 2007). An interesting

finding from the trait approach is that risk propensity, a trait commonly associated with entrepreneurship in the popular media, is only weakly related to entrepreneurship (Rauch & Frese, 2007; Stewart & Roth, 2004). This finding indicates that the role of risk propensity is either overrated or the relationship between risk propensity and entrepreneurship is more complex than a purely linear relationship. In recent years, the trait approach has lost some of its appeal to explain entrepreneurship. In fact, Gartner (1988) has noted that asking ‘Who is an entrepreneur?’ is the wrong question and does not help much to understand successful entrepreneurship and venture creation. Although traits are related to entrepreneurship, traits do not elucidate the underlying processes and mechanisms that lead to new venture creation. Consequently, traits do not help to develop leverage points to promote entrepreneurship. To gain deeper insights into the processes and mechanisms involved in entrepreneurship, scholars have turned to a cognitive and self-/action-regulatory perspective on entrepreneurship.

2.3.3 The Cognitive Approach

The cognitive approach has focused on entrepreneurial cognition (Baron, 2004). Entrepreneurial cognition is defined as the knowledge structures that entrepreneurs use to think, reason, and behave in order to evaluate opportunities, create new ventures, and grow their ventures (Mitchell et al., 2002, 2007). The cognitive approach assumes that entrepreneurs’ actions and decisions are heavily influenced by cognitive factors and mechanisms (Baron & Ward, 2004). For example, opportunity identification and exploitation depend on people’s capacities to acquire and process relevant information (Shane & Venkataraman, 2000). Scholars have therefore suggested that a cognitive approach is particularly helpful to understand why some people are more successful in the entrepreneurial process than others (Mitchell et al., 2002, 2007). Central cognitive factors are knowledge (including experience and expertise) (Keh, Foo, & Lim, 2002; Shane, 2000; Simon, Houghton, & Aquino, 2000; Zhou, 2008), cognitive capabilities (e.g. general mental ability

and creativity), and decision-making biases or heuristics (e.g. overconfidence or illusion of control). Knowledge is central to the entrepreneurial process as it helps entrepreneurs to identify new business opportunities, proceed more efficiently through the launch phase, and develop better strategies to grow their ventures. Meta-analytic evidence has provided extensive support for the important role of knowledge in the entrepreneurial process (Crook, Todd, Combs, Woehr, & Ketchen, 2011; Martin, McNally, & Kay, 2013; Unger, Rauch, Frese, & Rosenbusch, 2011). Similarly, cognitive capabilities, such as creativity, help entrepreneurs to process and combine new information with positive effects on generating business ideas and problem solutions (Gielnik, Frese, Graf, & Kampschulte, 2012; Gielnik, Krämer, Kappel, & Frese, 2014a). Finally, scholars have linked decision-making biases and heuristics, such as overconfidence and illusion of control (the overestimation of one's skills to control the outcome of a certain situation (Keh et al., 2002; Simon et al., 2000)) to entrepreneurship. Overconfidence is a cognitive bias and as such leads to flawed decisions. Research has shown that overconfidence has a positive effect on starting a business but a negative effect on survival (Dawson & Henley, 2012). On the one hand, overconfidence helps to overcome the initial uncertainty inherent in new venture creation, because people are overly confident that their venture will be successful. On the other hand, overconfidence has a negative effect on venture performance and survival because overconfidence leads to flawed decisions, biased forecasts, and escalation of commitment (Frese & Gielnik, 2014). In general, the cognitive approach has great potential in explaining new venture creation by providing insights into the decision-making processes of entrepreneurs and how they identify and exploit opportunities.

2.3.4 The Self- or Action-Regulation Approach

The self- or action-regulation approach focuses on regulatory and motivational aspects influencing entrepreneurs' actions (Frese, 2007; McMullen & Shepherd, 2006). A central

assumption in literature is that any form of entrepreneurship requires action (Frese, 2007; McMullen & Shepherd, 2006). Entrepreneurs have to identify and develop business opportunities, they have to acquire the necessary resources and equipment to build viable business structures, and they have to manage the business to ensure growth and survival of the new venture. Several theories in entrepreneurship consider action to be the key success factor (Baron, 2007a; Frese, 2009; McMullen & Shepherd, 2006). Action is goal-oriented behavior (Frese, 2009). Given the importance of action, scholars have suggested that self- and action-regulatory factors are central to understanding entrepreneurship. Self-regulation is defined as an internal or transactional process that enables a person to guide his or her goal-directed activities over time and across changing circumstances (Karoly, 1993). Similarly, action-regulation refers to how individuals regulate their actions to achieve goals actively (Frese, 2007). Important theories in this domain are control theories (Carver & Scheier, 1982), social cognitive theory (A. Bandura, 1991), and action-regulation theory (Frese & Zapf, 1994). These theories seek to explain how people initiate and maintain action. Building on these theoretical frameworks, entrepreneurship scholars have particularly focused on constructs such as goal-setting, goal intentions, action planning, and entrepreneurial self-efficacy (Brinckmann, Grichnik, & Kapsa, 2010; Castrogiovanni, 1996; Delmar & Shane, 2003; Gielnik, Frese, Kahara-Kawuki, Wasswa Katono, Kyejjusa, Ngoma et al., 2015; Gielnik et al., 2014a; Gruber, 2007; Honig & Samuelsson, 2012). Goal intentions reflect what entrepreneurs want to achieve. The strength of entrepreneurs' goal intentions is an indicator of the effort they are willing to invest (Bird, 1988). Action plans are mental simulations of actions outlining how to achieve a goal (Frese, 2009). Entrepreneurial self-efficacy is rooted in social cognitive theory (A. Bandura, 1991) and reflects entrepreneurs' confidence in their skills to successfully complete entrepreneurial tasks (Chen, Greene, & Crick, 1998). Goal-setting and action planning helps to initiate and maintain entrepreneurial action; accordingly, goal-setting

and action planning have been consistently linked to entrepreneurial success across all phases of the entrepreneurial process (Baron, 2007b; Baum, Locke, & Kirkpatrick, 1998; Brinckmann et al., 2010; Frese & Zapf, 1994; Frese, 2007; Frese, Krauss, Keith, Escher, Grabarkiewicz, Luneng, & Friedrich, 2007; Gielnik, Barabas, Frese, Namatovu-Dawa, Scholz, Metzger, & Walter, 2013). Similarly, entrepreneurial self-efficacy has a motivational function with positive effects in all phases of the entrepreneurial process (Rauch & Frese, 2007). The self-/action-regulatory approach is particularly useful to understand new venture creation insofar as it specifically looks at the processes underlying entrepreneurs' actions to create a new venture.

2.3.5 The Affect Approach

Finally, the affect approach examines how feelings or emotions influence entrepreneurs' actions and thus new venture creation (Foo, Uy, & Baron, 2009). Emotion is conceptualized as a construct with two dimensions: activation and valence (Russell, 1980). Activation describes the state of wakefulness or attention and is usually indicated as high or low; valence describes whether an emotion is pleasant or unpleasant (Baron, Hmieleski, & Henry, 2012). We can thus distinguish between positive and negative affect, and high and low activation. In entrepreneurship, scholars have mainly focused on the motivating function of positive affect with high activation. An example of a positive and activating affect is entrepreneurial passion. Entrepreneurial passion describes strong and positive feelings that entrepreneurs experience when they are engaged in key activities that are important to the self-identity of the entrepreneur (Cardon, Sudek, & Mitteness, 2009). In regard to new venture creation, scholars have proposed that entrepreneurial passion can promote creativity, the discovery and exploitation of opportunities, the acquisition of resources, and other activities important for launching a new venture (Cardon, Grégoire, Stevens, & Patel, 2013). However, further research has shown that not only positive affect but also negative affect increases

entrepreneurs' efforts to create a new venture. Whereas positive affect is positively related to effort in tasks that go beyond immediately required tasks, negative affect is positively related to effort in tasks that are immediately required (Foo et al., 2009). The beneficial function of negative affect has also been demonstrated by Bledow, Schmitt, Frese, and Kühnel (2011) and Bledow, Rosing, and Frese (2013), who have shown that a shift from negative to positive affect increases people's creativity. In conclusion, both positive and negative affect play an important role in influencing several mechanisms important for entrepreneurship, such as opportunity identification, effort, and creativity (Baron, 2008).

After focusing on the individual-level we will now turn to the team level and its role in the entrepreneurial process.

2.4 New Venture Creation from a Team Perspective

Prior research concentrated mostly on the single entrepreneur as the driving force behind new venture creation (Baron, 2007a). However, a large percentage of new ventures are created and led by teams (Cooper et al., 1989; Kamm et al., 1990). These are usually described as founding teams. Founding teams are two or more persons, who have a common interest in actively establishing a new venture, leading the venture, and having the final decision-making authority regarding the venture (Brinckmann & Hoegl, 2011; Cooney, 2005; Kamm et al., 1990).

The team perspective focuses on four general research questions. First, how do founding teams form or what are the factors that influence the formation of teams (Bird, 1989; Forbes, Borchert, Zellmer-Bruhn, & Sapienza, 2006; Kamm et al., 1990)? Second, how does the composition of the team affect new venture creation? More precisely, how does team diversity in terms of background (gender, age, race) and functional (experience, education) variables influence new venture creation (Ensley & Hmieleski, 2005; Hoogendoorn, Oosterbeek, & van Praag, 2013; Kamm et al., 1990; Klotz, Hmieleski, Bradley, & Busenitz,

2013)? Third, how does team size affect new venture creation (Brinckmann & Hoegl, 2011; Brinckmann, Salomo, & Gemuenden, 2011; Cooper et al., 1989; Kamm et al., 1990; West, 2007)? Fourth, what are the social processes in founding teams and how do they affect performance (Brinckmann & Hoegl, 2011; Brinckmann et al., 2011; Ensley & Hmieleski, 2005; Lechler, 2001)? The fourth question is particularly important as it looks at the underlying mechanisms and processes relevant for new venture creation. We suggest that team members' interactions and the entrepreneurial actions by the teams are mediating mechanisms in the relationship to new venture creation (see Figure 1). In the following, we describe this perspective in more detail.

2.4.1 The Formation of Founding Teams

The first research question deals with the formation of teams. Although there is no recipe on how to create the perfect new venture team, scholars have identified some standard influences on how teams come together. For example, Kamm et al. (1990) adopted social network theory and argued that team members are not selected based on the complementarity of each individual's skills and knowledge, but that new venture teams typically develop out of existing relationships. The interpersonal attraction theory has a similar approach and posits that the inherent human desire for interpersonal attraction and social connection is the main driver influencing team formation (Forbes et al., 2006). Likeability, proximity, enjoyment of each other's company, likeness, and complementarity of characteristics are central factors to this theory and influence whether people are attracted to each other or not (Kamm et al., 1990). However, Bird (1989) showed that economic rationalism can also be a factor in team formation. In this context, factors such as willingness to invest money, or know-how in new venture creation, are the main drivers of the formation process (Bird, 1989). In conclusion, interpersonal attraction, economic rationalism, and further factors like social networks or shared backgrounds are factors explaining formation of founding teams.

2.4.2 Founding Team Diversity

The second research question deals with team diversity, which describes the degree to which team members differ, with regard to factors such as gender, age, or nationality. The relationship between team diversity and performance is however inconsistent: there are positive as well as negative effects of team diversity (van Knippenberg, De Dreu, & Homan, 2004). The apparent advantage of diversified teams is that they have access to more information and expertise. One reason why diversity results in negative effects is intergroup bias, referring to the categorization of team members into similar in-group members or dissimilar out-group members (van Knippenberg et al., 2004; van Knippenberg & Schippers, 2007). This categorization is usually accompanied by less positive reactions to members with an out-group status, which can result in relational conflicts, low identification with and commitment to the group, low satisfaction, and high turnover (van Knippenberg et al., 2004). Ensley and Hmieleski (2005) analyzed the difference between new venture teams with a shared background and independent new venture teams, finding positive relationships between diversity and performance. In particular they found that independent (diverse) teams showed advanced group dynamics and performed better in terms of revenue growths and cash flow. These independent teams were more heterogeneous in terms of education, experience, expertise, and skills compared with teams with a shared background. This helped them in the process of new venture creation by being more efficient in planning and problem solving, as well as reacting faster and being more flexible. Similarly, Hoogendoorn et al. (2013) analyzed the composition of founding teams with regard to the gender distribution. Their findings suggest that an equal gender distribution results in better performance in terms of sales and profits compared with male-dominated teams. In conclusion, research findings suggest that independent and diverse founding teams have an advantage over homogeneous founding teams with a shared background.

2.4.3 The Initial Team Size

The third question deals with the initial team size. Several studies have focused on the initial team size as a predictor of new venture performance (Cooper et al., 1989; Feeser & Willard, 1990; Klotz et al., 2013; Lechler, 2001). The theoretical consideration is that larger teams have a greater pool of resources. In fact, research shows that a founding team with more members has access to a wider range of resources, including the initial capital and the available networks, as well as individual experience and expertise (Cooper et al., 1989; Eisenhardt & Schoonhoven, 1990; Sine, Mitsuhashi, & Kirsch, 2006; Teach, Tarplay, & Schwartz, 1986). The consistent result of these studies is that the size of the founding team is related to the venture's success in terms of opportunity recognition and exploitation, survival, and performance. However, larger teams may be more susceptible to process loss. Process loss is the team's inability to realize their full potential (Kerr & Tindale, 2004). One reason for process loss is that the team fails to identify members' competencies and thus fails to utilize their resources (Kerr & Tindale, 2004). Especially in larger teams process loss is usually due to redundant communication and conflict, resulting in reduced productivity (Haleblian & Finikelstein, 1993).

2.4.4 Social Processes within Founding Teams

The fourth question deals with social processes and the actions and interactions taking place in teams. Recently, research shifted its focus from team composition factors to the social processes and interactions within teams in order to explain new venture performance (Baron & Tang, 2008; Brinckmann & Hoegl, 2011; Ensley & Hmieleski, 2005; Ensley, Pearson, & Amason, 2002; Hoegl and Gemuenden, 2001). This shift is based on the consideration that team composition represents an easy to observe factor, which, however, is too distal from the processes and actions influencing new venture performance. Team

composition constitutes the input, which is less proximal to the outcome (new venture performance) than the social processes. Thus, in order to understand how new venture performance is achieved, it is necessary to analyze how and which social processes occur in teams (van Knippenberg & Schippers, 2007).

Important social processes that occur among the team members are, for example, team cohesion, shared strategic cognition, team potency, and conflicts (Ensley & Hmieleski, 2005). Team cohesion describes the internal solidarity and affects the team's performance by influencing the members' motivation and commitment (Ensley & Hmieleski, 2005). Shared strategic cognition refers to the degree of agreement on the venture's future development. A high level of agreement entails a high level of commitment with positive effects on new venture creation (Ensley & Hmieleski, 2005). Team potency is similar to self-efficacy, as both describe the degree to which the team or self is convinced to successfully realize their plans. A founding team with high team potency thus strongly believes that they can start and manage a new venture (Pearce, Gallagher, & Ensley, 2002). Conflicts within teams received much attention. Ensley and Pearce (2001) divided conflicts into two categories: a) cognitive conflicts and b) affective conflicts. Cognitive conflicts refer to the members' disagreement about the activities, strategies, and goals necessary to implement the new venture and as such can contribute to a positive exchange of ideas (Pearce et al., 2002). Affective conflicts have personal differences as the subject of discussion and as such are more likely to lead to discord (Ensley and Hmieleski, 2005; van Knippenberg et al., 2004).

In summary, the team perspective is able to explain phenomena in new venture creation that have not been addressed by the psychological perspective, which has mainly focused on the individual entrepreneur. However, it is important to note that team formation, composition, and size are only distal factors. In the same way as individual characteristics

(see psychological perspective), team characteristics have an indirect effect on new venture creation through actions and interactions of the team members (see Figure 1).

2.5 New Venture Creation from a Resource Perspective

Scholars agree that the availability of resources is a central factor for the creation of new ventures (Alvarez & Busenitz, 2001; De Mel, McKenzie, & Woodruff, 2008; Evans & Leighton, 1989; Ho & Wong, 2007). Resources are necessary to establish business structures in order to be able to pursue and exploit business opportunities, and they substantially contribute to the venture's success and survival (Chrisman, Bauerschmitt, & Hofer, 1998). Scholars have even suggested that combining resources in novel ways to deliver superior value is the very essence of entrepreneurship (Ardichvili, Cardozo, & Ray, 2003). Resources play two roles (see Figure 1): on the one hand, the availability of resources influences entrepreneurs' actions and new venture creation (main effect of resources). On the other hand, the absence of resources makes it less likely that entrepreneurs' actions lead to new venture creation. In the following, we will explain to what extent tangible and intangible resources promote entrepreneurial action to create new ventures (main effect). Moreover, we will focus on new venture creation under resource constraints and how concepts like financial bootstrapping, bricolage, and effectuation might help to overcome a lack of resources (integrative effect).

The resource-based view explains and analyzes the sources of competitive advantages for existing enterprises (Barney, 1991). It introduces two assumptions, which are that: a) resources among the different firms of an industry are heterogeneously distributed, and b) these strategic resources are to a certain degree immobile, which guarantees that competitive advantages can be maintained over time (Barney, 1991). Alvarez and Busenitz (2001) identify the concept of resource heterogeneity as the connecting link between entrepreneurship and resource-based theory. The term resource encompasses a multitude of factors that are usually

classified as tangible or intangible assets or physical, human, and organizational capital (Barney, 1991; Chrisman et al., 1998; Katz & Gartner, 1988).

General research questions from the resource perspective are: First, what role do tangible and intangible resources play for new venture creation and performance (Barney, 1991; Chrisman et al., 1998; Ho & Wong, 2007; Katz & Gartner, 1988; Kwon & Adler, 2002)? Second, how do resources come into existence and how do entrepreneurs utilize them to exploit business opportunities (Alvarez & Busenitz, 2001)? Third, how do resource constraints affect new venture creation (Castrogiovanni, 1991; Ho & Wong, 2007)? Fourth, what are the specific mechanisms with which entrepreneurs overcome resource constraints (Shane & Venkataraman, 2000; Venkataraman, Sarasvathy, Dew, & Forster, 2012)?

2.5.1 The Role of Tangible and Intangible Resources in New Venture Creation

Tangible resources are primarily a venture's material assets; a common example is the company's financial capital. Intangible resources refer to the immaterial assets such as social capital. Chrisman et al. (1998) argue that, in order to sustain or to create a competitive advantage, the venture depends particularly on its intangible resources. This follows from the fact that tangible resources are simple to understand and easy to acquire or imitate (Barney, 1991). Intangible resources on the other hand are path-dependent, socially complex and firm-specific (Alvarez & Busenitz, 2001; Barney, 1991; Peteraf, 1993). As such they are more likely to fulfill Barney's (1991) conditions of being valuable, rare, imperfectly imitable, and non-substitutable for generating a sustained competitive advantage. The most important intangible resource is the venture's unique competence, the one thing the company does best and that distinguishes it from every other company (Alvarez & Busenitz, 2001).

In this chapter we focus on financial capital and social capital as the main representatives of tangible and intangible resources. Financial capital refers to the availability of money. Different sources of financial capital are traditional debt financing, venture capital

financing, and informal investments (Ho & Wong, 2007). However, during the entrepreneurial process entrepreneurs usually have to rely on alternative financing methods, such as informal investors like family and friends (Ho & Wong, 2007). Social capital represents a social resource and refers to the goodwill that arises through social relations and can be used to facilitate action (Kwon & Adler, 2002). Meta-analytic research has provided evidence for the importance of social capital in entrepreneurship (Stam, Arzlanian, & Elfring, 2014).

Tangible and intangible resources play an important role across all three phases of the entrepreneurial process (Alvarez & Busenitz, 2001; Baron, 2007a; Chrisman et al., 1998; Gartner, 1985; Shane, 2000). The pre-launch phase requires activities like raising financial capital to develop a business idea into a viable and feasible business opportunity, and to overcome entry barriers like economies of scale or product differentiation (Baron, 2007b; Ho & Wong, 2007). Social capital helps to raise financial capital, because it offers access to the support and assistance of people (Kwon & Adler, 2002). During the launch phase there is a need for tangible and intangible resources to implement the idea and to set up the new venture by establishing viable business structures and acquiring the necessary equipment (Ho & Wong, 2007). A surplus of financial capital thereby serves as a buffer against initial mistakes (Chrisman et al., 1998). At the same time social capital facilitates the access to distribution and supply channels, as well as to the labor market (Kwon & Adler, 2002). Finally, during the post-launch phase entrepreneurs need resources to grow their ventures. Entrepreneurs gain access to traditional financing sources by building up tangible assets and credibility that can be pledged as collateral (Ho & Wong, 2007). Intangible resources remain relevant, since they continue to fulfill the conditions of being valuable, rare, imperfectly imitable, and non-substitutable.

2.5.2 The Effects of Resource Constraints on New Venture Creation

Resource constraints affect new venture creation in several ways. Firstly, resource constraints act as an entry barrier. As such they prevent new venture creation because the capital requirements exceed the entrepreneur's financial capabilities to initiate and maintain start-up activities (Ho & Wong, 2007). One explanation is that the industry's prevailing economies of scale impede the entrepreneur from reaching an efficient production level (Ho & Wong, 2007; Wright, 1987). Secondly, resource constraints affect launch and post-launch performance. This is, for example, due to a lack of financial capital, which hinders the acquisition of necessary assets to build viable organizational structures and production processes (Gartner, 1985). Furthermore, initial mistakes cannot be compensated for and wrong choices cannot be reversed when insufficient resources are available (Chrisman et al., 1998). Furthermore, it restricts the choice of strategies that entrepreneurs can choose from (Chrisman et al., 1998; Wright, 1987). A strategy of cost leadership or differentiation is not feasible for new ventures, when cost advantages or high initial investments cannot be realized (Wright, 1987). Resources and resource constraints thus have a direct effect on the actions entrepreneurs can take and thus affect new venture creation (see Figure 1; main effect of resources).

2.5.3 Overcoming Resource Constraints

Although resource constraints complicate new venture creation they do not prevent it. This may be a) due to an environment or industry in which economies of scale, and other cost advantages, do not protect already existing companies (Shane & Venkataraman, 2000); b) due to the fact that some entrepreneurs are able to secure the necessary financial resources through traditional sources of capital (Holtz-Eakin, Joulfaian, & Rosen, 1994); or c) due to specific action strategies like effectuation, bricolage, and financial bootstrapping, which help

entrepreneurs to attenuate or overcome the negative effect of resource constraints (Baker & Nelson, 2005; Sarasvathy, 2001; Winborg & Landström, 2001). These concepts are briefly described as examples of how previous research has sought to address the problem of resource constraints in new venture creation. These concepts also illustrate how resources and entrepreneurs' actions interact in the new venture creation process (see Figure 1; integrative effect of resources).

Effectuation is a concept based on four core principles and an underlying logic developed by Sarasvathy (2001). The four principles state that entrepreneurs who apply effectuation start with the means at hand, shift their focus from possible profit to affordable loss, form strategic alliances to cooperate with third parties, and exploit contingencies whenever they arise as possible opportunities to enter new markets and industries. The underlying logic of effectuation says that the future cannot be predicted and therefore the entrepreneur should concentrate on those parts that can be controlled (Read, Song, & Smit, 2009; Sarasvathy, 2001). In the context of resource constraints, effectuation offers an approach that facilitates taking action and the creation of a new venture. For example, the vast acquisition of capital or the need for a large employee base is bypassed by concentrating on the means at hand (Sarasvathy, 2001). The entrepreneur thus might forgo the optimal set-up of the company and assemble only the minimum set of resources. Eventually, however, a new business is launched even under resource constraints.

Bricolage is another concept that supports new venture creation under resource constraints (Baker & Nelson, 2005). It is built on similar principles to effectuation, insofar as it strives to always make do with whatever is at hand by recombining it in new ways (Baker & Nelson, 2005). Bricoleurs thus rely on their skill set, knowledge, and any kind of tangible resource in their possession (Baker & Nelson, 2005). Recombining resources in new ways means that bricoleurs find new and originally unintended purposes for existing resources

(Baker & Nelson, 2005). Accordingly, ventures experiment with material inputs and try out new solutions (Baker & Nelson, 2005). Bricolage is often associated with penurious environments (Baker & Nelson, 2005; Fisher, 2012). Making do by creatively recombining the resource at hand constitutes an approach for new venture creation that assumes an extreme form of resource constraint.

Financial bootstrapping describes the different methods used by entrepreneurs in order to secure financial resources whilst avoiding traditional sources of capital (Freear & Wetzel, 1990; Van Auken & Neeley, 1996; Winborg & Landström, 2001). Winborg and Landström (2001) conducted an empirical study in Sweden and identified six different groups of bootstrapping methods. They labeled the different groups as follows: 1) owner financing methods (an exemplary method is withholding the manager's salary); 2) minimization of accounts receivable (using interest on overdue payment); 3) joint utilization (sharing and borrowing resources from other businesses); 4) delaying payments (delaying payments to suppliers); 5) minimization of capital invested in stock (seeking the best conditions possible with the supplier); 6) subsidy finance (applying for funding) (Winborg & Landström, 2001). Financial bootstrapping helps to overcome resource constraints insofar as entrepreneurs can get access to alternative sources of funding and thus engage in start-up activities although they lack traditional sources of funding.

In summary, tangible and intangible resources constitute important enabling or hindering factors in the new venture creation process by affecting the actions entrepreneurs can take (direct effect). However, entrepreneurs can attenuate the hindering effect by using adequate action strategies, such as effectuation, bricolage, or financial bootstrapping. We therefore assume an interaction between resources and entrepreneurs' actions (see Figure 1).

2.6 New Venture Creation from an Institutional Perspective

The institutional perspective plays an important role insofar as institutions provide the context in which entrepreneurship happens. Scott (1987) and Welter (2011) established a threefold division of formal (laws, regulations), informal (culture and norms of society and the market) and social (networks and family) institutions. These institutions set the framework in which the entrepreneur operates, and therefore have to be considered as important factors influencing entrepreneurial action and new venture creation (Gartner, 1995; North, 1990; Shane, 2003; Welter, 2011).

The most recurring research question from the institutional perspective is: How do the different institutional contexts enable as well as constrain the new venture creation process (Gartner, 1995; Manolova, Eunni, & Gyoshev, 2008; North, 1990; Welter & Smallbone, 2011; Welter, 2011)? Second and third interesting questions are: How does institutional change affect new venture creation (Manolova et al., 2008; Meek et al., 2010; Smallbone & Welter, 2010; Welter & Smallbone, 2011; Welter, 2011)? And how does entrepreneurship affect institutional change (Johnstone & Lionais, 2004; Pacheco, Dean, & Payne, 2010; Spence, Gherib, & Biwolé, 2011; Welter & Smallbone, 2011)? The following sections will provide answers to these questions.

2.6.1 The Role of Formal, Informal and Social Institutions in New Venture Creation

The first question asks how formal, informal, and social institutions enable and constrain new venture creation. Formal or regulatory institutions represent the officially codified, enacted, and enforced structure of laws in a community, society, or nation (Manolova et al., 2008). Formal institutions determine the ease of starting a business and set the legal framework the business is operating in (North, 1990). They account for a majority of opportunity creations and restrictions (Welter, 2011), for example by providing a legal infrastructure that reduces the transaction costs (Welter & Smallbone, 2011). Research has

shown that the introduction of property rights promotes new venture creation since it decreases the risk of property loss (Baughn & Neupert, 2003; Luthans, Stajkovic, & Ibrayeva, 2000). Additionally, entrepreneurs can exploit opportunities that emerge from new regulations and rules (Welter, 2011). Yang (2004) describes how entrepreneurs became successful by exploiting poorly defined and enforced rules, allowing them to take advantage of tax deductions. Yet formal institutions can also constrain entrepreneurship by erecting entry barriers through laws and regulations, as well as regulating market exits, and limiting strategic choices by enacting laws that regulate the economic, constitutional, and legal framework (Manolova et al., 2008; North, 1990; Welter & Smallbone, 2011).

Informal institutions like social norms and cultural values compel the entrepreneur to behave in certain ways and influence the decision about whether or not someone engages in an entrepreneurial activity and what type of business is initiated (Meek et al., 2010; Scott, 1987; Welter, 2011). For example, Meek et al. (2010) have shown that social norms in terms of sustainability influence the rate of ecologically sustainable businesses created in a specific region. Furthermore, society's norms and values determine whether a new venture is tolerated and whether the entrepreneur can acquire legitimacy (Zimmerman & Zeitz, 2002).

Social institutions refer to the entrepreneur's networks, such as family and friends (Welter, 2011). They enable entrepreneurial action by providing additional resources, ranging from financial capital, information, potential employees, clients, and business partners, to emotional understanding and support (Welter & Smallbone, 2011; Welter, 2011). Social institutions can also constrain entrepreneurial action by perpetuating prevailing gender roles or stereotypes that prevent individuals from starting their own venture (e.g. age discrimination) (Funken & Gielnik, 2015; Welter, 2011). Social discrimination, for example, can complicate the formation of strategic alliances with third parties as well as entering new markets.

2.6.2 The Effects of Institutional Change on New Venture Creation

The second question pertains to institutional change and how it affects entrepreneurs' actions and new venture creation. Social, societal, and geographical contexts can change over time. In general, entrepreneurship scholars have noted that changing conditions, such as advancements in technology, or economic, political, social, and demographic change, are the source of new opportunities and thus facilitate opportunity identification (Baron, 2006). Opportunity identification and new venture creation can thus be regarded as a consequence of a juxtaposition of new situations or conditions (Baron, 2006). Furthermore, changing contexts have additional effects on new venture creation. First, formal institutional change means changes in laws or regulations (North, 1990; Welter, 2011). As mentioned above, these changes constitute a main source and repression of entrepreneurial opportunities, since they may remove, erect, lower or raise market entry and exit barriers overnight (Smallbone & Welter, 2010). The World Bank's (2010) report on the ease of doing business highlights how such changes affect new venture creations. For example, countries that reduce the necessary time to register a business increase the rate of new venture creations. Further findings show that heavy-handed regulation increases start-up costs. This results in lower profit margins, which discourage entrepreneurs to take action, thus decreasing the rate of new venture creation.

Changes in informal institutions are less frequent and rapid. Whereas political or judicial decisions may become valid instantaneously and thus change the formal institutional context abruptly, informal institutions are more constant (North, 1990). One of the main reasons for this is that informal institutions are based on social norms, which are deeply embedded in society (Manolova et al., 2008; Meek et al., 2010; North, 1990). A change in social institutions, for example a change in local traditions, can promote entrepreneurship by providing more autonomy and freedom to take entrepreneurial action (Welter, 2011). One

example is the efforts by the Indian government to reduce the negative effects of the caste system on class mobility in order to increase entrepreneurship (Dana, 2000). Similarly, changes in norms towards environmental or sustainable behavior have resulted in a trend of pro-environmental and social entrepreneurship (Shepherd & Patzelt, 2011).

2.6.3 New Venture Creation as a Driver of Institutional Change

Just as institutional change can drive entrepreneurial action and new venture creation, entrepreneurial action and new venture creation can drive institutional change. This is because institutions and entrepreneurship are mutually dependent (Johnstone & Lionais, 2004). Institutions can, for example, be changed by the process of path-dependent institutional evolution. This process states that informal institutions are either being changed gradually by adding new procedures or structures, or through the reorientation or recombination toward new purposes (Welter & Smallbone, 2011). Boas (2007) describes this as the layering process, in which an institution is changed incrementally by adding further rules to the pre-existing ones. He argues that this process can result in an eventual change of the institution's fundamental nature (Boas, 2007). The process of reorientation or recombination may be particularly applicable for sustainable entrepreneurs. Sustainable entrepreneurs focus on the preservation of nature, life support, and community, while pursuing business opportunities in order to develop future products and services (Shepherd & Patzelt, 2011). Sustainable entrepreneurs are further being described as the engine of sustainable development which will cause the next industrial revolution and a more sustainable future (Pacheco et al., 2010). Entrepreneurs may change institutions through acting as role models for others to adopt and implement social or environmental practices (Spence et al., 2011). Furthermore, entrepreneurs change institutions by altering and creating norms, government legislation, and property rights (Pacheco et al., 2010). One way of doing this is the use of collective action (Pacheco et al.,

2010). These examples emphasize that entrepreneurs can act as change agents who interact with and change their institutional environment (Welter & Smallbone, 2011).

In short, institutions can constitute drivers as well as obstacles of new venture creation. However, this does not represent a single-sided dependency, since entrepreneurs and the process of creating new ventures can change the institutional context.

2.7 Future Research

Based on the previous sections we will now explain the specific gaps that emerged for each perspective and offer suggestions on how future research can address these gaps. We use our overview of the theoretical perspectives and the phases of the entrepreneurial process to develop an outline of future research questions. In total, we suggest that there are five broad areas for future research. This includes questions with regard to 1) the psychological and team perspective, 2) the resource perspective, 3) the institutional perspective, 4) the process perspective (questions about how certain effects change along the entrepreneurial process), and 5) the integrative perspective (combining perspectives within each phase of the entrepreneurial process).

2.7.1 Future Research Directions for Different Perspectives

First, although the trait approach has received less consideration in recent years, scholars argue that the psychology of entrepreneurs requires further attention (Baron, 2007a; Baum & Frese, 2007; Rauch & Frese, 2007). Future research should therefore refocus on the effects of traits and investigate the mediating mechanisms underlying the relationship between traits and new venture creation (Baum & Frese, 2007; Hisrich et al., 2007; Rauch & Frese, 2007). Rauch and Frese (2007) thereby emphasized the need to a) study specific traits such as achievement motive, and b) match the traits to specific tasks. For example, Baum and Locke (2004) examined how entrepreneurial traits, such as tenacity, affected new venture growth

through the motivational constructs of goal-setting and self-efficacy. An additional avenue for future research is considering personality not only as a predictor but also as an outcome of entrepreneurship. For example, Gielnik, Spitzmuller, Schmitt, Klemann, and Frese (2014b) found that changes in passion are an outcome of entrepreneurial effort. Moreover, personality may change as a consequence of certain events. For example, Judge, Simon, Hurst, and Kelley (2014) provide evidence that work experiences shape personality traits. Consequently, future research should ask the following two questions: To what extent does entrepreneurship positively or negatively affect personality? And to what extent are individual characteristics an outcome of the entrepreneurial process? Future research adopting the trait approach should thus consider Bandura's (1978) concept of reciprocal determinism when analyzing new venture creation.

Furthermore, the field of entrepreneurial cognition offers a multitude of directions for future research. The main question is: What are important cognitive factors in new venture creation and how do they influence the success in the various phases of the entrepreneurial process? For example, Haynie, Shepherd, and Patzelt (2012) analyzed how differences in individuals' metacognitive ability, the ability to reduce the negative consequence of a knowledge deficit, and feedback type affect cognitive adaptability. They found that individuals who scored high on metacognitive ability were more effective in adapting their decisions when new information became available. This suggests that individuals inexperienced in the entrepreneurial process can substitute this knowledge deficit to a certain degree. Grégoire, Corbett, and McMullen (2011) proposed an agenda for future research in the cognitive perspective. They emphasize the need to further analyze the relationship between mind, environment, and entrepreneurial action and to study the role and interactions of different cognitive variables at the same time on different levels of analysis.

With regard to the self-regulatory approach, scholars should research within-person changes of self-regulation and motivation. Lord, Diefendorff, Schmidt, and Hall (2010) point out several promising research opportunities including the analysis of the simultaneous pursuit of multiple goals and the levels of self-regulation involved. Furthermore, important motivational constructs, such as entrepreneurial passion, are not stable but change over time (Gielnik et al., 2014b). Lord et al. (2010) found that 50 percent of the variance in motivation and self-regulation is within-person variability. Thus, a dynamic approach as a direction for future research seems promising. Future research on fluctuations of constructs like entrepreneurial passion would contribute to our understanding of the temporal dynamics inherent in motivational factors.

Regarding entrepreneurial teams, empirical research provides evidence that founding teams are responsible for the majority of new venture creations and are generally more successful than single entrepreneurs (Cooper et al., 1989; Kamm et al., 1990; Lechler, 2001). Hence, it would be of great interest to gain a deeper understanding of the relational and cognitive dynamics and social processes in founding teams. We propose to analyze social processes and how they change along the different entrepreneurial phases and over time. This would allow for a better understanding of how social processes affect new venture creation.

Resources and their effects on new venture creation have been thoroughly studied. However, there is still potential for future research by focusing on how entrepreneurs overcome resource constraints. In this regard future research could analyze the relationship between bricolage, effectuation, and financial bootstrapping as well as which method to apply under what circumstances. Furthermore, cognitive factors might similarly attenuate the negative effect of capital constraints on new venture creation. For example, Bischoff, Gielnik, Frese, and Dlugosch (2013) provide evidence that entrepreneurs can overcome financial constraints through training that promotes financial mental models. Thus, analyzing

moderating effects on the relationship between financial constraints and new venture creation offers a promising direction for future research.

Considering the institutional perspective, Welter (2011) calls for a stronger contextualization of entrepreneurship research in general and stresses that new venture creation not only takes place within a precise context but also carries its own context to the research project. Hence, interesting questions for future research from the institutional perspective are: How do the different institutional contexts enable as well as constrain the venture creation process? How does institutional change affect new venture creation? And how does entrepreneurship affect institutional change (Meek et al., 2010; Welter & Smallbone, 2011)? Since institutions not only constitute market entry barriers but also affect the growth and development of new ventures, we propose it would be interesting to conduct future research that incorporates all phases of the entrepreneurial process. In this context, future research could use longitudinal studies to gain a more nuanced understanding of new venture creation from an institutional perspective, and how the different institutions influence new venture performance across the phases of the entrepreneurial process.

2.7.2 Future Research: Combining the Different Perspectives and Taking an Integrative Approach

We propose that future research should consider a) the combined roles, and possible integrative effects, of the four categories and b) the intermediate role of entrepreneurial action in this process. Combining the different perspectives into an integrative perspective is the most promising avenue for future research. In this integrative perspective on new venture creation, the actions by the entrepreneur, respectively the entrepreneurial team, are at the center of factors predicting new venture creation (see Figure 1). We suggest placing entrepreneurs and their actions center stage because entrepreneurs are the ones who discover, evaluate, and exploit opportunities for new venture creation (Shane & Venkataraman, 2000;

Shane, 2000). Entrepreneurs engage in start-up activities (developing business strategies, acquiring equipment, hiring employees, etc.) to establish viable business structures and operational procedures (Gartner, 1985). New venture creation is thus the outcome of the actions and decisions taken by entrepreneurs to exploit opportunities (Baron, 2007b; Lichtenstein, Carter, Dooley, & Gartner, 2007; McMullen & Shepherd, 2006).

The psychological perspective provides antecedents for entrepreneurial action (see Figure 1). For example, the personality trait creativity is related to entrepreneurial action and the resource perspective. This is because creativity will help entrepreneurs to process and combine new information, which has a positive effect on the generation of creative solutions to overcome resource constraints (Zhao & Seibert, 2006; Gielnik et al., 2012, 2014a). In a similar way, factors from the cognitive, self-regulation and affect approach act as antecedents for entrepreneurial action. Illusion of control, as an example of the cognitive approach, is a bias that indicates how likely it is that an individual overstates his or her ability to control a situation that is mostly determined by chance (Keh et al., 2002). Hence, illusion of control lowers the perceived level of risk when entrepreneurs take actions, resulting in more favorable opportunity evaluations (Keh et al., 2002). Illusion of control can therefore lead to a positive orientation resulting in greater effort (McKenna, 1993). In regard to formal institutions an entrepreneur might thus show more persistence to work his way around unfavorable regulations. Entrepreneurial passion, as an example of the affect approach, offers a further explanation of how entrepreneurs overcome uncertainties or unfavorable conditions. Entrepreneurial passion becomes particularly important when entrepreneurs are confronted with resource constraints, since passion leads to a higher degree of energy and effort (Baum & Locke, 2004). A specific example is the entrepreneur's passion for developing his venture. Passion for development is characterized by activities such as acquiring new customers, entering new markets, and adapting and improving organizational processes (Breugst,

Domurath, Patzelt, & Klaukien, 2012). These activities affect the venture's employees and increase their motivation and commitment, which is imperative, when faced with a lack of financial resources and the inability to pay competitive salaries (Breugst et al., 2012).

The team perspective provides further antecedents for entrepreneurial action, visualized in Figure 1 as the line connecting the team perspective with entrepreneurial action. For example, the initial team size affects the pool of available resources that the team can use to start its business. Hence, a smaller team with a smaller pool of resources may have to invest more effort into overcoming resource constraints. Correspondingly, a homogeneous team, with similar skills and a similar knowledge background, may have to invest more time into searching for information and developing business strategies. Additionally, relational capabilities such as the team's social competence decide how successfully the team is connected to third parties (Baron & Markman, 2003). This can affect the team's capability to exploit opportunities that emerge from new regulations, laws, or strategic alliances, for instance, gaining access to new distribution channels or securing the support and services of different stakeholders.

The resource perspective and especially the existence of resource constraints is a common approach to explain new venture creation or why it may be limited (Chrisman et al., 1998). However, we argue that financial resources are important but constraints can be overcome through entrepreneurial actions and action strategies. For example, the lack of financial capital can be overcome by engaging in financial bootstrapping (Winborg & Landström, 2001). In other words, the lack of financial capital induces the entrepreneur to engage in alternative actions such as borrowing resources from other businesses. The above mentioned concepts of bricolage and effectuation offer two further pathways to create a new venture under financial resource constraints. Effectuation suggests that entrepreneurs achieve their aims by concentrating on their given means (Sarasvathy, 2001). In this context,

entrepreneurs may utilize their networks and form alliances or partnerships in order to acquire the necessary financial capital (Sarasvathy, 2001). Bricolage suggest that entrepreneurs improvise and continuously adapt in order to achieve their aims (Garud & Karnøe, 2003). This is done by using existing resources and applying them in creative and useful ways (Gundry, Kickul, Griffiths, & Bacq, 2011). For instance, in their comparative study Garud and Karnøe (2003) follow a Danish producer of wind turbines, who successfully applies a bricolage approach by using modest resources and local knowledge, in order to progressively build up a viable product. Thus, resource constraints may not hinder new venture creation but lead to the application of new or different action strategies.

Institutions play a significant role in new venture creation. Manolova et al. (2008), Meek et al. (2010) and Welter (2011) show that formal, as well as informal, and social institutions can promote the creation of new ventures. Meek et al.'s (2010) findings further suggest that institutions affect the type of new venture that is created. This is in line with Welter's (2011) notions that local traditions define gender roles, which in turn affect the nature and extent of female entrepreneurship. However, we argue that entrepreneurs are not merely influenced by institutions, but act as change agents who create and alter existing institutions. This becomes especially apparent when looking at social or ecological venture creations, where entrepreneurs are more prone to question the existing paradigms, attempt to do more with less, and focus on long-term sustainability rather than short-term gain (Spence et al., 2011). Pacheco et al. (2010) identified three ways in which entrepreneurial action can change existing institutions. First, by changing industry norms; Pacheco et al. (2010) provide examples from the coffee, tourism, and nanotechnology industry, in which social norms were changed by entrepreneurs through the introduction of formal and informal codes of conduct. Second, entrepreneurs can establish self-enforced property rights (Pacheco et al., 2010). In their study Pacheco et al. (2010) offer an example of how local fishermen established property

rights in order to maintain the lobster population and thus create an environment for sustained venture survival. Third, entrepreneurs can act as change agents by obtaining support from governmental legislation in order to implement cooperative behavior. In this case, Pacheco et al. (2010) refer to the solar energy industry, which achieves the intervention of the government through the Solar Energy Industries Association. This association acts as a voice for the solar energy industry, lobbying its interests. In all three cases, entrepreneurs' actions change institutions. Figure 1 depicts this interplay as the intersection between institutions, entrepreneurial actions, and new venture creation.

Hence, the integrative perspective suggests that the psychological, team, institutional, and resource perspective alone do not sufficiently explain new venture creation. Instead it is the combination of these perspectives and the entrepreneur's actions that provide a comprehensive idea of the interplay between the different factors.

2.8 Conclusion

In this chapter, we sought to demonstrate that there have been different perspectives which scholars have used to explain new venture creation. These perspectives are the psychological, team, resource, and institutional perspectives. The psychological perspective deals with how entrepreneurs think, how they regulate and take control of their actions to achieve their goals, and how emotions affect their actions. The team perspective replaces the concept of the single entrepreneur with the founding team and its members; the team perspective thus moves research to an interpersonal level, looking at how the team's size and composition as well as the social processes affect the team's action. The resource perspective looks at the role of tangible and intangible resources and their effects on new venture creation. Finally, the institutional perspective deals with new venture creation from a macro-perspective, distinguishing between formal (e.g. laws and regulations), informal (e.g. culture and norms), and social institutions (e.g. networks). Although these different perspectives

make their unique contributions, we suggest that a thorough understanding of new venture creation requires an integrative model combining the different perspectives into a single theoretical framework. Only an integrated theoretical model gives due consideration to the complexities entrepreneurs deal with when engaging in new venture creation. This model is depicted in Figure 1, with entrepreneurial action at the center. The other factors either indirectly influence new venture creation through the entrepreneurs' actions or interact with the entrepreneurs' actions on new venture creation.

The review of the literature presented in this chapter has several theoretical implications. We can infer that factors on the individual, team, and societal level influence new venture creation. Scholars can use a theoretical framework from each level to examine and explain new venture creation. However, a more promising approach resulting in theoretical models with higher predictive value is to combine and integrate theories from different levels. For example, Hmieleski and Baron (2009) have used social cognitive theory (A. Bandura, 1989) to explain growth of new ventures. Social cognitive theory proposes that there is a reciprocal determinism between factors on the individual level (e.g. personality), individuals' actions, and the environment (e.g. resources and institutions). Hmieleski and Baron (2009) showed that entrepreneurs' optimism (a construct rooted in the psychological perspective) interacts with environmental dynamism (an environmental construct) in predicting new venture growth. This study demonstrates the value of taking an integrative perspective. Besides social cognitive theory (A. Bandura, 1989), the action-characteristic model of entrepreneurship (Frese & Gielnik, 2014) explicitly considers factors on different levels to explain new venture creation. We hope that future research builds on these theories and develops new theoretical frameworks integrating the different perspectives into a comprehensive model of new venture creation.

The chapter also has several practical implications. While each theoretical perspective (psychological, team, resource, and institutional) provides its own recommendations to promote new venture creation, there are two approaches, which follow from the theoretical model presented in Figure 1. First, the model puts action center stage. This means that interventions focusing on facilitating action should be particularly effective. Recently, scholars have presented training interventions to enhance personal initiative and entrepreneurial action with beneficial effects on new venture performance and new venture creation (Gielnik et al., 2015; Glaub, Frese, Fischer, & Hoppe, 2014). Second, these training interventions should complement interventions which have been implemented on macro levels. For example, reports by the World Bank (2010) on the ease of doing business show that governments are constantly changing the regulatory requirements to facilitate entrepreneurship. Similarly, several measures have been taken to provide entrepreneurs with easy access to capital (De Mel et al., 2008). An integrative perspective combining the individual/team perspective with the resource and institutional perspective should provide better results in promoting new venture creation. In fact, the study by De Mel et al. (2008) provides evidence that providing financial resources works best when entrepreneurs have acquired the necessary abilities to effectively use the financial capital. Similarly, changing regulatory frameworks so that they become more conducive to entrepreneurship only translates into successful entrepreneurship when people take the necessary actions to benefit from the new laws and regulations.

Although an integrative perspective may complicate things in research on new venture creation because it assumes that no single theoretical perspective is sufficient, we think that adopting such a perspective is most promising in advancing our understanding of new venture creation.

3. How Do They Do It?

How Younger Generations Identify Sustainable Opportunities

Abstract

The younger generations are more likely to engage in sustainable entrepreneurship. However, the question how they identify sustainable opportunities (i.e., opportunities for the creation of an environmentally and/or socially sustainable economic activity) goes unanswered. We aim at contributing to the literature on sustainable entrepreneurship by developing a process model of sustainable opportunity identification, which integrates norm-activation theory and attitude theory. Specifically, we argue that the identification of sustainable opportunities is a successive process with transitions from problem to solution identification and from solution identification to sustainable opportunity identification. We further argue that the transitions in this process are moderated by awareness of consequences and entrepreneurial attitude, respectively. We conducted a field study as well as two hybrid experiments. The results confirmed the successive process and the hypothesized moderating effects of awareness of consequences and entrepreneurial attitude. Our findings show that the process of sustainable opportunity identification by younger generations is contingent on their awareness of consequences and entrepreneurial attitude.

Keywords:

Opportunity Identification, Sustainable Entrepreneurship, Entrepreneurial Attitude, Awareness of Consequences

3.1 Introduction

People and institutions worldwide acknowledge the numerous challenges the world is facing (see for example the UN Millennium Development Goals (United Nations, 2015) or the Global 2018 Risk Report (World Economic Forum, 2018)). Environmental degradation, social inequality, and poverty are only some of the many problems, which need global and local solutions. Recently, researchers discussed the role that entrepreneurship could play in this regard, suggesting that sustainable entrepreneurship might constitute an effective approach for identifying and implementing solutions to address the environmental and social problems of our days (see, for example, the special issue of *Journal of Business Venturing* on sustainable entrepreneurship (Hall, Daneke, & Lenox, 2010) or the special issue of *Entrepreneurship: Theory and Practice* on social entrepreneurship (Nicholls, 2010)). Sustainable entrepreneurship deals specifically with “the preservation of nature, life support, and community in the pursuit of perceived opportunities to bring into existence future products, processes, and services for gain, where gain is broadly construed to include economic and non-economic gain to individuals, the economy, and society” (Shepherd & Patzelt, 2011, p. 142).

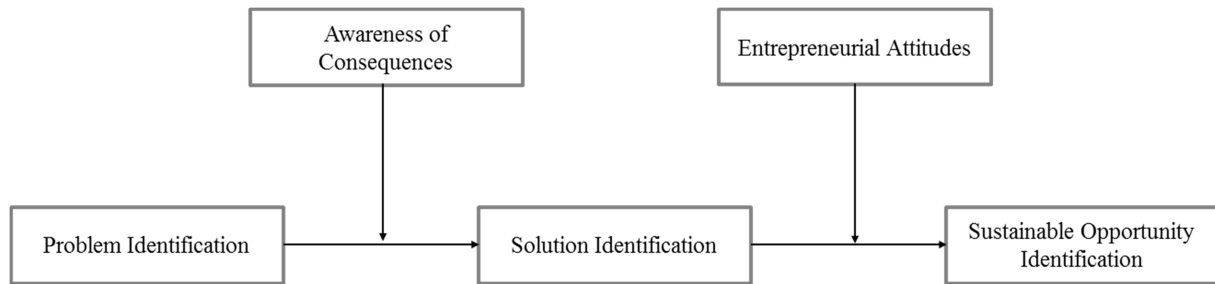
Given the relevance of sustainable entrepreneurship, researchers begun to investigate the phenomenon and revealed an important finding: Interestingly, it is the younger generations who are more likely to engage in sustainable entrepreneurship. Specifically, the Global Entrepreneurship Monitor (GEM) conducted a global comparison and found that sustainable entrepreneurship is more prominent in younger generations, specifically among 18 to 34-year old individuals. Moreover, sustainable entrepreneurship is particularly high for individuals with full-secondary and post-secondary education (Bosma & Levie, 2010; Bosma, Schott, Terjesen, & Kew, 2016). These findings indicate that younger and well-educated individuals are primarily representing the group of people who engage in sustainable

entrepreneurship. To give a typical example of this group of young people, we refer to Carlotta, who we interviewed in the course of this study to explore how the younger generations identify opportunities for engaging in sustainable entrepreneurship. Carlotta was an undergraduate student at the time we interviewed her, and she was engaging in sustainable entrepreneurship. Carlotta started a company, called 2nd Page, together with a group of fellow students. By starting 2nd Page, Carlotta tried to solve the problem of paper waste at her university by turning misprints into notepads. Carlotta had observed that “we print so much: essays, scripts, scientific papers, and all the time misprints are just thrown away.” As a team, Carlotta and her fellow students came up with the solution of reusing the paper even before it gets recycled. “We thought, why not use something that already exists and turn it into something useful.” To upcycle the misprints the team cooperates with a sheltered workshop, where people with disabilities bind new notepads using the misprints. The notepads are subsequently sold on campus. 2nd Page thus successfully exploited a sustainable opportunity.

The case of Carlotta is real and illustrates the engagement of the younger generations in sustainable entrepreneurship. Indeed, we know that sustainable entrepreneurship peaks at a lower age (Bosma & Levie, 2010). However, we do not know how they actually do it. Specifically, we lack a theoretical understanding of how the younger generations identify and exploit opportunities for sustainable entrepreneurship. Both, identification and exploitation of opportunities are critical elements of entrepreneurship (Shane & Venkataraman, 2000). In this paper, we focus on the identification of sustainable business opportunities, which are opportunities for the creation of “future goods and services that sustain the natural and/or communal environment and provide development gain for others” (Patzelt and Shepherd, 2011, p. 632). We focus on the identification of sustainable opportunities because opportunity identification is the starting point of the entrepreneurial process (Baron, 2007b; Kier &

McMullen, 2018), and thus being a prerequisite for developing innovations that can transform businesses and society (Desa, 2012; Schumpeter, 1976; Sankaran Venkataraman, 2004).

In this study, we contribute to answering the question of how they do it by developing a theoretical model that seeks to explain how the younger generations identify sustainable business opportunities (see Figure 2). Specifically, we provide an individual level approach that combines theories from the domain of entrepreneurship and sustainable behavior. We build on the process model of sustainable opportunity identification (Belz & Binder, 2017), which holds that sustainable opportunity identification consists of two transitions: first, from the identification of a social or ecological problem to the identification of a solution to the problem, and second from the identification of a solution to the identification of a sustainable opportunity (Belz & Binder, 2017). Furthermore, we combine the process model of sustainable opportunity identification with norm-activation theory (Schwartz, 1977; Stern, 2000) and attitude theory (Krosnick et al., 1993; Robinson et al., 1991) to explain why individuals are more or less likely to make the first and second transition, respectively. Specifically, we argue that individuals high in awareness of consequences will be more likely to make the transition from problem identification to solution identification and individuals high in entrepreneurial attitude will be more likely to make the transition from solution identification to sustainable opportunity identification. Awareness of consequences is a central element of the norm-activation and value-belief-norm theory of environmentalism (Schwartz, 1977; Stern, 2000). Entrepreneurial attitude represents an element of the attitudinal approach to explain entrepreneurship (Robinson, Stimpson, Huefner, & Hunt, 1991). We focus on these two factors because awareness of consequences guides individuals' attention towards sustaining the natural/communal environment (Patzelt & Shepherd, 2011), and entrepreneurial attitude towards the identification of business opportunities (McCline, Bhat, & Baj, 2000).

Figure 2. Theoretical Model of how the Younger Generations Identify Sustainable Opportunities

To test our theoretical model, we conducted a longitudinal study and two experiments. In a first step, we tested our theoretical model in a longitudinal study with a baseline survey and four measurement waves to capture dynamic aspects in problem-, solution-, and sustainable opportunity identification as well as in awareness of consequences and entrepreneurial attitude. This enables us to investigate time-lagged effects of our independent variables on sustainable opportunity identification. This dynamic perspective takes into account that opportunity identification is not a single event, but a process oftentimes preceded by problem and solution identification (Baron, 2007; Dimov, 2007). In a second step, we replicated the results of the field study and provided evidence for the causal effects of awareness of consequences and entrepreneurial attitude on transitioning through the process of sustainable opportunity identification. We conducted two hybrid between-subject experiments, which combine randomized and quasi-experimental methods (Hsu, Simmons, & Wieland, 2017). In Experiment I, we manipulated awareness of consequences and in Experiment II, we manipulated entrepreneurial attitude. The combination of field study and experimental studies provides robust evidence for the validity of the theoretical framework and answers recent calls for replication studies (Nosek, Spies, & Motyl, 2012; Open Science Collaboration, 2015).

3.2 Theory and Hypotheses Development

3.2.1 Transitions from Problem Identification to Solution Identification and from Solution Identification to Sustainable Opportunity Identification

We hypothesize that sustainable opportunity identification by the younger generations is a process involving transitions from problem identification to solution identification and from solution identification to opportunity identification. We base this hypothesis on the process model of sustainable opportunity identification by Belz and Binder (2017). According to the process model, sustainable entrepreneurship starts with the perception of ecological or social problems for which individuals then identify solutions (Belz & Binder, 2017; Perrini, Vurro, & Costanzo, 2010). Based on the solutions, individuals subsequently identify sustainable business opportunities. Building on the general process model, we more specifically argue that identifying multiple ecological or social problems increases the likelihood of coming up with a solution for at least one of these problems. We base this assumption on the chance-configuration theory by Simonton (1989). Chance configuration theory describes the generation of ideas as a stochastic process. When applied to our theoretical model this stochastic process implies that with an increasing number of identified problems it becomes more likely that individuals will be able to solve at least one of the problems. Similarly, the greater the pool of identified solutions is, the more likely it becomes that one of the solutions will qualify as a sustainable opportunity. Indeed, research supports this reasoning by showing that the likelihood of identifying an opportunity that can be exploited increases with the number of identified opportunities (Gielnik, Krämer, Kappel, & Frese, 2014; Gielnik, Zacher, & Wang, in press.; Gruber, Mac Millan, & Thompson, 2008). We therefore hypothesize:

Hypothesis 1: The number of identified problems is positively related to the number of identified solutions.

Hypothesis 2: The number of identified solutions is positively related to the number of identified sustainable opportunities.

3.2.2 Awareness of Consequences: Facilitating the Transition from Problem

Identification to Solution Identification

How do younger generations transition from problem to solution identification? Based on norm activation theory we theorize that awareness of consequences facilitates this transition. Norm activation theory states that altruistic behavior, including pro-environmental and pro-social behavior (Stern, 2000), results from personal norms that are activated by awareness of consequences and the belief that the individual can take actions to prevent these consequences (Schwartz, 1977). Awareness of consequences is the belief that a valued object is under threat from adverse environmental or social conditions (Stern, 2000). The valued object can be oneself, other people, other species or the biosphere (Stern, Dietz, Abel, Guagnano, & Kalof, 1999). Awareness of consequences takes a central position in the norm activation theory because it activates an individual's sense of obligation to take actions (Stern, 2000). Indeed, research provided evidence that willingness to help others and motivation to engage in environmental action was activated by high levels of awareness of consequences (Schwartz, 1968; Stern, Dietz, & Kalof, 1993).

We hypothesize that awareness of consequences facilitates the transition from problem to solution identification because a high level of awareness of consequences provides the necessary motivation to align the individual's attention towards the social or ecological problem and to generate a solution. Accordingly, in response to the perceived threat, individuals produce a multitude of solutions to prevent the threat. In contrast, individuals with a low level of awareness of consequences are less likely to make the transition from problem to solution identification because they are less likely to perceive the environmental or social problem as a threat. For this reason, they do not align their attention towards the

problem and are less likely to identify a solution to the problem. The facilitating effect of awareness of consequences on transitioning from problem to solution identification can be statistically expressed in a moderation effect (cf., Gielnik et al., in press). Accordingly, we hypothesize:

Hypothesis 3: Awareness of consequences moderates the relationship between problem identification and solution identification: The higher the level of awareness of consequences the stronger is the relationship.

3.2.3 Entrepreneurial Attitude: Facilitating the Transition from Solution Identification to Sustainable Opportunity Identification

How do younger generations transition from solution to sustainable opportunity identification? Based on attitude theory (Krosnick, Boninger, Berent, & Carnot, 1993; Robinson et al., 1991), we hypothesize that high entrepreneurial attitude increases the likelihood to make this transition. This is the case because individuals high in entrepreneurial attitude will be more likely to consider entrepreneurship when thinking about how to implement an identified solution. Attitudes reflect the positive or negative evaluations of an object and influence people's perceptions and feelings, how they process, retain and utilize information, and the extent to which they think and talk about an attitude object (Krosnick et al., 1993). We argue that strong entrepreneurial attitude facilitates the transition from solution to sustainable opportunity identification for two reasons.

First, in cases of a strong attitude, the attitude object becomes subject to more frequent thinking and talking (Krosnick et al., 1993). Thinking and talking refer to how we make sense of the world around us and process information (Baron, 2000). It includes deductive and inductive reasoning, as well as mental stimulations, drawing comparisons and articulating thoughts and possibilities (Markman & Gentner, 2001). Thinking and talking about an attitude thus structures our information about the object and increase its accessibility. Accessibility

can be described as the ease with which the individual will retrieve information about the attitude object (Powell & Fazio, 1984). A higher accessibility increases the sensitivity to situational cues and makes it more likely that the individual will process information in accordance with the attitude (Fazio, Powell, & Herr, 1983; Fazio, Sanbonmatsu, & Powell, 1986). This suggests that an individual high in entrepreneurial attitude will be more likely to consider entrepreneurship when thinking about the implementation of an identified solution.

Second, a positive attitude enhances the interest in the object, which results in increased information gathering and thus knowledge about the attitude object (Krosnick et al., 1993). Support for this assumption is provided by Holbrook et al. (2005), who showed that greater personal importance is associated with information accumulation and a better memory for relevant information. Individuals with a favorable attitude are thus more likely to have a greater knowledge about the attitude object and related topics. In the case of entrepreneurship, this is knowledge about the process of identifying and developing business opportunities. A greater knowledge about these aspects increases the likelihood that individuals identify particular features of the identified solutions that can be developed into potential businesses. Hence, sustainable opportunity identification becomes more likely as a result of solution identification when individuals have a favorable entrepreneurial attitude. We hypothesize:

Hypothesis 4: Entrepreneurial attitude has a moderating effect on the relationship between solution identification and sustainable opportunity identification. The higher the level of entrepreneurial attitude the stronger is the relationship.

3.2.4 The Conditional Indirect Effects

Based on Belz and Binder (2017), we argue that identifying solutions mediates the effect of problem identification on sustainable opportunity identification. Thus, the initially separately described and theoretical derived main effects of problem identification on solution identification and solution identification on sustainable opportunity identification are two

links of the same mediation process. We further assume that the mediating process of problem identification via solution identification on sustainable opportunity identification depends on the level of awareness of consequences. More specifically, there only is a positive effect of problem identification on sustainable opportunity identification through solution identification in cases of high levels of awareness of consequences. We hypothesize:

Hypothesis 5: There is an indirect effect of problem identification on sustainable opportunity identification through solution identification in cases of high awareness of consequences but not in cases of low awareness of consequences.

Furthermore, we hypothesize that the mediation process is moderated by entrepreneurial attitude. This means that the mediating process of solution identification that is responsible for producing the effect of problem identification on sustainable opportunity identification depends on the level of entrepreneurial attitude. More specifically, there only is a positive effect of problem identification on sustainable opportunity identification through solution identification in cases of high levels of entrepreneurial attitude. We hypothesize:

Hypothesis 6: There is an indirect effect of problem identification on sustainable opportunity identification through solution identification in cases of high entrepreneurial attitude but not in cases of low entrepreneurial attitude.

We conducted three studies to test our theoretical model, one field study, and two experiments. In our field study, we tested the overall model and its external validity. Based on the results from our field study we conducted two experiments to test the internal validity of our model and provide evidence for the moderating effects of awareness of consequences and entrepreneurial attitude. In the first experiment, we examined whether awareness of consequences moderates the transition from problem identification to solution identification. In the second experiment, we examined whether entrepreneurial attitude moderates the transition from solution identification to sustainable opportunity identification.

3.3 Field Study: Methods

3.3.1 Sample and Procedure

Our sample consisted of 107 students from a German university. We decided to use a student sample for the two reasons. First, the GEM reports showed that especially younger and highly educated individuals engage in sustainable entrepreneurship (Bosma & Levie, 2010; Bosma et al., 2016). Accordingly, it seems that sustainable entrepreneurship is currently a young (wo-)man's game. We therefore oriented our research question towards the younger generations asking how the younger generations identify sustainable opportunities. Second, human capital and the level of education are positively related to entrepreneurship (Crook et al., 2011; Unger et al., 2011). Bates (1995) showed that individuals with higher levels of education are more likely to become self-employed. Hence, we assume that a student sample is likely to include potential sustainable entrepreneurs.

We contacted the students via social media or direct approach. In our sample, 45 percent of the students were female. On average, the participants were 25 years old. In terms of education, 32 percent of the students were majoring in business psychology, 25 percent in economics and business, 16 percent in sustainability studies, and 27 percent in other fields of study. 57 percent of all students were currently in their bachelor, 21 percent in their master, 17 percent just finished their studies, and 5 percent were doing their PhDs. Of the total sample, 39 percent participated in at least one entrepreneurship course and 65 percent participated in at least one sustainability course. 31 percent of the participants had a self-employed family member.

To test our hypotheses, we used a repeated measurement design. To create and administer our survey we used the online application "LimeSurvey" (Schmitz, 2015). The original English items were translated to German and discussed for meaning and comprehensibility with a native English speaker who was also fluent in German. We

employed one baseline survey and four weekly surveys. We used the baseline survey to measure control variables like age and gender. Subsequently, the participants were asked to fill out four weekly surveys. The weekly surveys assessed the number of identified problems, solutions and sustainable opportunities, the level of awareness of consequences, and entrepreneurial attitude. These measures were assessed in each of the four weekly surveys. Our participants received an email with a link to the surveys each week on Wednesdays and a reminder on Fridays and Saturdays. 113 participants filled out the baseline survey. In order to be included in our study, participants had to fill out at least two consecutive weekly surveys in order to run a lagged analysis (i.e., observations on two consecutive weeks are indicated as t and $t+1$ in the tables). Six participants did not meet these requirements and were therefore excluded. In total, we gathered 424 observations from 107 participants. The lagged design of our study reduced the final number of intra-individual observations to 310 nested within the 107 individuals.

3.3.2 Study Measures

Problem Identification. We measured problem identification during the weekly measurements. We based our measures of problem identification on the first step in the process model of sustainable opportunity identification by Belz and Binder (2017) which is the identification of a problem. In the weekly questionnaires, we asked the participants “During the last week how many ecological problems have you identified?” Subsequently, we asked the same question for social problems. In line with Ucbasaran et al. (2008) and Gielnik et al. (2014), we used winsorizing to eliminate extreme responses and to approximate a normal distribution. We allowed for a maximum of six problems per week in our data analysis, which set values above the 95th percentile to the 95th percentile. For further analysis, we computed the mean score across the two domains of ecological and social problems. The

scale for problem identification showed a good reliability with Cronbach's alpha being .81, computed over all four weeks.

Solution Identification. We measured solution identification during the weekly measurements. We base our measures of solution identification on the second step in the process model of sustainable opportunity identification by Belz and Binder (2017) which is the identification of a solution. In the weekly questionnaires, we first asked the participants how many solutions for the ecological problems they have identified. In a second step we asked them how many solutions for the social problems they have identified. We used winsorizing and allowed for a maximum of six solutions per week in our data analysis, setting values to the 95th percentile. We computed the mean weekly score for identified ecological and social solutions. The scale for solution identification showed a good reliability with Cronbach's alpha being .70, computed over all four weeks.

Sustainable Opportunity Identification. We measured sustainable opportunity identification during the weekly measurements. We base our measures of sustainable opportunity identification on the process model of sustainable opportunity identification by Belz and Binder (2017) and the theoretical conceptualization of business opportunities by McMullen and Shepherd (2006). The third step in the process model of sustainable opportunity identification is the identification of a business opportunity as a solution for a social or ecological problem (Belz & Binder, 2017). In the weekly questionnaires, we asked the participants "During the last week, how many of your solutions seemed promising as a business opportunity in general?" regarding the solutions for ecological and social problems, respectively. We used winsorizing and allowed for a maximum of three sustainable opportunities per week in our data analysis, setting values to the 95th percentile. We computed the mean weekly score for ecological and social opportunities. The scale for sustainable

opportunity identification showed a good reliability with Cronbach's alpha being .76, computed over all four weeks.

Awareness of Consequences. We measured awareness of consequences during the weekly measurements. Awareness of consequences was based on the scale by Stern et al. (1999). Subjects rated the severity of two environmental and two societal problems on a 5-point Likert scale ranging from "not really a problem" to "a very serious problem." The two environmental problems were climate change and toxic substances in air, water, and the soil. The two social problems were overpopulation and poverty with growing inequality. The original scale only covers environmental problems. We added two social problems in order to correspond with the definition of sustainable behavior, which implies that a person is aware of consequences from environmental and social problems (Corral-Verdugo, Mireles-Acosta, Tapia-Fonllem, & Fraijo-Sing, 2011). An example item was "Do you think that climate change is currently a very serious problem, somewhat of a problem or won't really be a problem?" We computed the mean of the four items to attain the participants' individual weekly score for awareness of consequences. Internal consistency was good with Cronbach's Alpha being .89, computed over all four weekly surveys.

Entrepreneurial Attitude. We measured entrepreneurial attitude during the weekly measurements with four items. We based our scale of entrepreneurial attitude on Ajzen (2002). The stem, "To me starting a business is" was rated on a series of five 5-point evaluative semantic differential scales. The following is an example for a negative and positive endpoint: *harmful-beneficial*. High values were associated with the positive endpoints. The mean across the four items was used as a measure of attitude toward entrepreneurship. The internal consistency was good with Cronbach's Alpha being .93, computed over all four weekly surveys.

Controls. All control variables were ascertained in the baseline survey before the weekly measurements. Participants were asked about their age and gender. We further determined if participants had taken any course on sustainability or entrepreneurship and whether any relative owned a business in order to control for prior knowledge on sustainability and entrepreneurial experience. We also controlled for the measurement wave to account for possible trend effects.

3.3.3 Method of Analysis

All analyses were conducted using the RStudio software with the nlme version 3.1-121 for linear and nonlinear mixed effects models (Pinheiro & Bates, 2000). To analyze our data, we used a longitudinal lagged design stacking the weekly measurements to use measures of one week (indicated as t in the following tables) to predict values in the subsequent waves (indicated as $t+1$ in the following tables). Specifically, we used predictors measured in week 1 to predict outcomes in week 2, predictors measured in week 2 to predict outcomes in week 3, and so forth (Ployhart, Weekley, & Ramsey, 2009). This offers several benefits: First, it allows us to determine whether there are consistent patterns among the variables by analyzing their behavior over time. Second, it allows for an approximation of the cause and effect relation. Third, we can model change by controlling for the preceding measurement of the same variable. Our dataset consists of multiple observations, which were derived from the same participants over the course of four weeks. The observations are thus nested within the individuals. This means that our data is subject to dependency and requires a hierarchical approach (Holcomb, Combs, Sirmon, & Sexton, 2010). To account for the dependency, we used random coefficient modeling, as suggested by Bliese and Ployhart (2002). This technique allows intercepts to randomly vary among individuals (Bliese, 2013). The model with random intercepts fitted the data significantly better than a model with fixed effects only ($-2\text{Loglikelihood} = 804.44$ vs. $-2\text{Loglikelihood} = 1009.43$; $\text{Chi}^2 = 204.99$; $p < .001$). We

tested the moderation effects by including an interaction term of the mean-centered predictor and moderator variables. To interpret the direction of the moderated relationships between problem, solution, and sustainable opportunity identification, we followed the procedure suggested by Preacher et al. (2006) and conducted a simple slope analysis. To test our moderated mediation hypotheses, we followed the approach described by Tein et al. (2004) and Muller et al. (2005). We calculated the different pathways for the conditional indirect effects at 1 SD above and below the mean. To test the overall significance we calculated the 95% confidence intervals (CI) with the Monte Carlo method as described by Selig and Preacher (2008).

3.4 Field Study: Results

3.4.1 Test of Hypotheses

To test Hypothesis 1, which states that problem identification has a positive effect on solution identification, we used random coefficient modeling and a lagged design based on the stacked data (Ployhart et al., 2009). The lagged design allows us to predict the effect of problem identification on solution identification while controlling for prior solution identification. This enables us to investigate time-lagged effects of problem identification (t) on changes in solution identification ($t+1$) across all four weeks of the study. We controlled for the prior measurement of the dependent variable in all models. Table 1 presents the results. Model 1a shows that problem identification had a positive and significant effect on solution identification ($b = .14, p < .01$). The data thus provided support for Hypothesis 1.

To test Hypothesis 2, which states that solution identification has a positive effect on sustainable opportunity identification, we used the same approach as described above. Table 2 presents the results. Model 1b shows that solution identification had a positive and significant

effect on sustainable opportunity identification ($b = .04, p < .01$). The data thus provided support for Hypothesis 2.

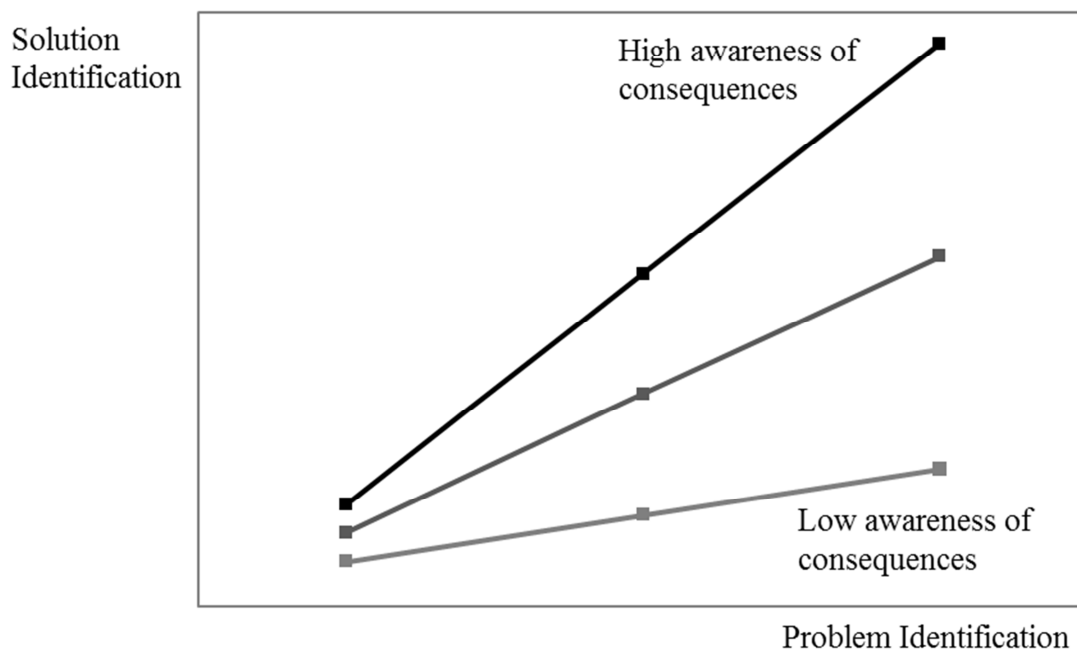
To test Hypothesis 3, the moderating effect of awareness of consequences on the relationship between problem and solution identification, we added the interaction term of awareness of consequences and problem identification to Model 1a in Table 1. Model 2a shows that the interaction term between awareness of consequences and problem identification was significant ($b = .15, p < .01$). We conducted a simple slope analysis for low, moderate and high levels of awareness of consequences. The analysis revealed that in cases of low levels of awareness of consequences the slope was non-significant ($t = 0.81, p = .42$). In cases of moderate and high levels of awareness of consequences the slope was stronger and significant (moderate level: $t = 3.04, p < .01$; high level: $t = 4.45, p < .01$). Figure 3 shows the strength of the relationship between problem and solution identification contingent on awareness of consequences. The data thus provided support for Hypothesis 3.

Table 1. Field Study Results for the Transition from Problem Identification to Solution Identification

DV = Solution Identification (t+1)	Model 1a		Model 2a	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Time	.23 **	.06	.21 **	.06
Age	.00	.01	-.01	.01
Gender	.12	.10	.15	.10
Entrepreneurship Course	.12	.10	.12	.10
Sustainability Course	.05	.10	.07	.10
Family Owned Business	-.10	.10	-.14	.10
Problem Identification (t)	.14 **	.04	.12 **	.04
Solution Identification (t)	.57 **	.06	.53 **	.06
Awareness of Consequences (AC) (t)	.13	.09	.14	.09
Problem Identification x AC (t)			.15 **	.05
AIC	798.74		795.66	
BIC	843.19		843.76	
LogLikelihood	- 387.37		- 384.83	

Note: N = 107, Observations = 310 (lagged design); ^a 0 = female, 1 = male;
^b 0 = no, 1 = yes; * p < .05; ** p < .01.

Figure 3. The Moderating Effect of Awareness of Consequences on the Relationship between Problem and Solution Identification



To test Hypothesis 4, the moderating effect of entrepreneurial attitude on the relationship between solution and opportunity identification, we added the interaction term of entrepreneurial attitude and solution identification to Model 1b in Table 2. Model 2b shows that the interaction term between solution identification and entrepreneurial attitude was significant ($b = .02, p < .05$). We conducted a simple slope analysis for low, moderate and high levels of entrepreneurial attitude. The analysis revealed that in cases of low levels of entrepreneurial attitude the slope was non-significant ($t = 1.28, p = .20$). In cases of moderate and high levels of entrepreneurial attitude the slope was positive and significant ($t = 3.28, p < .01 / t = 3.76, p < .01$). Figure 4 shows the relationship between solution identification and opportunity identification contingent on entrepreneurial attitude. The data thus provided support for Hypothesis 4.

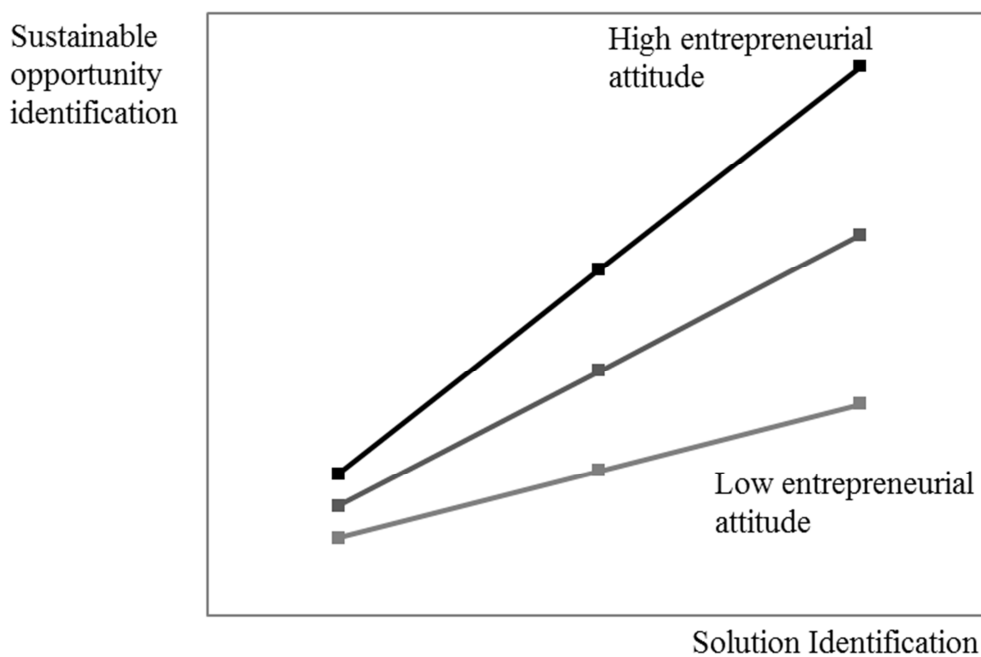
Table 2. Field Study Results for the Transition from Solution Identification to Sustainable Opportunity Identification

DV = Sustainable Opportunity Identification (t+1)	Model 1b		Model 2b	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Time	.00	.01	- .01	.01
Age	.00	.01	.00	.01
Gender	- .02	.07	- .02	.07
Entrepreneurship Course	.11	.07	.11	.07
Sustainability Course	.06	.07	.06	.07
Family Owned Business	- .01	.07	- .02	.08
Solution Identification (t)	.04 **	.01	.04 **	.01
Sustainable Opportunity Identification (t)	- .09 **	.03	- .11 **	.03
Entrepreneurial Attitude (EA) (t)	.03	.02	.03	.02
Solution Identification x EA (t)			.02 *	.01
AIC		5.06		10.23
BIC		49.51		58.34
LogLikelihood		9.47		7.88

Note: N = 107, Observations = 310 (lagged design); ^a0 = female, 1 = male; ^b0 = no, 1 = yes;

* p < .05; ** p < .01

Figure 4. The Moderating Effect of Entrepreneurial Attitude on the Relationship between Solution Identification and Sustainable Opportunity Identification



To test Hypotheses 5 and 6, the moderated mediations, we followed the approach by Tein et al. (2004). Table 3 shows the conditional indirect effects of problem identification on sustainable opportunity identification through solution identification at the mean value as well as one standard deviation above and below the mean of awareness of consequences and entrepreneurial attitude. In order to test overall significance, we calculated the 95% confidence intervals (CI) with the Monte Carlo method as described by Selig and Preacher (2008).

For awareness of consequences as moderator, the results showed that there was a significant indirect effect at one standard deviation above the mean of awareness of consequences (indirect effect at one standard deviation above the mean = .02; 95% CI: Lower bound = .007, upper bound = .026). There was no significant effect at the mean value and at one standard deviation below the mean of awareness of consequences. The findings thus indicate that only for participants with high levels of awareness of consequences there was a significant mediation effect from problem identification to sustainable opportunity identification through solution identification. The data thus provided support for Hypothesis 5.

For entrepreneurial attitude as a moderator, the results showed that there were significant indirect effects, both at the mean value and one standard deviation above the mean (indirect effect for one standard deviation above the mean = .01; 95% CI: Lower bound = .001, upper bound = .017; indirect effect for mean = .01; 95% CI: Lower bound = .001, upper bound = .011). The findings indicate that for participants with high and moderate levels of entrepreneurial attitude there was a significant mediation effect from problem identification to sustainable opportunity identification. As expected there was no significant effect of entrepreneurial attitude for one standard deviation below the mean. The data thus provided support for Hypothesis 6.

Table 3. Field Study Results for the Conditional Indirect Effects of Entrepreneurial Attitude and Awareness of Consequences

Awareness of Consequences	Value	Path a	SE	Path b	SE	Indirect Effect	95% Confidence Interval	
							Lower Level	Upper Level
Entrepreneurial Attitude	+1 SD	0.209	0.047	0.075	0.018	0.016	0.007	0.026
	M	0.125	0.041	0.027	0.015	0.002	-0.000	0.008
	-1 SD	0.042	0.052	-0.020	0.024	0.001	-0.006	0.002
Entrepreneurial Attitude	+1 SD	0.139	0.054	0.050	0.020	0.007	0.001	0.015
	M	0.137	0.041	0.038	0.014	0.005	0.001	0.011
	-1 SD	0.135	0.047	0.026	0.019	0.003	-0.002	0.010

Note: 95% Confidence Interval was calculated with the Monte Carlo method for assessing mediation (Selig & Preacher, 2008).

3.5 Field Study: Discussion

In our field study, we examined who makes the transition from problem identification to solution identification and from solution identification to sustainable opportunity identification. We found support for the hypotheses that awareness of consequences increases the likelihood of transitioning from problem to solution identification and that entrepreneurial attitude increases the likelihood of transitioning from solution to sustainable opportunity identification. The effects that we found are externally valid and the lagged design gives a preliminary idea about the causal direction (Ployhart et al., 2009). However, to provide causal evidence for the moderating effects of awareness of consequences and entrepreneurial attitude we conducted two randomized controlled experiments. We tried to replicate the results of our field study by manipulating the participants' level of awareness of consequences in Experiment I and entrepreneurial attitude in Experiment II. The two experiments tested Hypothesis 1 to 6 in a pre-test post-test control group design. In both experiments, subjects were assigned randomly to one of the two conditions. In both experiments condition A aimed at enhancing the participant's awareness of consequences/ entrepreneurial attitude, while condition B aimed at inhibiting it.

3.6 Experiment I (Manipulating Awareness of Consequences): Method

3.6.1 Sample and Procedure

Participants were contacted in person. In total 53 students from a German university participated in the experiment. 27 students participated in the enhanced awareness of consequences condition and 26 participated in the inhibited awareness of consequences condition. Experiment I thus exceeds the required minimum of 20 participants per condition for between-subject experimental designs (Simmons, Nelson, & Simonsohn, 2011). 55

percent of the participants were female. On average, the participants were 22 years old. In terms of education, 79 percent of the students were majoring in Economics & Business, 21 percent in other fields of study. The sample consisted of 53 bachelor students. Of the total sample, 42 percent participated in at least one entrepreneurship course and 94 percent participated in at least one sustainability course. 45 percent of the participants had a self-employed family member.

The experiment included four separate parts. On average it took the participants 25 minutes to answer all questions. First, the participants had to fill in their personal details and complete a questionnaire on their awareness of consequences. Second, we asked the participants to describe in bullet points all social and ecological problems that came to their mind. We set a time limit of three minutes for answering this question. In step three, we manipulated the participants' awareness of consequences.

We followed the central route to persuasion in order to manipulate the participants' awareness of consequences (Petty & Cacioppo, 1984). We handed out two different articles. In the enhanced condition, the participants read an article about the negative consequences of climate change, toxic substances in air, water and land, overpopulation and poverty, aimed at increasing the participants' awareness of consequences. The participants of the inhibited condition read an article that simplified and downplayed the same problems and the corresponding consequences, aiming at lowering the participants' awareness of consequences. Once the participants read the article, we asked them to summarize in their own words, the main points of the text. After finishing the assignment the participants had to come up with solutions to the identified problems, giving a short description in bullet points. The response time was limited to three minutes. This procedure was then repeated for the identification of sustainable opportunities.

In step four, we asked them to complete a questionnaire on awareness of consequences; we used this measure as a manipulation check. After the participants finished the questionnaire we explained the experiment and thanked them for their participation.

3.6.2 Measures

The measures were identical to those used in the field study, with the exception that we asked the participants to describe all identified problems, solutions and sustainable opportunities in bullet points. We used these descriptions as our measures for problem identification, solution identification, and sustainable opportunity identification.

Problem Identification. For our measure of problem identification, we used a standardized coding scheme based on Mumford et al. (1998). Two independent raters coded the participants' answers for flexibility. In our case flexibility is the number of ecological and social problems that were part of different categories. For example, we asked the participants to describe all social and ecological problems that came to their mind. If a participant wrote down CO₂ emission from passenger cars and CO₂ emission from power plants the answers would be counted as one problem, namely air pollution. We collapsed participants' answers into broader categories to winsorize extreme responses and approximate a normal distribution. We allowed for a maximum of ten ecological and ten social problems, setting values to the 95th percentile. To estimate the inter-rater reliability between the two raters, we calculated intra-class correlation coefficients (Shrout & Fleiss, 1979). The ICC for ecological and social problems was .93, representing good reliability. Based on these results we computed the mean across the two raters for ecological and social problems. Cronbach's Alpha showed good internal consistency for problem identification (.97).

Solution Identification. For our measure of solution identification, the two independent raters counted the number of responses based on fluency (Mumford et al., 1998).

Fluency describes the number of different non-identical answers. For example, if a participant wrote down more efficient wind turbines and solar power plants the answers would be counted as two solutions. We used winsorizing to limit statistical outliers. We allowed for a maximum of ten social and ten ecological solutions, setting values to the 95th percentile. The ICC for ecological and social solutions was .93, representing good reliability. Based on the results we computed the mean across the two raters for ecological and social solutions. Cronbach's Alpha showed good internal consistency for solution identification (.96).

Sustainable Opportunity Identification. For our measure of sustainable opportunity identification, the two independent raters coded the number of business opportunities based on fluency. For example, upcycling plastic into new pellets and upcycling textiles into new clothes was counted as two business opportunities. We allowed for a maximum of six social and six ecological business opportunities, setting values to the 95th percentile. The ICC for ecological and social opportunities was .91, representing good reliability. Based on the results we computed the mean across the two raters for ecological and social solutions. Cronbach's Alpha showed good internal consistency for solution identification (.96).

Awareness of Consequences. The measurement of awareness of consequences was based on the scale of Stern et al. (1999). Subjects rated the severity of two environmental and two societal problems on a 5-point Likert scale ranging from "not really a problem" to "a very serious problem." The two environmental problems were deforestation and toxic substances in air, water, and the soil. The two social problems were overpopulation and undernourishment. An example item was "Do you think that deforestation is currently a very serious problem, somewhat of a problem or won't really be a problem?" We computed the mean of the four items to attain the participants' individual score for awareness of consequences before and after the experiment. Cronbach's Alpha showed satisfactory internal consistency for awareness of consequences (.64).

3.7 Experiment I: Results

To test whether the manipulation was successful, we measured awareness of consequences prior to the experiment and once again at the end of it. The t-test of awareness of consequences prior to the experiment shows a non-significant difference between the enhanced ($M = 5.89$) and inhibited condition ($M = 5.73$; $t = -.87$; $p = .39$). Hence, we can assume that the randomization for awareness of consequences was successful. The results for the independent-sample t-test after the experiment show a significant difference in the mean scores for awareness of consequences in the enhanced ($M = 6.19$) and the inhibited condition ($M = 5.43$; $t = -3.79$; $p < .01$). To analyze how the manipulation worked we conducted a paired t-test for each condition. The results for the enhanced condition of awareness of consequences showed a significant increase from t1 ($M = 5.89$) to t2 ($M = 6.19$; $t = 3.75$; $p < .01$). The results for the inhibited condition of awareness of consequences showed a significant decrease from t1 ($M = 5.73$) to t2 ($M = 5.43$; $t = 2.61$, $p < .01$). We can conclude that the manipulation was successful for both conditions.

To test if the randomization was successful we conducted an independent t-test for the control variables age, gender, self-employed family member, participation in an entrepreneurship and sustainability course. The results show a significant difference for gender in the enhanced ($M = .63$) and the inhibited condition ($M = .27$; $t = -2.78$; $p < .05$) and for participation in an entrepreneurship course in the enhanced condition ($M = .26$) and the inhibited condition ($M = .58$; $t = 2.43$; $p < .05$). For all other variables, the randomization was successful.

We carried out two separate multiple regression analyses to test Hypotheses 1 and 2. The results are displayed in Table 4. Model 1c shows that problem identification had a positive effect on solution identification ($b = .43$, $p < .01$) and Model 3c shows that solution

identification had a positive effect on sustainable opportunity identification ($b = .36, p < .01$).

The data thus provided support for Hypotheses 1 and 2.

Hypothesis 3 predicts the moderating effect of awareness of consequences. The results in Model 2c show a significant interaction effect between problem identification and the experimental condition ($b = .23, p < .05$). The simple slope analysis revealed that for the inhibited awareness of consequences condition the slope was non-significant ($t = 0.75, p = .46$). In case of the enhanced awareness of consequences condition the slope was steeper and significant ($t = 3.22, p < .01$). The data thus provided support for Hypothesis 3. Since the randomization check revealed that there was a significant difference for gender and participation in an entrepreneurship course we conducted a robustness check by adding the interaction terms for problem identification and gender as well as problem identification and participation in an entrepreneurship course to the regression (not displayed in Table 4). The results showed that the interaction between problem identification and the experimental condition remained significant ($b = .29, p < .05$), while the interaction terms for gender and problem identification ($b = -.07, p = .22$) and participation in an entrepreneurship course and problem identification were not significant ($b = .10, p = .28$).

Table 4. Results for Experiment 1 - Manipulating Awareness of Consequences

DV =	Solution Identification						Sustainable Opportunity Identification	
	Model 1c		Model 2c		Model 3c		b	SE
	b	SE	b	SE	b	SE		
Age	-0.03	0.10	0.00	0.09	0.05	0.08		
Gender	1.10 *	0.50	0.74	0.48	0.07	0.39		
Entrepreneurship Course	-0.72	0.49	-0.17	0.46	0.28	0.39		
Sustainability Course	-1.19	1.13	-1.30	1.03	0.88	0.83		
Family Owned Business	-1.22 *	0.50	-0.92	0.48	0.20	0.04		
Problem Identification	0.43 **	0.12	0.42 **	0.10				
Solution Identification					0.36 **	0.10		
Awareness of Consequences Manipulation (AC)			-0.99	0.79				
Problem Identification x AC			0.23 *	0.10				
R ²	0.31		0.48		0.25			
F	3.44 **		5.09 **		2.51 *			

Note: Number of participants = 53; ^a 0 = female, 1 = male; ^b 0 = no, 1 = yes; * p < .05; ** p < .01.

3.8 Experiment II (Manipulating Entrepreneurial Attitude): Method

3.8.1 Sample and Procedure

Participants were contacted via social media or direct approach. In total 70 students from different German universities participated in the experiment. One participant was excluded due to severely incomplete responses, leaving 33 participants in the enhanced entrepreneurial attitude condition and 36 participants in the inhibited entrepreneurial attitude condition. Experiment II thus exceeds the required minimum of 20 participants per condition for between-subject experimental designs (Simmons et al., 2011). 69 percent of the participants were female. On average, the participants were 23 years old. In terms of education, 28 percent of the students were majoring in economics and business, 26 percent in business psychology, 11 percent in teaching, 10 percent in sustainability and cultural studies, 7 percent in engineering and informatics, 15 percent in other fields of study, and 3 percent did not name a field of study. The sample consisted of 47 bachelor students, 14 master students, and 8 otherwise enrolled students. Of the total sample, 30 percent participated in at least one entrepreneurship course and 66 percent participated in at least one sustainability course. 31 percent of the participants had a self-employed family member.

To conduct the experiment we used the online survey application “LimeSurvey.” On average it took the participants 20 minutes to complete the study. The experiment included four separate parts. First, the participants had to fill in their personal details and complete a questionnaire on their entrepreneurial attitude. Second, we asked the participants to describe in bullet points all social and ecological problems that came to their mind. We set a time limit of three minutes for answering this question. In step three, we manipulated the participants’ entrepreneurial attitude.

In order to manipulate the participants’ entrepreneurial attitude, we gave them two assignments. In assignment one, the participants in the enhanced entrepreneurial attitude

condition read an article about the benefits of being self-employed, while the participants of the inhibited entrepreneurial attitude condition read an article about the detriments of being self-employed. We based this manipulation on the central route to persuasion (Petty & Cacioppo, 1984; Petty, Cacioppo, & Goldman, 1981). The central route to persuasion assumes that the number and quality of arguments in a message increases its persuasive impact, by providing more information and thus increasing favorable issue-relevant thoughts (Petty & Cacioppo, 1984). In the enhanced entrepreneurial condition we presented six positive consequences of being self-employed (e.g. higher job satisfaction). In the inhibited entrepreneurial attitude condition we presented six negative consequences of being self-employed (e.g. higher levels of stress). After finishing the first assignment the participants had to come up with solutions to the identified problems. Again, the participants had to give a short description in bullet points. The response time was limited to three minutes. The second assignment was based on the persuasion-from-within approach (McGuire & McGuire, 1996). The persuasion-from-within approach aims at manipulating the salience of an attitude by giving the subject a directed-thinking task. In line with McGuire and McGuire (1991, 1996), we asked the participants to write down as many desirable or undesirable consequences of being self-employed as they could think of. The persuasion-from-within theory predicts that the directed-thinking task will affect the participants' attitude towards self-employment negatively when asked to generate unfavorable consequences and positively when asked to generate favorable consequences. Following the second assignment, the participants were asked to write down the number of solutions that qualified as sustainable opportunities and to describe them in bullet points. The response time was limited to three minutes.

In step four, we asked them to complete a questionnaire about their entrepreneurial attitude; we used this measure as a manipulation check. After the participants finished the questionnaire we explained the experiment and thanked them for their participation.

3.8.2 Measures

We used two independent raters and the same standardized coding scheme as in Experiment I to code our measures of problem, solution, and sustainable opportunity identification. To estimate the inter-rater reliability between the two raters, we calculated intra-class correlation coefficients.

Problem Identification. We used winsorizing to limit statistical outliers. We allowed for maximum values of ten ecological and social problems, setting values to the 95th percentile. The ICCs for ecological and social problems ranged between .91 and .94, representing good reliability. Based on these results we computed the mean across the two raters for ecological and social problems. Cronbach's Alpha showed good internal consistency for problem identification (.82).

Solution Identification. We used winsorizing to limit statistical outliers. We allowed for a maximum of ten ecological and social solutions, setting values to the 95th percentile. The ICCs for ecological and social solutions ranged between .87 and .94, representing good reliability. Based on these results we computed the mean across the two raters. Cronbach's Alpha showed good internal consistency for solution identification (.86).

Sustainable Opportunity Identification. We used winsorizing to limit statistical outliers. We allowed for a maximum of six social and ecological opportunities, setting values to the 95th percentile. The ICCs for ecological and social business opportunities ranged between .97 and .99, representing good reliability. Based on the results we computed the mean across the two raters. Cronbach's Alpha showed good internal consistency for sustainable opportunity identification (.88).

Entrepreneurial Attitude. The measurement of entrepreneurial attitude was based on the scale of Azjen (2002). We used five items to rate entrepreneurial attitude. The stem "To me starting a business is" was rated on a series of five 5-point evaluative semantic differential

scales. The following is an example for a negative and positive endpoint: *useless-worthwhile*. High values were associated with the positive endpoints. Cronbach's Alpha showed good internal consistency for entrepreneurial attitude (.91).

3.9 Experiment II: Results

The manipulation check of the experimental conditions revealed that the manipulation was successful. An independent-sample t-test was conducted to compare the entrepreneurial attitude scores for the enhanced and inhibited conditions before the manipulation. The results show a non-significant difference in the scores for enhanced ($M = 3.04$) and inhibited entrepreneurial attitude ($M = 2.70, t = 1.56, p = .12$) demonstrating the randomization was successful. We conducted a second independent-sample t-test to compare the entrepreneurial attitude score after the manipulation. The results show a significant difference for the mean scores of enhanced ($M = 3.08$) and inhibited entrepreneurial attitude ($M = 2.59, t = 2.10, p < .05$). Furthermore, we conducted a paired t-test for each condition. The results for the enhanced condition of entrepreneurial attitude showed a non-significant increase from t1 ($M = 3.04$) to t2 ($M = 3.08, t = -0.57, p = .57$). The results for the inhibited condition of entrepreneurial attitude showed a significant decrease from t1 ($M = 2.70$) to t2 ($M = 2.59, t = 2.06, p < .05$). We can conclude that the manipulation was successful.

To test if the randomization was successful we conducted an independent t-test for the control variables. The results show a significant difference for participation in a sustainability course between the enhanced condition ($M = .79$) and the inhibited condition ($M = .53, t = 2.34, p < .05$). For all other variables, the randomization was successful.

To test Hypothesis 1 and 2, the direct effects of problem identification on solution identification, and solution identification on sustainable opportunity identification, we carried out two separate multiple regression analyses. We controlled for age, gender, participation in an entrepreneurship and sustainability course, as well as whether a relative owned a business.

We used the control variables for all further analyses. The results in model 1d in Table 5 show that problem identification had a positive effect on solution identification ($b = .57, p < .01$). Model 2d shows that solution identification had a positive effect on sustainable opportunity identification ($b = .45, p < .01$). The data thus provided support for Hypothesis 1 and 2.

Hypothesis 4 predicts the moderating effect of entrepreneurial attitude on the relationship between solution and opportunity identification. The results in Model 3d show a significant interaction effect between solution identification and the experimental condition ($b = .22, p < .01$). We conducted a simple slope analysis for the enhanced and inhibited entrepreneurial attitude condition. The analysis revealed that in cases of inhibited levels of entrepreneurial attitude the slope was non-significant ($t = 0.62, p = .54$). In cases of enhanced levels of entrepreneurial attitude the slope was positive and significant ($t = 3.60, p < .01$). The data thus provided support for Hypothesis 4.

Since the randomization check revealed that there was a significant difference for participation in a sustainability course we conducted a robustness check by adding a second interaction term between solution identification and participation in a sustainability course to the regression (not displayed in Table 5). The results showed that the interaction between solution identification and entrepreneurial attitude remained significant ($b = .20, p < .01$), while the interaction term for solution identification and participation in a sustainability course was non-significant ($b = .22, p = .09$).

Table 5. Results for Experiment 2 - Manipulating Entrepreneurial Attitude

DV =	Solution Identification		Sustainable Opportunity Identification			
	Model 1d		Model 2d		Model 3d	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Age	0.02	0.06	-0.01	0.03	-0.01	0.03
Gender	0.02	0.40	-0.05	0.24	-0.08	0.21
Entrepreneurship Course	0.65	0.43	-0.01	0.26	-0.14	0.23
Sustainability Course	0.04	0.44	0.19	0.25	0.20	0.22
Family Owned Business	-0.16	0.40	0.17	0.24	0.14	0.22
Problem Identification	0.57	** 0.09				
Solution Identification			0.45	** 0.06	0.42	** 0.05
Entrepreneurial Attitude Manipulation (EA)					0.16	0.10
Solution Identification x EA					0.22	** 0.05
R ²	0.47		0.54		0.66	
F	9.07	**	11.90	**	8.09	**

Note: Number of participants = 69; ^a 0 = female, 1 = male; ^b 0 = no, 1 = yes; * $p < .05$; ** $p < .01$.

3.10 Overall Discussion

Sustainable entrepreneurship could play a prominent role in solving some of today's pressing ecological and social problems (Shepherd & Patzelt, 2011). Unfortunately, the field of sustainable entrepreneurship is still considered to be in a nascent stage (Belz & Binder, 2017; Muñoz & Cohen, 2018; Shepherd & Patzelt, 2011). To foster sustainable entrepreneurship, we need a better theoretical understanding that goes beyond our current knowledge, which primarily comprises that sustainable entrepreneurship is carried out by younger generations (Bosma & Levie, 2010; Bosma et al., 2016). Our study aimed at contributing to the field of sustainable entrepreneurship by answering the question of how younger generations identify sustainable opportunities. To this end, we developed and tested a theoretical model of sustainable opportunity identification. Our model was built on the process model of sustainable opportunity identification (Belz & Binder, 2017) and introduced two moderators, entrepreneurial attitude and awareness of consequences, to explain why some individuals of the younger generations are more likely to transition through the process. Specifically, we analyzed how awareness of consequences affects the transition from problem to solution identification and how entrepreneurial attitude affects the transition from solution to sustainable opportunity identification. We found support for our hypotheses suggesting that awareness of consequences and entrepreneurial attitude facilitate the transitions from problem identification to sustainable opportunity identification through solution identification. We believe that our findings have important theoretical and practical implications.

3.10.1 Contributions

Focusing on the younger generations, who are the dominant groups engaged in sustainable entrepreneurship (Bosma & Levie, 2010; Bosma et al., 2016), our study adds to the understanding of how the process of opportunity identification in sustainable entrepreneurship unfolds. Previous work on sustainable entrepreneurship has mostly focused

on system-level factors that explain external factors promoting or inhibiting sustainable entrepreneurship (Cohen & Winn, 2007; Dean & McMullen, 2007; Meek et al., 2010). On the individual level, there are only a few publications which mostly adopted a case study approach (Belz & Binder, 2017; Choi & Gray, 2008; Corner & Ho, 2010; Perrini et al., 2010). However, in order to explain why certain individuals engage in sustainable entrepreneurship and others do not, an individual-level perspective is critical. Patzelt and Shepherd (2011) were the first to offer a model for sustainable opportunity identification that includes individual level factors. However, this model remains conceptual. We contribute to this work by offering an individual level, theoretical framework of opportunity identification in sustainable entrepreneurship that combines theories from the domains of entrepreneurship and sustainable behavior. Specifically, we draw on theories of opportunity identification in sustainable entrepreneurship (Belz & Binder, 2017), sustainable behavior (Stern, 2000) and attitude theory (Krosnick et al., 1993; Robinson et al., 1991) and examine the interplay between these theories in predicting sustainable opportunity identification. Our findings showed that the combination of the theories offer a more comprehensive approach and a better prediction model to explain sustainable opportunity identification. Combining these theories is important because it allows us to incorporate moderator variables that explain who transitions through the process of sustainable opportunity identification. Our study provides evidence that sustainable opportunity identification rests in part on the direction (i.e. awareness of consequences) and motivation (i.e. entrepreneurial attitude) to attend to problems in the ecological or social environment. The addition of awareness of consequences and entrepreneurial attitude to the sustainable opportunity identification process is important because by including these factors we add boundary conditions to the model that enhance or hinder sustainable opportunity identification. We thus add predictive accuracy, which is important in order to develop a more comprehensive understanding of opportunity identification in the sustainable entrepreneurship literature.

Second, our study answers the call to provide theoretical and practical implications of how to change and facilitate people's action concerning sustainability (Stern, 2011) and sustainable entrepreneurship (Patzelt & Shepherd 2011). Our study provides empirical evidence of the importance of awareness of consequences and entrepreneurial attitude for sustainable opportunity identification. As opportunities constitute the first step in entrepreneurship (McMullen & Shepherd, 2006; Shane & Venkataraman, 2000), actors and institutions that want to promote sustainable entrepreneurship can use our findings as a starting point for designing more effective interventions. For example, entrepreneurship training could incorporate lessons that increase awareness of consequences in order to change peoples' perception of social and ecological problems with the aim to identify more solutions. Furthermore, trainings could incorporate lessons to foster participants' entrepreneurial attitudes to increase the likelihood that people consider entrepreneurship as a potential means for implementing the solutions.

3.10.2 Strengths and Limitations

One limitation of our field study is that we relied on self-reported and individual level data in weekly retrospective reports, which may have caused different biases. Self-reported data may be subject to different response biases such as the tendency to respond in socially desirable ways (Donaldson & Grant-Vallone, 2002). Sustainable topics such as environmental protection are seen as collectively desirable but possibly conflicting with individual goals and convenience (Karp, 1996). It is, therefore, possible that participants over reported on their awareness of consequences because they consider it as socially desirable. However, when designing the questionnaire we took steps to minimize a social desirability response bias. First, to ensure the privacy of the interviewee, the questionnaire was carried out online. Second, to ensure anonymity, participants were assured that their names would not be associated with the findings. The participants thus had no reason to deceive on the

questionnaire. Even though these measures may not have completely reduced the social desirability bias we do not assume that it affects the findings of our study. This is because we had no differences in the baseline measure of awareness of consequences in our experiment and were able to replicate the findings of our field study.

Second, our study involved weekly retrospective reports by our participants. We, therefore, admit that memory biases may have occurred (Bolger, Davis, & Rafaeli, 2003). However, weekly reports do have acceptable overlap with momentary reports (Parkinson, Briner, Reynolds, & Totterdell, 1995). Moreover, opportunities are defined as beliefs or expectations that an opportunity exists in the market (Shepherd, McMullen, & Jennings, 2007). As such they are subjective beliefs that cannot be observed adequately. Hence, we assume that self-reports are the most reasonable method for our study.

Third, we acknowledge that the process of problem, solution, and opportunity identification might take other forms. In the process model of sustainable opportunity identification (Belz and Binder, 2017) entrepreneurs first develop a social or ecological solution and only thereafter develop a sustainable solution. However, we challenge the idea that developing a double bottom line solution has to precede the development of a sustainable opportunity. For example, Cohen et al. (2007) argue that market imperfections lead to significant opportunities for sustainable entrepreneurship. Accordingly, we believe that our process model of sustainable opportunity identification is relevant. Furthermore, we acknowledge that our theorizing is likely to be equally applicable to older individuals as well. However, we believe that it is especially pertinent to younger individuals as they grew up being confronted with sustainability topics throughout their basic school education.

Fourth, the generalizability of our study could be limited. Firstly, all participants were German nationals. Scholars agree that culture is an important factor that influences entrepreneurship (Hayton, George, & Zahra, 2002) and sustainability (Husted, 2005). Cultural factors could, therefore, prevent our findings from being applicable to other countries.

Secondly, we specifically used a student sample, which might prevent drawing conclusions to a broader range of the population. However, a student sample may still be appropriate for our study of sustainable opportunity identification, since sustainable entrepreneurship is a prevalent phenomenon for highly educated 18-34 year olds (Bosma & Levie, 2010; Bosma et al., 2016). These findings are further supported by studies that provide evidence that individuals with higher levels of education are more likely to become self-employed (Frederic Delmar & Davidsson, 2000). We, therefore, believe that our findings provide insights into sustainable opportunity identification. Furthermore, entrepreneurship scholars successfully use student samples to test boundary conditions of theoretical models (Hsu et al., 2017). For example, Shepherd and DeTienne (2005) conducted a study using a student sample to examine the moderating effect of prior knowledge on the relationship between financial rewards and opportunity identification. Also, a student sample provides a more homogenous sample than entrepreneurs do (Davidsson, 2004). Entrepreneurship can be seen as a heterogeneous phenomenon where many confounding factors come into play (Davidsson, 2004). Consequently, a more homogenous sample, such as undergraduates may be the better sample to reduce the noise of extraneous variables so that the theoretical model can be tested more profoundly (Hsu et al., 2017).

A major strength of our study is its design including a field study with repeated measurements using random coefficient modelling as well as replicating the findings with randomized controlled experiments. In the field of entrepreneurship, longitudinal studies are considered of great importance to understand and evaluate the entrepreneurial process and its changes over time (Baron, 2007b). Random coefficient modelling enables us to examine relationships that cross both multiple levels and time (Holcomb et al., 2010). We were therefore able to examine time lagged effects of our independent variables nested within individuals on sustainable opportunity identification over a time period of four weeks. This lagged-design enables us to adopt a dynamic perspective that takes into account that

opportunity identification is continuous processes (Baron, 2007b; Lichtenstein et al., 2007). Further, random coefficient modelling accounts for the dependence in our data caused by multiple observations from single persons (Diez Roux, 2002). Finally, while the field study supports the external validity of our findings, the two experiments we conducted support the internal validity and allow us to draw causal conclusions (Campbell, 1957).

3.11 Conclusion

In our study, we developed and empirically tested a process model to examine how younger generations identify sustainable opportunities. We found that individuals had to make two transitions from problem to solution identification and from solution to sustainable opportunity identification. Individuals with high levels of awareness of consequences were more likely to make a successful transition from problem identification to solution identification than individuals with low levels of awareness of consequences. Individuals with high levels of entrepreneurial attitude were more likely to make a successful transition from solution identification to sustainable opportunity identification. Consequently, the joint examination of awareness of consequences and entrepreneurial attitude in the process leading from problem identification over solution identification to sustainable opportunity identification provides a more comprehensive picture of sustainable opportunity identification in younger generations.

4. Adjusting the Sails:

How Deviation from the Business Opportunity affects Performance in Entrepreneurial Teams

Abstract

This article develops a theoretical model that explains how and under which conditions entrepreneurial teams deviate successfully from their business opportunity. Based on action regulation theory, we hypothesize that deviating from the business opportunity has a positive effect on performance which is mediated by goal setting. Furthermore, we hypothesize that the mediating effect is contingent on teams' error orientation. To test our theoretical model we conducted a longitudinal field study with one baseline measurement and 5 bi-weekly measurements. In total our analysis is based on 32 entrepreneurial teams resulting in 145 team observations. Our findings indicate that entrepreneurial teams with high error orientation set themselves higher goals when deviating from their business opportunity. Higher goals then lead to higher team performance. Our study informs theories that seek to explain how action regulation processes in entrepreneurial teams increase performance over time.

Keywords:

Opportunity Identification, Sustainable Entrepreneurship, Entrepreneurial Attitude, Awareness of Consequences

4.1 Introduction

In the process of launching a new venture, entrepreneurs usually deviate from their original business opportunities. Entrepreneurs refine and modify their business opportunities before they reach the final form of a product or service that can be successfully introduced into the market (Dimov, 2007; Eckhardt & Shane, 2003). Profitable and feasible opportunities thus emerge and change in a constant process of interaction between entrepreneurs and their environment (Ravasi & Turati, 2005; Wood & McKinley, 2010). Indeed, research showed that deviation from the original business opportunity is an important process, which may lead to higher new venture growth (Hmieleski & Baron, 2008). Accordingly, scholars agree that deviations from business opportunities are essential in the venture creation process (Frédéric Delmar & Shane, 2004; Reynolds & Miller, 1992; Samuelsson & Davidsson, 2009).

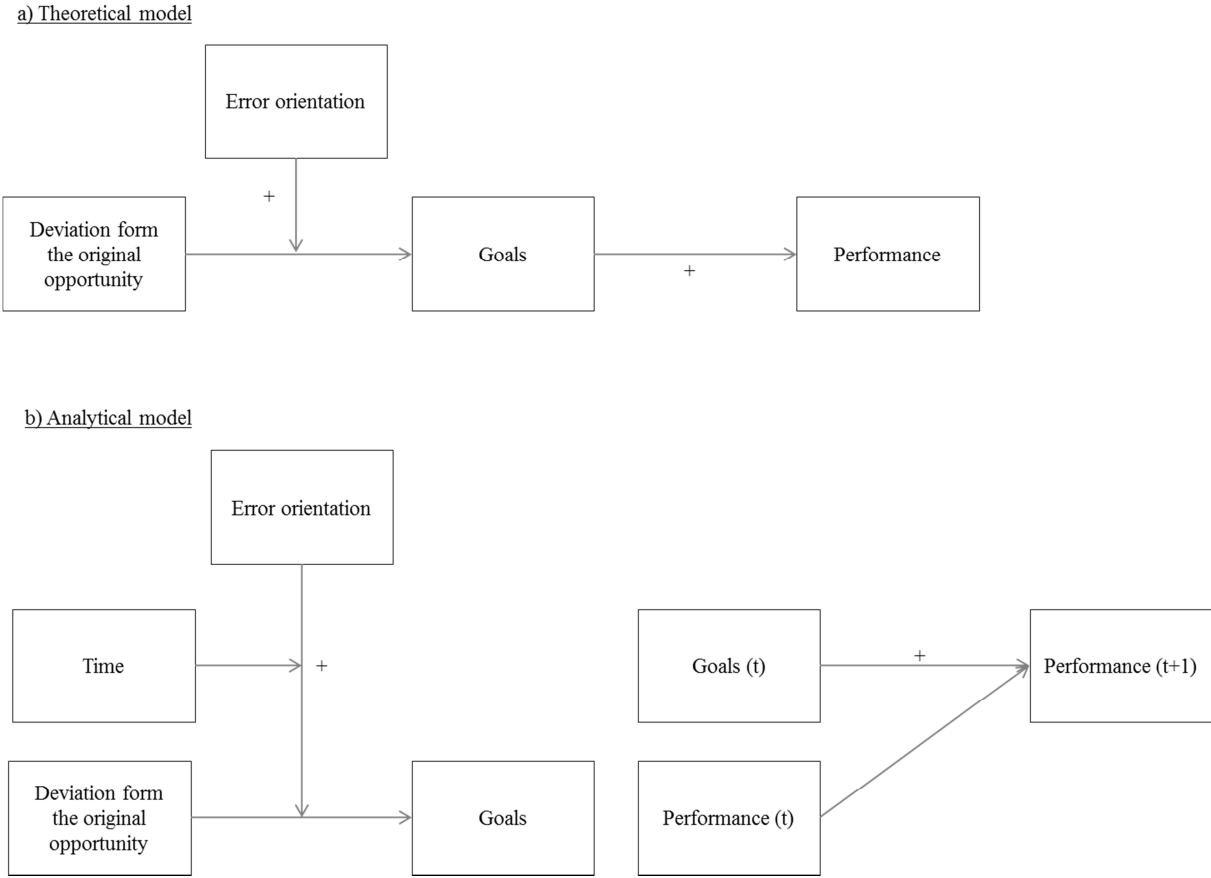
Given the importance of deviations from business opportunities, it is surprising that we lack an understanding of why and under which conditions deviation has a positive effect (Baron, 2007b; Davidsson, 2015; Dimov, 2007; Hmieleski & Baron, 2008; Jack & Anderson, 2002; McMullen & Dimov, 2013; Wood & McKinley, 2010). This study therefore develops a theoretical model from an action theory perspective, which explains how and under which conditions deviation has a positive effect on performance. Furthermore, we focus on the entrepreneurial team as unit of analysis because new venture creation is often a team effort (Cooper et al., 1989; Kamm et al., 1990; Lechler, 2001).

Based on action regulation theory, we argue that teams who are high in error orientation and deviate from their business opportunity more substantially will set themselves higher goals and thus perform more successfully (see Figure 5a, Theoretical model). In general, action regulation theory explains how individuals regulate their actions in order to achieve their goals (Frese, 2007, 2009). In our study, we argue that goal setting mediates the relationship between deviation and performance because setting higher goals directs attention

and increases effort as well as persistence (Locke & Latham, 2002). Furthermore, we argue that error orientation moderates the relationship between deviation and goal setting. Error orientation is an important construct in action regulation theory (Frese & Zapf, 1994). Error orientation is defined as an individual's disposition towards errors (Rybowiak, Garst, Frese, & Batinic, 1999). We focus on error orientation because error orientation captures how people handle errors. Errors are defined as deviations from previously set goals and standards (Frese & Zapf, 1994; Heimbeck, Frese, Sonnentag, & Keith, 2003). Error orientation is thus helpful to understand how people react to deviations from originally specified opportunities. We argue that high error orientation is the base for using deviations to develop and test hypotheses about the venture and the business environment it operates in. Entrepreneurs who are high in error orientation use deviations as informative feedback, reflect about why deviations led to positive or negative performance outcomes, and thus systematically develop their ventures. In contrast, teams with low levels of error orientation will be more likely to follow an unsystematic trial and error approach when deviating from their business opportunity. Consequently, they will be less likely to develop and set higher goals. We therefore argue that error orientation helps to understand the boundary conditions under which deviation from opportunities results in higher performance.

In our study, we focus on the team level because new ventures are frequently started by entrepreneurial teams (Kamm et al., 1990). We assume that goal setting and error orientation are functionally equivalent and therefore homologous across multiple levels (G. Chen, Bliese, & Mathieu, 2005). Indeed, research showed that self-regulatory processes, like goal setting, work equivalent on the individual and team level (DeShon, Kozlowski, Schmidt, Milner, & Wiechmann, 2004). We thus extend the regulatory function of error orientation and goal setting from the individual to the team level. In order to do so we aggregate the team member's attributes to team level constructs. Research has provided evidence that justifies the appropriateness of aggregating individual measures to team level constructs (Jin et al., 2017).

Figure 5. Our Theoretical and Analytical Model of the Interplay between Deviation from the Business Opportunity, Error Orientation, Goals and Performance



Our study contributes to research on deviation from the business opportunity, action regulation theory, and entrepreneurial teams. To our knowledge there are only few studies in the field of entrepreneurship that have analyzed deviation from the business opportunity over the course of time. We take a first step to address this shortcoming by analyzing deviation over the course of the first three months of the entrepreneurial process. We thus add to the understanding of deviation from business opportunity through an action theory lens. Specifically, we contribute to action regulation theory by analyzing why and under which conditions deviations are helpful in the venture creation process. The findings show that teams who are high on error orientation and deviate from their businesses opportunity more substantially will set themselves higher goals over time and perform more successfully.

Second, although research on entrepreneurial teams receives growing attention there is still a relatively small amount of studies that focus on regulatory processes, like goal-setting, when explaining new venture performance (Klotz et al., 2013). We address this gap, by examining the black box through which deviation from the business opportunity leads to higher performance. The findings of our study provide important insights into this black box by analyzing the moderating effect of error orientation on the relationship between deviation and goal setting.

4.2 Hypotheses Development

4.2.1 Deviation from the Business Opportunity, Goal Setting and the Moderating Effect of Error Orientation

We hypothesize that error orientation moderates the effect of deviation from the business opportunity on goals. Deviation from the business opportunity is defined as taking actions to modify the business concept (Hmieleski & Baron, 2008), such as re-specifying a target market or changing the functionality of a product or service. In line with Baum and Locke (2004) we define goals as short-term objectives regarding venture performance. Error orientation is defined as an individual's disposition towards errors (Rybowiak et al., 1999) We base our hypothesis on action regulation theory. The concept of error management is an integral part of action regulation theory. Error management distinguishes between errors and their consequences (Frese, 1995; Frese & Zapf, 1994), whereby errors are defined as deviations from previously set goals and standards (Frese & Zapf, 1994; Heimbeck et al., 2003). Error orientation thus captures how people handle deviations. Specifically, individuals high in error orientation are described as having a focus on the consequences of a deviation instead of the deviation itself (Seckler, Funken, & Gielnik, 2017; Van Dyck, Frese, Baer, & Sonnentag, 2005). Individuals may learn from the deviations, so that unsuccessful deviations from the opportunity will not be repeated in the future (Van Dyck, Van Hooft, De Gilder, & Liesveld,

2010). Behaviors associated with individual-level error orientation should also be beneficial for the entrepreneurial team. For example, team members high in error orientation engage in open communication about deviations from a goal (Van Dyck et al., 2005). This suggests that error orientation is related to creating a positive atmosphere in which deviations are not seen as something negative, but as opportunities to learn, share knowledge, and develop (Frese, 1995). Error orientation has further been related to faster error detection and a better understanding of why a certain situations caused a deviation (Van Dyck et al., 2005). Consequently, team members high in error orientation are able to warn the team if it is headed in a wrong direction. Error orientation is thus helpful to understand how people handle deviations from originally specified opportunities.

We argue that in cases of low error orientation it is likely that the team follows an unsystematic trial and error approach. This is because the team will be less likely to learn from past deviations (Hofmann & Frese, 2011). Thus, the team will randomly deviate from their business opportunity. Consequently, they are less likely to systematically develop their goals. Therefore, there is no effect on goal setting. Indeed, research provided evidence that an unsystematic trial and error approach has no effect on performance (Van Der Linden, Sonnentag, Frese, & Van Dyck, 2001). Moreover, research provided evidence that a low level of error orientation is more likely to reduce learning opportunities when people deviate (Edmondson, 2000).

In cases of high error orientation, it is likely that the team forms hypotheses about their deviation. This is because team members are more likely to engage in collective theorizing (Frese, 1995). The team thus hypothesizes how their deviation may affect performance. Their deviations are not random but based on learning and generating hypotheses based on past deviations (Frese, 1995; Nordstrom, Wendland, & Williams, 1998). Consequently, the team develops a better understanding of their business and environment. Therefore, they make better strategic choices in their deviations from the business opportunity. Thus, in the case of

high error orientation the teams develop over time and consequently, are more likely to set higher goals. Indeed, research provided evidence that hypotheses driven entrepreneurship that is responsive to environmental demands increases performance (Frese, van Gelderen, & Ombach, 2000). Further evidence is provided by van Dyck et al. (2005) who show that a high error orientation in medium sized firms had a positive effect on goal achievement. We therefore hypothesize:

Hypothesis 1: Error orientation moderates the effect of deviation from the business opportunity on goals.

4.2.2 The effect of goals on performance

We hypothesize that higher goals will increase the entrepreneurial teams' performance. In our study we define performance as profit. We base our hypothesis on goal-setting theory (Locke & Latham, 1990). Goal-setting is part of the action sequence in action regulation theory and thus an important building block in action regulation theory (Frese, 2007, 2009). It assumes that higher and more specific goals will lead to higher levels of performance (Hollenbeck & Klein, 1987; Locke, 1991; Locke & Latham, 2002). Specifically, goals affect performance through four mechanisms: First, goals direct attention towards goal-relevant activities, second, they lead to greater effort, third, they increase persistence, and fourth, they indirectly affect action via arousal, discovery, and the use of task-relevant knowledge and strategies (Locke & Latham, 2002). Meta-analytic results provide support for the strong effect of goals on performance (Locke & Latham, 1990). Research showed that this effect is also applicable to groups (Durham, Knight, & Locke, 1997; Knight, Durham, & Locke, 2001; O'Leary-Kelly, Martocchio, & Frink, 1994). We therefore hypothesize:

Hypothesis 2: Higher performance goals will have a direct positive effect on performance.

4.2.3 The conditional indirect effect of error orientation

We hypothesize that goals mediate the effect of deviation from the business opportunity on performance. Furthermore, we assume that the mediating process of deviation via goals on performance depends on the level of error orientation. More specifically, we argue that there only is a positive effect of deviation on performance in cases of high and moderate levels of error orientation. We hypothesize:

Hypothesis 3: There is a conditional indirect effect of deviation from the business opportunity through goals on performance in cases of high and moderate levels of error orientation but not in cases of low error orientation.

4.3 Method

4.3.1 Procedure

The study was part of an entrepreneurship training program that was conducted in Mexico. We used the entrepreneurship training for our data collection for the following three reasons. First, the students had to form teams during the training. Therefore, the training provides a good setting to examine team processes in entrepreneurship. Second, the entrepreneurship training ensured that all students experienced the entire entrepreneurial process. This means that the students had to start their own businesses by identifying and evaluating an opportunity, accumulating the necessary resources, developing a marketing strategy, conducting negotiations, and finally selling their products or services in order to generate profit. This setting allowed us to measure the teams' deviation from their business opportunity, as well as their goals, and performance on a bi-weekly basis. Baseline variables such as gender, age and error orientation were measured before the training started. Third, we sampled student teams who had a strong interest in entrepreneurship. Hence, we assume that our sample is likely to include potential entrepreneurs. The call to apply for the training was

open for students from all disciplines. Participation was free of charge and not part of the curriculum. At the end of the training, students who participated in at least eight sessions received a certificate of participation.

The entrepreneurship training took place at three universities over a course of 12 weeks, from August to November 2016. During the entrepreneurship training the university students received weekly sessions in, for example business opportunity identification, overcoming barriers, and finding starting capital. Each session lasted three hours. In the first session, each group received 2.000 MXN (approximately 100 USD) starting-capital, which was paid back at the end of the training. Exemplary businesses that were started by the student teams were a web design agency, a furniture shop, and a merchandise and accessory shop.

The baseline measurement (T1) was carried out before the training, followed by 5 bi-weekly measurement waves (T2-T6) commencing in the second week of the training. The baseline measurement was completed by 200 students. The bi-weekly measurements during the training were completed by 127 students for t2, 123 students for t3, 97 students for t4, 85 students for t5, and 65 students for t6. In order to test whether there were significant differences between the participants who actively participated (present in at least 8 sessions) and those who dropped out (present in less than 8 sessions) sessions of the training we conducted *t* tests for all baseline measures. The *t* test for gender was significant (Gender: $t = 2.32$; $p < .05$). The *t* test indicates that male participants were more likely to drop out.

4.3.2 Sample

In total 418 students applied for the training. We had the capacity to train 200 students in four classes with approximately 50 students in each class. The 200 students were randomly selected for the training. In the first training session these 200 students formed 40 entrepreneurial teams consisting of five students on average. In total 73 students dropped out in the first two weeks. Among the 73 students were 40 students who had started their teams

together, resulting in the disbandment of eight teams. We conducted interviews with the students who dropped out. We asked them for their main reasons for withdrawal. Most students stated that the training schedule overlapped with their university schedule. The second most common reason were team internal disputes. One more student dropped out over the course of the training, resulting in a total of 74 drop outs. These students were excluded from our analysis. We thus assured that only teams who actively participated in the training were included. Our final sample consisted of 32 teams comprising 126 students. Over the 5 bi-weekly measurement waves we collected 145 team observations (4.53 observations on average per team). We collected less than 5 observations on average because some teams were missing entirely during data collection.

The students were located in three universities. Two of which are situated in Mexico-City and one in Puebla, Mexico. We advertised the training using posters on the campus and by giving short presentations at the universities about the training content and prior results of the training. In order to apply for the training, the students had to fill out an application form and the baseline questionnaire. On average the students were 23.3 years old. Of the final sample 42.9 percent were female and 47.6 percent had a family member who owned a business and 21.4 percent had previously started a business. The teams had 4.8 members on average.

4.3.3 Measures

Deviation from the business opportunity. We measured deviation from the business opportunity during the bi-weekly measurement waves. We based our measure of deviation from the business opportunity on Hmieleski and Baron (2008). However, they measured deviation from the business opportunity with a single item. To have a more comprehensive measure we developed 12 items based on Miles et al (1987) who argue that deviating from the business opportunity can relate to product and market issues, as well as internal operating procedures (Miles, Snow, Meyer, & Coleman Jr., 1978). The items asked “During the last

week, have you” followed by 12 activities to change the business opportunity (e.g. “made changes to the functionality of your product/service”, “made changes to the brand or design of your product or service?”, “changed your target group?”). We used a 3-point Likert scale with the answer options being “no”, “a little”, and “yes”. The internal consistency of the scale was good with Cronbach’s alpha being .82, computed over all five measurement waves. We further computed intra-class correlation coefficients (ICC[1] and ICC[2]) to decide whether the scores for deviation from the business opportunity can be aggregated to the group level (Bliese, 2000). Aggregating deviation from the business opportunity to the team level was justified by a significant one-way analysis of variance (ANOVA) (ICC[1] = .17, $p < .001$; ICC[2] = .71).

Goal setting. We measured goal setting during the bi-weekly measurement waves. Following previous research we measured goals as the team’s next week’s objective for profit (Baum & Locke, 2004). The item asked “Please tell me about your goals for the next week. How much profit do you aim to make next week? Following Kennedy, Lakonishok, and Shaw (1992) we used the “winsorizing” method to deal with extreme responses by participants. The method involves setting values of extreme observations equal to reasonable values (Kennedy et al., 1992). To avoid outliers and to approximate a normal distribution, we used a cut-off that recoded all responses larger than 5,000 MXN as 5,000 MXN, setting values above the 95th percentile to the 95th percentile (see also Gielnik et al., 2015; Ucbasaran, Westhead, & Wright, 2008). Aggregating individual goals to the team level was justified by a significant one-way analysis of variance (ANOVA) (ICC[1] = .31 $p < .001$; ICC[2] = .84).

Performance. We measured performance during the bi-weekly measurement waves. Performance was measured as profit generated in the last week. The item asked “Please tell me about your past week’s performance. How much profit did you make last week? To deal with extreme response regarding performance, we applied the “winsorizing” method and used a cut-off that recoded all responses larger than 5,000 MXN as 5,000 MXN. Aggregating

performance to the team level was justified by a significant one-way analysis of variance (ANOVA) ($ICC[1] = .28$ $p < .001$; $ICC[2] = .82$).

Error orientation. We measured error orientation in the baseline survey before the bi-weekly measurements. We used 14 items from the subscales “learning from errors”, “covering up errors”, and “thinking about errors” from the error orientation questionnaire (Rybowiak et al., 1999). Responses to the subscale “covering up errors” were reverse coded. Sample items for the different subscales are “mistakes assist me to improve my work”, “why mention a mistake when it isn’t obvious”, and “after I have made a mistake, I think about how it came about”. The items were measured on a 5-point Likert scale ranging from “not at all” to “very much”. The internal consistency of the scale was good with Cronbach’s alpha being .71. Following previous research, which argues that in order to understand multilevel phenomena, researchers should operationalize composition variables such as preference for teamwork as the mean across the team we aggregated team members’ individual scores for error orientation and formed the team’s average (mean-level) in error orientation (Bell, 2007; Klein & Kozlowski, 2000). The theoretical reasoning is that a higher level of error orientation on the individual level should manifest itself at the group level as well (Klein & Kozlowski, 2000). This means that it is beneficial for the group to have individual members with a high level of error orientation who increase the team’s overall error orientation rather than having a homogenous level of error orientation. A high level of within group agreement is therefore not a prerequisite for aggregation (Jin et al., 2017).

Control variables. We controlled for the mean levels of the teams’ age, gender, entrepreneurial experience (measured as having an entrepreneur in the family (1 = yes, 0 = no)), having started a business in the past (1 = yes, 0 = no), and team size. Following Foo, Wong, and Ong (2005) we further controlled for diversity in age, gender, and entrepreneurial experience. We measured diversity in age as the coefficient of variation which is calculated by dividing each team’s standard deviation of age by the team’s mean age (M. Der Foo et al.,

2005). We used the Blau's index of heterogeneity (Blau, 1977) to calculate diversity in gender, having an entrepreneur in the family, and having started a business in the past.

4.3.4 Method of Analysis

We hypothesized that entrepreneurial teams' error orientation moderates the relationship between deviation and goals (H1). The dependent variable in Hypothesis 1 is goal setting. We are thus interested in the teams' changes in goals over time. We used our bi-weekly measurement waves to collect repeated measures of goals from each team. Over the course of the training we obtained between three and five observations per team. This allowed us to link the goals for each team over time and model growth trajectories (Ployhart & Vandenberg, 2010). Collecting data from the same teams at repeated measures causes dependency. To account for the nested structure of our data we used random coefficient modelling (Bliese & Ployhart, 2002; Ployhart & Vandenberg, 2010). To test whether there was significant slope variation among the teams we compared a model with random slopes to a model with only fixed effects. The model with random slopes fitted the data significantly better (Deviance: $-2 * \text{Loglikelihood} = 2656.31$ vs. $-2 * \text{Loglikelihood} = 2633.73$; $\text{Chi}^2 = 22.59$; $p < .001$). This indicates that there is significant slope variation among the teams (Bliese & Ployhart, 2002). We hypothesize that error orientation moderates the effect of deviation from the business opportunity on goals. We thus assume that the moderation effect of error orientation on the relationship between deviation from the business opportunity on goals increases over time. We therefore tested the moderating effect of error orientation on the relationship between deviation from the business opportunity and goals by including time as a second moderator (see Figure 5b, Analytical model). Prior to all analysis we mean centered the variables to facilitate the interpretation of the parameter estimates (Preacher et al., 2006).

We used a cross-lagged approach to test the effect of goals on performance (H2). This approach is used to test the effect of the predictor variable measured at time one (t) on the

outcome variable measured at time two (t+1), while controlling for the outcome variable at time one (t) (see Figure 5b, Analytical model). In our study we measured goals and performance in the bi-weekly measurement waves (t2-t6). We thus regressed performance at, for example, t3 on goals at t2 while controlling for performance at t2, and so forth (t4 regressed on t3, t5 regressed on t4, and t6 regressed on t5). The cross-lagged design thus allows us to control for the dependent variable in the previous measurement wave and model change in the dependent variable (Ployhart et al., 2009).

4.4 Results

The statistical measures and the correlations for the study are presented in Table 6 and Table 7. Table 6 shows the correlations for the aggregated baseline measures and the weekly variables at time t. Table 7 shows the correlations for the weekly variables at time t and t+1. The results for the regression analysis testing the effect of deviation from the business opportunity on goals as well as the three-way interaction between deviation from the business opportunity, error orientation and time are presented in Table 8. The results for the regression analysis testing the direct effect of goals on performance are presented in table 9.

Table 6. Correlations of Aggregated Variables

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Mean age ^a												
2. Mean gender ^{a,b}	-.23**											
3. Mean family owned business ^{a,c}	.22**	.04										
4. Mean entrepreneurial experience ^{a,c}	.00	.06	.15*									
5. Mean team size ^a	-.09	.44**	-.02	.14								
6. Age diversity	.76**	.04	-.07	.09	-.07							
7. Gender diversity	-.04	.36**	.07	.20**	.25**	-.05						
8. Family owned business diversity	.41	.17	.18*	.23**	.35**	.32**	.10					
9. Entrepreneurial experience diversity	-.09	.14	.20**	.88**	.27**	-.03	.27**	.15*				
10. Deviation from opportunity	-.18*	.21**	.13	.09	.16*	-.18*	.25**	-.02	.16*			
11. Error Orientation	.03	.31**	-.06	-.17*	.26**	.12	.26**	-.09	-.10	.09		
12. Goals	-.06	.02	-.09	.09	.00	-.02	.02	-.13	.18*	.24*	.03	
13. Performance	.04	.01	-.05	.09	-.06	.12	.03	-.06	.09	.03	-.07	.70**

Note. Number of Teams = 32; Team observations = 145; ^a team mean; ^b = male, 1 = female; ^c 0 = No, 1 = Yes; * p < .05; ** p < .01.

DEVIATION FROM THE BUSINESS OPPORTUNITY

Table 7. Correlations of Aggregated Variables at t and t+1

	<i>Variables</i>	<i>Time</i>	<i>1.</i>	<i>2.</i>	<i>3.</i>	<i>4.</i>
1.	Time	t				
2.	Deviation from opportunity	t	-.04			
3.	Goals	t	-.02	.21*		
4.	Performance	t	.07	.06	.74**	
5.	Performance	t+1	-.03	.08	.43**	.32**

Note. Number of Teams = 32; Team observations = 145; * p < .05; ** p < .01.

4.4.1 Test of Hypotheses

To test Hypothesis 1, which states that the relationship between deviation from the business opportunity and goals is moderated by error orientation we used a random coefficient growth model. The model with a random slope for time fitted the data significantly better than a model without a random slope for time ($\text{Chi}^2 = 22.59$; $p < .001$). The relationship between time and goals thus varies significantly across teams. To account for the varying development of goals we included time as a second moderator variable (see Figure 5b, Analytical model). Table 8 shows the coefficients and model statistics. Model 2 in table 8 shows the interaction between error orientation and deviation from the business opportunity. The results show that the interaction was non-significant ($B = 2411.27$; $p > .05$). Model 3 in table 8 presents the results for Hypothesis 1. The results show that the three-way interaction of deviation from the business opportunity, error orientation, and time had a positive and significant effect on goals ($B = 2,514.87$; $p < .05$). We conducted a simple slope analysis for low and high levels of error orientation, deviation from the business opportunity, and time. For error orientation and deviation from the business opportunity we selected conditional values at one standard deviation above and below the mean. We took time into account by setting the conditional values to 1 and 5, representing the 5 bi-weekly measurement waves. The analysis revealed that in cases of low levels of error orientation and deviation from the business opportunity the slope was non-significant ($t = 0.09$; $p = .93$). In cases of high levels of error orientation and deviation from the business opportunity the slope was steeper and significant ($t = 2.94$, $p < .01$). The data suggests that the effect of deviation from the business opportunity on goals increased over time for teams high in error orientation. The data thus provided support for Hypothesis 1.

Table 8. Goals regressed on Deviation from the Business Opportunity and Error Orientation over Time

Variable	Model 1		Model 2		Model 3	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Mean levels						
Mean age ^a	4.83	87.75	-1.29	84.88	-14.64	82.31
Mean gender ^{a,b}	354.15	521.66	317.38	504.02	156.18	489.68
Mean family owned business ^{a,c}	-300.47	493.91	-160.64	483.91	51.10	476.60
Mean entrepreneurial experience ^{a,c}	-725.02	1035.71	-794.67	999.52	-822.69	974.74
Mean team size ^a	-85.51	112.62	-89.16	108.72	-82.72	104.90
Diversity measures						
Age diversity	-354.11	2232.02	-359.56	2158.48	-376.29	2095.29
Gender diversity	-558.29	760.60	-542.29	735.90	-635.02	714.36
Family owned business diversity	-468.60	746.38	-328.46	735.90	-167.35	701.33
Entrepreneurial experience diversity	1888.63	1387.41	1790.65	1339.42	1580.43	1296.66
Independent variables						
Time	-25.09	70.43	-22.29	70.34	-18.46	62.53
Deviation from opportunity (DO)	752.04 **	246.72	754.32 **	241.93	792.45 **	239.39
Error orientation (EO)	542.60	775.40	555.93	754.97	159.79	778.78
DO x EO			2411.27	1468.15	2208.96	1445.23
Time x DO					154.35	159.02
Time x EO					613.92	338.44
Time x DO x EO					2514.87 *	1005.51
Deviance (-2*Log Likelihood)						
	2219.48		220.55		2149.54	

Note. Number of Teams: 32; Team observations: 145; ^a team mean; ^b = male, 1 = female; ^c 0 = No, 1 = Yes; * p < .05; ** p < .01.

Figure 6 illustrates the three-way interaction of deviation from the business opportunity, error orientation, and time. Following the approach described by Bliese (2013) we used the model coefficients in conjunction with high and low values for error orientation and deviation from the business opportunity to predicted goals for t2 to t6. In line with Ployhart and Vandenberg (2010), we expressed time as a linear term using orthogonal polynomials for t2 to t6 to mitigate the collinearity among the terms. Figure 6 shows that teams with a high level of error orientation who deviated more substantially from the business opportunity set themselves higher goals over the course of the study. Teams with a low level of error orientation and deviations from the business opportunity set themselves lower goals over the course of the study.

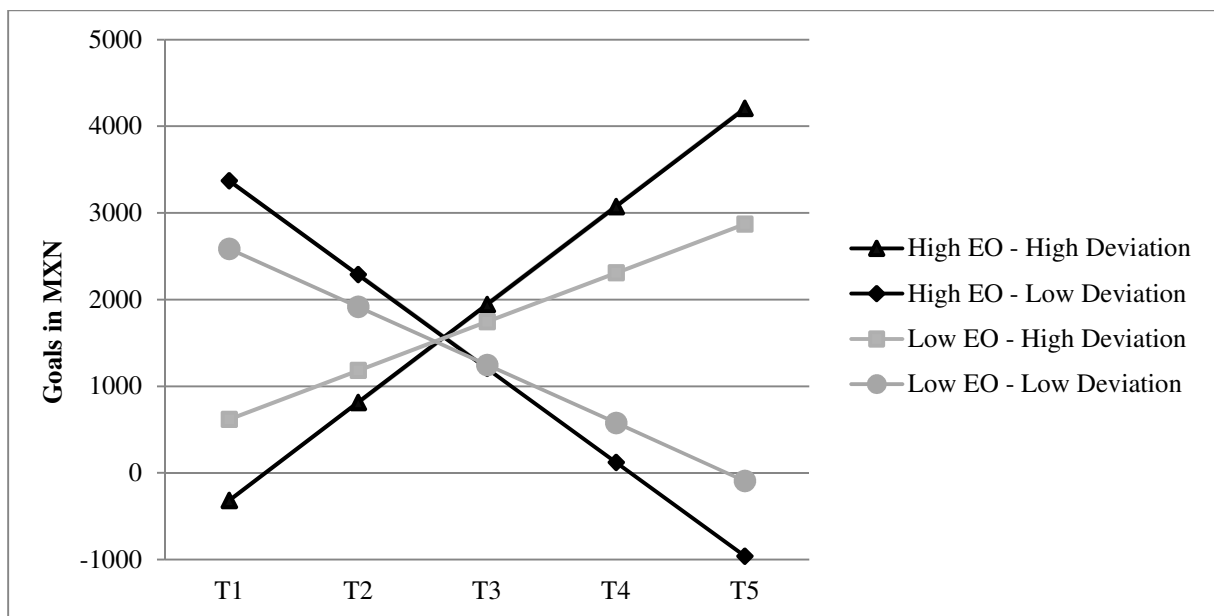
To test Hypothesis 2, which states that goals have a direct effect on performance, we used random coefficient modelling and calculated a cross-lagged effects model in which we predict performance at measurement wave t+1, with goals at measurement wave t, while controlling for performance at measurement wave t. Model 4 in table 9 presents the results. The results show that goals had a positive and significant effect on performance ($B = .13$; $p < .05$). The data thus provided support for Hypothesis 2.

Table 9. Performance (t+1) regressed on Goals (t)

Variable	Model 4	
	Coefficient	SE
Mean levels		
Mean age ^a	8.13	34.39
Mean gender ^{a b}	314.29	212.56
Mean family owned business ^{a c}	-290.53	179.66
Mean entrepreneurial experience ^{a c}	59.95	399.15
Mean team size ^a	13.51	40.00
Diversity measures		
Age diversity	-271.81	861.92
Gender diversity	-638.62	307.11
Family owned business diversity	-21.92	286.90
Entrepreneurial experience diversity	371.53	562.88
Independent variables		
Time	-13.72	37.82
Performance (t)	-0.01	0.08
Goals (t)	0.13 *	0.05

Number of Teams: 32; Team observations: 110 (lagged-design);
^a team mean; ^b = male, 1 = female; ^c 0 = No, 1 = Yes; * p < .05.

Figure 6. The Three-way Interaction of Deviation from the Business Opportunity, Error Orientation and Time on Goals



DEVIATION FROM THE BUSINESS OPPORTUNITY

To Test Hypothesis 3, the conditional indirect effect of deviation from the business opportunity at high, moderate, and low levels of error orientation via goals on performance, we followed the approach described by Tein et al. (2004). Table 10 presents the results for the moderated mediation. The results show that there was a significant indirect effect at one standard deviation above the mean of error orientation (indirect effect = 162.48; confidence interval: lower level = 19.82, upper level = 380) and at the mean of error orientation (indirect effect = 99.45; confidence interval: lower level = 13.98, upper level = 220.50). There was no significant effect at one standard deviation below the mean of error orientation (indirect effect = 27.71; confidence interval: lower level = -86.52, upper level = 160.00). The findings thus indicate that only for teams with moderate and high levels of error orientation there was a significant mediation effect from deviation from the business opportunity to performance. The data thus provided support for Hypothesis 3.

Table 10. Indirect and Conditional Indirect Effect of Deviation from Business Opportunity and Error Orientation on Performance through Goals

	Value	Path a	SE	Path b	SE	Indirect Effect	95% Confidence Interval	
							Lower Level	Upper Level
Conditional Indirect Effect of Error Orientation	+1 SD	1,353.96	429.67	0.13	0.05	162.48	19.82	380.00
	M	792.45	239.39	0.13	0.05	99.45	13.98	220.50
	-1 SD	230.94	447.12	0.13	0.05	27.71	-86.52	160.00

Note: 95% Confidence Interval was calculated with the Monte Carlo method for assessing mediation (Selig & Preacher, 2008).

4.4.2 Robustness Tests and Supplemental Analysis

Given the high correlation between goals and performance ($r = .74$; $p < .01$), we might face an issue of multicollinearity. Multicollinearity can be problematic because it increases the variance of the regression coefficient and makes the coefficient estimates sensitive to minor changes in the regression model (O'Brien, 2007). We assessed multicollinearity using the variance inflation factor (VIF). The VIFs for goals and performance were 1.83 and 1.87, respectively. VIF values smaller than 4 are usually not considered to significantly influence the stability of the parameter estimates (O'Brien, 2007). Nevertheless, we conducted an additional regression analysis to test the effect of goals on performance. In the second regression analysis we did not control for performance at the prior measurement wave to test how stable the coefficients and standard errors are. The results show that goals had a positive and significant effect on performance ($B = .12$; $SE = .04$; $p < .01$). When we compare the results of this second regression analysis to the results of the first regression analysis in table 4 ($B = .13$; $SE = .05$; $p < .05$), we can see that the coefficient and standard error remain stable. We thus assume that multicollinearity is not a serious problem.

4.5 Discussion

While deviation from the business opportunity has a prominent role in the entrepreneurship literature, little research has looked at the underlying mechanism and boundary conditions of this process. This study aimed at developing and testing a model that adds to the understanding of how deviation from the business opportunity affects performance in entrepreneurial teams. Our results show that error orientation moderates the effect of deviation from the business opportunity and goals, such that entrepreneurial teams high in error orientation set themselves higher goals over the course of the study. This effect particularly develops over time. We also found support for the relationship between goals and performance, such that higher goals had a direct positive effect on the team's performance.

Finally, our results show that the mediation effect of deviation from the business opportunity via goals on performance is moderated by error orientation. These findings suggest that it is important to deviate from the business opportunity; second, that error orientation is necessary to improve the relationship between deviation from the business opportunity and goals; third, that goal-setting theory holds true for entrepreneurial teams; and fourth that goals mediate the effect of deviation from the business opportunity only for teams with a high and moderate level of error orientation.

Our findings have several theoretical implications for the entrepreneurship literature. First, a multitude of studies in the entrepreneurship literature argue that entrepreneurs will have to adapt their opportunity through a trial and error approach once they launch their business (e.g. Alvarez & Barney, 2007; Hmieleski & Baron, 2008; McMullen & Shepherd, 2006). For example, Hmieleski and Baron (2008) argue that the fit between the environment and the individual entrepreneur's self-regulation focus will have a substantial influence on the performance of the entrepreneur's business. Specifically, they show that entrepreneurs with a promotion focus will be more successful in an uncertain environment because they are more willing to deviate from their business opportunity. Our study contributes to these findings and shows that teams with a high level of error orientation are especially successful when they deviate from the business opportunity. We argue that deviating from the business opportunity without a high level of error orientation can be detrimental because it is more likely to result in an unsystematic trial-and-error approach which may hinder the entrepreneurial team from developing and setting higher goals. In contrast, a high level of error orientation will increase the likelihood with which the team will generate hypotheses about their deviations. Thus, enabling the team to gain a better understanding of their business and environment and systematically increase their goals.

Second, our study has theoretical implications for the literature on entrepreneurial teams. Recently, research has started to focus on the processes within entrepreneurial teams when

explaining performance, arguing that transitional and interpersonal processes influence performance (Klotz et al., 2013). We argue that there is a need to analyze action processes to gain a balanced understanding of when and under which conditions entrepreneurial teams perform best. By analyzing the dynamic process of goal-setting within entrepreneurial teams our study draws a more comprehensive picture of how entrepreneurial teams become successful.

Third, our study has theoretical implications for the literature on goal-setting and error orientation. We advance theories that seek to explain how goals in entrepreneurial teams develop and change over time. Previous studies that analyzed entrepreneurial teams identified feedback and team characteristics such as goal commitment or team efficacy as significant predictors in explaining changes in team goals and performance (Albert Bandura & Locke, 2003; DeShon et al., 2004; Locke, 1991; Locke, Frederick, Lee, & Bobko, 1984). Our study adds a new construct by introducing error orientation as a moderator. We thus add to the understanding under which conditions entrepreneurial teams perform successfully. Furthermore, our study adopted a dynamic perspective and measured the independent and dependent variables on multiple occasions across the first three months of venture creation. This enables us to examine the goal-setting process during the early start-up phase of the entrepreneurial process. We found that teams high in error orientation set themselves higher goals as they reach later stages of the start-up phase. Our findings thus emphasize that besides a sense of goal commitment and team efficacy it is important that teams have a high level of error orientation. Teams with a low level of error orientation are less likely to benefit from the positive effects of goal-setting. Based on the points above we can assume that team performance is the outcome of a complex process that requires a dynamic research approach.

4.5.1 Strength and Limitations

As with most studies, there are potential limitations in our study that need to be addressed. First, our study used a student sample. The students started their businesses as part of a training program. This may have affected our results, since the students who applied for the training may have been especially eager to acquire new skills and knowledge on how to become an entrepreneur. This might compromise the generalizability of our findings. However, the entrepreneurship literature shows that eagerness to learn new skills and knowledge is an integral part of being an entrepreneur (Deakins & Freel, 1998; Harrison & Leitch, 2005; Wang et al., 2014). It should therefore not matter whether the venture was started as part of a training or within a professional context.

Second, there may have been potential measurement limitations. Performance and goals were both measured with a single item. Thus, we were not able to estimate the measures' reliability. However, the teams reported facts (profit generated in the last week) and predictions of the future (expected profit for the next week). Measuring these kinds of facts and predictions with single items is considered less problematic because they do not evaluate psychological constructs (Wanous, Reichers, & Hudy, 1997). Moreover, the questions were clearly framed, leaving little room for misinterpretation. Considering the fact that the ICC values were good, we assume that reliability was not a problem. However, goals and performance showed a high correlation ($r = .74$; $p < .01$), which may indicate multicollinearity. In the robustness check we were able to show that the regression coefficient and standard error for goals stayed stable, when controlling for performance in the previous measurement wave and when not doing so. Moreover, the VIF values were smaller than 4 and thus acceptable. We therefore assume that multicollinearity is not a serious problem. Furthermore, we assessed all variables using self-reports. We may therefore have inflated correlations due to common method bias. However, Evans (1985) as well as Siemsen and

colleagues (2010) showed that interaction terms are not affected by inflated variances when controlling for the main effect of the respective variable. The three-way interaction between deviation from the business opportunity, error orientation and time should thus lower the risk of common method bias.

We consider the longitudinal design of our study a major strength. In the entrepreneurship literature longitudinal studies are especially useful because they help us to understand the changes in the entrepreneurial process over time (Baron, 2007b). Using random coefficient growth modelling and integrating cross-lagged effects has further benefits. Growth modelling is the appropriate way to look at how teams change over time and whether there are differences in patterns of change (Bliese & Ployhart, 2002). Random coefficient modelling further accounts for the dependence in our data caused by the longitudinal design of our study (Diez Roux, 2002), while the integration of cross-lagged effects is an appropriate way to measure change in the dependent variable (Holcomb et al., 2010).

4.5.2 Implications for Practice and Future Research

Our study has shown that it is necessary to deviate from the business opportunity in order to increase goals and thus performance. Practitioners who are launching their business should therefore be prepared to deviate from their business opportunity. By building a team that is high in error orientation practitioners may increase the likelihood to take the right actions and to prevent the negative consequences of errors when deviating from the business opportunity. However, we do not suggest that practitioners follow a blind trial and error approach. Rather, practitioners have to formulate ideas as to what effect they believe their deviation will have in order to be able to trace back which actions were effective.

Since our study only covered the first 12 weeks of the entrepreneurial process we cannot say with certainty whether deviating from the business opportunity will be beneficial at all stages of the entrepreneurial process. It would thus be interesting for future research to

conduct a study that follows the entrepreneurial team for a longer timeframe to see whether deviating from the business opportunity becomes detrimental at a later stage.

4.6 Conclusion

Our study showed that goal-setting in entrepreneurial teams is a dynamic and complex process that is contingent on error orientation. We were able to confirm that entrepreneurial teams have to deviate from their business opportunity when launching their business. However, this deviation should be accompanied by a high level of error orientation to increase the teams' goals. We were further able to replicate the goal-setting effect for entrepreneurial teams, showing that higher goals led to higher performance.

5. General Discussion

In this dissertation, we sought to contribute to the literature on the process perspective and provide insights into underlying mechanisms of the startup phase of new ventures. More specifically, we developed three theoretical process models that advance our understanding of essential phases of the entrepreneurial process. In chapter 2, we developed a process model that combines the psychological, team, resource, and institutional perspectives into a single theoretical framework. Thus, providing an integrated theoretical model that gives due consideration to the complexities entrepreneurs deal with when engaging in new venture creation. Chapter 3 focused on the process of how younger generations identify sustainable opportunities. The theoretical model and empirical findings demonstrate that sustainable opportunity identification is a process that requires two transitions, from problem identification to solution identification and from solution identification to sustainable opportunity identification. Moreover, the findings show that these transitions are contingent on awareness of consequences and entrepreneurial attitude. Chapter 4 addressed the moderated mediation of deviation from the original opportunity on performance via goals. The results showed that entrepreneurial teams with a high level of error orientation set themselves higher goals when deviating from their original. Higher goals then lead to higher team performance.

5.1 General Theoretical Implication

This dissertation contributes to the literature on entrepreneurship and in particular to the process perspective. Three important theoretical implications result from this dissertation.

First, this dissertation answers the call for more theoretical and empirical research on entrepreneurship as a process (McMullen & Dimov, 2013). The integrative process model in chapter 2 provides a framework that includes variables at all levels of analysis. By combining

and integrating theories from different levels the model provides a promising approach for future research offering higher predictive value and resolving the tension between different approaches to the study of entrepreneurship (Baron, 2007b). Moreover, the model in chapter 2 reflects that the factors from the four perspectives may have a changing influence on the different stages in the entrepreneurial process. In chapter 3, we used a longitudinal research design to show that the identification of sustainable opportunities is a process with two transitions. In chapter 4 we demonstrate how the interplay of deviation from the original opportunity and error orientation stimulates change in the team's goals and performance. Thus, this dissertation advances our understanding of important underlying mechanisms in entrepreneurship and recognizes the inherent dynamics in the entrepreneurial process.

Second, we add to the literature on entrepreneurship by developing and testing a theoretical model of sustainable opportunity identification. The process of sustainable opportunity identification, depicted by our findings, points towards a more complex and segmented process of opportunity identification in sustainable entrepreneurship. Specifically, sustainable opportunity identification may involve more transitions than typically assumed in entrepreneurship research (Short, Ketchen, Shook, & Ireland, 2010). The existence of these additional phases implies that until now research may have neglected part of the opportunity identification process. Our findings suggest that the inclusion of additional transitions and variables may be necessary to fully understand the process of opportunity identification in sustainable entrepreneurship.

Third, we add to the entrepreneurship literature by developing and testing conditional indirect effect models. Specifically, our results suggest that a) problem identification has an effect on sustainable opportunity identification through solution identification at high levels of awareness of consequences and entrepreneurial attitude and b) deviation from the original opportunity increases performance via goals for teams that have a high average of error orientation. Our models thus go beyond mediating models and take into account the

conditions under which sustainable opportunities are identified and the effect of goal-setting occurs. We therefore answer the call for more conditional indirect effect models that determine both how and when entrepreneurs identify sustainable opportunities and entrepreneurial teams perform successfully (Johns, 2006; Klotz et al., 2013; Preacher, Rucker, & Hayes, 2007).

5.2 General Practical Implication

Our findings have important implications for practitioners. First, chapter 2 showed that each theoretical perspective provides its own way of promoting new venture creation with the different factors becoming important at different stages in the process. However, the integration of these different perspectives into an integrative framework provides a more holistic approach to promote new venture creation. Thus, governments that try to promote entrepreneurship should take the interplay of the different factors and levels into account when introducing interventions aimed at new venture creation.

Second, if sustainable entrepreneurship can indeed make substantial contributions to the preservation of our natural and communal environment then efforts to understand the process of sustainable opportunity identification are well justified. Hence, individuals interested in launching a sustainable start-up and governments interested in fostering sustainable entrepreneurship should acknowledge the underlying transitions of the sustainable opportunity identification process. Understanding this process will enable educational institutions to train not only the younger generations to be more capable at identifying and thus starting sustainable ventures.

Third, entrepreneurial teams might wish to consider the inclusion of team members that are high in error orientation. This involvement might increase the teams focus on the positive consequences of errors such as learning and the reduction of negative consequences such as undesirable emotions. Consequently, the team should gain a higher average of error

orientation and thus improve the effect of deviation from the original opportunity via goals on the team's performance.

5.3 General Conclusion

Entrepreneurial processes like sustainable opportunity identification and deviation depict a promising direction to deepen our understanding of new venture creation. This dissertation examined underlying mechanisms and boundary conditions of these processes and suggested how an integrative model of entrepreneurship may advance future research. The findings support the assumption that sustainable opportunity identification and deviation are dynamic processes that are contingent on moderating variables. This indicates that entrepreneurial processes are complex, yet important to understand since entrepreneurship is a key driver of economic, social, and individual development.

6. References

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